

Saratoga Solar Project

Public Service Commission of Wisconsin
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Appendix Q
Road Condition Report



Road Condition Report

Summary of Roadway Conditions

Saratoga Solar Project, LLC

Wood County, Wisconsin.

PSC Docket No. 9816-CE-100

April 12, 2022

Prepared for:

Saratoga Solar Project, LLC

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1.0 INTRODUCTION

Saratoga Solar Project, LLC. (Saratoga) is developing a 150.5-megawatt (MW) alternating current (AC) photovoltaic (PV) solar farm with a 50MW Battery Energy Storage System (BESS) in Wood County, Wisconsin. The Saratoga Solar Project (Project) will be located on approximately 825 acres of land dominated by red pine plantation. The major components of the Project will include solar modules, inverters, collection lines, access roads, a substation, a 138kV generation tie (gen-tie) transmission line, temporary laydown yards, and an Operation and Maintenance (O&M) building.

The Project will be built north of Blue Ridge Lane and south of Evergreen Avenue. State Trunk Highway (STH) 13 bisects the Project north to south, and Tower Road bisects the Project west to east. The Project will be connected to the existing electric transmission grid via an approximately 500-foot 138kV gen-tie line. The approximate Project area is shown on Figure A.1 in Appendix A.

Construction of the Project is planned to begin Q2 2023 with a Commercial Operations Date (COD) anticipated in Q4 2024. Temporary workspaces for Project construction will include staging areas for vehicles and equipment, and laydown areas for Project components. Permanent Project workspaces include areas proposed for the placement of solar arrays, power conversion units, and inverters; gravel roads required to access and maintain the solar arrays.

Saratoga has retained the services of Stantec Consulting Services Inc. (Stantec) to compile data and perform visual inspections of public roadways and infrastructure. Stantec will consider roadways within the limits of the Project and along access routes to the Project location. Stantec will also evaluate the suitability of that infrastructure to support the expected construction traffic, internal utility connections, as well as on-going O&M vehicles.

2.0 METHODOLOGY

2.1 DESKTOP REVIEW

Stantec reviewed maps of proposed facility locations to identify roads within the Project area and potential roads to be used during construction. Aerial maps of the roadways were studied, as well as street-level photography for road conditions, existing driveway locations, pavement materials, shoulder materials and surrounding uses. Potential constraints and concerns were noted and are discussed in Section 3.3.

Traffic count information was acquired from the Wisconsin Department of Transportation (WisDOT) Roadrunner Geographic Information System (GIS) website for the nearby State Trunk Highways and County Trunk Highways.

State Trunk Highways 13 and 73 were not reviewed in detail for this report, as it is assumed that they have been built to accommodate standard weight construction traffic. They are maintained to State Highway standards by the Wood County Highway Department and for the purpose of this analysis are deemed to be suitable for traffic associated with this Project. It is assumed that STH 13 and STH 73 will be utilized for the Project, as construction traffic and material delivery will utilize Interstate Highways that connect to both.

Roadway and land-use data from the Town of Saratoga Comprehensive Land Use Plan were also acquired and reviewed.

2.2 AGENCY INTERVIEWS

Roads within the Project area fall under the jurisdiction of two agencies, Wood County Highway Department and the Town of Saratoga, for maintenance and normal upkeep. STH 13 and STH 73 are State Highways and as such the Wood County Highway Department has the responsibility of maintenance.

- On January 13, 2022, Stantec interviewed Joel Ortman, Highway Engineer for the Wood County Highway Department, to discuss the conditions of State and County Highways within the Project area. Mr. Ortman provided a detailed description of the maintenance concerns, road ratings, bridge locations, culvert crossings, typical road and shoulder widths.

Mr. Ortman stated that the major highways in the Project area (STH 13, STH 73) are in good or very good condition, much of these roadways having been reconstructed or resurfaced in the past two to five years.

- On February 2, 2022, Stantec interviewed Town of Saratoga Road Oversight Manager Douglas Passineau, former Saratoga Township Supervisor, regarding the local roads. Mr. Passineau reviewed the Project Area and identified locations where he had maintenance concerns. Mr. Passineau also confirmed that all roads within the Town of Saratoga are subject to Load Limits during the spring thaw.

Mr. Passineau stated that a number of the roads, including Tower Road and Blue Ridge Lane, have thin asphalt surfaces (typically less than one inch) and will probably experience damage during construction.

