Invenergy LLC
Alternative Proposal

In the Matter of Xcel Energy's Competitive Resource Acquisition Process for up to 800 Megawatts of Firm Dispatchable Generation

Minnesota Public Utilities Commission Docket No. E002/CN-23-212

January 22, 2023

Submitted by Invenergy LLC and its affiliate Lake Wilson Solar Energy LLC

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STATE OF MINNESOTA
MINNESOTA PUBLIC UTILITIES COMMISSION

In the Matter of Xcel Energy's Competitive Resource Acquisition Process for up to 800 Megawatts of Firm Dispatchable Generation	Docket No. E002/CN-23-212

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Alternative Proposal
Wilson Lake Solar Energy Center

SUMMARY OF FILING
LAKE WILSON SOLAR ENERGY CENTER

Pursuant to the Minnesota Public Utilities Commission's November 3, 2023 Order Approving Petition and Requiring Compliance Filing, Invenergy LLC and its affiliate, Lake Wilson Solar Energy LLC, submitted a proposal for the Lake Wilson Solar Energy Center to meet Xcel Energy's need for up to 800 MW of firm dispatchable resources.

The Lake Wilson Solar Energy Center consists of up to a 150 MW of photovoltaic solar energy generating facility ("Solar Facility") and up to a 95 MW, 380-megawatt hour battery energy storage system ("BESS") near Lake Wilson in southwestern Minnesota. Combined, this solar-plus-storage project consists of up to 170 MW of firm dispatchable generation. The project has a Generation Interconnection Agreement with the Midcontinent Independent System Operator ("MISO") for 150 MW for the Solar Facility and 20 MW for the BESS. An additional 75 MW is under consideration for the BESS under MISO's Surplus Interconnect process.

This solar-plus-energy project will be a new-build resource and is currently under review for a Certificate of Need and Site Permit. The proposed in-service date for the Project is December 31, 2027. As a renewable resource, this project has significant environmental benefits, has no carbon emissions, and is sited with minimum environmental impacts.

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APPLICATION CONTENT REQUIREMENTS COMPLETENESS CHECKLIST

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
7849.0240	**Need Summary and Additional Considerations**		
Subp. 1	Need Summary	3.1	No
Subp. 2	Additional Considerations	3.2	Yes - Partial
7849.0250	**Proposed LEGF and Alternatives Application**		
A	Description of the Facility	4.1	No
1	Nominal generating capability of the facility, and discussion of economies of scale on facility size and timing;	4.1.1	
2	Description of anticipated operating cycle, including expected annual capacity factor	4.1.2	
3	Type of fuel used, including the reason for the choice, its projected availability over the facility's life, and alternative fuels, if any	4.1.3	
4	Anticipated heat rate of the facility	4.1.4	
5	Anticipated areas the facility could be located	4.1.5	
B	Discussion of Available Alternatives	-	Yes
C	Proposed Facility and Alternatives	-	Yes
D	System Map	4.2	No
E	Other Relevant Information	-	-
7849.0270	**Peak Demand and Annual Consumption Forecast**	-	Yes
7849.0280	**System Capacity**	-	Yes
7849.0290	**Conservation Programs**	-	Yes
7849.0300	**Consequences of Delay**	-	Yes
7849.0310	**Required Environmental Information**	5.0	No
7849.0320	**Generating Facilities**	6.0	
A	Estimated range of land requirements, including water storage, cooling systems, and solid waste storage	6.1	No
B	Estimated amount of vehicular, rail, and barge traffic generated by construction and operation of facility	6.2	No
C	Fossil-fuel facilities – Fuel	6.3.1	No
D	Fossil-fuel facilities – Emissions	6.3.2	No
E	Water Use for Alternate Cooling Systems	6.4	No
F	Sources and types of discharges to water	6.5	No
G	Radioactive releases	6.6	No
H	Types and quantities of solid wastes in tons/year	6.7	No

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
I	Sources and types of audible noise attributable to facility operation	6.8	No
J	Estimated work force required for facility construction and operation	6.9	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet for the generating facility	6.10	No
7849.0340	**No-Facility Alternative**	-	Yes
IRP Order	**Supplementary Data Required for Alternative Providers**	7.0	No
A.	Developer experience and qualifications.	7.1	No
B.	Pricing of the proposal,	7.2	No
C.	Scheduling provisions	7.3	No
D.	Discussion of the guaranteed performance factors, such as construction costs, unit completion, availability, and efficiency.	7.4	No
E.	Any other key contract terms the provider requires.	7.5	No
800 FD Order	**Supplementary Data Required for All Providers**	8.0	No
Metric 32	Climate Change Analysis	8.1	No
Metric 32	Environmental justice area evaluation	8.2	No
Metric 61	Information necessary for consideration of Energy Justice factors	8.3	No
Metric 32	Minn. R. 7849.1500 Subp. 2: Impacts of Power Plants	9.0	No
Minn. Stat. §§ 216B.2422, subd. 4; 216B.243, subd. 3a	Whether the applicant for a project generating nonrenewable energy has demonstrated that the project is less expensive than one generating renewable energy or is otherwise in the public interest.	10.0	No
Minn. Stat. § 216B.243, subd. 3(10)	Whether the applicant is in compliance with Minnesota's renewable energy objectives, including purchasing energy from C-BED projects.	11.0	No
Minn. Stat. § 216B.2426	Whether the applicant has considered the opportunities for installation of distributed generation.	12.0	No
Minn. Stat. § 216B.243, subd. 3(12)	Whether an applicant proposing a nonrenewable energy generating plant has assessed the risk of environmental costs and regulation over the expected useful life of the plant.	13.0	No

Minnesota Rule	Required Information	Application Section(s)	Exemption Granted
Minn. Stat. § 216B.1694, subd. (2)(5)	Whether the applicant has considered an innovative energy project as a supply option before expanding a fossil-fuel-fired generation facility or entering into a 5+-year purchased power agreement.	14.0	No

LAKE WILSON SOLAR ENERGY CENTER

1.0 EXECUTIVE SUMMARY

Invenergy LLC and its affiliate, Lake Wilson Solar Energy LLC, are pleased to submit this alternative proposal pursuant to the Minnesota Public Utilities Commission's ("Commission") competitive resource acquisition process for up to 800 MW of firm dispatchable resources to serve Xcel Energy's ("Xcel") Upper Midwest service territory. Invenergy is offering firm capacity from its proposed Lake Wilson Solar Energy Center, solar-plus-storage facility, located within Xcel's service territory.

The Lake Wilson Solar Energy Center (the "Project" or Lake Wilson Project) is a proposed 150 megawatt ("MW") alternating current ("AC" or "MWac") photovoltaic ("PV") solar energy facility ("Solar Facility") and associated 95 MW AC battery energy storage system ("BESS") at a single 2,621-acre site within Chanarambie and Leeds Townships in Murray County, Minnesota. As a capacity-rich firm dispatchable resource with complete site control and executed interconnection agreements, the Project represents one of the most advanced solar-plus-storage opportunities in MISO Local Resource Zone 1.

The Solar Facility and has executed a Generation Interconnection Agreement ("GIA") with the Midcontinent Independent System Operator ("MISO") for 150 MW and the BESS has a GIA for 20 MW. Invenergy intends to submit additional 75 MW of surplus interconnection for the BESS. The Project will tap NSP's Fenton-Chanarambie 115kV transmission line that is located within the site bounday.

Lake Wilson Solar Energy LLC submitted its Certificate of Need Application for the Project in February 2022. The Minnesota Department of Commerce, Energy Environmental Review and Analysis (DOC-EERA) issued an Environmental Assessment for the project in October 2023.[1] The Department of Commerce ("Department") Division of Energy Resources reviewed Lake Wilson's Certificate of Need Application and recommended that the Commission issue a Certificate of Need in its November 9, 2023 comments. A final decision is expected by April 12, 2024.[2]

The Lake Wilson Solar Energy Center would be an ideal and mature new-build resource for Xcel to meet its need for firm dispatchable resources. The current pricing and offer are for a Power Purchase Agreement ("PPA") but can accommodate a Build-Transfer arrangement. The Project is expected to reach commercial operation by December 31, 2027.

Invenergy LLC is a global leader in the development and operation of sustainable energy solutions, having successfully developed over 31 GW of wind, solar, natural gas power generation, and energy storage projects across the Americas, Europe and Asia. As the largest privately held

[1] *Environmental Assessment Lake Wilson Solae Energy Center Project*, MPUC Docket Nos. IP-7070/CN-21-791, GS 21-792; OAH Docket No. 5-2500-39336

[2] *In re Applications of Lake Wilson Solar Energy LLC for a Certificate of Need and Site Permit for the up to 150 MW Lake Wilson Solar and Associated Battery Storage Project in Murray County*, MPUC Docket Nos. IP-7070/CN-21-791, GS 21-792; OAH Docket No. 5-2500-39336, First Prehearing Order at 2 (Aug. 7, 2023).

independent power producer in the United States, Invenergy has demonstrated a long track record of success, with a unique ability to remain nimble in an ever-changing marketplace, by executing on reliable, low-cost solutions tailored to individual customer needs. These are just a few of the many advantages of partnering with Invenergy.

2.0 GENERAL PROJECT INFORMATION

2.1 THE LAKE WILSON SOLAR ENERGY CENTER

Lake Wilson Solar Energy LLC is a Delaware limited liability company and an affiliate of Invenergy LLC, a clean energy infrastructure company. Through its affiliate, Invenergy proposes to construct and operate the proposed solar-plus-storage Project in Chanarambie and Leeds Townships in Murray County, Minnesota (**Figure 1**). The Project is located near the city of Lake Wilson in southwestern Minnesota. The overall Project, including the 150 MW Solar Facility, the associated 95 MW BESS, and the transmission line interconnection facilities are to be sited within an approximately 2,621 acres under lease, easement or purchase option ("Project Area").

The Project will consist of:

- PV solar panel modules;
- Inverters;
- Step-up transformers (connecting solar panel inverters to collection lines/Project substation);
- Electrical wiring/cables (connecting PV panels to solar panel inverters);
- Single-Axis Trackers;
- Collection lines (connecting solar panel inverters to Project substation);
- Security fencing and gates;
- Access roads;
- Stormwater treatment areas (associated with the Project);
- Operations and maintenance (O&M) facility;
- Supervisory Control and Data Acquisition (SCADA) system;
- BESS (including inverters, storage devices, emergency generators and electrical connection to the Project substation);
- Project Substation;
- Power transformer(s);
- Switchgear;
- Metering equipment;
- Ancillary equipment or buildings as necessary.

Lake Wilson has secured site control for the entire proposed Project via lease and easement agreements, and a purchase option agreement (for the proposed new Switchyard and some additional Project solar and BESS infrastructure). The final Project design is expected to occupy approximately 1,526 acres (Preliminary Development Area), within the overall 2,621-acre Project Area. The Preliminary Development Area is generally defined as the area containing all Project facilities located within the Project security fencing (e.g., arrays, inverters, collection lines, etc.) and includes the access roads extending beyond the Project's fenced area. It also includes the Project substation, new switchyard (Xcel Switchyard), and operation and maintenance ("O&M")

building. The 1,526-acre Project footprint is larger than what is anticipated to ultimately be required to host 150 MWac Solar Facility and associated 95 MWac BESS. The final Project footprint will be dependent on the permitting process, final field surveys, engineering and geotechnical studies, and equipment selection. Lake Wilson will optimize the Project to the degree practicable to minimize the overall impact of the Project.

Lake Wilson filed two queue positions with MISO for the Project. A 150 MWac solar queue position was filed in the MISO Definitive Planning Phase (DPP)-2017-AUG study cycle and a 20 MWac BESS queue position was filed in the MISO DPP-2018-APR study cycle. Lake Wilson Solar Energy initially obtained an executed GIA with MISO in September 2021 for the 150 MWac solar queue position. Working with MISO, the GIA was amended and restated to incorporate both the 150 MWac solar and 20 MWac BESS queue positions. Lake Wilson will work with MISO to pursue an additional 75 MWac BESS capacity via MISO's Surplus Interconnection Process.

MISO has made significant progress updating its interconnection process to provide multiple pathways for the interconnection of battery storage facilities, as required by FERC Order 845. One of these pathways, the Surplus Interconnection Process, has recently enabled more batteries in a hybrid configuration to be interconnected quickly and efficiently. Surplus Interconnection Service, as defined by MISO, derives from the unneeded portion of Interconnection Service established in a GIA or in agreement with, or under the tariff of, the Transmission Owner prior to integration into MISO so that the total amount of Interconnection Service at the Point of Interconnection ("POI") would remain the same. Designed to reduce costs for interconnection customers and improve wholesale market competition, the Surplus Interconnection Process allows Lake Wilson to create additional capacity value by leveraging the interconnection facilities and network upgrades necessary to accommodate the solar generation component of the Lake Wilson Project. Surplus interconnection requests also proceed through a separate queue process outside of the standard DPP allowing review to occur on an expedited timeline.

Lake Wilson will seek MISO approval for the additional 75 MWac of BESS capacity via MISO's Surplus Interconnection Process based on: (1) the energy and capacity levels for the Solar Facility generation assets during the peak and shoulder times that were incorporated into the MISO studies; (2) the energy and capacity value of the BESS during the summer and shoulder peak that are incorporated into the MISO studies; and (3) MISO's methodology for assigning capacity. The solar and BESS portions of the Project will operate in tandem as one combined, associated facility. This interconnection configuration will provide sufficient outlet to maximize the use of all solar energy generation from the Project.

The Lake Wilson Project will include a proposed approximately 200-400-foot long 115 kilovolt ("kV") above-ground Gen-Tie Line that is needed to connect the Project Substation to the Xcel Switchyard. The 115 kV overhead Gen-Tie Line will likely exit from the western portion of the Project substation and route to the Xcel Switchyard. The anticipated route of the Gen-Tie Line is shown on **Figures 3 and 4**. The proposed Gen-Tie Line is planned to be a 115 kV line spanning less than 1,500 feet and thus will not trigger the need for a Route Permit from the Commission. The planned Project Gen-Tie Line is further exempt from Certificate of Need requirements because

it does not meet the voltage and length requirements of a large energy facility under Minn. Stat. § 216B.2421, subd. 1.

Lake Wilson proposes to interconnect the Project to the existing Fenton – Chanarambie 115 kV high voltage transmission line ("HVTL"), which transects the Project Area, via a 250-300 foot in/out 115 kV transmission line (Xcel Line Tap) from the Xcel Switchyard. Lake Wilson Solar Energy will acquire land rights for the Xcel Switchyard and Xcel Line Tap, and Xcel will design, permit, construct, own, and operate the Xcel Switchyard facility and Xcel Line Tap.

As a Large Electric Power Generating Plant ("LEPGP") as defined in Minn. Stat. § 216B.2421, subd. 2(1), and a "large electric generating facility" as defined in Minn. R. 7849.0010, subp.13. Lake Wilson is concurrently seeking a Site Permit pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. Ch. 216E) and Minn. R. Ch. 7850 in Docket No. IP-7070/GS-21-792 and a Certificate of Need pursuant to Minn. State. § 216B.243 and Minn. R. Ch. 7849 in Docket No. IP-7070/CN-21-791.

