Appendix B
Prime Farmland Assessment Memo

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MEMO

Date:

May 2024

To:

Gopher State Solar, LLC

From:

Merjent, Inc.

Subject:

Prime Farmland Impact Assessment
Gopher State Solar Project, Renville County, MN

1.0 INTRODUCTION

On behalf of and in coordination with Gopher State Solar, LLC (Gopher State Solar), Merjent, Inc. (Merjent) prepared this memorandum to address siting a utility-scale photovoltaic (PV) solar energy conversion facility in Minnesota on soils designated as prime farmland. The Gopher State Solar Project (Project) will generate up to 200 megawatts (MW) of reliable, renewable energy. The proposed Project will be located in Kingman, Osceola, and Bird Island townships, Renville County, Minnesota. The Project is approximately 1,645 acres and 977 acres are proposed for use by the solar panels and associated infrastructure (see Figure 1).

The applicant is Gopher State Solar, LLC. Ranger Power, a Delaware limited liability company specializing in the development of utility-scale renewable energy projects in the United States, is developing the Project on behalf of Gopher State Solar. Gopher State Solar's indirect parent company is D.E. Shaw Renewable Investments (DESRI). DESRI and its affiliates acquire, own, and manage long-term contracted renewable energy assets in North America.

Similar to other Minnesota solar projects, Gopher State Solar evaluated alternative sites within 5 miles of the chosen substation, and more broadly within the county in which the project would be located and a neighboring county. Other sites were ultimately ruled out because they were unable to meet the limit set in the Rule that an energy generation facility should not occupy more than 0.5 acre of prime farmland per MW of net generating capacity. The Rule goes on to state that the limit does not apply if no feasible and prudent alternative is available. Gopher State Solar determined that other sites within 5 miles of the proposed substation were not feasible or prudent.

This prime farmland impact assessment was completed in accordance with guidance issued by the Minnesota Department of Commerce Energy Environmental Review Analysis (EERA) in May 2020 (Guidance) as it relates to the Rule. The goal of the Guidance is to outline factors that developers should consider and describe steps that should be taken to develop a solar site on prime farmland. This assessment supports pertinent sections of the Site Permit Application (Application) being prepared for the Project.

The assessment includes a summary of the Rule, Project description, the need for the Project, and permitting requirements. This is followed by an analysis of siting constraints listed in the Guidance, which addresses factors driving choice of region where the Project is located and assessment of a suitable site for compliance with the Rule. The assessment indicates that Gopher

State Solar was unable to identify a feasible and prudent alternative to the proposed Project location. Therefore, Gopher State Solar has complied with the Rule and the Project should be allowed to occupy more than 0.5 acre of prime farmland per MW.

2.0 PRIME FARMLAND EXCLUSION RULE

The Guidance indicates that “expansion of solar development frequently conflicts with the Public Utilities Commission (Commission) Rule to exclude energy generating installations from prime farmland (a federal designation of soil types). Specifically, no such installation may be permitted that includes more than 0.5 acre of prime farmland per MW of net generating capacity,” unless the project qualifies for an exemption from the Rule, such as that there is no feasible and prudent alternative to the chosen location.

In its entirety, Minnesota Rule 7850.4400, subpart 4, states:

> No large electric power generating plant site may be permitted where the developed portion of the plant site, excluding water storage reservoirs and cooling ponds, includes more than 0.5 acres of prime farmland per megawatt of net generating capacity, or where makeup water storage reservoir or cooling pond facilities include more than 0.5 acres of prime farmland per megawatt of net generating capacity, unless there is no feasible and prudent alternative. Economic considerations alone do not justify the use of more prime farmland. "Prime farmland" means those soils that meet the specifications of Code of Federal Regulations 1980, title 7, section 657.5, paragraph (a). These provisions do not apply to areas located within home rule charter or statutory cities; areas located within two miles of home rule charter or statutory cities of the first, second, and third class; or areas designated for orderly annexation under Minnesota Statutes, section 414.0325.

The following assessment takes into account the above Rule, the Guidance, as well as the Commission’s recent orders considering the Rule for other solar energy projects permitted by the Commission.

3.0 PROJECT DESCRIPTION

The Project is an up to 200 MW PV solar energy generating facility located in Kingman, Osceola, and Bird Island townships, Renville County, Minnesota. The Project Area is approximately 1,645 acres with 977 acres proposed for use by the solar panels and associated infrastructure (see Figures 1 and 3). The current layout and proposed equipment are preliminary and subject to change as the design advances.

Gopher State Solar has secured site control for the entire Project Area via easement agreements and lease agreements for the generation interconnect (gen-tie) line, Project substation, operations and maintenance building, and solar arrays. The use of agricultural land for the Project is temporary and is reversible because the Project land agreements are for a finite term and Gopher State Solar has developed a Decommissioning Plan to describe the process of project removal and site restoration, with provisions for financial security to ensure the decommissioning work can be performed. The term of the solar easements for Project operation is up to 40 years. At the end of the Project operation, the land will be restored to its original condition and will likely return to agricultural use, or any other use chosen by the applicable landowners. A Vegetation and Soil Management Plan (VSMP) and an Agricultural Impact Mitigation Plan (AIMP) will be implemented during construction and operation of the Project.

Within the 1,645-acre Project Area, approximately 1,135 acres are within the Preliminary Development Area, with approximately 977 acres currently designated to host proposed Project facilities as shown on Figures 1 and 3. The excess acreage allows for planned buffers and flexibility in overall Project design. Gopher State Solar does not anticipate requiring the entire 1,645 acres to host 200 MW of solar generating facilities; however, this assessment analyzed the 1,645 acres that make up the Project Area. The final footprint will be dependent on the permitting process, final field surveys, engineering and geotechnical studies, and equipment selection. Gopher State Solar will optimize the Project to the highest degree practicable to minimize the overall impact of the Project. Certain portions of the Project Area that are not used for the Project and are located outside of the fenced infrastructure may be used by the landowner to continue farming operations or will be vegetated/revegetated in accordance with the VSMP and landowner preference. The electrical collector lines between the solar arrays/inverters and Project Substation will be 34.5 kilovolt (kV) feeders that will be installed underground. Directional boring may be used to install collectors in some portions of the Project.