2.3 IN PERSON FIELD REVIEW

After review of the Wisconsin Information System for Local Roads (WISLR) database and aerial mapping and other publicly available databases, Stantec visited the Project area to complete an on-site evaluation of the roadways that are within the Project area, adjacent to the Project, or provide a direct link to accessing the Project from Interstate Highways. Roads linking the Project area to the surrounding Interstate Highways and within the Project area were also driven to verify the conditions and materials that had been noted in earlier portions of the investigations.

3.0 ROADS AND INFRASTRUCTURE

3.1 EXISTING ROAD INFRASTRUCTURE

The Project footprint lays generally within 1.5 miles, east and west, of STH 13 and generally north of Blue Ridge Lane within Sections 19, 20, 21, 27, 28, 29, 30, and 34 of the Township of Saratoga. STH 13 will serve as the north-south backbone of access in and around the Project.

Since WisDOT recommends that permanent driveway access points be minimized onto the State highway system, access drives for the Project arrays will be along Town roads. Access permits are required and must be obtained from the Town of Saratoga prior to construction.

3.1.1 Town Roads

Town of Saratoga roads will provide the majority of circulation and all access points within the Project area. The Town of Saratoga maintains these roads which are referred to as Local roads in the Town's Comprehensive Plan. They are generally 20'-24' wide, in a 66' right-of-way, and are either paved with hot-mix asphalt or a thin sealcoat of asphalt on a compacted gravel bed. Other Town roads are only constructed of gravel base with no asphalt surface.

The Town of Saratoga reviews the condition of all roadways under their jurisdiction at least bi-yearly and provides detailed roadway data in the WISLR database. The roadways are evaluated by the Pavement Surface Evaluation and Rating (PASER) scale. This is a 10-point rating system for roadway pavement condition developed by the University of Wisconsin-Madison Transportation Information Center. PASER uses visual inspection to evaluate pavement surface conditions. The numerical ratings signify the following conditions for paved roads: 10 & 9 – Excellent, 8 – Very Good, 7 & 6 – Good, 5 & 4 – Fair, 3 – Poor, 2 – Very Poor, 1 – Failed. The PASER rating of 4, corresponding with 'fair', typically signals that some type of reconditioning should be considered.

Although the PASER rating system typically only considers the surface appearance of the roadway, it is a simple, general assessment of the combined impacts of age, pavement structure, subgrade condition and traffic. In the case of a typical low-volume Town road, a PASER rating of 5 might not warrant immediate pavement repair if the traffic rates remain low. However, if a roadway may be utilized by a high volume of truck traffic during the solar facility construction phase, significant pavement deterioration should be expected, especially at intersections.

Many of the Town roads in and around the Project area have been designated as weight limited Class “B” Roadways by the Town Board. This limits truck traffic without a permit to 60% of standard Class “A” weight limitations, or 48,000 lbs. maximum gross weight. Additionally, all Town roads are subject to temporary weight limits during the spring thaw. The following table provides data for the Town roads in and around the Project area.

Table A: Town Road Data

Road Name	Within Project Area	Possible Access Point	Potential for High Construction Traffic	Weight Class	PASER Rating	Average Daily Traffic (ADT)	Surface and Width	Shoulder Material and Width	Description/Comments
Blue Ridge Lane	X	X	Required	B	3	15*	22' <1" thick Wearing Surface	2' Grass	Will provide access to significant portion of Project area. Unpaved Sealcoat Roadway – Assuming high construction traffic levels and major access point, improvements are recommended Town has applied for a grant to re-surface this road.
Tower Road	X	X	Required	B	5	15*	22' <1" thick Wearing Surface	2' Gravel	Will provide access to majority of Project area. Unpaved Sealcoat Roadway – Assuming high construction traffic levels and major access point, improvements are recommended
Bell Road			Emergency access only	A	7	15*	22' Asphalt Surface	3' Gravel	Emergency access only.
Deer Ridge Road			Emergency access only	A	7	35*	22' Cold-Mix Asphalt	2' Gravel	Emergency access only.
Rangeline Road			Optional haul route	B	4-8	150*	22'-24' Asphalt Surface	2' Gravel	Outside of immediate Project area. Optional haul route from the west. Road surface deteriorates southern end, near Hillcrest
Evergreen Road			Emergency access only	B	10	75*	18' Cold-Mix Asphalt	2' Grass	Emergency access only.