2.2 APPLICANT INFORMATION

Lake Wilson Solar Energy LLC ("Lake Wilson") is a Delaware limited liability company and a wholly owned subsidiary of Invenergy Solar Development North America LLC, and an affiliate of Invenergy LLC ("Invenergy"). Invenergy is an energy development company with headquarters in Chicago, Illinois and will provide development services to Lake Wilson for the Project.

As the world's largest privately held developer and operator of renewable power, Invenergy works with leading utilities, global brands and public sector partners to take energy infrastructure projects from drawing board to reality. Invenergy's 2,000 employees are united by a vision to be innovators building a sustainable world. Headquartered in Chicago, Illinois, the Company has successfully developed over 31 gigawatts of power projects across the Americas, Europe and Asia.

Invenergy has developed 68 projects across the Midwest region totaling more than 12,000 MW. The total is comprised of 41 wind projects, 19 solar projects, 3 natural gas facilities & 6 storage projects. These projects have generated investments of more than $67 million annually in local communities. In Minnesota, Freeborn Wind Energy LLC, an affiliate of Invenergy, recently completed development, permitting, and sale of the Freeborn Wind Project located in Freeborn County, MN and Worth County, IA to Xcel Energy in 2019.

Invenergy continually maintains an active dialogue with key providers of debt and tax equity to inform and maintain the accuracy of our financing metrics. During the late stages of project development, Invenergy typically approaches target lenders to seek proposals for construction financing. The construction loan combines with Sponsor equity will raise sufficient capital for the entire construction costs of the Project.

Construction financing for a project is typically structured as non-recourse debt financing. The security and collateral package held by the project financing parties customarily consists of a pledge of the equity in the Project company, a pledge of all Project assets, and collateral

assignments of certain material Project agreements. Over nearly two decades, Invenergy has completed more than $45 billion in transactions, and the Company's deep bench of financiers is unparalleled in the renewable energy development sector. The Company proficiently structures project financing and maintains strong relationships with a wide range of partners including international and domestic banks, multilateral development banks, export credit agencies and pension funds.

On or shortly after the commercial operation date ("COD"), the construction financing is replaced by more permanent financing, such as a tax equity investment with or without back-leverage or a senior secured term loan. The security and collateral package during the term loan period depends on the type of permanent financing that is put in place.

2.3 PROJECT CONTACTS

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3.0 NEED SUMMARY AND ADDITIONAL CONSIDERATIONS (MINN. R. 7849.0240)

3.1 NEED SUMMARY

In its 2022 order approving Xcel's Integrated Resource Plan ("IRP"), the Commission stated "it is more likely than not that Xcel will need up to 800 MW of generic firm dispatchable resources between 2027 and 2029."[3] The Commission defined firm dispatchable resources as resources that are able to provide capacity and energy.[4] In this current proceeding, the Commission initiated a process to address Xcel's proposal for acquiring 800 MW of firm dispatchable resources consistent with its 2019 IRP order and facilitate the resource acquisition process using the Xcel-Bid Contested Case/Track 2 Process.[5]

Invenergy is proposing to construct the Lake Wilson Solar Energy Center to sell energy, capacity, and renewable energy credits to Xcel Energy. The proposed project would consist of 150 MW of solar generating capacity and 95 MW of storage capacity to create 170 MW of firm dispatchable generation.

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[3] *In re Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan*, MPUC Docket No. E002/RP-19-368, Order Approving Plan with Modifications and Establishing Requirements for Future Filings at 14 (Apr. 15, 2022).

[4] *Id*. at 32.

[5] Order Approving Petition and Requiring Compliance Filing (Nov. 3, 2023); *see also In re Xcel Energy's 2020-2034 Upper Midwest Integrated Resource Plan*, MPUC Docket No. E002/RP-19-368, Order Approving Plan with Modifications and Establishing Requirements for Future Filings at 33 (Order Point 6), Appendix A (Apr. 15, 2022).

The Lake Wilson Project will provide up to 170 MW of MISO accredited capacity as a planning resource to meet Xcel's resource adequacy requirements. Under current MISO rules, the Lake Wilson Project would have an accredited capacity of 165.25 MW in the summer, 165.25 MW in the fall, 97.75 MW in the Winter, and 165.25 MW in the spring.

The Solar Facility will produce approximately 332,570 MWh annually of clean and reliable solar generated electricity. The BESS system will be able to charge/discharge 137,800 MWh of electricity from the solar project or the grid in order to optimize the system. Lake Wilson will convey all energy, capacity, ancillary services including reactive supply and voltage control, full dispatch control, and any environmental benefits generated from the project.

Minnesota recently adopted a carbon-free standard to accelerate the energy transition to attain carbon-free electricity by 2040 with certain milestones along the way.[6] Firm dispatchable resources will be needed during this transition to 100 percent carbon-free electric generation. These resources are needed as baseload plants retire and additional renewable energy, which is intermittent by nature, comes online. The Lake Wilson Project is uniquely situated to provide firm dispatchable energy and capacity while utilizing only renewable energy resources due to the on-site battery storage.

Xcel must also comply with Minnesota's solar energy standard and 10 percent of its retail electric sales must be generated by solar energy.[7] The Lake Wilson Project is a clean-fuel alternative to any new-build combustion turbines and is a cost-effective and reliable investment that aids Xcel in compliance with Minnesota's new carbon-free standard and its solar energy standard.[8] The Lake Wilson Project can be ready to operate by the end of 2027 and is ideally suited to meet the requirements of the identified need for 800 MW of firm dispatchable resources while fulfilling Minnesota's clean energy policies.

As discussed in more detail in its site permit application, Lake Wilson conducted a detailed analysis to identify the current POI and solar site location for development. Lake Wilson proposes to interconnect the Project to the existing Fenton-Chanarambie 115 kilovolt kV HVTL via the Xcel Line Tap and a new Xcel Switchyard that will be permitted, constructed, and owned by Xcel Energy. Lake Wilson identified this POI as having available capacity and low interconnection costs along with community interest in the Project with minimal impact to the environment.

3.2 ADDITIONAL CONSIDERATIONS

3.2.1 Socially Beneficial Uses of Energy Output

Energy produced by the Lake Wilson Project will provide significant, numerous, and varied societal benefits. First, the Project will provide a large amount of renewable energy with minimal environmental impact as well as avoided environmental costs. Further, regional, and

[6] Minnesota 2023 Session Laws, Ch. 7, Section 10, H.F. 7 (amending Minn. Stat. § 216B.1691 to require investor-owned utilities, such as Xcel Energy, to achieve 80 percent of all electricity sold to be from carbon-free sources by 2030, 90% by 2035, and 100% by 2040).

[7] Minn. Stat. § 216B.1691, subd. 2f.

[8] *See* Minn. Stat. § 216B.1691, subds. 2f-2g.

national security and energy reliability can be enhanced through the development of diversified generation resources such as solar energy generation plus energy storage from the Project.

The Project will provide up to 170 MW of capacity and approximately 332,570 MWh annually of clean and reliable solar generated electricity. The BESS system will be able to charge/discharge 137,800 MWh of electricity from the solar project or the grid in order to optimize the system. As such, the Project will produce affordable, clean, renewable energy that will help meet energy demands and clean energy and carbon reduction standards and voluntary goals. According to the United States Environmental Protection Agency's (USEPA's) Greenhouse Gas Equivalencies Calculator (USEPA, 2022), the Project is expected to offset approximately 489,000,000 pounds (~244,500 short tons) of carbon dioxide equivalent annually and provide electricity for approximately 28,000 homes annually. In addition, the local economy will benefit from the landowner lease, easement and purchase payments for the Project, production taxes, income from jobs created, and local spending. It will also provide carbon-free energy that will assist in meeting carbon and GHG reduction goals.

The Project is also designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary option leases, easements or purchase agreements between the landowners and Lake Wilson for lease, easement or purchase of the land for the Project. Lake Wilson has secured 100 percent land control for the Project, which is the approximate 2,621-acre Project Area comprised of private land under a solar lease or collection easement agreement, as well as a small portion of land under a purchase agreement option. The 2,621-acre land control area includes land which was secured to provide the acreage needed to complete final design, construction and operation of the Project. Lake Wilson estimates that up to approximately 1,526 acres of the 2,621 acres is necessary to accommodate the final design and engineering of the proposed up to 150 MWac Project (i.e., the Preliminary Development Area). As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design.

The Project will also create new local job opportunities for various trade professionals that live and work in the area as it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes. Lake Wilson plans to issue a Request for Proposal to an Engineering, Procurement and Construction ("EPC") contractor to construct the Project. Lake Wilson will include preferences for contractor bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project's budget, timeline, industry standards and requirements, and corporate safety policies. The selected EPC contractor will work with labor unions, local subcontractors, or other vendors to implement a Project construction staffing model that attempts to maximize local hiring and local economic benefits for the Project to the extent practicable, while ensuring the Project is safely built on time and on budget. Moreover, the timing of construction of the Project is also likely to necessitate the payment of prevailing wages during construction and operation of the Project to satisfy new Investment Tax Credit ("ITC") qualification requirements contained within the Inflation Reduction Act ("IRA"). Lake Wilson expects to utilize the tax credits provided for in the IRA as part of the Project's long-term financing structure.

Typical onsite construction staff levels will depend on the number of concurrent tasks being performed and the phasing of the Project. The Project will create approximately 250 jobs during the construction and installation phases, and up to 5 onsite jobs and 11 indirect jobs in Murray County, as well as an additional 9 indirect jobs in the State of Minnesota during the operations phase. Temporary construction jobs within Murray County will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. As an operating facility, the Lake Wilson Project will annually generate an estimated $4.5 million in economic output for the State of Minnesota by supporting onsite and indirect jobs as described, and distributing nearly $1.7 million in earnings.

Additionally, much of the workforce needed to construct a solar facility must be comprised of Minnesota licensed electricians because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code, which in turn requires that Minnesota licensed electricians complete that work. Wages and salaries paid to contractors and workers in Murray County will contribute to the total personal income of the region. At least part of the wages paid to temporary and permanent Project workers will be circulated and recirculated within the county and the state. Expenditures made by the Applicant for equipment, fuel, operating supplies, and other products and services will benefit businesses in the county and the state. In addition, lease and purchase payments paid to the landowners will more than compensate for potential financial losses associated with removing a portion of their land from agricultural production, and these payments will diversify and strengthen the local economy.

Long-term benefits to the county's tax base as a result of the construction and operation of the Project will contribute to improving the local economy. For example, the Minnesota solar energy production tax rate is $1.20 per MWh. The Project is expected to generate an estimated average annual solar energy production and property tax revenue over the life of the project of approximately $330,000 for Murray County and approximately $75,000 for Leeds Township. The Project is expected to generate about $12 million in local tax revenues over a 30-year period.

The Lake Wilson Project offers an opportunity to maximize the economic attributes that benefit the local community and deliver an overall cost-competitive energy project. The Project's strong solar resource, proximity to existing electrical and transportation infrastructure, an executed GIA, and ability to create a construction-efficient layout are some of the major benefits of the Project.

The environmental impacts of the Project will be minimal and significantly less than a fossil-fuel based facility. One of the greatest attributes of solar energy is its minimal impact on the environment. The Project will not directly release CO_2, sulfur dioxide, nitrogen oxides, mercury, or particulate matter. It will not require water for power generation and will not discharge wastewater containing any heat or chemicals during operation. It will produce energy without the extraction, processing, transportation, or combustion of fossil fuels. The Project will be sited to minimize environmental impacts. Additionally, recent research on the environmental impacts of solar farms indicates that there could be some net benefits to soil resources over the lifecycle of the Project.

In general, the socioeconomic impacts associated with the Project will be positive. Wages will be paid and expenditures will be made to local businesses and landowners during the Project's construction and operation. The construction and operation of the Project will increase Murray County's tax base. In addition, lease and purchase payments paid to the landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project will impact up to approximately 1,526 acres of agricultural land within the Preliminary Development Area, roughly 0.4 percent of the farmland in Murray County. The Project will not result in a significant impact to land-based economies in the Project vicinity as this acreage constitutes well under one percent of the farmland in Murray County. Of the 461,000 acres in Murray County, the majority (approximately 362,082 acres) is classified as cropland. Impacts to approximately 1,526 acres of agricultural land within the Preliminary Development Area would temporarily reduce the amount of farmland land in the County by roughly 0.4 percent.

Agricultural production would be allowed to continue in certain areas within the Project Area but outside the fence of the Preliminary Development Area during construction and operation of the Project. In addition, taking land that has been farmed for more than 100 years temporarily out of production results in benefits to the soil at the end of the Project's useful life. According to the United States Department of Agriculture, establishing and maintaining permanent cover of either introduced or native grasses, legumes and forbs for nesting cover, winter cover, brood cover, pollinator habitat, and food for wildlife can reduce soil erosion, improve water and air quality, enhance plant diversity, and increase soil organic matter and overall soil health.

Not building an electrical generation facility would result in no physical impact to the environment in Murray. However, not building the Project would also not provide an additional source of tax revenues to the county, an increase in the income stream to residents and businesses, an increase in perennial grasses that is expected to increase carbon sequestration and storage capacity of the soils over the life of the Project, or an increase in the amount of low-cost, clean, reliable renewable energy available to state or regional utilities and their customers. The Project will have a minimal impact on the physical environment, while simultaneously providing significant benefits.

3.2.2 Effects of Facility in Inducing Future Development

The Project is not expected to directly affect development in Murray County or hinder future development that can otherwise occur in surrounding agricultural areas.

The Project is designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by voluntary leases or purchase agreements between the landowner and Lake Wilson for lease or purchase of the land. Lease payments will be made to the owners of the land used for the Project. These payments will replace the revenue which would have been generated if agricultural production were continued by the landowners. In fact, based upon an analysis completed by Strategic Economic Research in 2021, the land use value of leasing the land for solar far exceeds the value for agricultural use when considering the development of the land for the Project.

Solar energy infrastructure will also provide an additional source of revenue to the townships and county in which the Project is sited. The Minnesota solar energy production tax

rate is $1.20 per megawatt hour ("MWh"). The Project is expected to generate an estimated average annual solar energy production and property tax revenue over the life of the project of approximately $330,000 for Murray County and approximately $75,000 for Leeds Township.

As discussed in Section 3.2.1, the Lake Wilson Project will create new local job opportunities for various trade professionals that live and work in the area. Construction jobs within Murray County will generate indirect economic benefits as employees spend their income on local goods and services and pay local sales tax. As an operating facility, the Project will annually generate an estimated $4.5 million in economic output by supporting approximately 25 direct and indirect jobs in Minnesota and distributing nearly $1.7 million in direct earnings.