All electricity generated by the Project will be routed to a new substation with a step-up transfer. A new 230 kV gen-tie line, approximately 1,300 feet long and not longer than 1,500 feet, will connect the Project substation with Great River Energy's 230 kV Panther substation (see Figure 3). The Project substation and Project gen-tie line will be constructed, owned, and operated by Gopher State Solar.

4.0 PROJECT NEED, PERMITTING, AND SCHEDULE

The Project will generate up to 200 MW annually of reliable, renewable energy. The Project is being sited and permitted to meet or exceed applicable local and state requirements, including the prime farmland exclusion rule to the extent practicable.

The Project will support the state's carbon-free standards (CFS), renewable energy standards (RES), and solar energy standards (SES) in Minn. Stat. § 216B.1691, which requires Minnesota utilities to provide 100 percent (%) of their retail energy sales from carbon-free energy sources by 2040, as well as setting other interim renewable energy and solar energy targets. As such, the Project will support the state's growing demand for renewable energy and for utilities, independent power purchasers, and corporations seeking to use renewable energy for business growth. In addition, the Project will diversify electricity sources, address environmental concerns, meet anticipated growth in electrification (e.g., vehicles, heating), and address CFS, RES, SES, and policy goals, as described above. The Project will also benefit the local community through investment in construction spending, operation of the Project, property and business taxes, and landowner lease payments.

Gopher State Solar is working towards securing a Power Purchase Agreement (PPA) or other enforceable mechanism to sell the electricity generated by the Project. The power generated by the Project will be offered for sale to wholesale customers, including Minnesota utilities and others who have identified a need for additional renewable energy and capacity.

Gopher State Solar filed a queue position with the Midcontinent Independent System Operator (MISO) in the MISO DPP 2021 West - J1846 study cycle. It is anticipated that Gopher State Solar will execute a Generator Interconnection Agreement (GIA) with MISO for 200 MW; Gopher State Solar will notify the Commission when the GIA has been executed. This interconnection will provide sufficient outlet to accommodate all of the solar energy generation from the Project.

The anticipated Project construction schedule facilitates an in-service date by the end of the fourth quarter of 2027.

5.0 SITING CONSTRAINTS ANALYSIS – FACTORS DRIVING CHOICE OF REGION

Gopher State Solar will demonstrate that the Project has considered the factors in the Rules, minimized impacts to prime farmland to the extent possible, and that there are no feasible or prudent alternatives to the proposed Project. In addition, Gopher State Solar will describe how the proposed Project meets the requirements for siting and how other areas, evaluated near the current, proposed substation, are not compliant with the Rule.

Gopher State Solar specifically proposed building the Project in southwest Minnesota because of the high-quality solar resource, willing landowners, and a point of interconnect (POI). This area of southwest Minnesota contains both a high-quality solar resource and access to transmission infrastructure to deliver electricity to the grid (see Figures 7 through 9). The area is comprised mostly of prime farmland, with the exception of riparian areas, which leads to challenges in the identification of areas of sufficient size to support utility-scale solar facilities that would impact less and 0.5 acre of prime farmland per MW.

Minnesota contains approximately 25.5 million acres of farmland, including 17.3 million acres of prime farmland. As of September 2023, there were about 5,800 MW of planned solar in the MISO queue, which would require approximately 50,000 acres of land. If all 50,000 acres were on prime farmland, that would account for 0.3% of Minnesota's prime farmland (Clean Grid Alliance, 2024).

Gopher State Solar chose to develop the Project in Minnesota because Minnesota is a state that has renewable energy goals, is generally supportive of solar development, and has landowners who are willing to lease land for solar projects. Gopher State Solar considered several factors and land use characteristics to further identify economically and environmentally viable sites within Minnesota (see Sections 5.1 through 5.3). Large portions of the state are heavily wooded and were therefore determined unsuitable for solar development. Specifically, the northeastern and eastern-most portions of the State are more densely forested than the northwestern and southwestern parts of the state, and provide habitat for state and federally listed wildlife and plants. These areas of the state were removed from further consideration.

The southwestern-most portion of Minnesota has the strongest solar resource in the state, a significant amount of transmission line infrastructure which allows access to the grid, and land that is typically flat, non-forested, agricultural land, with little to no habitat for state and federally protected species. The northwestern part of Minnesota also provides opportunities for solar development due to open land, larger tracts of land, somewhat less prime farmland than the southwest portion of the state and potential access to the grid. Based on this, Gopher State Solar continued to evaluate this region for the Project.

Similar to other Minesota proposed solar facilities, Gopher State Solar evaluated alternative sites within 5 miles of the chosen substation, and more broadly within the county in which the project would be located and a neighboring county. The constrained electrical grid and willing landowners played a significant role in determining potential Project locations and, ultimately, the final site for the Project. A multi-faceted approach factoring in numerous state, regional, and local characteristics was implemented to identify the Project site. The Project site in Renville County met all the site selection criteria necessary to advance development of the Project.

5.1 CHOOSING A REGION & DESCRIPTION OF SOLAR RESOURCE IN THE PROPOSED REGION V. OTHERWISE COMPLIANT AREAS

General Identification of Good Solar Resource Sites in Minnesota

Gopher State Solar's primary goal while siting the proposed Project was to identify a highly productive solar resource in Minnesota which will allow economic operation of a high net capacity factor solar energy generation facility and optimize the solar resources, allow for efficient and effective use of installed facilities, and minimize impacts to human settlement and natural resources.

Gopher State Solar used publicly available solar generation data in Minnesota to determine solar potential in western Minnesota. According to data compiled by the Minnesota Solar Suitability Analysis (MSSA) program, southern Minnesota has some of the best locations in the state for exposure to the sun's solar radiation (insolation), and thus, the highest net capacity factors (see Figure 7)[1]. Small areas of relatively high, but lower net capacity areas, exist in western Minnesota (see Figure 7).

With this data, Gopher State Solar focused on identifying a suitable Project site near an existing substation with available capacity to maximize solar generation in an area where it can be economically delivered to the electrical grid.

5.2 IDENTIFICATION OF SUBSTATIONS AND DETERMINATION OF AVAILABLE INTERCONNECTION POINTS

Available Interconnection Capacity and Likely Low Interconnection Costs

Identifying existing electrical infrastructure with available capacity was the largest driving factor in selecting a suitable Project location. Gopher State Solar conducted a search within western Minnesota and looked for existing substations and transmission lines that had available capacity to support the proposed 200 MW interconnection capacity of the Project. Gopher State Solar identified the Panther 230 kV substation, with capacity for this project to interconnect via a 230 kV gen-tie line (see Figures 2 and 3).