* WISLR Estimated Traffic

3.1.2 State and County Highways

State highways that provide access to the Project area are defined as Minor Arterials in the Town's Comprehensive Plan. Roads classified as Minor Arterials provide intracommunity continuity and service to trips of moderate length, with more emphasis on land access than principal arterials. The State highways near the project area are described below:

- STH 13 is a two-lane undivided highway that provides an alternate connection from I-39 (via STH 73) and I-94 to the project site. It is classified as a Minor Arterial with 12 to 13-foot traveled lanes and a 2-foot paved shoulder. In 2017 the Annual Average Daily Traffic (AADT) was measured at 5900 Vehicles Per Day (VPD).

Although STH 13 runs directly through the Project area, State highways are not typically approved for Project access points unless there are no options to use Town or County roadways for access. The roadway carries nearly constant traffic therefore clear "Construction Traffic" signage will be recommended for traffic safety.

- STH 73 is a two-lane undivided highway that will provide moderately high-speed, high-capacity access from Interstate I-39 to the project area. It is classified as a Minor Arterial with 12 to 13-foot lanes and 2-foot paved shoulders. At various times between 2014 and 2017 the AADT was measured at 2400-3200 VPD by WisDOT. Intersections with County and Town roads are built to WisDOT dimensional standards and should not pose a concern for typical semi-trailers when built at right angles.

A number of intersections with STH 73 are sharper than 90-degree angles (Bell Road, Tower Road, Deer Ridge Road) which could create safety concerns for turning semi-trucks. Access routes should be selected to minimize the occurrence of acute angle turns as they are difficult for large trucks to safely negotiate.

3.1.3 Culverts

Culverts within the Project area were reported to be in good condition by County and Town representatives (Joel Ortman, Wood County Highway Superintendent, and Douglas Passineau, Town Road Oversight Manager). Stantec has not visually inspected roadway culverts, other than a cursory review for severely damaged or structurally compromised features.

No culverts within the Project area is listed on the State of Wisconsin Highway Structures Information System (HIS) database. Three structures near the project area are included in the database, and all are listed as being in Satisfactory or better condition:

- P-71-186 – Rangeline Road over Ten Mile Creek has a Bridge Sufficiency Rating of 94.9
- B-71-058 – STH 13 over Ten Mile Creek has a Bridge Sufficiency Rating of 87.8
- C-71-9000 – STH 13 over Seven Mile Creek has a Culvert rating of 6 (Satisfactory)
- B-71-187 – Bell Road over Ten Mile Creek has a Bridge Sufficiency Rating of 94.0

The smaller (unrated) culverts within the project area appear to be in generally good condition and surface pavements do not appear to show additional cracking which could be a sign of weakness or failure. None of the culverts within the project area appear to require replacement or enhancement if standard weight

vehicles are utilized for construction, although some of the culverts have been constructed with less than 12" of cover which may make them more susceptible to damage from truck traffic.

If overweight trucks are used for construction or deliveries, culverts should be structurally analyzed to verify that their load capacity is adequate for the expected loads. Accommodations should be made to temporarily or permanently increase the load capacity of the culverts if they are found to be inadequate.

3.2 METHODS TO BE USED TO HANDLE HEAVY OR LARGE LOADS ON LOCAL ROADS

Upon completion of construction, the day-to-day operation of the Project will require almost no large or heavy traffic. Typical vehicles used during day-to-day operations will be pick-up trucks or small vans for regular panel maintenance and site work (mowing, etc.).

During the approximately 18-month construction phase of the Project, large and heavy vehicles will be required more frequently. Heavy and large loads associated with the construction stage of this Project are described in the following sections.

3.2.1 Types of Over-Weight Loads

The heaviest Project load will be associated with the step-up transformer to be located near the substation yard in center west of the Project. The transformer will be transported on low-boy trailers and will require a crane for installation. Cranes will also be used to erect transmission structures.

Truckloads of aggregate for installation of permanent gravel access roads will also be delivered to the solar array sites.

3.2.2 Types of Over-Size Loads

Electrical poles for placement near the substation are proposed to be either steel poles in sections or wood, depending on the purpose of the pole (i.e., angle structures, in-line structures, span over wetlands, etc.). Oversize trucks are often needed to deliver taller poles. The poles for this Project are anticipated to require only standard-length trucks.

Solar inverters within the solar array portion of the Project may exceed the 8.5-foot height that can be shipped on a standard height trailer. Low-boy trailers can accommodate 10-foot-tall equipment and will be utilized as needed.