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

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for housing, lodging, food services, fuel, transportation, and general supplies. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes. At the same time the Project is providing income to residents, an increase in renewable energy will also help to lessen wholesale energy market volatility. The development of solar energy technology now makes solar power's relative price competitive with other generators, including natural gas and coal.

4.0 DESCRIPTION OF PROJECT AND ALTERNATIVES (MINN. R. 7849.0250)

4.1 PROPOSED PROJECT

As a solar-plus-storage facility, the Lake Wilson Solar Energy Center will consist of up to a 150 MWac PV Solar Facility and up to a 95 MWac, 380 MWh BESS located in Leeds Township, Murray County, Minnesota. The proposed Project Area is approximate 2,621 acres the Lake Wilson Project would connect to the existing Fenton - Chanarambie 115 kV HVTL that transects the Project boundary. Lake Wilson has secured site control for the entire proposed Project via lease and easement agreements and a purchase option agreement (for the proposed new Switchyard and some additional Project solar and BESS infrastructure). The final Project design is expected to occupy approximately 1,526 acres within the overall 2,621-acre Project Area. As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design. The Project will include a proposed 115 kV Gen-Tie Line that will be approximately 200-400 feet long and will connect the Project substation to the Xcel Switchyard (which facilitates the interconnection to the existing Fenton - Chanarambie 115 kV HVTL). The 115 kV overhead Gen-Tie Line will likely exit from the western portion of the Project substation and route to the Xcel Switchyard. The Project will interconnect to the grid via a 250-300 foot in/out

115 kV Xcel Line Tap that will extend from the Xcel Switchyard to the existing Fenton - Chanarambie 115 kilovolt kV HVTL (which transects the Project Area).

The Project's primary components include PV panel modules mounted on a one-in-portrait single axis tracking system (**Image 1**), centralized inverters, a BESS system that consists of racks of Lithium-ion batteries arranged in pre-constructed outdoor containers, BESS inverters, a substation, Project Gen-Tie Line, an O&M facility, fencing, and access roads. For descriptive purposes, an individual tracker row is used as a basic unit of the Solar Facility. A tracker row is made up of panels mounted on a flat beam oriented north-south, with a break in the middle where the gear box is located. The tracker rows, which tilt east-west to follow the sun throughout the day, are connected together in groups and, depending on the manufacturer, served by a single motor. The racking system consists of all the components involved in fastening the panels to the tracker rows, plus the tracker beams, gearboxes, motors, and pier foundations. Associated facilities include electrical cables and accessories, conduit, inverter pads, switchgears, step-up transformers, SCADA systems, and metering equipment. The Project solar arrays and BESS will be fenced/secured and access allowed for authorized personnel via lockable gates. The Project Substation and Xcel Switchyard will also be fenced with controlled/locking access gates.

As construction of the Project nears completion, temporary staging and laydown areas and other temporary disturbance areas will be restored. The Project will be graded to natural contours where possible and soil will be de-compacted. Disturbed areas will be reseeded and re-vegetated with specific seed mixes in accordance with the Project Vegetation and Soil Management Plan and the Stormwater Pollution Prevention Plan. The Applicant will work collaboratively with the Minnesota Department of Natural Resources to maximize the opportunity to establish and manage the vegetation at the Project site pursuant to the Agricultural Impact Mitigation Plan.

Image 1: Typical Solar Tracker Row Design.

The solar array at the Project will consist of PV solar panels, a racking system, inverter skids, security fencing, and up to ten weather stations. The weather stations would be up to 15

feet in height. Panels will likely be affixed to tracking mechanisms that would allow the panels to "track" the sun from east to west on a daily basis. 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 (**Image 2**). 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.

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

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

A specific solar module has not yet been selected for the Project. The proposed module at the time of the alternative proposal submittal is the Jinko JKM580N-72HL4-BDV model. Several other manufacturers are under consideration, including modules manufactured by LONGi, Canadian Solar, Hanwha, JA Solar, Risen, Seraphim, Talesun, Hyperion Solar (Runergy), and Trina. All modules under consideration are mono- or poly-crystalline models. Lake Wilson will consider the costs and performance of each technology option as well as environmental and safety standards when making its final selection. This process has been included in the proposed Project timeline and the final selection should not alter the Project scope, timeframe or budget.

A specific racking and tracker selection has not been made. The NexTracker Horizon Gen 3 SPT is under consideration, as well as racking and tracker vendors including: the ATI DuraTrack, GameChange Solar's Genius Tracker, PV Hardware's Axone/Monoline, and Soltect's SF7/SF7 Bifacial model. Racking infrastructure and trackers will be selected closer to the procurement stage to ensure performance standards are met.

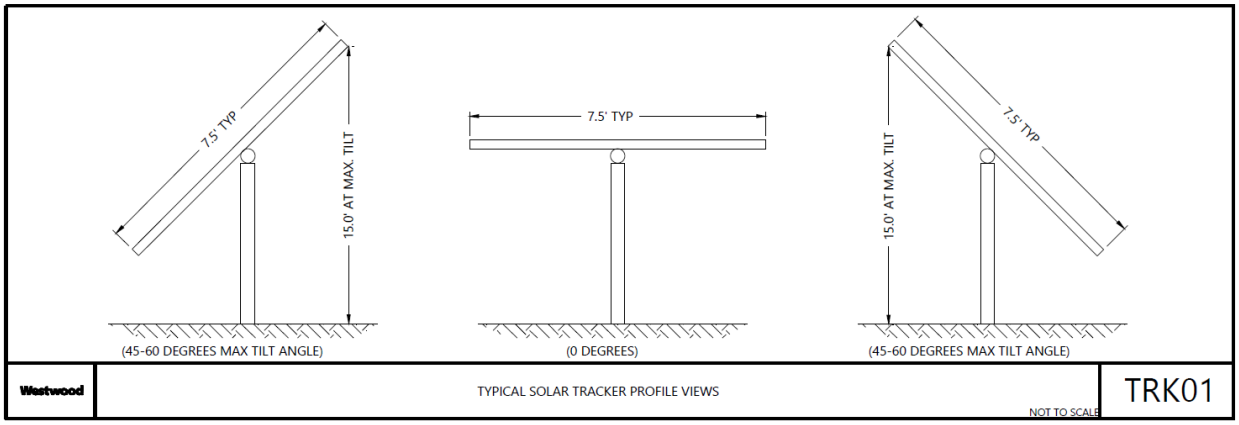


Image 2: Typical Solar Tracker Profile.

Solar energy generation begins with the installed solar modules converting energy from sunlight into direct current (DC) electrical power. Electrical wiring will connect the PV panels to inverters which will convert solar energy generated power from DC to alternating current (AC). A step-up transformer (located with each of the inverters) then converts the AC voltage to an intermediate voltage of 34.5 kV. Collection cables then carry the 34.5 kV power to the BESS and/or Project Substation.

The DC electrical collection cabling will be installed either below ground or underhung beneath the PV solar modules and racking via the CAB system. The CAB system is a cable management system that delivers a safe, strong, and durable support for utility-scale wiring for ground-mount solar power generation facilities. CAB systems are quick and easy to install and provide potential labor and material cost benefits on solar projects. If buried, the underground trench will be approximately 2-5 feet below ground and 1-2 feet wide for AC cabling, or 4-10 feet wide for DC cabling (**Image 3**). Excavation and refilling the trench will be conducted in accordance with the AIMP.

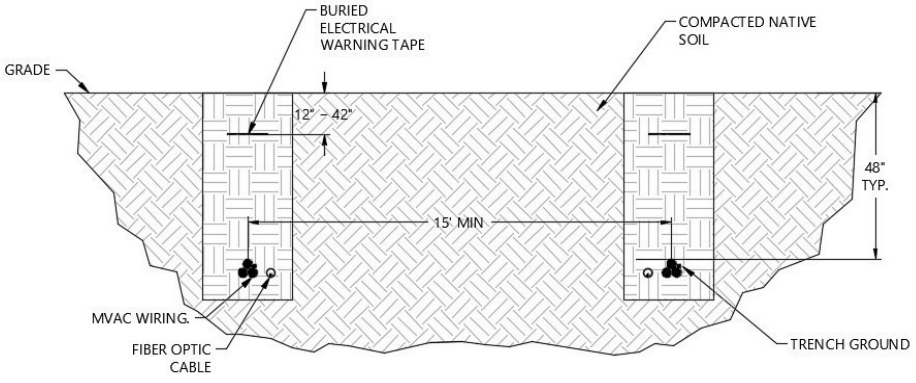


Image 3: Typical Solar Collection Trenches for Cables

Inverter skids will be installed at locations throughout the Preliminary Development Area. Each skid includes a DC to AC inverter and a step-up transformer to which the inverters will feed electricity. The final number of inverters for the Project will depend on the inverter size, as well

as inverter and panel availability. To represent maximum potential impacts, the Project's preliminary design proposes 39 inverter skids. Skids provide the steel foundation for the enclosed inverter, step-up transformer, and SCADA system. The height of a skid is approximately 6-10 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 20 feet long, with final dimensions to be determined during detailed design by the contracted engineer and will be influenced by the inverter make and model. If a concrete pad is used, the selected contractor will provide the concrete pad. Concrete foundations will be poured onsite or precast and assembled off-site. The inverters skids are located within the interior fenced portion of the Project along access roads.

A specific solar inverter has not yet been selected for the Project. Preliminary designs modeled use of the SMA SC 4200-UP-US Unit. However, several other models and vendors are under consideration, including units manufactured by FIMER, TMEIC, GE, PE, and Sungrow. Lake Wilson will consider the costs and performance of each option as well as environmental and safety standards when making its final selection.

Each inverter pad will also include one or more transformers to which the inverters will feed electricity (**Image 4** which shows the DC cables buried option). Inverters convert the DC output of the PV modules to AC, which is required for delivery to the electrical grid. After the inverter has converted the electricity, it is stepped-up via a transformer from low-voltage to medium or intermediate voltage (stepped up to 34.5 kV). The final number of inverters for the Project will depend on the inverter size, inverter and module availability, as well as the final array configuration. For the purposes of generation estimates, Lake Wilson modelled the SMA SC 4200-UP-US Unit.

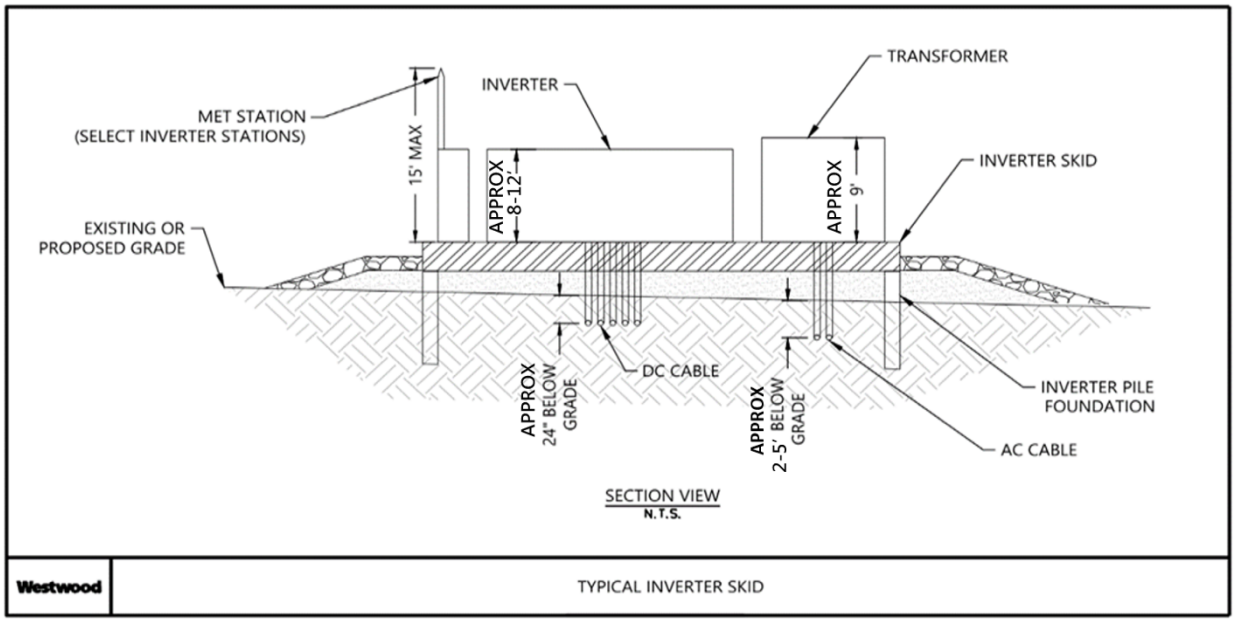


Image 4: Typical Solar Inverter Skid (DC Cables Buried Option)

Project BESS facilities would include commercial-scale lithium-ion (or similar technology) batteries, converters or inverters, pad-mount transformers, and electrical interconnection facilities. The BESS also incorporates backup diesel generators to ensure this

function can still be activated when there is a grid failure or power outage. The backup generators will be sized to provide at least two hours of standby power consistent with NFPA requirements and will be mounted on a concrete foundation. Lake Wilson anticipates a centralized, AC-coupled system for the BESS (i.e., all batteries being in one location as opposed to distributed throughout the Project), which would have a footprint of approximately 4 acres by itself, and 6 acres including setbacks and fencing. This type of system allows for more efficient access, monitoring, and maintenance; has more flexible energy and power capacity sizing; and has more flexible dispatch capabilities. The centralized design is also more technologically developed. The preliminary designs for the BESS components incorporate a modular layout based on currently available technology, which provides a conservative analysis of the potential overall size of the BESS.

The BESS will be used to firm, smooth, or shift energy output generated by the Project as it is distributed to the overall electric grid. The BESS component is in part designed to reduce costs for interconnection customers and improve wholesale market competition, allowing Lake Wilson to create additional energy and capacity value by maximizing the use of interconnection facilities and network upgrades necessary to accommodate the solar generation component of the Project. The BESS is intended to maximize the usefulness of the network upgrades by dispatching stored power during times when less solar energy is being produced. For example, during off-peak times, if the Project is producing 100 MWac of solar generation, the BESS could dispatch up to an additional 70 MWac of power to fully utilize the 170 MWac of capacity allowed under the GIA. A BESS is accredited capacity based generally on its ability to provide the energy equivalent of its claimed capacity for a minimum of at least four continuous hours each day.

The BESS will be configured of storage cells (batteries) arranged in modules for efficient operations. The cells themselves will be lithium-ion chemistry. The BESS industry is currently deploying two main types of lithium-ion battery chemistries: nickel manganese cobalt oxide ("NMC"), and lithium iron phosphate ("LFP"). Lake Wilson intends to use LFP due to its superior safety profile when compared to NMC. The batteries will be housed in racks within a series of steel shipping containers or similar outdoor-rated enclosures (see **Image 5**). These enclosures will also house necessary systems and equipment to ensure the safe operation of the batteries. These include, but are not limited to, a Battery Monitoring System ("BMS"), thermal cooling system, and fire detection system. The BMS monitors the temperatures and voltages of the cells via sensors to ensure they are within the appropriate operating ranges. The fire detection system consists of smoke, heat, or other types of detectors that monitor the enclosure for the presence of a potential thermal event.