Similar to other proposed Minesota solar projects, Gopher State Solar evaluated alternative sites within 5 miles of the Panther substation; however, they were ultimately ruled out because they were unable to meet the limit set in the Rule that an energy generation facility should not occupy more than 0.5 acre of prime farmland per MW of net generating capacity.

Gopher State Solar proposes to interconnect the Project at Great River Energy's existing Panther Substation in Renville County, Minnesota (see Figure 2). Gopher State Solar filed a queue position with the MISO in the MISO DPP 2021 West - J1846 study cycle. It is anticipated that Gopher State Solar will execute a GIA with MISO for 200 MW; Gopher State Solar will notify the Commission when this has been executed. This interconnection will provide sufficient outlet to accommodate all the solar energy generation from the Project.

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[1] The MSSA is an ongoing project led by graduate students in the Masters of Geographic Information Science program at the University of Minnesota. The project aims to map solar potential on a large scale across Minnesota using LiDAR data and GIS technology with the goal of providing free and open-source tools and data to the GIS community. See https://solar.maps.umn.edu/app/.

5.2.1 Identification of Suitable Developable Sites Near Substations; Site Selection & Avoidance of Other Prohibited Areas; Good Faith Consideration of Alternative Site Configurations or Technologies

Gopher State Solar evaluated the area within 5 miles of the POI to determine if land was available and suitable for construction of the Project. The 5-mile search radius was largely driven by the economics of solar construction. A solar project of this size, requiring more than 5 miles of electrical transmission infrastructure, is generally uneconomical due to the costs of constructing the transmission infrastructure and the line losses that would be realized over distances greater than 5 miles. Optional sites that would require longer transmission facilities to connect a project to the grid would result in higher costs for tasks such as design, permitting, and construction. These sites would also necessitate completing a routing study, identifying possible suitable land and willing landowners, potentially impacting significantly more natural and cultural resources, creating additional visual impacts, and requiring additional operation and maintenance needs.

Similar to other Minesota solar proposals, Gopher State Solar evaluated alternative sites within 5 miles of the chosen substation, and more broadly within the county in which the project would be located and a neighboring county.

In addition, State of Minnesota policy requires the siting of transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion" (Minnesota Statutes Section 216E.02, Subd. 1), and requiring the efficient use of resources, especially if a viable, feasible and prudent alternative exists.

Within 5 miles of the POI, Gopher State Solar evaluated project areas using the following characteristics:

- significant tracts of cleared land;
- overall distance to the potential POI and the cost of transmission to reach the POI;
- specific areas of the region that were determined suitably flat to allow for economical construction of solar energy generation equipment;
- community and landowner outreach indicated community support and acceptance of the Project in the proposed area;
- local landowners willing to enter into voluntary leases or easements; and
- avoidance of sensitive environmental resources and an attempt to minimize potential adverse environmental impacts.

Based on these analyses, the Project Area was further evaluated. The analysis and results of the area within a 5-mile radius of the potential POI is presented below. All factors were used in the evaluation and selection of the proposed Project Area.

The Project Area is comprised of open land primarily used for row crop agriculture. The Project Area is located within the Des Moines Lobe region of the Western Corn Belt Plains Ecoregion (U.S. Environmental Protection Agency, 2023). Topography within the Project Area is relatively flat with two prominent narrow, channelized stream valleys associated with Judicial Ditch Number

Nine located in the northeast portion of the Project boundary, and East Fork Beaver Creek located in the southwestern portion of the Project Area. Elevations across the Survey Area range from approximately 1,074 feet above mean sea level (MSL) to 1,130 feet above MSL. The area is mostly devoid of permanent landcover and environmental constraints. With the exception of collector lines, Gopher State Solar was able to secure sufficient easement agreements to allow it to design the Project around Conservation Research Enhancement Program (CREP) land that provides farmers and ranchers an annual rental rate along with other federal and non-federal incentives, specified in the CREP easement. In addition, Gopher State Solar will site solar infrastructure outside delineated streams, including Public Waters and Ditches; however, collector lines will be bored under the four Public Ditches within the Project Area. No other significant environmental constraints were identified in or near the Project Area (see Figures 3, 4, 4a, and 9).

The area within 5 miles of the POI was also evaluated. The Guidance indicates that “otherwise compliant areas” refers to areas not specifically prohibited (subpart 1) or generally excluded (subpart 3) for energy development as enumerated in Minnesota Rules 7850.4400, including subpart 1. Gopher State Solar began its search for sites by evaluating otherwise compliant areas near available transmission capacity that would require less than 0.5 acre per MW of prime farmland due to the general scarcity of prime farmland in this part of the State. Gopher State Solar was ultimately unable to find such a site within 5 miles of the POI that met the Rule.

6.0 ASSESSMENT OF SUITABLE SITES FOR COMPLIANCE WITH PRIME FARMLAND EXCLUSION RULE

Nearly all land in Minnesota considered highly suitable for solar energy development is also classified as prime farmland. Willing landowner participation and transmission interconnection were more significant factors in Project siting than the use of prime versus non-prime farmland. Gopher State Solar relies on voluntary easements with landowners and these participants voluntarily decided that participation in the Project was a better and more economical use of their land than traditional agricultural uses.

Gopher State Solar followed the Guidance to demonstrate compliance with the Rule requirement that there is no “feasible and prudent” alternative site. Gopher State Solar considered each of the Guidance factors and determined that the proposed Project Area site is the only feasible and prudent alternative site identified for the Project. Below, Gopher State Solar describes how they determined the proposed Project Area meets the Guidance requirements and how it was unable to find a reasonable and prudent alternative to the Gopher State Solar Project.