3.2.3 Methods – Over-Size and Over-Weight Loads

State highways and selected County highways should be used for the delivery of large or heavy loads to minimize impacts on lower-strength or compromised local roads. Normal weight loads, such as PV Panels, should follow damage prevention strategies so that the high volume does not cause damage to existing roadways.

Due to absence of a preferred access points, it may be necessary to utilize low strength or deficient highways for the delivery of equipment or machinery. Mitigation techniques should be employed to minimize damage to the extent practicable. Mitigation techniques may include:

- Decrease in vehicle speed;
- Increase vehicle turning radius;
- Construction of deceleration lanes, additional asphalt lifts, paved shoulders or wider driveway widths;
- Utilize vehicles which possess additional axles or special weight-distribution features;
- Using protective mats or temporary asphalt lifts for heavy load crossings.

In general, the most successful technique to preserve marginal local roads is avoidance. There are Town roads within and adjacent to the Project which have posted weight limits or deteriorated pavement. These roads should be avoided, when possible.

3.2.4 Construction Materials and Equipment Transport

Construction materials and equipment will be delivered by a variety of truck types. A total of approximately 7,000 truck trips are anticipated for construction support items. Construction support trips can be expected to include the following major items (an approximate count is given per trip type; the actual count will vary depending on final bid and equipment selection):

- Harvesting of red pine plantation which covers most of the project area. Approximately 20 trucks moving harvesting equipment onto the site, 3,000 truckloads of lumber removed from the site and another 50 truckloads of waste and scrap materials.
- Mobilization/demobilization of construction equipment including excavators, bulldozers, graders, water trucks, concrete pumps, cranes, forklifts, trailers, plows, trenchers, etc. – 150 total trucks during the construction phase – 25 to 35 weeks.
- Delivery of aggregate with dump trucks. Since the access drives will be constructed of native materials, aggregate use will be limited to access points (driveways) and inverter areas – 150 total trucks during a 10 to 12-week internal road construction period.
- Delivery of ready-mixed concrete with traditional ready-mix trucks – 250 truck deliveries during the approximate 10 to 12-week foundation construction period. The majority of the concrete trucks will be for foundations associated with the substation and Operations and Maintenance(O&M) building.
- Delivery of skid mounted inverters including transformers on low-boy semis – 42 trucks during the 10-week electrical construction period.
- Delivery of electrical conductor and fiber optic spools and other equipment and supplies on lowboy semis – 50 trucks during the 20 to 25-week electrical construction period.
- Delivery of solar panels and tracker parts on semis –1,275 delivery trucks and 300 dunnage removal trucks during the 20 to 25-week electrical construction period.
- Delivery of Miscellaneous Items (fencing, landscaping, meteorological station, culverts, tools and consumables, office trailers, etc.) – 100 trucks over the entire construction phase.
- For the Transmission Line, electrical poles will be composed of wood and steel on 5 semi-trucks.

3.2.5 Potential for Road Damage and Compensation for Damage

If required, prior to the start of construction, all roads in the Project area (as well as access routes from the Interstate highways, if necessary) will be documented using a high-frame rate, high-definition digital camera (Go-Pro or equal). This will set a baseline showing the condition of the roadways prior to the beginning of the Project and provide a “before” for comparison purposes. After construction is complete, the same roads will be re-documented in the same manner to record the “after” condition.

The greatest potential for roadway pavement damage will typically appear at the construction driveway access points due to the starting, stopping, and turning of heavy vehicles. Additionally, roadway edges are often the first part of an otherwise adequate roadway to show signs of failure. If roadway edges are damaged, the outside three to four feet of the roadway can be reconstructed cutting down the costs of pavement rehabilitation.

Culverts within the Project area are reported to be structurally adequate for standard load vehicles by local highway officials. Since heavy vehicles are required for construction and transport of large equipment, culverts on the selected routes should be visually inspected for cracks or other evidence of deterioration prior to construction and after construction.

3.3 PREFERRED ACCESS HIGHWAYS

Materials and equipment arriving on site from the south or west will likely utilize Interstate Highway I-94 to access the Project site. Materials and equipment arriving from the north or east will likely utilize I-39 to access the Project site. The following section describes potential trucking routes. These routes are highlighted on figure A-2 Haul Route Map in Appendix A.

3.3.1 Vehicles Arriving from the North, South, and East

The most suitable access route for vehicles arriving from the North or South will be via I-39 to STH 73 to STH 13 to Blue Ridge Lane. STH 73 avoids routing construction traffic through the City of Wisconsin Rapids, which is about six miles north of the Project site.