A specific BESS vendor has not yet been selected for the Project. Preliminary designs modeled use of the Fluence Cube (Gen 6) Unit. However, several other models and vendors are under consideration, including units manufactured by POWIN, GE, CATL, and Evlo. Lake Wilson will consider the costs and performance of each option as well as environmental and safety standards when making its final selection.

The BESS will utilize a power conversion system ("PCS") (i.e. a combination of inverters and medium voltage transformers) to convert its power from AC to DC then step up from low voltage to 34.5kV medium voltage to be transmitted to the Project Substation via the collection system. The PCS units are similar to the solar inverter skids in form, function, and design. The

final number of inverters for the Project will depend on the inverter size, inverter and BESS availability, as well as the final BESS configuration.

A specific PCS has not yet been selected for the Project. Preliminary designs modeled use of the Power Electronics FP4200M Unit. However, several other models and vendors are under consideration, including units manufactured by FIMER, TMEIC, GE, SMA, and Sungrow. Lake Wilson will consider the costs and performance of each option as well as environmental and safety standards when making its final selection.

Image 5: Example of BESS Containers

The AC electrical collection system from the Project inverters/step-up transformers to the Project Substation will be buried between 2 to 5 feet below ground. The final type of electrical system will be determined prior to construction based on technology, availability of materials, and costs. Below-ground AC electric conductor collection lines will transfer the converted 34.5 kV AC electricity from the inverter equipment (which is assembled on skids and delivered to the Project as a package) to the Project Substation. During trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with the AIMP. Once the electric conductor collection lines are laid in the trench, the trench will be backfilled with subsoil followed by segregated topsoil. Electrical collection technology is changing and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement recommendations will help determine the construction method for the electrical collection system.

The depth to cables may be deeper for installation under existing utilities or other features requiring avoidance. The specific electrical collection technology used 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. Underground cabling will be installed in accordance with the AIMP.

The Project substation is proposed in the west-central part of the Project Area. The Project substation is estimated to occupy approximately 3.7 acres of land. The Project substation will consist of high voltage electrical structures (i.e., poles), breakers, medium power transformers to step-up the power from the 34.5 kV feeders to the grid voltage of 115 kV, metering and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and Xcel Energy. Underground 34.5 kV collector lines from the Project inverters will deliver solar generated energy as well as charged and discharged energy from the BESS to or from the Project substation. The 34.5 kV collector system voltage will then be stepped up to the interconnection voltage of 115 kV by medium power transformers located at the Project substation and transmitted to the Xcel Switchyard via a 200-400 foot long overhead 115 kV Project Gen-Tie Line in a single span between deadend structures. The current design includes a set of A-frame deadend structures (up to 100 feet in height) located within the Project substation site and in the Xcel Switchyard which will be connected via conductors in a single short span. Final layout and design of these facilities may require use of intermediate tangent structures if the span length is increased from what is expected at this time. In that case, a single dead-end structure will be located within the Project substation and additional tangent pole structures will route the Project 115 kV Gen-Tie Line from the Project substation to the Xcel Switchyard. The number of poles and length of 115 kV Project Gen-Tie Line are pending final engineering and design. The tangent structures will likely be made of wood or metal and will be 100 feet tall.

The Project substation location will be graded and the ground surface dressed with crushed rock, and secondary containment areas for the transformer(s) will be installed. The fenced area of the Project Substation footprint will be approximately 320 feet x 305 feet in size (subject to final substation design and layout). The area within the Project Substation fence will be graveled to minimize vegetation growth and reduce fire risk. The substation will be fenced with a 7-foot chain-link fence topped with one foot of barbed wire in accordance with North American Electric Reliability Corporation ("NERC") requirements for security and safety purposes. The Project Substation will include a parking area, secured with a lockable gate, and will be accessible to qualified, trained Project operational personnel or those escorted by such personnel at all times using the Project's access roads.

The proposed new Xcel Switchyard will be used to interconnect the Project to the existing Fenton - Chanarambie 115 kV HVTL which travels north-south along the eastern edge of 70th Avenue, adjacent to the western portion of the Project Area and travels west at the intersection of 70th Avenue and 91st Street. The Xcel Switchyard will be fenced with a 7-foot chain-link fence topped with one foot of barbed wire in accordance with NERC requirements for security and safety purposes. The Xcel Switchyard will be connected to the existing Fenton - Chanarambie 115 kV HVTL to interconnect the Project to the grid via a new in/out 250-300 foot long Xcel Line Tap. The Xcel Line Tap will be installed in a new easement area from the existing Fenton - Chanarambie

115 kV HVTL to the Xcel Switchyard. The length of the Xcel Line Tap is approximately 250-300 feet and will include installation of either two dead-end pole structures (for single dead-ends) or six dead-ends (for 3-pole dead-ends), depending on Xcel Energy's selected design, and required electric conductors.

Lake Wilson will acquire the land underlying the Xcel Switchyard site (via a purchase agreement) and secure any other land rights that are necessary to facilitate the connection of the Northern States Power Fenton - Chanarambie 115 kV HVTL to the Xcel Switchyard. Lake Wilson Solar will thereafter transfer ownership of this site to Xcel Energy. Xcel Energy will modify the existing Fenton - Chanarambie 115 kV HVTL, installing new deadend structures within the right-of-way to re-direct the circuit in/out of the Xcel Switchyard. These facilities will be network facilities owned and operated by Xcel Energy. Xcel Energy will design, permit, construct, own and operate the Xcel Switchyard facility and the Xcel Line Tap

Lake Wilson believes that the selected Project location in Murray County is advantageous for Xcel Energy based upon a good solar resource, willing landowner participants, consistency with local land use designations and zoning, the excellent proximity to existing electric transmission infrastructure, and minimal impact to natural and cultural resources.

4.1.1 Nominal Generating Capability and Effect of Economies of Scale

The Project includes an up to 150 MWac nameplate solar-energy capacity project paired with a 95 MW battery energy storage system. The Project will provide up to 170 MWac of capacity and an average of up to approximately 332,570 MWh of solar generation annually. The BESS system will have to capability to charge/discharge 138,700 MWh of energy annually. The Project will provide enough electricity to power approximately 28,000 homes annually and prevent emission of approximately 489,000,000 pounds (~244,500 short tons) of carbon dioxide equivalent annually. Larger solar projects, such as the Project, can realize some economies of scale by spreading out the relatively fixed transaction, operation, and maintenance costs over the entire Project, resulting in decreased costs per kilowatt hour ("kWh") of electricity produced.

Generally, economies of scale (system size) do not affect the generation characteristics of the proposed facilities since the efficiency of a photovoltaic system depends primarily on the characteristics of the individual panels and the inverter. This allows excellent flexibility to adjust system size for the site-specific constraints without impacting the facilities' overall efficiencies.

The impact to the grid from the integration of a BESS will be positive as the BESS can act to shift the output of the Project from the likely peak of solar generation at noon to a potential peak of electrical demand in the early evening. The BESS could also stabilize the grid during high congestion periods. Depending on final design, the system can furnish other grid services such as frequency response and voltage support and could act as an electrical suspension to smooth the output of the Project on partly cloudy days.

4.1.2 Annual Capacity Factor

The Project is anticipated to have a solar net capacity factor of approximately 25.3 percent, with projected average output of up to approximately 332,570 MWh annually of reliable, on peak deliverable solar energy. The BESS system will be available to charge energy from the solar

system or the grid as necessary and discharge for a total of four (4) hours per day to support peak load management.

4.1.3 Fuel

The Project will generate electricity from sunlight or store electricity from the solar facility and grid; therefore, aside from limited amounts of fuel for the back-up generators, no fuel is required.

4.1.4 Anticipated Heat Rate

The conversion of solar to electricity or the charge/discharge of the BESS does not generate heat as combustion or nuclear electricity generation facilities would when generating electricity. Therefore, heat rates are not applicable to the Project.

4.1.5 Facility Location

The Applicant is proposing to build the Project in Leeds Township in Murray County. **Figures 1** and **3** depict the location of the proposed Project, Project facilities, and the interconnection facilities. The Project location is indicated on **Table 4**.

Table 4: Project Location

Township	Range	Section
106N	42W	15-17, 20-22, 27

No incorporated communities are located within the Project Area. There are three cities that are located in close proximity to the Project: Lake Wilson, Hadley, and Chandler. The city of Lake Wilson is located just over one-mile northwest of the Project Area. Hadley is just over one-quarter mile east of the Project Area.

The Project encompasses approximately 2,621 acres (Project Area). The city of Lake Wilson has 100 percent land control for the Project, which is the approximate 2,621-acre Project Area comprised of private land under a solar or collection lease agreement, as well as a small portion of land under purchase agreement. The final Project design is expected to occupy up to approximately 1,526 acres (Preliminary Development Area), within the overall 2,621-acre Project Area. As design and engineering is not yet completed for the Project, the excess acreage between the Preliminary Development Area and Project Area allows for planned buffers and flexibility in overall final Project design.

Figures 3 and **4** depict the preliminary layout and associated infrastructure of the proposed Project. The Project's facilities will include solar panel modules and racking, BESS enclosures, inverters, security fencing, access roads, an O&M building, Project Substation, transformers, electrical collection and communication lines, up to ten weather stations, Gen-Tie Line, laydown areas, and ancillary equipment or buildings as necessary. The locations of the weather stations are not yet final and not shown on **Figures 3** and **4**. This preliminary layout reflects Lake Wilson's effort to maximize the Project's energy production, follow applicable setbacks, and minimize impacts to the land, environment, and surrounding community. Although Lake Wilson expects the

final layout to remain similar to the preliminary layout, changes may occur as a result of ongoing site evaluation, permitting processes, landowner preferences, and engineering activities.

4.2 MAP OF SYSTEM (MINN. R. 7849.0250(D))

Maps showing the proposed site of the Project and its location relative to the power grid are included as **Figure 5.**

5.0 ENVIRONMENTAL INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES (MINN. R. 7849.0310)

5.1 VISUAL IMPACTS AND MITIGATION

Siting utility-scale solar and BESS projects in rural environments can change the overall aesthetics of the landscape by introducing a commercial-like facility into an otherwise agricultural setting. Similar to wind farms, solar arrays and BESS enclosures may be viewed by some as a disruption to the existing agricultural landscape, and by others as a welcomed complimentary use to farming practices (harvesting solar energy, soil resting and pollinator-friendly habitats). Consequently, aesthetics related to utility-scale solar and storage is largely one of personal perspective and preference.

Land use in the Project Area is characterized as primarily agricultural (95 percent). Most of the agricultural land in the Project Area is subject to row-crop agriculture, such as corn and soybeans. The topography of the Project Area is generally flat with elevations ranging from 1620 to 1784 feet above sea level. Farmsteads in the area (often containing a farmhouse with barns, machine sheds and grain storage) are sprinkled across the landscape approximately 0.25 to 1 mile apart. Most farms have planted windbreaks consisting of trees and shrubs around them. Untilled lines of trees and shrubs can be seen along fence rows.

The Project Area is located on approximately 2,621 acres of land, immediately adjacent to Xcel Energy's existing 115 kV HVTL. Additionally, a number of utility scale wind energy facilities and projects are located in the vicinity of the Project including the Northern Wind, Rock Aetna, Fenton, and East Ridge wind projects. *See* **Figure 5**. The Northern Wind and Rock Aetna Wind Projects replaced the Chanarambie Wind Project.

There are two farmsteads within the Project Area; there are 25 residences and farmsteads within 0.25 of the Project Area. *See* **Figure 6**. **Table 6** provides distances to the nearest residences to the Project, including approximate distance to the Preliminary Development Area boundary and approximate distance to the edge of solar arrays based upon the current preliminary design.

Table 6: Proximity of Residences within 0.25 mile of the Project Area

Residence	Distance to Development Boundary (feet)	Distance to Project (feet) [1]	Distance to Nearest Inverter (feet)	Vegetative Screening from Solar Facilities
1	1514	1597	1940	Residence has existing vegetation on the western side of the property.

Table 6: Proximity of Residences within 0.25 mile of the Project Area

Residence	Distance to Development Boundary (feet)	Distance to Project (feet) [1]	Distance to Nearest Inverter (feet)	Vegetative Screening from Solar Facilities
2	389	516	1046	Residence has existing vegetation on the western side of the property.
3	309	335	762	Residence has existing vegetative screening along the western side of the property, screening the residence from the solar panels.
4	337	527	884	Residence has existing vegetative screening along the property, screening the residence from the solar panels.
5	370	406	1337	Residence has some existing vegetative screening along the southwestern side of the farmstead, screening the residence from a majority of the solar panels.
6	2408	2452	3398	Residence has some existing vegetative screening along the west side of the farmstead, screening the residence from a majority of the solar panels.
7	586	2291	3074	Residence has existing vegetative screening along the north side of the property. The residence will likely have views of the solar panels from all other angles.
8	1752	1801	2452	Residence is screened is surrounded by existing vegetative screening along all sides of the farmstead.
9	238	238	844	Residence has scattered existing vegetative screening along the northern side of the property. The residence will likely have views of the solar panels from all other angles.
10	355	699	1364	Residence has scattered existing vegetative screening along the Northwest side of the property.
11	2511	2634	3743	Residence has existing vegetation and will be screened from the proposed solar facilities.
12	863	899	1347	Residence has some existing vegetative screening along the west side of the farmstead, screening the residence from majority of the solar panels.
13	2184	2215	2683	Residence has existing vegetative screening along all sides, which will fully screen the residence from the solar panels.
14	273	319	787	Residence has some existing vegetative screening along all sides of the farmstead, screening the residence from majority of the solar panels.
15	2394	2431	3039	The existing vegetation on the western side of the property will likely screen the residence from the proposed solar facilities.
16	1584	1642	2087	The existing vegetation on the eastern side of the property will likely screen the residence from the proposed solar facilities.
17	2127	2138	2336	Residence has existing vegetative screening along all sides of the property.
18	2165	2358	2711	Residence has existing vegetation on the northern side of the property and will likely be screened from the proposed solar facilities.

Table 6: Proximity of Residences within 0.25 mile of the Project Area

Residence	Distance to Development Boundary (feet)	Distance to Project (feet) [1]	Distance to Nearest Inverter (feet)	Vegetative Screening from Solar Facilities
19	3178	3236	3762	Residence has existing vegetation on the northern side of the property and will likely be screened from the proposed solar facilities.
20	2193	2302	3363	Residence has existing vegetation on the northern side of the property and will likely be screened from the proposed solar facilities.
21	1539	1659	2327	Residence has existing vegetative screening along all sides of the property and will likely be screened from a majority of the proposed solar facilities.
22	679	719	1430	Residence has existing vegetative screening along the northern side of the property and will likely be screened from a majority of the proposed solar facilities.
23	1765	1935	2449	Residence has existing vegetation on the southeastern side of the property and will likely be screened from the proposed solar facilities.
24	3034	3699	4053	Residence does not have any existing vegetation that would screen the property from the proposed solar facilities
25	1731	4768	5002	Residence has some existing vegetation on the northern side of the property, however, it will likely not be screened from proposed solar facilities.
[1] Residences 7, 9 and 12 are within the Project Area.				

