



**Minnesota Public Utilities Commission  
Certificate of Need Application for a Solar  
Energy Conversion System**

**Red Rock Solar, LLC  
Cottonwood County, Minnesota  
Submitted November 9, 2020  
Docket No. IP-7014/CN-19-486**

**Red Rock Solar, LLC**

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**Project Name:** Red Rock Solar Project

**Project Location:** The Project's boundary includes approximately 846 acres in Midway Township, Cottonwood County, MN

**Applicant:** Red Rock Solar, LLC

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**Signature:**  \_\_\_\_\_

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## ACRONYMS

2016 Quad Report	Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report
AADT	Annual Average Daily Traffic
AC	Alternating current
AIMP	Agricultural Impact Mitigation Plan
Apex	Apex Clean Energy Holdings, LLC
Applicant	Red Rock Solar, LLC
BMPs	Best management practices
Big Bend	Big Bend Wind, LLC
BOP	Balance of Plant
C&I	Commercial and industrial
CN	Certificate of Need
CN Application	Red Rock Solar CN Application
CO <sub>2</sub>	Carbon Dioxide
Commission	Minnesota Public Utilities Commission
CSAH	County State Aid Highway
dBA	The dBA scale is A-weighted decibels
DC	Direct current
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
Exemption Request	Request for Exemption from Certain Certificate of Need Application Content Requirements
FAA	Federal Aviation Administration
GHG	Greenhouse Gas Emissions
GW	Gigawatts
IPaC	Information for Planning and Conservation
IPP	Independent Power Producer
IRPs	Integrated Resource Plans
ITC	Investment Tax Credit
JEDI	Jobs and Economic Development Impacts
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour

LEGF	Large Electric Generating Facility
LHVTL	Large High Voltage Transmission Line
MDA	Minnesota Department of Agriculture
Minn. R.	Minnesota Rules
Minn. Stat.	Minnesota Statutes
MISO	Midcontinent Independent System Operator
MNDOC	Minnesota Department of Commerce, Division of Energy Resources
MNDNR	Minnesota Department of Natural Resources
MNDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MW	Megawatt Alternating Current
MWh	Megawatt hour
NHIS	Natural Heritage Information System
NLCD	National Land Cover Database
NLEB	Northern long-eared bat
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
PPA	Power Purchase Agreement
Project	Red Rock Solar Project
Project Boundary	The land under a purchase option between the landowner and Red Rock
Project Footprint	That portion of the Project Boundary currently anticipated to be occupied by the Project
PV	Photovoltaic
RECS	Renewable Energy Credits
Red Rock Solar	Red Rock Solar, LLC
RES	Renewable Energy Standards
RFP	Request for Proposal
RP	Route Permit
Rules	Minnesota Rules
SCADA	Supervisory Control and Data Acquisition
SES	Solar Energy Standards
SMMPA	Southern Minnesota Municipal Power Agency
SP	Site Permit



SWPPP	Storm Water Pollution Prevention Plan
TWh	Terawatt hours
USACE	U.S. Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WNS	White-nose syndrome

## APPLICATION CONTENT REQUIREMENTS COMPLETENESS CHECKLIST

<b>Minnesota Rule</b>	<b>Required Information</b>	<b>Application Section(s)</b>	<b>Exemption Granted</b>
<b>7849.0120</b>	<b>Criteria – Probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, the applicant’s customers, or to the people of Minnesota and neighboring states</b>		
A(1)	Accuracy of the applicant’s forecast	4.1/6.0	Yes
A(2)	Effects of applicant’s existing or expected conservation programs and state and Federal conservation programs	4.1	No
A(3)	Effects of promotional practices on demand	4.1/3.2.2	Yes
A(4)	Ability of current and planned facilities, not requiring certificates of need, to meet future demand	5.2.1.7.5	No
A(5)	Effect of proposed facility in making efficient use of resources	4.1	No
<b>7849.0120</b>	<b>Criteria – A more reasonable and prudent alternative has not been demonstrated</b>		
B(1)	Appropriateness of size, type, and timing	4.2.1	Yes-partial
B(2)	Cost of facility and its energy compared to costs of reasonable alternatives	4.2.2	No
B(3)	Effects of the facility upon natural and socioeconomic environments compared to the effects of reasonable alternatives	4.2.3	No
B(4)	Expected reliability compared to reasonable alternatives	4.2.4	No
<b>7849.0120</b>	<b>Criteria – Facility will provide benefits to society</b>		
C(1)	Relationship of proposed facility to overall state energy needs	4.3.1/3.1	No
C(2)	Effects of facility upon the natural and socioeconomic environments compared to the effects of not building the facility	4.3.2	No
C(3)	Effects of facility in inducing future development	4.3.3	No
C(4)	Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	4.3.4	No
D	Facility or suitable modification will not fail to comply with relevant policies, rules, and regulations of other state and Federal agencies and local governments	4.4	No
<b>7849.0210</b>	<b>Filing Fees and Payment Schedule</b>	2.4	No
<b>7849.0240</b>	<b>Need Summary and Additional Considerations</b>		
Subp. 1	Need Summary – summary of major factors justifying need for facility	3.1	No
Subp. 2(A)	Additional Considerations – Socially beneficial uses of the output of the facility, including to protect or enhance environmental quality	3.2.1	No
Subp. 2(B)	Additional Considerations – Promotional activities that may have given rise to the demand for the facility	3.2.2	Yes