3.3.2 Vehicles Arriving from the West

The most suitable access route for vehicles arriving from west of the Project site, via I-94, will be to utilize STH 21 and STH 13 to the project site. Alternate routes, including Rangeline Road or STH 173 and STH 13, could also be utilized.

3.3.3 Possible Road Modification Locations

Road width or turning radius modifications are not expected to be required for Project deliveries except for the Tower Road and Blue Ridge Lane which could be reinforced prior to construction. If internal array road access points are constructed sufficiently wide (18 to 22 feet) at culvert locations, other modifications should not be necessary.

3.3.4 Roads to be Avoided

Discussions with the County and Township road personnel did not identify any roadways in the Project area to be structurally deficient or otherwise problematic except for Town roads during the spring thaw. For safety

and maintenance reasons, Town roads, other than specific Project access points, should be avoided to minimize damage to thinner pavement sections. Turning movements for large vehicles should be analyzed for acute angles between STH 73 and Tower Road, Bell Road, and Deer Ridge Road. Intersections with angles sharper than 90-degrees are more difficult for larger vehicles to negotiate, especially with trailers, and truck wheels are more likely to leave the pavement and cause rutting, pavement and property damage.

3.4 SAFETY CONCERNS

Access on and off existing roadways presents the largest safety concern for roads proposed to be utilized during Project construction and operation. Adherence to posted speed limits is an important factor in reducing accidents. Speed limits on roads within the Project area are not posted and can be assumed to be 55 mph. Speed limits on I-94 and I-39 are all 65 mph or greater.

3.4.1 Safety During Construction

Construction access points will be the most significant safety concern for this project. Whether it is a direct access point on a Town road or a near-by intersection (STH 13, STH 73, etc.) access points along the roadway should be marked by warning signage and lights when possible to alert other drivers to their presence. Construction Routes should be selected to avoid acute angle turning movements.

3.4.2 Safety During Permanent Maintenance Operations

During the operational phase of the solar Project, maintenance vehicles will typically consist of pick-up trucks, small box trucks, vans and small to mid-sized tractors for vegetation maintenance and mowing. Access drives should be properly signed and wherever possible, locations of new drives should be selected for best visibility.

3.5 FIGURES

3.5.1 Location Map:

Stantec has prepared a Location Map showing the project area and adjacent Roadways. This map is attached as figure A-1.

3.5.2 Regional Highway Map:

Stantec has prepared a Regional Highway Map showing the principal access roads for the project. This map is attached as figure A-2.

4.0 CONCLUSION

Stantec performed a Roadway Condition Report for the Saratoga Solar Project including the solar array, and connections to the existing sub-station on behalf of Saratoga Solar Project, LLC. Results of the assessment include the following:

- Permanent access drives may be placed on the nearest convenient Town highways without creating a significant safety hazard subject to permitting requirements of WisDOT, Wood County, and the Town of Saratoga.
- Construction access drives should not be located on weight-limited roads wherever possible.
- The recommended access route from I-39 to the Project site is via STH 73. Proper signage and possible use of warning lights should be investigated for turning points on STH 13 and STH 73.
- Significant culvert damage is not expected based on the existing condition of the infrastructure and the small number of over-weight vehicles expected for this Project.
- Significant Pavement damage is not expected on most roadways based on the existing condition of the infrastructure; however, localized damage should be expected along local roads, especially at turn-offs to Project access drives.

APPENDIX

Appendix A FIGURES

A.1 LOCATION MAP

A.2 REGIONAL HIGHWAY MAP

V:\1937\active\19370835203_data\gis_cad\gimxds\Road_Study\fig1_location_193708352.mxd Revised: 2022-04-13 By: carmer