It is expected that there will be minimal visual impacts from the Project. Most of the facility, including the solar arrays, will be low-profile, typically less than 12 feet, but no more than 15 feet tall. While the proposed substation, BESS, Switchyard and O&M Facility are similar in visual impacts to existing electrical facilities and buildings in the area, the Project solar arrays will create new aesthetic impacts, changing the viewscape in these areas from crops to solar arrays. Since the Project Area and vicinity are generally flat and due to existing trees along agricultural fields and vegetative cover along wind rows, the visual impact of the Project is expected to be limited to higher elevation points, as well as immediately surrounding land, which is mitigated to an extent by existing vegetative screening at most residences as indicated in **Table 6**. The feedback that Lake Wilson has gathered so far from public outreach efforts completed for the Project to date has not indicated aesthetic or visual concerns associated with the Project from the surrounding landowners or community.

The Project substation and Xcel Switchyard will contain transmission pole A-frame deadend structures that will support above ground conductors. The deadend structures will be up to 100 feet tall. These transmission facilities will be grouped together and connect to the existing Fenton-Chanarambie 115 kV HVTL that travels north-south along the eastern edge of the Project Area. They will be visible from the local roadways and about 0.5 mile from the nearest residence. From outside the facility these structures would be most visible from 70th Avenue and 81st Street.

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

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

Exterior security lighting will be installed at the O&M building, Project Substation, BESS and Xcel Switchyard; as needed by maintenance personnel, lights will be used if work or maintenance is required after dark. A motion sensing, down casting security light will be installed at the locked entrance of the Project. Switch activated lights will be placed at each inverter for repair purposes. Impacts to light-sensitive land uses are not anticipated given the rural Project location coupled with minimal required lighting for operation of the Project.

5.2 WILDLIFE

Impacts to wildlife are expected to be minimal. The proposed establishment of stable, year-round herbaceous cover post-construction will likely benefit many wildlife species. The Project layout is designed to avoid those portions of the Project Area and Preliminary Development Area with the highest concentration of high-quality habitat and water resources.

Overall, construction of the Project is expected to minimally impact wildlife or their populations. During operations, any potential impacts to wildlife are also expected to be minimal. Movement of large mammals, such as white-tailed deer, will not be impeded within the Project Area. Lightweight agricultural woven wire fencing extending approximately 8 feet above grade will be used around the Project arrays/construction units for safety and security purposes to prevent larger wildlife and the public from access Project electrical equipment. There will be wide corridors between fenced areas throughout the Project Area. The arrangement of the fenced areas of the Project array relative to existing roads and utilities provide various pathways through the Project Area which would allow wildlife to cross. These corridors will allow larger wildlife various options to cross unimpeded through the Project Area. After consultation with state and federal agencies, no protected species are expected to be affected by the Project.

5.3 THE PROJECT COMPLIES WITH FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
Federal			

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
U.S. 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. Project layout currently avoids all jurisdictional waters, therefore a Section 404 permit is not expected to be needed for the project.
U.S. Environmental Protection Agency	Spill Prevention, Control, and Countermeasures Plan	Project facilities with oil storage of more than 1,320 gallons.	To be prepared prior to construction as needed for construction related storage of fuel. To be prepared prior to operation for operation related storage of fuel if storage exceeds applicability thresholds.
State			
Minnesota Public Utilities Commission	Certificate of Need	Required for LEFs (electric power generating plant or combination of plants at a single site with a combined capacity of 50 MWs or more and transmission lines directly associated with the plant that are necessary to interconnect the plant to the transmission system).	To be obtained prior to construction, CN Application filed concurrent with the SP Application.
	Site Permit	Required for LEFs 50 MW or greater.	To be obtained prior to construction, SP Application filed concurrent with the CN Application.
Minnesota Pollution Control Agency	Section 401 Water Quality Certification	Required for Section 404 Individual and Nationwide Permits.	To be obtained prior to construction as needed. Project layout currently avoids all jurisdictional waters, therefore a Section 401 permit is not expected to be needed for the project.

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
	National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit and Stormwater Pollution Prevention Plan	Construction activity that disturbs one or more acre of land.	To be obtained/prepared prior to construction.
	State Air Registration Permit	Required if back-up generators if selected generators do not qualify for an exemption under Minn. R. 7007.0300, Subp. 1(B)	To be obtained prior to installation of a back-up generator if exemptions do not apply to chosen generators.
	Storage Tank Registration	Required for back-up generator aboveground storage tanks exceeding 500 gallons and underground storage tanks exceeding 110 gallons	To be obtained prior to operation if storage tanks exceeding registration thresholds are installed.
Minnesota Department of Health	Well Construction permit	Installation of a water supply well.	To be obtained prior to construction of a well (if needed for O&M building), as needed.
Minnesota Department of Labor and Industry	Request for Electrical Inspection	Necessary to comply with state electrical codes.	Inspection to be conducted after installation of electrical equipment during construction and prior to operation.
Minnesota Department of Natural Resources	Water Appropriation Permit	Required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year (dewatering).	Temporary Water Appropriation Permit, for Temporary Dewatering: To be obtained, as needed, if water withdrawals exceed 10,000 gallons per day or 1 million gallons per year. Permanent Appropriation Permit, for well at O&M Building: Not expected to be needed, expected water use will be under the threshold

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
	Public Water Work Permit	Placement of structures in public waters.	To be obtained prior to construction of structures in public waters, as needed. Project layout currently avoids all MNDNR Public Waters, and a Public Water Work Permit is not expected to be needed for the project.
MNDNR, Division of Lands & Minerals	Utility Crossing License	Required to cross state land with utility infrastructure.	To be obtained prior to crossing state land with utility infrastructure, as needed. Project layout currently avoids all State Lands and therefore a Utility Crossing License is not expected to be needed for the project.
Minnesota State Historic Preservation Office	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require State permits or affect State registered properties or require Section 106 compliance.	Obtain concurrence on Phase I inventory prior to construction.
Minnesota Department of Transportation (MnDOT)	Application for Utility Accommodation on Trunk Highway Right-of-Way	Installing utilities along, across or within trunk highway right-of-way.	To be obtained prior to installation of utilities within MnDOT right-of-way, as needed. Project layout currently avoids all MnDOT Right-of-Way with any utilities, therefore an Application for Utility Accommodation on Trunk Highway Right-of-Way is not expected to be needed for the project.

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of-way.	To be obtained prior to construction of driveway on MnDOT right-of-way, as needed. Project layout currently avoids all MnDOT Right-of-Way with access roads, therefore no MnDOT Access Driveway permits are expected to be needed for the project.
	Oversize/Overweight Permit	Vehicles delivering equipment, materials and supplies that exceed applicable MnDOT height/length limits and weight limits.	To be obtained prior to equipment deliveries, as needed.
County/Local			
Murray County, MN	Minnesota Wetland Conservation Act (WCA) Approval (in conjunction with Murray County Soil and Water Conservation District)	Activities affecting water resources.	To be obtained prior to construction in jurisdictional waters, if needed. Project layout currently avoids all WCA jurisdictional waters and a WCA permit is not expected to be needed for the project.
	Individual Sewage Treatment Systems Permit	Required prior to installation of any individual sewage treatment system in Murray County.	To be obtained prior to construction, as needed.
	Driveway/Entrance Permit	Required for constructing a new driveway access to county roads.	To be obtained prior to construction, as needed.
	Utility Permit	Required for installation of utility infrastructure in a county road right-of-way.	To be obtained prior to construction, as needed.
	Work in the Right-of-Way Permit	Required to work within public road right-of-way.	To be obtained prior to construction, as needed.

Table 14: Potential Permits/Approvals/Plans

Agency	Permit/Approval/ Plan	Applicability	Status and Timing
	Tile Crossing Permit	Required for boring or open cut of tile for utility crossings.	To be obtained prior to construction, as needed.
	Overweight Permit	Use of overweight/oversized vehicles on County roadways.	To be obtained prior to equipment deliveries, as needed.

6.0 FACILITY INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES INVOLVING CONSTRUCTION OF AN LEGF (MINN. R. 7849.0320)

6.1 LAND USE AND REQUIREMENTS (MINN. R. 7849.0320(A))

The Project is located within a rural landscape, and therefore the primary land use in the Project Area is agricultural. A small portion of the Project Area consists of developed land and a small amount of herbaceous or hay/pastureland.

Table 7 summarizes the land use types within the Project Area. Most of the agricultural land in the Project Area is subject to row-crop agriculture, such as corn and soybeans. The areas of hay/pasture and herbaceous lands within the Project Area is associated with roadside ditches, uncultivated areas, and near rural residences. Areas of emergent herbaceous wetlands are found in the south-central portion of the Project Area. The small amount of deciduous forest surrounds the rural residence located in the southeastern portion of the Project Area.

Table 7: Land Use Within the Project Area (in acres)

Land Use Type	Acres in Project Area	Percent of Total Acreage
Cultivated Crops	2,491.1	95.0
Developed (open space, low/med/high intensity)	80.9	3.1
Grassland/Herbaceous	42.6	1.6
Hay/Pasture	4.4	0.2
Emergent Herbaceous Wetlands	1.6	<0.1
Deciduous Forest	0.2	<0.1
Total	**2,620.8**	**100.0%**

Farmsteads are sparsely scattered throughout of the Project Area generally situated near public roads. All proposed Project facilities have been sited away from the residence and setbacks implemented. Based on review of available aerial photography, there are eight residences located on parcels adjacent to the Project Area.

The Project will temporarily change the land use from agricultural to solar energy generation use within the Preliminary Development Area (**Figure 2**). The temporary conversion of agricultural land to the solar facility will have a relatively minimal impact on the rural character of the surrounding area or Murray County. Of the 461,000 acres in Murray County, the majority are classified as agricultural land. Impacts to 1,526 or less acres of agricultural land within the planned Project facility would reduce the amount of agricultural land in the County by less than 1/2 of 1%. Expected land use impacts within the Preliminary Development Area are provided in **Table 8**.

Table 8: Expected Land Use Impacts – Preliminary Development Area

Land Use Type	Acres in Preliminary Development Area	Percentage of Total Acreage
Cultivated Crops	1,478.7	97.01%
Developed (open space, low/med/high intensity)	32.33	2.04%
Grassland/Herbaceous	15.0	0.95%
Deciduous Forest	<0.1	<0.1%
Emergent Herbaceous Wetlands	0	0
Pasture/Hay	0	0
Total	**1,526.0**	**100.0%**

Normal agricultural activities can continue within some portions of the Project Area not converted to solar modules, access roads, O&M building, BESS, transmission facilities, and fencing. After the useful life of the Project, the current agricultural land use would be restored by decommissioning the Project.

6.2 TRAFFIC (MINN. R. 7849.0320(B))

Access to the Project will be via existing county and township roads. The major roadways in the area include MN State Highway 30 (Hiawatha Pioneer Trail) and County Highway 28 (80th Avenue). Other roads that surround the Project Area are local County or township roads. The Project Area is bordered by MN State Highway 30 in the northern portion of the site. County Highway 28 travels to the west of the Project Area in a north to south direction. Lake Wilson will work with Murray County and Leeds Township on a road use agreement to address road use and related concerns.

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

Overall construction traffic will use the existing State and County roadway system to access the Project site and facilities to deliver construction materials and personnel. Traffic during construction is estimated to average approximately 150 trips per day for daily construction personnel commuter traffic. This traffic will consist of pickup trucks, cars, and/or other types of employee vehicles arriving onsite for the majority of construction and takes into account carpooling. This traffic will be dispersed across the Site Control Area depending on the construction activities at the time. Approximately 2-15 semi-trucks per day will be used for delivery of facility components during construction. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment.

For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day (AADT). Since the area roadways have AADTs that are well below capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Traffic congestion during construction will be minimal, and any traffic congestion will be managed, minimized, or mitigated to the extent practicable. To the extent site conditions allow, delivery trucks will be off loaded near the point of use to minimize double handling and the amount of trucking. Signage will be installed to guide trucks to the appropriate roads, after conferring with local officials. Trucks will not be allowed to stage or block public roads. If trucks cannot exit a road in a timely fashion, they will be directed to a designated staging area. Major component deliveries will be required to stagger delivery times and dates so the on-site teams are not overwhelmed with a surge of trucks at one time. Trucks will be directed off major roads, onto secondary roads or the site to minimize the potential for traffic congestion. Traffic delays should be limited to the time it takes for delivery trucks to turn on or off public roads. Lake Wilson will work with Murray County and Leeds Township staff on a road use agreement to address road use and related concerns. This agreement will be completed prior to start of construction. Except for the delivery of the main transformer(s) in the Project substation, overweight or oversized loads are unlikely given the type of construction and materials required for the Project if there becomes a need for overweight or oversized loads, Lake Wilson the equipment vendor, or the transportation company delivering the equipment will obtain the appropriate approvals prior to the delivery of the overweight or oversized loads in accordance with the requirements of the authority having jurisdiction over the roads that will be used for the move.

After construction is complete, traffic impacts during the operational phase of the Project are expected to be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis will monitor and maintain the facilities as needed; traffic function in the Project Area will not be impacted as a result.

No active or abandoned railways were identified in the Project Area or immediate vicinity. An abandoned railway was identified more than a quarter-mile north of the Project Area. Because no railways are located in the Project Area, no crossing or encroachments agreements will be required prior to construction. No impacts are anticipated and no mitigation measures have been considered with respect to railways.

According to the Federal Aviation Administration (FAA), there are no FAA-registered airports located within three nautical miles of the Project Area. Therefore, no mitigation is needed or planned concerning airports.

6.3 INFORMATION PERTAINING TO FOSSIL-FUELED ACTIVITIES (MINN. R. 7849.0320(C)–(D))

6.3.1 Fuel

The Project is not a fossil-fueled facility. Except for minimal amounts of fuel required for the emergency back-up generators, the Project will be fueled by the sun.

6.3.2 Emissions

The Project is not a fossil-fueled facility and, except for the emergency back-up generators, will not release any emissions from the power generation process.

Minor temporary effects on air quality are anticipated during construction of the proposed Project as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust from wind erosion of agricultural land that becomes airborne during dry periods of construction activity.