6.1 GOOD FAITH CONSIDERATION OF NON-PRIME FARMLAND SITES NEAR INTERCONNECTION SITES

The 1,645-acre Project Area contains approximately 1,576 acres (96%) of prime farmland: 416 acres of prime farmland (25%), 1,035 acres of prime farmland if drained (63%), and 125 acres of prime farmland if protected from flooding or not frequently flooded during the growing season (8%) (see Figure 4). Under the Rule (as applied to this proposed 200 MW Project), no more than 100 acres of prime farmland can be used without seeking an exemption or otherwise demonstrating an inability to find a feasible or prudent alternative (0.5 acre of prime farmland per MW of net generating capacity). Approximately 977 acres of the Project Area would be used for Project infrastructure as shown on the Preliminary Development Area map (see Figure 3). None of the Project Area is exempt from the prime farmland exclusion rule due to proximity to applicable

city designations. Therefore, Gopher State Solar has demonstrated an inability to find a feasible or prudent alternative.

Of the 1,135 acres of the Project's development area, a total of approximately 1,107 acres (98%) are considered prime farmland: 299 acres (26%) are prime farmland; 787 acres (69%) are prime farmland if drained; approximately 21 acres (2.0%) are prime farmland if protected from flooding or not frequently flooded during the growing season); and, approximately 28 acres (2%) are farmland of statewide importance. (see Figure 4a).[2]

Since the Project is planned to be up to 200 MW and the area required for Project development at the Project Area includes approximately 1,107 acres (98% of the development area) of prime farmland, it does not meet the 0.5 acre per MW limit in the Rule. The proposed Project Area does not contain acreage within the exempt home rule charter/statutory city areas. Gopher State Solar attempted to increase use of non-prime farmland to the maximum extent practicable at the Project Area site; however, the only areas of non-prime farmland within Renville County are associated with riparian areas (see Figure 6). Gopher State Solar was unable to locate any otherwise suitable sites within 5 miles of the POI, or within Renville County generally, that would be compliant with the Rule. There are no large tracts of non-prime farmland in Renville County.

After applying the Guidance, Gopher State Solar determined that the proposed Project Area is justifiably located within southwestern Minnesota where a conflict may be present with the Rule. As noted herein, the best solar resource areas generally overlap with areas dominated by prime farmland and agricultural use in southern Minnesota. Similar to other Minesota solar proposals, Gopher State Solar evaluated alternative sites within 5 miles of the Panther substation; however, they were ultimately ruled out because they were unable to meet the limit set in the Rule that an energy generation facility should not occupy more than 0.5 acre of prime farmland per MW of net generating capacity.

7.0 AVOIDANCE AND MINIMIZATION CONSIDERATIONS

As discussed above, the Project Area is an optimal site for development of the proposed 200 MW solar generating facility for all primary development factors and is superior to the other evaluated site considered for various reasons. Gopher State Solar has avoided and minimized impacts to prime farmland to the extent practicable given the amount of non-prime farmland in the developable Project Area at the site in comparison to the surrounding area. Gopher State Solar further minimized impacts to prime farmland and overall agricultural impacts within the Project Area by siting and designing Project facilities in non-prime farmland areas to the greatest extent possible, designing the Project around agricultural infrastructure (e.g., County drain tile and judicial ditches), and allowing landowners to continue to farm buffer areas and other areas not used by the Project.

8.0 IMPACTS, MITIGATIVE MEASURES AND BENEFITS

In addition to this assessment, the Application provides a description of prime farmland at the Project Area site and surrounding area and potential impacts to prime farmland from the Project. The Application, as well as an AIMP and a VSMP prepared for the Project and attached to the Application as Appendices D and E (incorporated herein by reference), also discuss a number of

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[2] Note that the *prime farmland if drained* and *prime farmland if protected from flooding or not frequently flooded during the growing season* designations acreages are considered prime farmland and to be included in prime farmland acreage; farmland of statewide importance is not considered prime farmland and not included.

mitigative actions and the numerous benefits the Project will provide to site soil and affected prime farmland area within the Project Area.

9.0 PROJECT BENEFITS

Gopher State Solar is committed to being a good neighbor to landowners and the broader community and a good steward to the environment during the development and operation of the Project. In addition to mitigative measures discussed above and in the Application, other Project benefits that would serve to offset the impacts to prime farmland are described in this section.

As introduced above, upon construction of the Project and implementation of the mitigative measures described in the Site Permit Application, AIMP, and VSMP, the Project will directly and indirectly provide benefits within the Project Area. Those benefits include:

- decreasing the amount of nutrients (including phosphorous and nitrogen) applied to the Preliminary Development Area during the anticipated 40-year life of the Project (i.e., row crop agricultural operations would temporarily cease during Project construction and operation);

- managing nutrients at the Project site through incorporation, installation, establishment and maintenance of native vegetative plant species, as detailed in the VSMP and AIMP that will be implemented for the life of the Project;

- designing, engineering, permitting, constructing, operating and maintaining a stormwater management system (i.e., stormwater ponds) in accordance with applicable Minnesota Pollution Control Agency (MPCA) rules and regulations to effectively address stormwater runoff from the Project site;

- obtaining and implementing a National Pollutant Discharge Elimination System construction stormwater runoff permit/Stormwater Pollution Prevention Plan from the MPCA during construction to address, manage and control erosion, stormwater runoff from construction activities, and re-establishment of vegetative cover post-construction; and

- maintaining county drain tile and judicial drainage ditches across the Project site to ensure no impact to neighboring agricultural land uses and field drainage.

As the permitting process advances and the Project becomes more developed, additional offsetting benefits may be identified. Gopher State Solar is committed to identifying additional benefits and incorporating such benefits into Project plans as it deems practicable.

10.0 CONCLUSIONS AND RECOMMENDATIONS

For all of these reasons and as shown in the above analysis, Gopher State Solar believes it has met prime farmland Guidance and requirements of the Rule to determine that the Project qualifies for an exemption from the Rule, in that there is no feasible or prudent alternative site to the Project Area.

11.0 REFERENCES

Clean Grid Alliance. 2024. Minnesota Solar and Agricultura. Available online at: https://cleangridalliance.org/_uploads/_media_uploads/_source/MN_Solar_and_Ag_Rev_9.23.pdf#:~:text=Minnesota%20is%20home%20to%20about,stewards%20of%20their%20own%20land. Accessed January 2024.

Minnesota Department of Commerce Energy Environmental Review Analysis (EERA). 2020. *Solar Energy Production and Prime Farmland – Guidance for Evaluating Prudent and Feasible Alternatives*. Available online at https://mn.gov/eera/web/doc/13929/. Accessed January 2024.