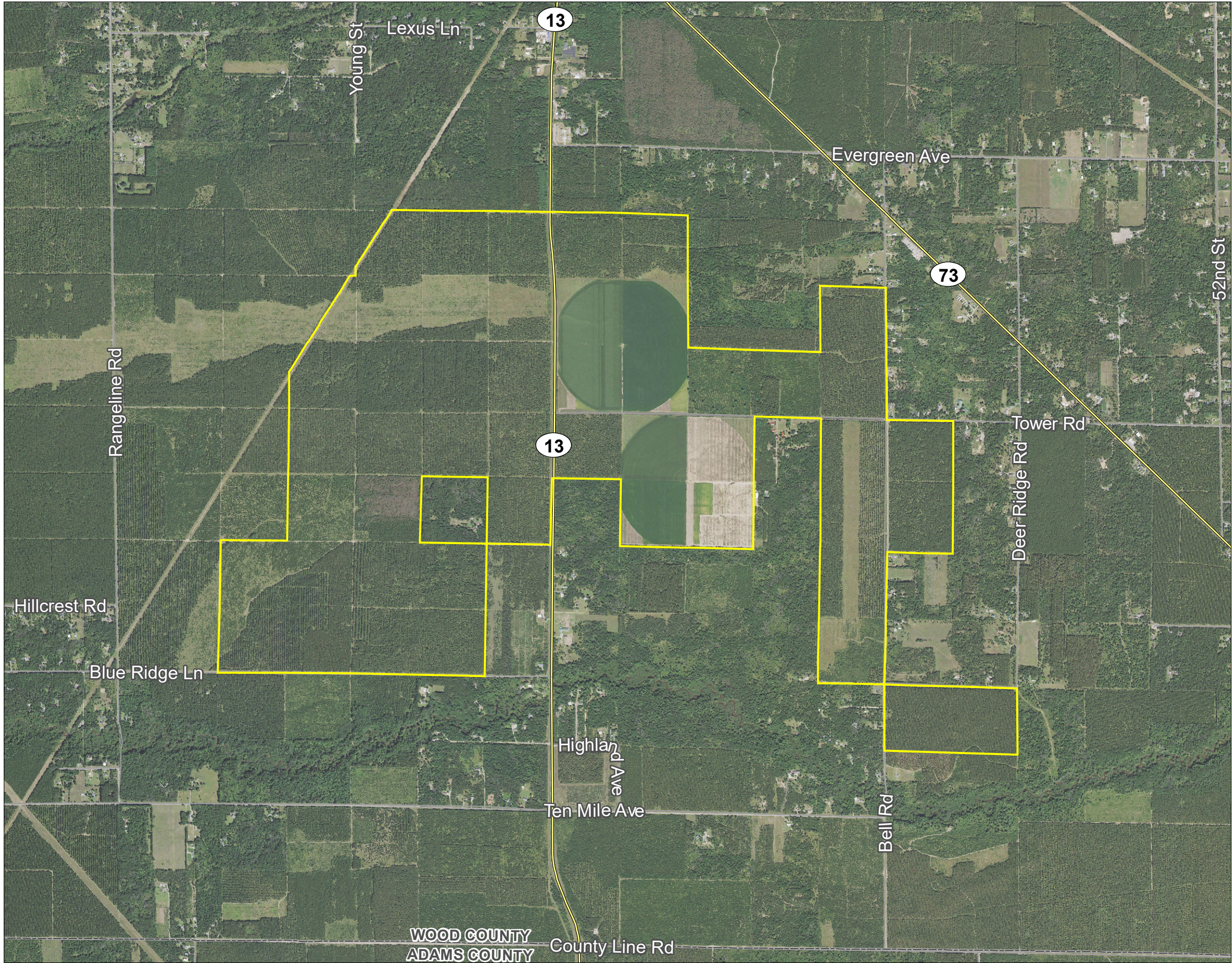


Figure No. **1**

Title **Location Map**

Client/Project **Saratoga Solar Project, LLC**
Saratoga Solar Project 193708352

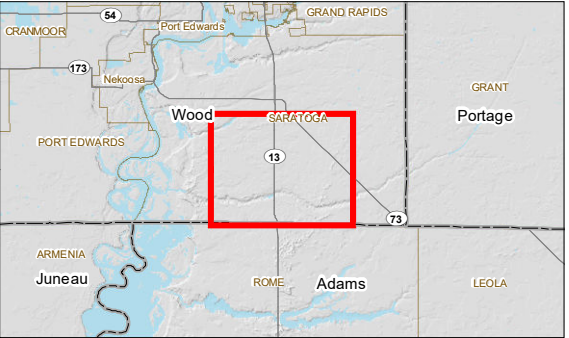
Project Location **Wood County, WI** Prepared by CA on 2022-04-12
TR by SP on 2022-04-13
IR by MC on 2022-04-13

N

0 1,000 2,000 Feet
(At original document size of 11x17)
1:24,000

Legend

- Project Area
- State Highway
- Town Road



Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin Central FIPS 4802 Feet
2. Data Sources: Stantec, Saratoga Solar Project, LLC, WDNR, WisDOT
3. Orthophotography: 2020 NAIP