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

Post-development emissions will be less than current and historic emissions due to the cessation of farming and the installation and maintenance of perennial native plantings and other vegetation planned at the Project site under solar panels and other areas disturbed by construction. The soil fertility at the site is suitable for the planned perennial mixture, therefore, the use of any fertilizers is not anticipated and will therefore not contribute to any emissions. In accordance with the VSMP, herbicide application will be limited to spot treatment and will be conducted in such a manner to minimize potential drift; as such, herbicide application will negligibly contribute to emissions, if at all. While some dust may be produced from use of planned gravel access road from O&M vehicles, this emission is expected to be minimal, temporary and infrequent throughout the year. Emissions generated during operational activities will further be limited in duration and frequency from use of relatively few trucks, cars and other related O&M vehicles as part of O&M activities associated with the Project. The normal operations of the emergency generators will be limited to once-a-month testing, consisting of a 30-minute run time for each unit.

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions. Additional BMPs will be implemented as part of the VSMP and AIMP which will also address emissions (e.g., mulching exposed soils, installing and maintaining vegetative cover, engineering controls, reducing vehicle and equipment speed, maintaining equipment and

exhaust/mufflers, etc.). Additional practices may include watering or treating haul and access roads and other exposed dust producing areas, containment of excavated material, protection of exposed soil, soil stabilization, and treating stockpiles to control fugitive dust. As part of the required construction stormwater permit that will be obtained for the Project, a National Pollutant Discharge Elimination System (NPDES)/State Disposal System construction stormwater permit and associated SWPPP will be developed prior to construction and implemented during construction that will include BMPs to minimize to potential for fugitive dust.

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

The Project will have no air emissions and will avoid emissions associated with fossil generation facilities, except for those emissions associated with the limited use of emergency generators.

6.4 WATER USAGE FOR ALTERNATE COOLING SYSTEMS (MINN. R. 7849.0320(E))

The Project will not use any water for alternate cooling systems. Minimal to no washing is anticipated to be needed at Project facilities due to the naturally occurring and frequent precipitation.

6.5 WATER DISCHARGES (MINN. R. 7849.0320(F))

No wastewater discharges will occur as a result of the construction or operation of the Project except for domestic-type sewage discharges of Project personnel. Temporary sanitary facilities will be provided during construction, which will be installed in accordance with applicable regulations.

Temporary dewatering may be required during construction. Water may be used during construction to provide dust control and water for concrete mixes, if applicable, and other construction purposes. If temporary dewatering is required during construction activities, discharge of dewatering fluid will be conducted under the NPDES permit program and addressed by the Project's SWPPP as required.

6.6 RADIOACTIVE RELEASES AND WASTE (MINN. R. 7849.0320(G))

The Project will not generate any radioactive or solid waste under normal operating procedures. No parts require greasing or oiling on a regular basis.

6.7 SOLID WASTE (MINN. R. 7849.0320(H))

The Project is not expected to generate significant quantities of solid waste during operation. The Project may occasionally require use of certain petroleum products such as gear

box oil, hydraulic fluid, and gear grease. These materials will be recycled or otherwise stored and disposed of in accordance with applicable State and Federal regulations. These materials will also be stored, recycled, and/or disposed of in accordance with applicable local, state, and federal regulations.

6.8 NOISE (MINN. R. 7849.0320(I))

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

Common sound sources within an agricultural and/or rural environment include, but are not limited to, sound from farm equipment such as tractors and combines, sound generated from traffic on roadways, sounds from birds, and wind rustling through the vegetation. Typically, the ambient acoustic environment of a rural or agriculturally oriented community has equivalent continuous sound levels (Leq, which is an energy-based time-averaged noise level) ranging from 30 dBA to 60 dBA.

The background noise in the vicinity of the Project facilities is typically a result of farming equipment/operations, wind, and vehicles. A comparison of typical noise-generating sources is outlined in **Image 6.**

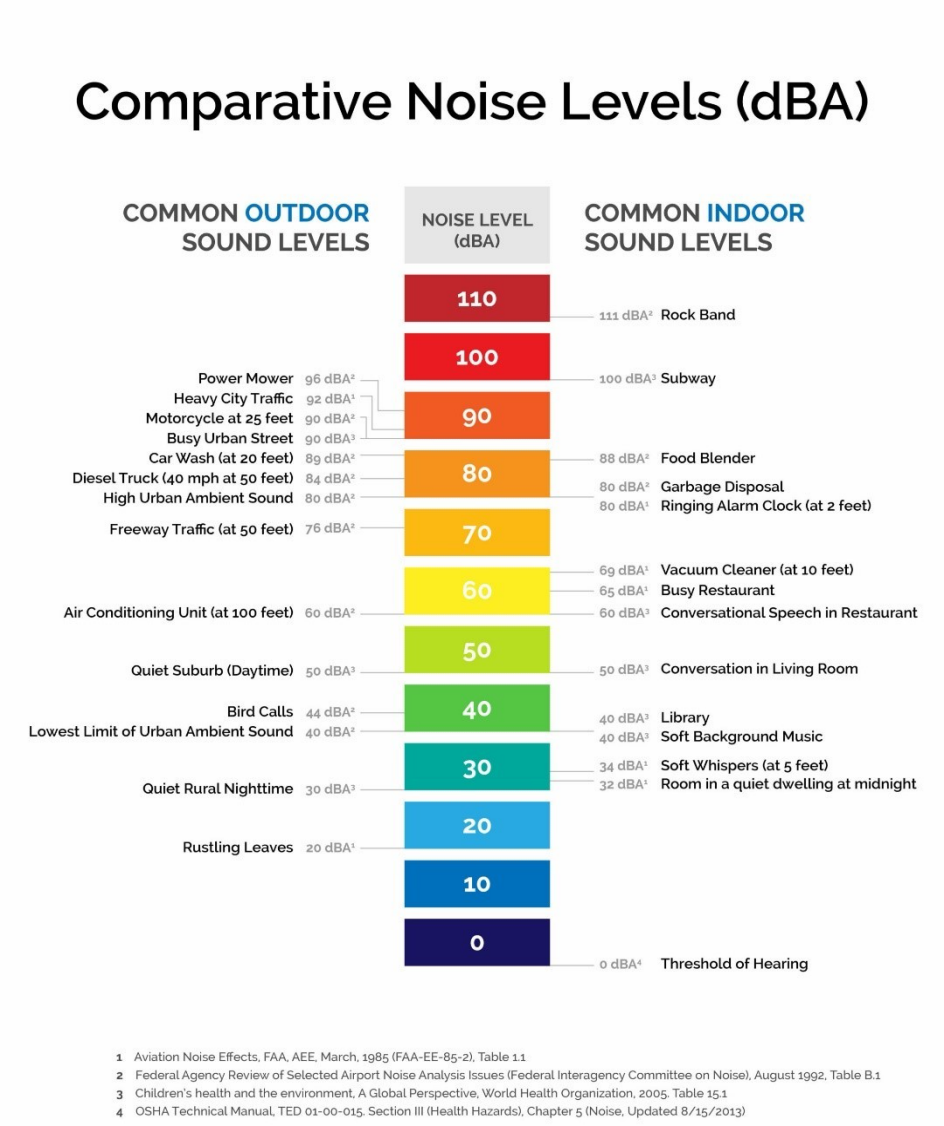


Image 6: Common Noise Sources

Construction Noise

During construction, intermittent noise will be emitted by the construction vehicles and equipment, including pile drivers for installation of piers. These noise impacts will be temporary, and the amount of noise will vary based on what type of construction is occurring at the Project on a given day. **Table 9** shows the maximum and minimum sound pressure levels at 25 meters and 15 meters dBA for construction equipment such as bulldozers, bobcats, and scrapers (FWHA, 2017).

Table 9: Typical Sound Levels from Construction Equipment

Equipment	Max Sound Pressure Level at 25 meters (82 feet) dBA	Max Sound Pressure Level at 15 meters (50 feet) dBA
Excavator	76	85

Dozer	76	85
Grader	76	85
Roller	76	85
Dump Truck	75	84
Concrete Mixing Truck	76	85
Concrete Pumper Truck	73	82
Man-lift	76	85
Flatbed Truck	75	84
Large Crane	76	85
Small Crane	74	83
Trencher	72	83
Compactor (Vibratory)	69	80
Forklift	75	85
Boom Truck	75	84
Small Pile Driver	73	84

Noise Standards

The MPCA has the authority to adopt noise standards pursuant to Minn. Stat. §116.07, subd. 2(c). 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 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) 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}). Portions of the Project Area comprised of residential homes are considered a Noise Area Classification 1 with daytime noise allowances of 60 dBA and nighttime noise allowances of 50 dBA according to the Minn. Stat. §116.07 and Minn. R. Ch. 7030 noise ordinance. **Table 10** depicts the MPCA state noise standards.

Table 10: MPCA 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

These limits are expressed as L50 and L10, which are statistical noise level metrics representing the sound level that is exceeded 50% and 10% of the measurement period, respectively. Noise modeling most accurately predicts Leq levels, which is the equivalent continuous sound level or the overall average sound level over the measurement period. L10 levels are, on average, 3 dBA higher than Leq levels, while L50 levels are typically below Leq levels. As such, modelled Leq levels can be used as a conservative metric for ensuring compliance with the L50 levels specified in Minn. R. 7030.0040. Therefore, if Leq limits are assumed to be the same

as the L50 limits, any modelled sound level below the Leq limits would be below the L50 limits prescribed by Minn. R. 7030.0040.

A sound propagation model was developed and run for the Project. CADNA-A (a sound modelling software in compliance with ISO 9613-2) was used to calculate cumulative Project sound at all occupied residences within ¼ mile of the proposed Project fence line. A conservative ground absorption coefficient of 0.5 was assumed to account for the varying surface properties of the ground throughout the year (e.g., hard, frozen ground in winter vs. porous ground covered by vegetation in summer). Marginal changes in the ground absorption coefficient will have a negligible effect of less than 1 dB. As described below, predicted maximum total sound levels as a result of Project operation do not exceed the applicable nighttime limit of 50 dBA set forth in Minn. Admin. R. 7030.0040. Accordingly, minimal sound impacts, within regulatory limits, are expected from Project operation.

The proposed Project inverters, transformers, BESS containers, and HVAC systems were modeled as point sources, with sound source data taken from manufacturer cut sheets and NEMA (National Electrical Manufacturers Association) standards. Where specific equipment specifications were not available, data from similar equipment was used. Preliminary Project equipment and layout configuration details as submitted in the CN are shown below in **Table 11**. Unweighted octave-band sound power levels are listed in **Table 12** along with overall A-weighted sound pressure levels. Levels represent the maximum sound output for Project components.

Table 11: Project Equipment and Layout Configuration

Noise Source	# of Units	Equipment Model/Reference	Sound Pressure Level @ 1 m (Single Unit)	Source Height AGL	Distance to Sound Pressure Level of 50 dBA (Single Unit)
Solar Inverter	55	Power Electronics PE FS4200M	79 dBA	2.89 m	27 m
Main Power Transformer	2	NEMA TR1	90 dBA	4.00 m	95 m
Auxiliary Transformer	12	Eaton Pad-Mounted (NEMA TR1)	61 dBA	1.85 m	4 m
BESS Power Conversion System	34	GE FlexInverter 1590	79 dBA	1.10 m	27 m
Battery Container HVAC Unit	204	Trane Voyager 3 – 30 ton RTU	81 dBA	1.10 m	32 m
Emergency Generator	3	CAT C15 (Sound Attenuated Enclosure) – 500 kW	90 dBA	2.80 m	91 m

Table 12: Project Equipment Spectral and Overall Data (CADNA-A Inputs)

Noise Source	Unweighted Octave Band (Hz) Sound Power Levels (dB L_w)								Sound Pressure Level at 1 m (dBA L_p)
	63	125	250	500	1000	2000	4000	8000	

Solar Inverter	80.9	89.6	86.6	83.6	79.9	77.8	79.6	72.1	79
Main Power Transformer	100.6	102.6	97.6	97.6	91.6	86.6	81.6	74.6	90
Auxiliary Transformer	71.6	73.6	68.6	68.6	62.6	57.6	52.6	45.6	61
BESS Power Conversion System	80.9	89.6	86.6	83.6	79.9	77.8	79.6	72.1	79
Battery Container HVAC Unit	88.7	89.6	83.6	3.4	84.3	82.0	77.0	73.0	81
Emergency Generator	95.5	93.0	94.4	94.1	93.2	90.9	84.8	79.7	90

A background ambient level of 40 dBA was assumed according to ANSI 12.9-2013 Table C.1 – A- weighted day, night, and day-night average sound levels in decibels and corresponding approximate population densities as indicated, which provides 40 dBA as the Day level for the "very quiet suburban and rural residential" residential land use category. In order to determine predicted total sound levels, the assumed background ambient level of 40 dBA was added to the predicted sound levels. These summed levels represent the predicted total sound level at each receptor.

As stated, the Project will create some intermittent noise during construction and 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 nearby residences. According to the Federal Highway Administration Construction Noise Handbook, the majority of the construction equipment that could be used on the site such as grading equipment and bobcats is anticipated to generate noise between 72-85 dBA. Sound levels from grading equipment are not dissimilar from the typical tractors and larger trucks used in agricultural communities during planting or harvest. Lake Wilson anticipates impact driving of the piles for rack supports (foundations for the solar panels) to be the most significant source of construction noise at roughly 101 dBA at 50 feet (FHWA, 2017). Installation of each rack support takes between thirty seconds to a few minutes depending on the soil conditions; Lake Wilson anticipates this activity will take up to 3-6 months (depending on construction crew size), however, construction noise will not be concentrated in the same location but will rotate around the Project site during that time as each stage of construction is completed in sequence; for example, site preparation at some array locations may occur while pile driving is occurring at others. The noise from construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. As shown in **Table 13** below and **Figure 6**, the average distance from the 25 homes within 0.25 miles of the proposed solar arrays is 1,752 feet with the closest being 238 feet.

Construction noise will be relatively minimal and will be temporary in duration with sound returning to background levels once construction is finalized. Lake Wilson plans to limit construction and staging activities to daylight hours and run vehicles and equipment only when necessary. Equipment used for construction will be in good working condition and will be equipped with properly functioning mufflers and associated noise-control devices to reduce sound

generation to the greatest extent practicable. Lake Wilson will provide notice of construction to all properties adjacent to the project prior to the commencement of construction. The notice shall include the contact information for a dedicated project contact person to answer questions about construction.

During operation, as shown in **Table 13**, modeling results indicated the highest predicted Project sound contribution to existing ambient sound was 38 dBA, and the highest predicted total sound level (i.e., inclusive of the assumed 40 dBA background level) was 42 dBA. These levels are well below the residential land use nighttime limit of 50 dBA set forth in Minn. Admin. R. 7030. The scenario modeled represents the single worst case, indicating that the Project will be in full compliance. Therefore, no mitigation is proposed at this time.