U. S. Environmental Protection Agency. 2023. Ecoregions. Available online at: https://www.epa.gov/eco-research/ecoregions#:~:text=Ecoregions%20are%20areas%20where%20ecosystems,environmental%20resources)%20are%20generally%20similar. Accessed January 2023.

Attachments

Attachment A MSSA Report - Project Area Site (Renville County)

Figures

Figure 1 Project Area & USGS Topography
Figure 2 Preliminary Identification of Potential Project Sites
Figure 3 Site Control and Preliminary Development Area
Figure 4 Project Area Prime Farmland
Figure 4a Prime Farmland within the Preliminary Development Area
Figure 5 Prime Farmland within Five Miles of Project Area
Figure 6 Prime Farmland within Renville County
Figure 7 Solar Resources in Minnesota
Figure 8 MSSA Insolation at Project Area Site
Figure 9 Gopher State Solar Site and POI Constraints

Attachment A

MSSA Report - Project Area Site (Renville County)

Solar Suitability Report

Latitude: 44.817410 Longitude: -94.896007

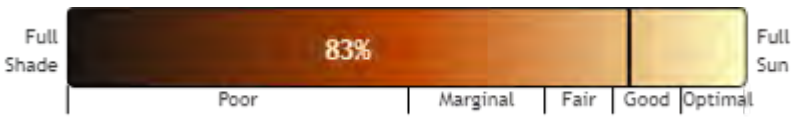
mn.gov/solarapp

Wed Nov 29, 2023

Site Name

Site Address

Site Notes

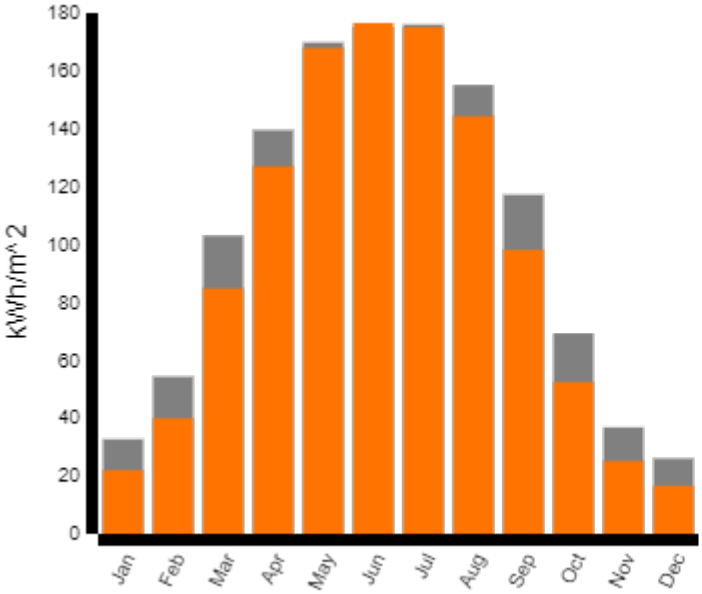


This site is **Good**. It would need a **4.91 kW** system to generate **50%** of average household use. This system would cost approximately **$18,420**. System payback is **13.4 years** after tax credit.

Utility Service Provider:
Renville Sibley Cooperative Power Association
P.O. Box 68
Danube, MN 56230
(320) 826-2593
www.renville-sibley.coop

Site Details:
Total Annual Insolation: 1139.73 kWh/m^2
Avg Insolation per Day: 3.12 kWh/m^2
Source Data: Spring and Fall 2010

Amount Actual Sun



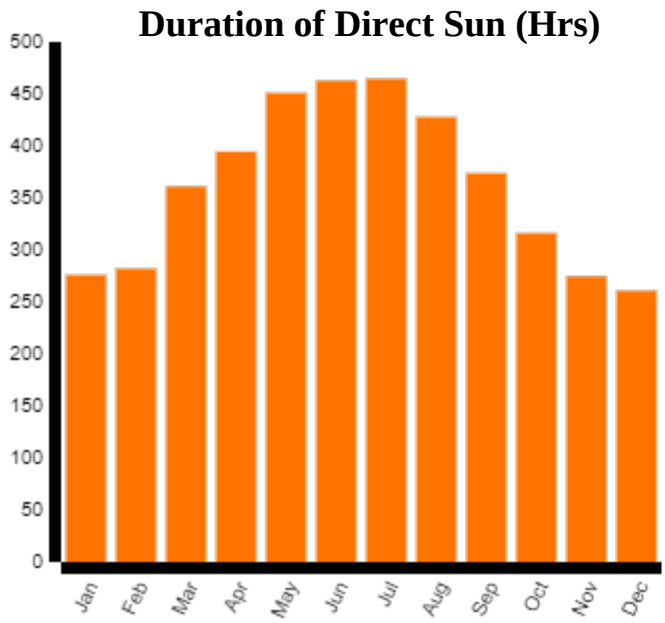
Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	$0.12/kWh	Minnesota's average residential cost of electricity is $0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.91 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	$18,420	Result is based on an average 2020 Minnesota residential system cost of $3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	18.10 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	13.40 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	67%	21.98	275.9
February	74%	39.93	281.9
March	82%	84.76	360.9
April	91%	126.97	394.6
May	99%	167.90	450.9
June	100%	176.55	462.7
July	99%	175.09	464.6
August	93%	144.31	427.7
September	84%	98.11	373.7
October	76%	52.41	316.1
November	68%	25.16	274.5
December	64%	16.58	260.7