Table 13: Sound Modeling Results

Receptor ID	UTM Coordinates (Zone 15N)			Predicted Project Noise Level (Leq dBA)	Predicted Total Noise Level (Leq dBA, assuming 40 dBA ambient)
	X (m)	Y (m)	Z (m)		
R01	266748	4875131	500	20.1	40.0
R02	267686	4875169	500	27.5	40.2
R03	269142	4875019	516	28.5	40.3
R04	269201	4874963	518	29.2	40.3
R05	269832	4875038	527	20.3	40.0
R06	270356	4875384	527	14.7	40.0
R07	266630	4874183	503	22.1	40.1
R08	267002	4873485	512	24.6	40.1
R09	268703	4873870	516	28.8	40.3
R10	269416	4873697	530	26.8	40.2
R11	271004	4873693	542	15.9	40.0
R12	268654	4872968	518	27.9	40.3
R13	270920	4872355	554	18.4	40.0
R14	270141	4871928	539	28.8	40.3
R15	270930	4871826	551	17.1	40.0
R16	265007	4872054	506	38.2	42.2
R17	266864	4872108	521	29.2	40.3
R18	265580	4871453	515	27.5	40.2
R19	266885	4871373	518	25.8	40.2
R20	267220	4871493	527	25.1	40.1
R21	268274	4871391	527	22.3	40.1
R22	268815	4871290	524	23.0	40.1
R23	266710	4875355	499	19.3	40.0

R24	266130	4875331	500	18.2	40.0
R25	265755	4874936	502	21.1	40.1

6.9 CONSTRUCTION AND OPERATION WORK FORCE (MINN. R. 7849.0320(J))

The Project will create approximately 250 jobs during the construction and installation phases, and up to 5 full time jobs onsite during the operations phase, and an additional 20 indirect jobs in Murray County and the rest of Minnesota.

If the Project is selected as a PPA or in the event the Project is selected as a build-transfer and Xcel contracts O&M with the Applicant, the Project will be professionally maintained and operated by Lake Wilson Solar Energy, an affiliate or a qualified contractor. Operations and maintenance activities for the BESS will be performed in coordination with the solar facility. Lake Wilson Solar Energy and its affiliate will hire employees or other appropriate contractors to complete operations and maintenance tasks.

6.10 NUMBER AND SIZE OF TRANSMISSION FACILITIES (MINN. R. 7849.0320(K))

Electrical wiring will connect the panels and batteries to inverters, inverters will transform the power from DC to AC current. Underground 34.5 kV collector lines from the Project will deliver energy to the Project Substation. The collector system voltage will then be stepped up from 34.5 kV to 115 kV by the transformer(s) located at the Project Substation and transmitted to the Xcel Switchyard via the 115 kV overhead Gen-Tie Line. The proposed new Xcel Switchyard will be used to interconnect the Project to the existing Fenton - Chanarambie 115 kV HVTL.

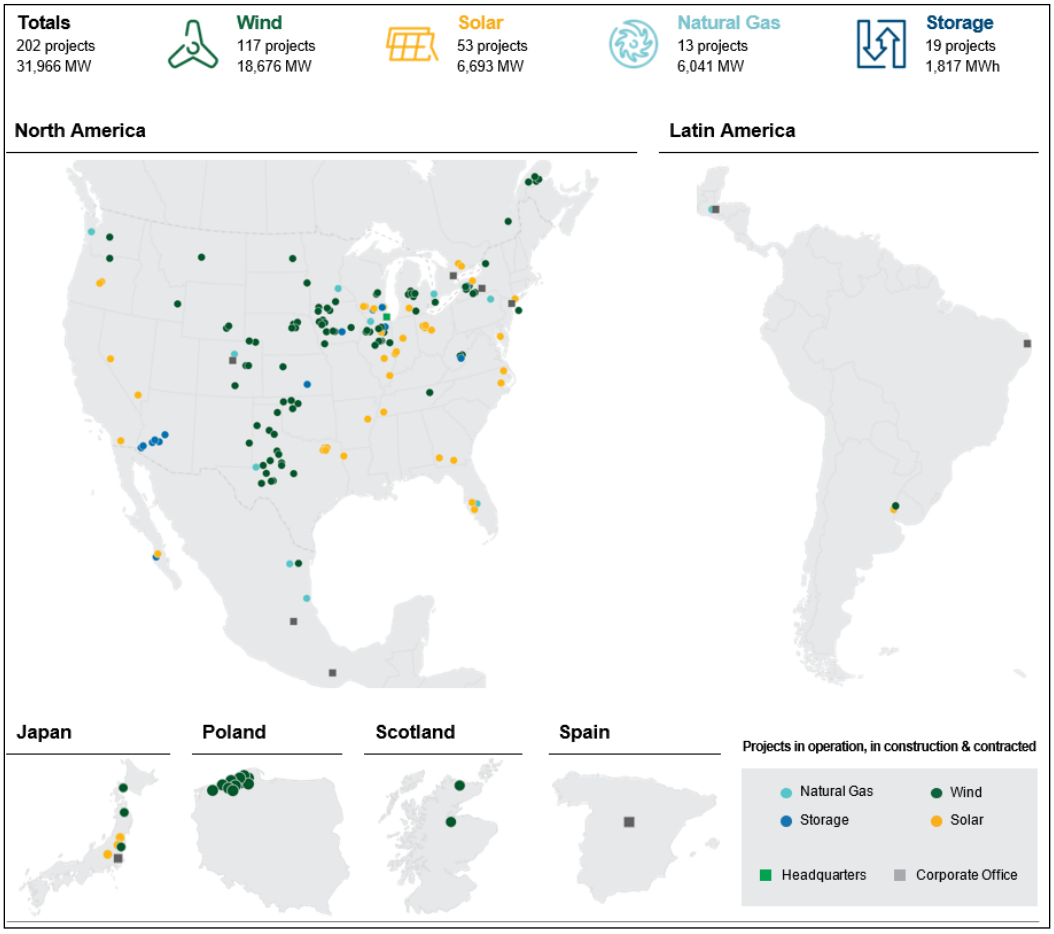
The interconnection details will be determined as a result of studies, discussions, and agreements with MISO. Access to transmission facilities beyond interconnection will be arranged by the entity or entities purchasing the Project's energy output and will depend on the buyer and the ultimate destination for the energy output.

7.0 IRP ORDER SUPPLEMENTARY DATA REQUIRED FOR ALTERNATIVE PROVIDERS

7.1 DEVELOPER EXPERIENCE AND QUALIFICATIONS

7.1.1 Company Overview

Invenergy's name is synonymous with innovation in an industry undergoing transformation. As the world's largest privately held developer and operator of renewable power, Invenergy works with leading utilities, global brands and public sector partners to take energy infrastructure projects from drawing board to reality. Invenergy's 2,000 employees are united by a vision to be innovators building a sustainable world. Headquartered in Chicago, Illinois, the Company has successfully developed over 31 gigawatts of power projects across the Americas, Europe and Asia. See the image below for additional information.



Since 2012, Invenergy has harnessed the power of the sun to deliver low-cost renewable energy. Today, Invenergy is a leading solar energy project developer in North America. Due to solar's rapid cost declines and technology improvements, Invenergy increasingly sees customers turning to this affordable, simple and scalable technology for on-peak renewable energy generation.

In a highly competitive market, Invenergy has positioned itself to meet the growing demand for solar through innovation and by building relationships with industry-leading suppliers. In December 2019, Invenergy reached the start of commercial operations on the first large-scale solar project in North America to use bifacial panels. Together with single-axis trackers, these technologies allowed Invenergy to maximize energy production at the site. Invenergy is also now using drones equipped with infrared cameras to inspect and process solar data. Invenergy has a total of 53 Projects in operation and construction with 6,693 MW across its portfolio.

As one of the earliest pioneers in advanced energy storage, Invenergy is a leading privately held owner and operator of grid-scale storage. Invenergy completed its first energy storage project in 2012 and since then has amassed over 150,000 hours of storage system runtime experience. In 2019, Invenergy received the Energy Storage Association's Brad Roberts Award recognizing extraordinary accomplishments in the storage market and comprehensive industry commitment and participation. Invenergy has a total of 19 Projects in operation and construction with a total of 556 MW across its portfolio.

The Project will also generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass. Solar generation growth is anticipated to continue because the solar incentives, along with falling technology costs for solar, support significant competition with natural gas for electricity generation and shares of coal and nuclear power generation continue to decrease in the U.S. electricity generation profile. Moreover, energy storage systems, such as the Project's proposed solar-battery hybrid system, will compete with natural gas-fired turbines as sources of back-up capacity for non-dispatchable renewable energy sources.

7.2 PRICING OF THE PROPOSAL

For proposed key commercial terms please see the table below.

Lake Wilson Solar + Storage Energy Center – Commercial Terms	
Buyer	Xcel Energy LLC
Seller	An Affiliate of Invenergy Renewables LLC
Technology	Bifacial PV modules mounted on a single axis tracker
Solar Nameplate Capacity	150.0 MW
Storage Nameplate Capacity	95.0 MW
Delivery Point	Fenton – Chanarambie 115 kV transmission line
Pricing Conditions	See below exclusions list for pricing conditions.
Power Purchase Agreement	
Solar Contract Capacity	150.0 MW-AC
Storage Contract Capacity	95.0 MW-AC
COD	December 31, 2027

Annual Expected Solar Generation	Approximately 332,570 MWh
Annual Net Capacity Factor (NCF)	Approximately 25.3%
Escalation	[NONPUBLIC DATA HAS BEEN EXCISED]
Term	**Solar:** [NONPUBLIC DATA HAS BEEN EXCISED]
Commercial Summary	**Solar PPA:** [NONPUBLIC DATA HAS BEEN EXCISED] **Storage PPA:** [NONPUBLIC DATA HAS BEEN EXCISED]

Invenergy Price Assumptions for the Lake Wilson Solar-plus-Storage project:

- Pricing assumes that the solar and storage portions of the project are purchased concurrently.
- Pricing assumes Invenergy's Internal Technical Specifications and Scope of Work subject to further review.
- Invenergy is open to discussing build transfer options with Xcel Energy
- Pricing includes costs for the project substation and transmission line to the POI.
- Pricing also includes MISO interconnection costs as contemplated in the current executed GIA. Invenergy contemplates a pass-through structure of these costs if they change.
- Pricing includes a $200/ kW Security Fund established at the execution of the agreement and stepped down to $75/kW held at COD held throughout the term of the PPA at Xcel Energy's request. Should Xcel Energy wish to lower the security, Invenergy may be able to reduce pricing.
- Module pricing assumes availability of polysilicon from China in compliance with applicable United States law at the time of the bid.
- Pricing does not include Section 301 or similar tariffs but does include applicable module-specific Section 201 tariffs as of the response date.
- Invenergy anticipates customary conditions precedent in this transaction to address outstanding material issues beyond Invenergy control, including but not limited to conditions precedent for achieving firm interconnection and final, non-appealable local permits and tax incentives.
- State and federal taxes and tariffs as they exist on January 17th, 2023.
- Storage sizing is subject to the approval of the MISO surplus interconnection application
- Pricing assumes a notice to proceed issued from Xcel Energy by August 2025.

7.3 SCHEDULING PROVISIONS

Please reference **Table 15 below** for associated scheduling provisions.

Table 15: Project Operation & Maintenance Tasks and Frequency

Plant Device	Task	Preliminary Frequency

Photovoltaic (PV) Field	Daily performance verification using SCADA	Daily
	PV solar modules visual check	Once Yearly
	Wiring and junction boxes visual check	Once Yearly
	Overview aerial thermal scan	Once Yearly
	Advanced diagnostics	At Owner's Direction
	PV strings and sting boxes faults	Once Yearly
	PV solar modules washing	No regular washing planned (only as site-specific conditions warrant)
	Vegetation Management (if necessary at site)	Up to here times a year depending on site conditions, and compatible with plant design and the VSMP
Electric Board	Case visual check	Once Yearly
	Fuses Check	Once Yearly
	Visual Torque check	Once Yearly
	Grounding check	Once Yearly
Inverter	Case visual inspection	Once Yearly
	Air intake and filters inspections	Once Yearly
	Conversion stop for lack of voltage	Once Yearly
	AC voltage and current check	Once Yearly
	Fuses check	Once Yearly
	Visual Torque check	Once Yearly
Support Structures	Visual check	Once Yearly
BESS	Daily performance verification using SCADA	Daily
	Inspection and cleaning of air filters for cooling system	Monthly
	HVAC systems check	Monthly
	Fire safety systems check	Monthly
	Fire safety system inspections and certifications from qualified third-party contractor	Semi-annual
	Capacity Test	Once Yearly

7.4 DISCUSSION OF THE GUARANTEED PERFORMANCE FACTORS, SUCH AS CONSTRUCTION COSTS, UNIT COMPLETION, AVAILABILITY, AND EFFICIENCY

7.4.1 SOLAR PROJECT RESOURCE

The 150 MWac Lake Wilson 150 MWac Solar Resource will have an approximate ~25.3% NCF with approximately 332,569 MWh generated in Year 1 from solar and 380 MWh available from storage. Lake Wilson will utilize Tier 1, bifacial solar panels and can achieve a commercial operation date by December 31, 2025.

7.4.2 STORAGE PROJECT RESOURCE

The 95 MW Storage Facility at the Lake Wilson Solar Energy Center has a 20 MW MISO queue position and an additional 75 MW through the surplus interconnect process. The 20 MW storage queue position has the only executed storage GIA in the state of Minnesota.

7.4.3 COLD WEATHER SPECIFICATIONS

Invenergy has taken measures to minimize operational risks from various environmental conditions. Snow loading, extreme annual snow depth and depth of frost penetration will be addressed with the tracker manufacturer at the time of design. Invenergy works with the two largest tracker providers in the United States, both of whom have experience with extreme weather conditions and designs for Bent Paddle can be altered to account for all extremes.

With regards to temperature ratings, most tracker and inverter equipment is rated to around -25 to -30 deg C. Invenergy will be procuring additional cold weather packages for tracker and inverter equipment down to -35 or -39 deg C depending on the selected equipment provider.

7.5 ANY OTHER KEY CONTRACT TERMS THE PROVIDER REQUIRES

The Project will also generate electricity at a lower cost per kilowatt hour than would other possible fossil fuel and renewable energy options, such as coal and biomass. Solar generation growth is anticipated to continue because the solar incentives, along with falling technology costs for solar, support significant competition with natural gas for electricity generation and shares of coal and nuclear power generation continue to decrease in the U.S. electricity generation profile. Moreover, energy storage systems, such as the Project's proposed solar-battery hybrid system, will compete with natural gas-fired turbines as sources of back-up capacity for non-dispatchable renewable energy sources.

8.0 800 FD ORDER SUPPLEMENTARY DATA REQUIRED FOR ALL PROVIDERS

8.1 PROVIDE A CLIMATE CHANGE ANALYSIS OF THE PROPOSAL CONSISTENT WITH THE MINNESOTA ENVIRONMENTAL QUALITY BOARD'S ENVIRONMENTAL

ASSESSMENT WORKSHEET GUIDANCE FOR DEVELOPING A CARBON FOOTPRINT AND INCORPORATING CLIMATE ADAPTATION RESILIENCE. (METRIC 32)

The Lake Wilson Project has considered the climate change metric proposed by the Minnesota Environmental Quality Board's environmental assessment worksheet guidance for developing a carbon footprint and incorporating climate adaptation resilience. Associated information is contained within this proposal submission.