**These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application

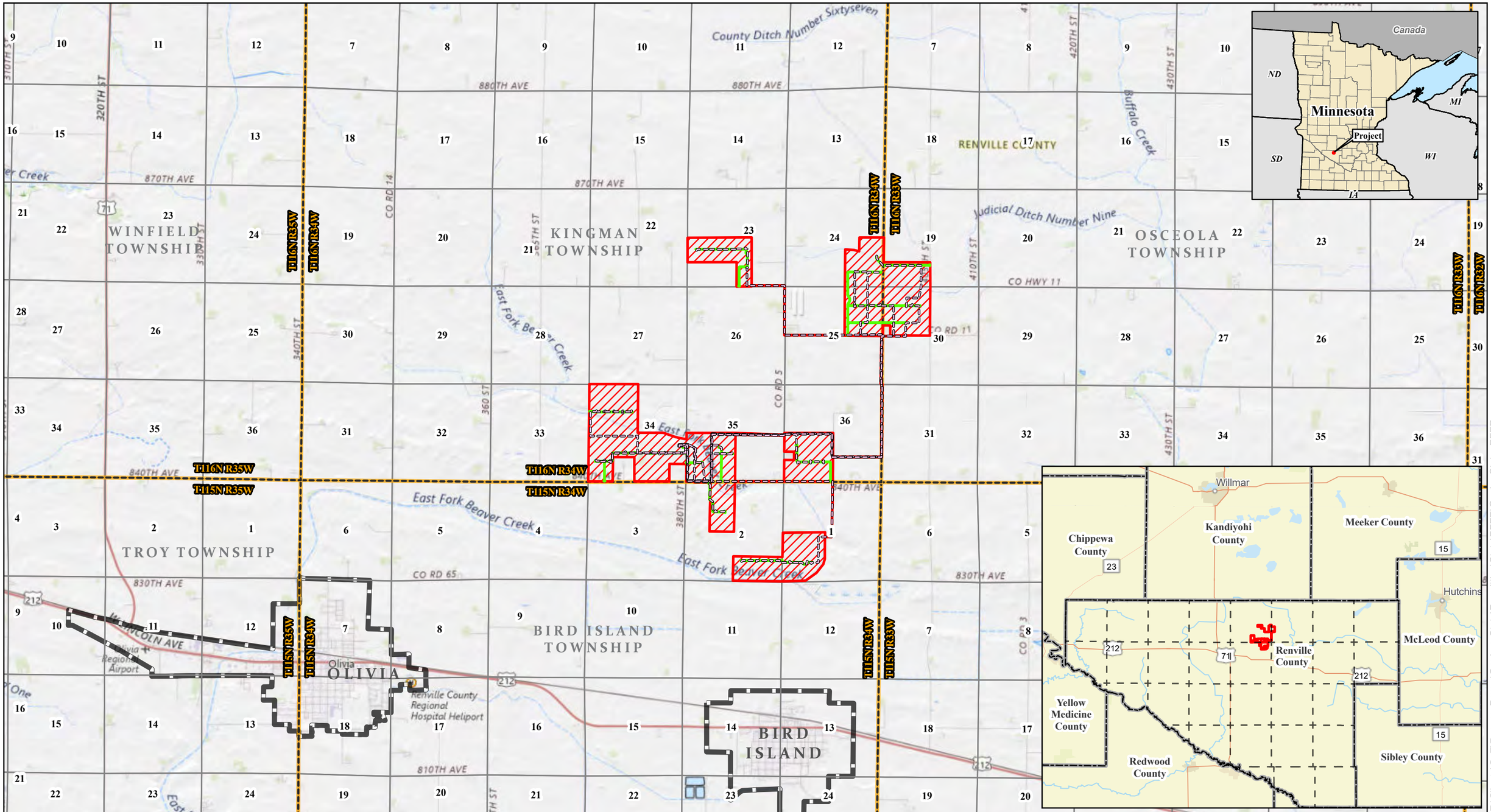


This service made possible by:

COMMERCE DEPARTMENT
ENERGY RESOURCES

Figure 1

Project Area & USGS Topography



GOPHER STATE SOLAR
A RANGER POWER PROJECT

merjent

0 0.75 1.5 Miles

1:60,000

For Environmental Review Purposes Only

Figure 1 - Project Area & USGS Topography
Gopher State Solar Project

Gopher State Solar, LLC

Renville County, Minnesota

- Project Area
- Proposed Access Road
- Proposed Collector Line
- Township Boundary
- Section Line
- Municipal Boundary

Source: Z:\Clients\Q_T\Ranger_Power\Gopher_State\Permitting\State\PFER\GopherState_PFER.aprx

Date: (6/3/2024)

Figure 2

Preliminary Identification of Potential Project Sites

KANDIYOHI COUNTY

RENVILLE COUNTY

71

212

GOPHER STATE SOLAR
A RANGER POWER PROJECT

merjent

0 1 2 Miles

1:105,000

N W E S

For Environmental Review Purposes Only

Figure 2 - Preliminary Identification of Potential Project Sites
Gopher State Solar Project
Gopher State Solar, LLC
Renville County, Minnesota

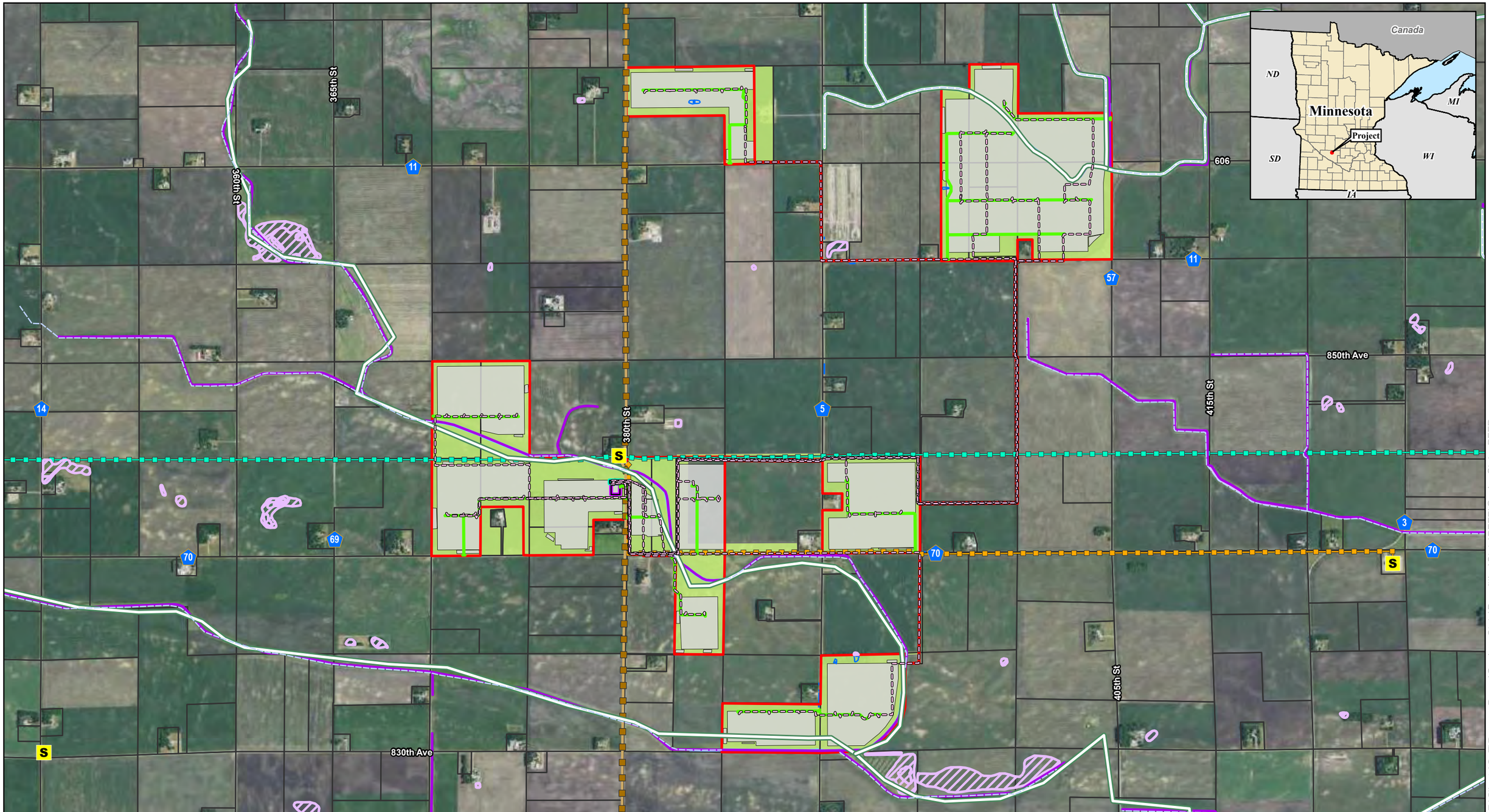
- Project Area
- Proposed Access Road
- Proposed Collector Line
- 5-mile Buffer
- County Boundary

Source: Z:\Clients\Q_TRanger_Power\Gopher_State\Permitting\State\PFER\GopherState_PFER.aprx

Date: (6/3/2024)

Figure 3

Site Control and Preliminary Development Area



GOPHER STATE SOLAR
A RANGER POWER PROJECT

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0 1,500 3,000 Feet

1:30,000

N W E S

For Environmental Review Purposes Only

Figure 3 - Site Control and Preliminary Development Area
Gopher State Solar Project

Gopher State Solar, LLC
Renville County, Minnesota

- S Existing Substation
- Project Area
- Proposed O&M Building
- Proposed Substation
- Preliminary Development Area
- Parcel Boundary
- Participating Land Owner
- Proposed Access Road
- Proposed Collector Line
- PWI Ditch
- Delineated Wetland
- Delineated Waterway
- NWI Wetland
- County Drainage Ditch

Existing Tranmission Line

- Bird Island to Lake Lillian 69kV
- Black Dog to Panther to Granite Falls 230kV
- Melville to Melville Tap 69kV

Source: Z:\Clients\Q_T\Ranger_Power\Gopher_State\Permitting\State\PFER\GopherState_PFER.aprx
Date: (6/3/2024)

Figure 4

Project Area Prime Farmland

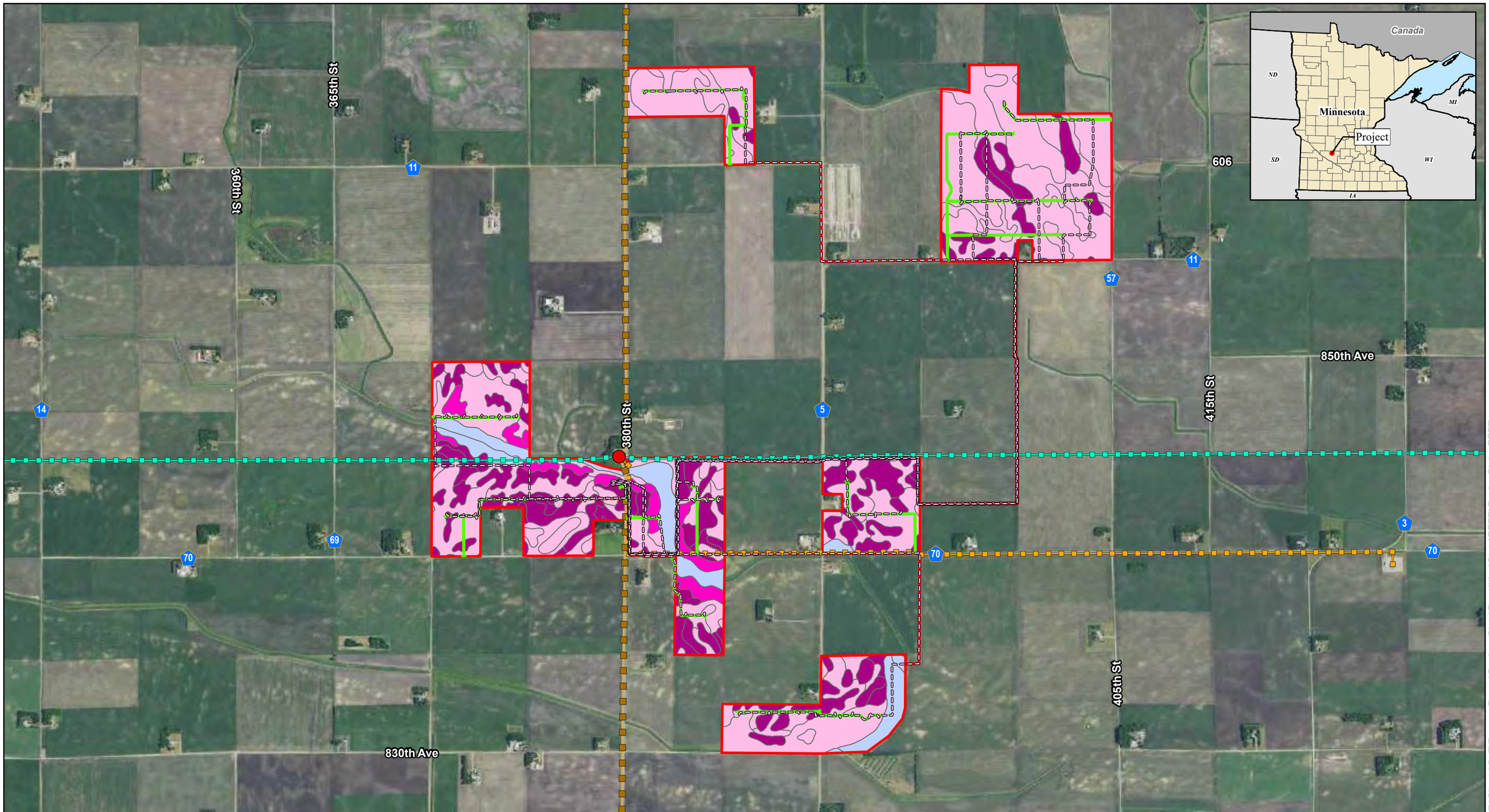

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Figure 4 - Project Area Prime Farmland
Gopher State Solar Project