8.2 IDENTIFYING WHETHER THE PROPOSAL IS LOCATED IN AN ENVIRONMENTAL JUSTICE AREA USING CENSUS CRITERIA IN MINNESOTA STATUTE 216B.1691, SUBD. 1(E). (METRIC 32)

The Environmental Assessment for the Project issued by Department of Commerce - Energy Environmental Review and Analysis ("EERA") in October 2023 found that the census data does not define the project area as an environmental justice area.

8.3 INFORMATION NECESSARY FOR CONSIDERATION OF ENERGY JUSTICE FACTORS (METRIC 61)

See section 3.2.1 for more detail

8.3.1 SOCIOECONOMIC FACTORS OF A PROJECT'S LOCATION

The Environmental Assessment issued by EERA evaluated the socioeconomic factors of the Project's location. The Project area is part of Census Tract 27101900200. In this census tract, approximately 16% of the population is nonwhite, 22% of people reported income less than 200% of the poverty level, 6% of people have limited English proficiency, and the area is not located within Indian County.

8.3.2 INVOLVEMENT OF LOCAL GOVERNMENT, COMMUNITY ORGANIZATION AND, WHERE RELEVANT, TRIBAL NATIONS

Prior to preparing and submitting a Site Permit Application, extensive and comprehensive engagement with local, state and federal regulatory stakeholders was done. Additionally, the eleven recognized Minnesota Tribal Nations and the Minnesota Indian Affairs Council Cultural Resources stakeholders for consulted for comments. We continue to engage with all interested stakeholders throughout the CN and SP application processes.

8.3.3 ESTIMATED LOCAL TAX REVENUE IT WILL PRODUCE

The Project is expected to generate an estimated average annual solar energy production and property tax revenue over the life of the project of approximately $330,000 for Murray County and approximately $75,000 for Leeds Township. The Project is expected to generate about $12 million in local tax revenues over a 30-year period.

8.3.4 TEMPORARY AND PERMANENT JOBS IT WILL CREATE

The Project will create approximately 250 temporary jobs during the construction and installation phases, and up to 5 onsite permanent jobs during the operations phase. Several indirect jobs are also expected to be created in Murray County and the greater State of Minnesota as a result of the Project.

8.3.5 COMMITMENT TO THE USE OF DIVERSE SUPPLIERS, AS DEMONSTRATED BY A HISTORY OF USE ON RECENT PROJECTS

Lake Wilson has not yet nailed down specific contractors or subcontractors for this project and will use commercially reasonable efforts to identify Small Companies when going out to market on this project. Invenergy is developing an enhanced policy to ensure that eligible diverse business entities (DBEs) designations are comprehensive and periodically reviewed. The Company also hired two Diverse Business Partners in August 2022 to help mainstream DEI considerations into not only People & Culture, but Invenergy's broader business processes.

Lake Wilson's subcontracting is built on trust, fairness and proactive communication. Invenergy evaluates all construction contractors based on relevant experience, current safety records, and current financial strength. Additionally, Invenergy is working to increase economic inclusion amongst subcontractors.

8.3.6 PAYMENT OF PREVAILING WAGES, AND WORKFORCE TRAINING OPPORTUNITIES

Lake Wilson is fully committed to complying with all applicable workforce requirements, including federal prevailing wage and apprenticeship utilization standards under the IRA, as the project progresses.

Lake Wilson will work closely with its contractors to comply with the PWA requirements provided under the Inflation Reduction Act. This compliance will be accomplished by requiring our contractors to meet these terms through a policies and procedures document negotiated with each specific contractor. Specific procedures may vary by contractor. The entity claiming the tax credits, dependent upon transaction type, will be required to have sufficient records to demonstrate that its contractors and subcontractors complied with PWA. Should Xcel Energy decide to move forward with the proposed PPA option(s), Lake Wilson will collect requirements from contractors and provide this information to Xcel Energy.

9.0 IMPACTS OF POWER PLANTS (MINN. R. 7849.1500, SUBP. (2)) (METRIC 32)

9.1 THE ANTICIPATED EMISSIONS OF THE FOLLOWING POLLUTANTS EXPRESSED AS AN ANNUAL AMOUNT AT THE MAXIMUM RATED CAPACITY OF THE PROJECT AND AS AN AMOUNT PRODUCED PER KILOWATT HOUR AND THE CALCULATIONS PERFORMED TO DETERMINE THE EMISSIONS: SULFUR DIOXIDE, NITROGEN

OXIDES, CARBON DIOXIDE, MERCURY, AND PARTICULATE MATTER, INCLUDING PARTICULATE MATTER UNDER 2.5 MICRONS IN DIAMETER;

Sulfur dioxide, nitrogen oxides, carbon dioxide, mercury, and particulate matter are known as primary pollutants. Primary pollutants form directly and must be emitted by a source. Because solar facilities and wind farms do not burn fuel, they do not emit primary pollutants during operation. Air pollutants would be emitted during construction of both solar facilities and wind farms. These pollutants include construction equipment exhaust and fugitive dust. Exhaust emissions from construction equipment and vehicles traveling to and from the facility would occur during construction. Fugitive dust occurs from earth moving activities and vehicle travel on unpaved roads. These impacts are influenced by weather conditions and the type of construction activity. Once the solar facility or wind farm is constructed, exhaust and dust emissions would be greatly reduced. Limited emissions would occur during routine maintenance and repairs.

9.2 THE ANTICIPATED EMISSIONS OF ANY HAZARDOUS AIR POLLUTANTS AND VOLATILE ORGANIC COMPOUNDS;

Minor emissions of hazardous air pollutants at solar facilities would occur from vehicle and equipment use and from solvents and coatings used during equipment maintenance and building upkeep. Emissions at wind farms would be similar, with the addition of petroleum-based fluids used in the operation of wind turbines, such as gear box oil, hydraulic fluid, and grease.

9.3 THE ANTICIPATED CONTRIBUTION OF THE PROJECT TO IMPAIRMENT OF VISIBILITY WITHIN A 50-MILE RADIUS OF THE PLANT;

The Project is not anticipated to contribute to the impairment of visibility. The Project Substation and Switchyard will contain transmission poles and dead-end structures up to 100-feet tall that will be visible from local roadways. There are already existing transmission facilities within the Project area; the addition of Project transmission facilities is not expected to significantly alter the viewshed or increase visual impacts. The Project solar arrays (surrounded by security fence) will be visible from adjacent roadways and parcels up to approximately 0.5 mile, and are not expected to impair visibility given their relative low profile and color. Project fencing around the solar arrays will look similar to existing agricultural field fencing.

9.4 THE ANTICIPATED CONTRIBUTION OF THE PROJECT TO THE FORMATION OF OZONE EXPRESSED AS REACTIVE ORGANIC GASES. REACTIVE ORGANIC GASES ARE CHEMICALS THAT ARE PRECURSORS NECESSARY TO THE FORMATION OF GROUND-LEVEL OZONE;

Solar facilities and wind farms do not produce ozone or ozone precursors. However, any transmission line associated with a project, whether new or existing, would generate small amounts of ozone and nitrous oxide.

9.5 THE AVAILABILITY OF THE SOURCE OF FUEL FOR THE PROJECT, THE AMOUNT REQUIRED ANNUALLY, AND THE METHOD OF TRANSPORTATION TO GET THE FUEL TO THE PLANT;

The Project will generate electricity from sunlight or store electricity from the solar facility and grid; therefore, aside from limited amounts of fuel for the back-up generators, no fuel is required.

9.6 ASSOCIATED FACILITIES REQUIRED TO TRANSMIT THE ELECTRICITY TO CUSTOMERS;

The Project will have a collection substation and switchyard that will consist of high voltage electrical structures (i.e., poles), breakers, conductors, medium power transformers to step-up the power from the 34.5 kV feeders to the grid voltage of 115 kV, metering and related equipment for connecting to the transmission grid, lightning protection, and control equipment according to the specifications of the GIA with MISO and Northern States Power Company (NSP). The 34.5 kV collector system voltage will be stepped up to the interconnection voltage of 115 kV by medium power transformers located at the Project Substation and transmitted to the Xcel Switchyard via a short (200-400 foot long) overhead 115 kV Project Gen-Tie Line in a single span between dead-end structures. NSP will build the switchyard.

9.7 THE ANTICIPATED AMOUNT OF WATER THAT WILL BE APPROPRIATED TO OPERATE THE PLANT AND THE SOURCE OF THE WATER IF KNOWN;

According to the U.S. Geological Survey, 133 billion gallons of water are withdrawn each day in the United States to cool thermoelectric power plants.[9] The majority of this water is returned to the source. Solar facilities and wind farms are not thermoelectric power plants—they do not use water to generate electricity or for cooling. Water is not appropriated to operate these facilities, and they do not discharge wastewater.

9.8 THE POTENTIAL WASTEWATER STREAMS AND THE TYPES OF DISCHARGES ASSOCIATED WITH SUCH A PROJECT INCLUDING POTENTIAL IMPACTS OF A THERMAL DISCHARGE;

Water is not appropriated to operate these facilities, and they do not discharge wastewater.

9.9 THE TYPES AND AMOUNTS OF SOLID AND HAZARDOUS WASTES GENERATED BY SUCH A PROJECT, INCLUDING AN ANALYSIS OF WHAT CONTAMINANTS MAY BE FOUND IN THE ASH AND WHERE THE ASH MIGHT BE SENT FOR DISPOSAL OR REUSE; AND

If not properly handled, solid and hazardous wastes can contaminate air, soils, and water, which can cause a variety of human and environmental impacts depending on the type and amount

[9] U.S. Geological Survey. *Total Water Use*. (n.d.) https://www.usgs.gov/mission-areas/water-resources/science/total-water-use?qt-science_center_objects=0#qt-science_center_objects.

of contamination. Solar facility and wind farm construction generates solid waste, such as scrap wood and metal, plastics, and cardboard. Petroleum products would be present on-site, including engine and hydraulic oil, lubricants, grease, cleaning solvents, and fuel. Operation is not expected to generate significant qualities of solid and hazardous wastes—but more so for wind farms. Small quantities of petroleum products would be kept onsite for routine maintenance activities. Certain electronic components in both solar facilities and wind farms, such as circuit boards, contain hazardous materials commonly found in electronic devices.

Decommissioning of solar facilities and wind farms will generate solid wastes. Certain electronic components in both solar facilities and wind farms, such as circuit boards, contain hazardous materials commonly found in electronic devices. In Minnesota, solar panels must be assumed to be hazardous waste due to the probable presence of heavy metals, unless they are specifically evaluated as non-hazardous. Heavy metals in solar panels can include arsenic, cadmium, lead, and selenium. Panels must be properly disposed of in a special facility or recycled if recyclers are available."[10]

About 85 percent of wind turbine components can be recycled or reused, including steel, copper, and electronics.[11] Wind turbine blades are difficult to recycle and must be cut into pieces for proper disposal.[12]

9.10 THE ANTICIPATED NOISE IMPACTS OF A PROJECT, INCLUDING THE DISTANCE TO THE CLOSEST RECEPTOR WHERE STATE NOISE STANDARDS CAN STILL BE MET.

The ROI for noise is the project vicinity (1,600 feet). The primary noise receptors are the 25 local residences. Residences are in NAC 1. Noise receptors could also include individuals working outside in the project vicinity. Ambient noise levels in rural areas such as the one surrounding the project are estimated to be 45 dBA.[13] Potential noise impacts from the project are associated with noise from construction and operation. For more detail see section 6.8.

10.0 RESOURCE PLANNING; RENEWABLE ENERGY

10.1 PUBLIC INTEREST (MINN. STAT. 216B.2422, SUBD. 4)

The Project is consistent with Minnesota's preference for renewable energy and satisfies these statutory criteria by furthering available resources to meet this renewable energy preference.

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[10] MPCA. *2017 Toxics and Pollution Prevention Evaluation Report*. (2018). https://www.pca.state.mn.us/sites/default/files/lrp-p2-2sy17.pdf, page 22; *see also* California Department of Toxic Substance Control (n.d.) *Solar Panel FAQs*.: https://dtsc.ca.gov/solar-panel-faqs/#easy-faq-348310 (solar panel wastes include heavy metals such as silver, copper, lead, arsenic, cadmium, selenium that at certain levels may be classified as hazardous wastes).

[11] Martin, C. (February 7, 2020) Wind Turbine Blades Can't be Recycled, So They're Piling up in Landfills, retrieved from: https://www.bloomberg.com/news/features/2020-02-05/wind-turbine-blades-can-t-be-recycled-so-they-re-piling-up-in-landfills.

[12] *Ibid.*

[13] ANSI/ASA S12.9-2013/Part 3.

10.2 USE OF RENEWABLE RESOURCE (MINN.STAT.216B.243, SUBD. 3A)

The Project is consistent with Minnesota's preference for renewable energy and satisfies these statutory criteria by furthering available resources to meet this renewable energy preference.

11.0 CERTIFICATE OF NEED FOR LARGE ENERGY FACILITY (MINN.STAT.216B.243, SUBD. 3(10))

Minnesota Statute Section 216B.243, subd. 3(10) requires the Commission to evaluate whether a CN applicant is in compliance with Minnesota's RES and SES. Lake Wilson Solar, however, is not subject to the RES or SES because it has no retail sales of electricity in Minnesota. Therefore, this requirement does not apply to the Project.

Minnesota Statute Section 216B.243, subd. 3(10) requires the Commission to consider whether a utility seeking a CN complies with certain transmission planning requirements. As an IPP, this statute does not apply to Lake Wilson.

12.0 OPPORTUNITIES FOR DISTRIBUTED GENERATION (MINN. STAT. 216B.2426)

Pursuant to Minn. Stat. § 216B.169, subd. 1(c), "distributed generation" refers to projects of no more than 10 MW. The Project is a utility-scale project and will not provide distributed energy to the system as defined by Minnesota law. However, Lake Wilson believes that the need for new energy resources is so great that it also will not displace any opportunities for installation of renewable energy. Additionally, the Project's transmission opportunities and economies of scale make it an exceptional electrical resource that will provide great benefits to the state and the local economy.

13.0 SHOWING REQUIRED FOR CONSTRUCTION (MINN.STAT.216B.243, SUBD. 3(12))

Minnesota Statute Section 216B.243, subd. 3(12) requires the Commission to evaluate the extent to which an applicant has considered the risk of environmental costs and regulation. As the Commission and the Department of Commerce have determined, this statute does not apply to renewable generation facilities such as the Project.

14.0 INNOVATIVE ENERGY PROJECT (MINN. STAT. 216B.1694, SUBD. (2)(5))

Minnesota also requires the Commission to consider an innovative energy project before authorizing construction or expansion of a fossil-fueled generation facility. Because the Project is not a fossil-fuel facility, this requirement is not applicable.