Gopher State Solar, LLC
Renville County, Minnesota

- Point of Interconnect
- Project Area
- Proposed Access Road
- Proposed Collector Line

Existing Transmission Line

- Bird Island to Lake Lillian 69kV
- Black Dog to Panther to Granite Falls 230kV
- Melville to Melville Tap 69kV

Prime Farmland Classification

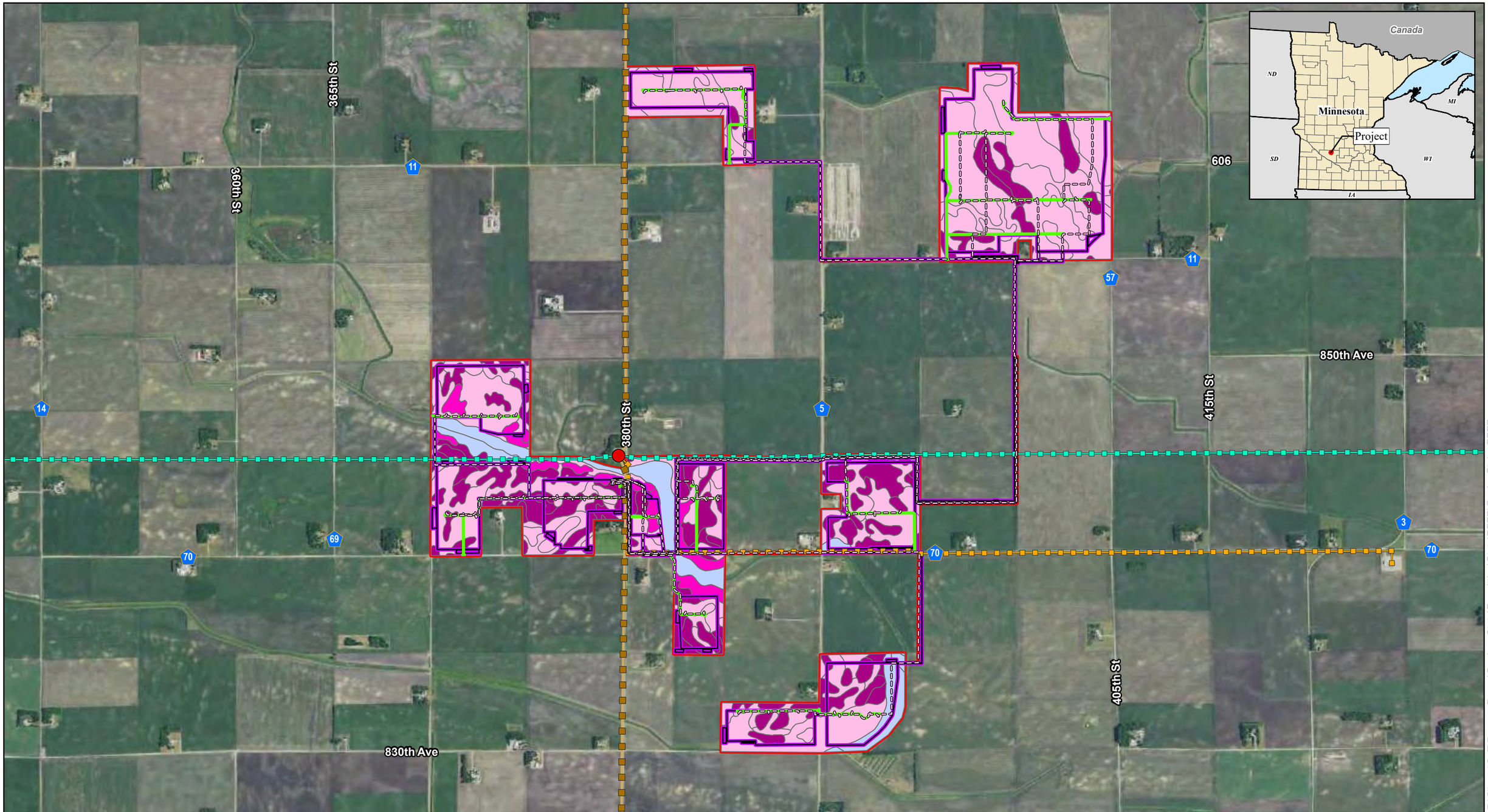
- All areas are prime farmland
- Farmland of statewide importance
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season

Source: Z:\Clients\Q_T\Ranger_Power\Gopher_State\Permitting\State\PFER\GopherState_PFER.aprx

Date: (6/3/2024)

Figure 4a

Prime Farmland within the Preliminary Development Area



GOPHER STATE SOLAR
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Figure 4a - Prime Farmland within the Preliminary Development Area Gopher State Solar Project

Gopher State Solar, LLC
Renville County, Minnesota

- Point of Interconnect
- Proposed Collector Line
- Proposed Access Road
- Project Area
- Preliminary Development Area

Existing Transmission Line

- Bird Island to Lake Lillian 69kV
- Black Dog to Panther to Granite Falls 230kV
- Melville to Melville Tap 69kV

Prime Farmland Classification

- All areas are prime farmland
- Farmland of statewide importance
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season

Source: Z:\Clients\Q_T\Ranger_Power\Gopher_State\Permitting\State\PFER\GopherState_PFER.aprx
Date: (6/3/2024)

Figure 5

Prime Farmland within Five Miles of Project Area