<b>Minnesota Rule</b>	<b>Required Information</b>	<b>Application Section(s)</b>	<b>Exemption Granted</b>
Subp. 2(C)	Additional Considerations – Effects of the facility in inducing future development	3.2.3	No
<b>7849.0250</b>	<b>Proposed LEGF and Alternatives Application</b>		
A(1)	Description – Nominal generating capability and effects of economies of scale on facility size and timing	5.1.1	No
A(2)	Description – Anticipated operating cycle, including annual capacity factor	5.1.2	No
A(3)	Description – Type of fuel, reason for selection, projection of availability over life of facility, and alternative fuels	5.1.3	No
A(4)	Description – Anticipated heat rate	5.1.4	No
A(5)	Description – Anticipated areas where facility will be located	5.1.5	No
B(1)	Discussion of Alternatives – Purchased power	5.2.1.1	Yes
B(2)	Discussion of Alternatives – Increased efficiency of existing facilities	5.2.1.2	Yes
B(3)	Discussion of Alternatives – New transmission lines	5.2.1.3	Yes
B(4)	Discussion of Alternatives – New generating facilities of a different size and energy resource	5.2.1.4–10	Yes - partial
B(5)	Discussion of Alternatives – Reasonable combination of alternatives	5.2.1.10	Yes
C	Proposed Facility and Alternatives	5.3	
C(1)	Capacity cost in current dollars per kilowatt	5.3.1	Yes - partial
C(2)	Service life	5.3.2	Yes - partial
C(3)	Estimated average annual availability	5.3.3	Yes - partial
C(4)	Fuel costs in current dollars per kilowatt hour	5.3.4	Yes - partial
C(5)	Variable operating and maintenance costs in current dollars per kilowatt hour	5.3.5	Yes - partial
C(6)	Total cost in current dollars of a kilowatt hour provided by it	5.3.6, Appendix A	Yes - partial
C(7)	Estimate of its effect on rates system-wide and in Minnesota	5.3.7	Yes
C(8)	Efficiency, expressed for a generating facility as the estimated heat rate	5.3.8	Yes - partial
C(9)	Majoring assumptions made in providing information in subitems (1) to (8), including projected escalation rates for fuel costs and operating and maintenance costs, as well as projected capacity factors	5.3	Yes - partial
D	System Map	5.4	Yes
E	Other relevant information about the facility and alternatives that may be relevant to a determination of need	5.3	No
<b>7849.0270</b>	<b>Peak Demand and Annual Consumption Forecast</b>		Yes
Subp. 1	Scope – Application shall contain pertinent data concerning peak demand and annual electrical consumption within the applicant’s service area and system	6.0	Yes

<b>Minnesota Rule</b>	<b>Required Information</b>	<b>Application Section(s)</b>	<b>Exemption Granted</b>
Subp. 2	Content of Forecast	6.0	Yes
Subp. 3	Forecast Methodology	6.0	Yes
Subp. 4	Data Base for Forecasts	6.0	Yes
Subp. 5	Assumptions and Special Information	6.0	Yes
Subp. 6	Coordination of Forecasts with Other Systems	6.0	Yes
<b>7849.0280</b>	<b>System Capacity</b>	7.0	Yes
<b>7849.0290</b>	<b>Conservation Programs</b>	8.0	Yes
<b>7849.0300</b>	<b>Consequences of Delay</b>	9.0	Yes
<b>7849.0310</b>	<b>Environmental Information – Provide environmental data in response to part 7849.0250, Item C, or 7849.0260, Item C, and information as requested in part 7849.0320 to 7849.0340</b>	10-11	No
<b>7849.0320</b>	<b>Generating Facilities</b>		
A	Estimated range of land requirements, including water storage, cooling systems, and solid waste storage	11.1	No
B	Estimated amount of vehicular, rail, and barge traffic generated by construction and operation of facility	11.2	No
C	Fossil-fuel facilities – Fuel	11.3.1	No
D	Fossil-fuel facilities – Emissions	11.3.2	No
E	Water Use for Alternate Cooling Systems	11.4	No
F	Sources and types of discharges to water	11.5	No
G	Radioactive releases	11.6	No
H	Types and quantities of solid wastes in tons/year	11.7	No
I	Sources and types of audible noise attributable to facility operation	11.8	No
J	Estimated work force required for facility construction and operation	11.9 (construction), 11.10 (operation)	No
K	Minimum number and size of transmission facilities required to provide a reliable outlet for the generating facility	11.11	No
<b>7849.0330</b>	<b>Transmission Facilities</b>	5.2.1.9	Yes
<b>7849.0340</b>	<b>No-Facility Alternative</b>	5.2.1.8	Yes

## **RED ROCK SOLAR PROJECT**

### **1.0 EXECUTIVE SUMMARY**

Red Rock Solar, LLC (“Red Rock Solar” or “Applicant”), submits this Certificate of Need (“CN”) application (“CN Application”) to the Minnesota Public Utilities Commission (“Commission”), pursuant to and in accordance with Minn. Stat. § 216B.243 and Minn. R. Ch. 7849. Red Rock Solar respectfully requests that the Commission issue a CN for the Red Rock Solar Project (“Project”), a solar energy conversion facility with an up to 60-megawatt (“MW”) alternating current (“AC”) nameplate capacity and associated facilities, in Midway Township, Cottonwood County, Minnesota. The Project is a “large energy facility,” as defined in Minn. Stat. § 216B.2421, subdivision 2(1), and a “large electric generating facility” as defined in Minn. R. 7849.0010, subpart 13. Red Rock Solar is also applying for a Site Permit (“SP”) pursuant to the Minnesota Power Plant Siting Act (Minn. Stat. Ch. 216E) and Minn. R. Ch. 7850 (MPUC Docket No. IP7014/GS-19-620).

### **2.0 INTRODUCTION**

#### **2.1 THE RED ROCK SOLAR PROJECT**

Red Rock Solar is an independent power producer (“IPP”) that proposes to construct and operate the Project at a site within Midway Township, Cottonwood County, Minnesota (Figure 1 – Project Vicinity Map). The power generated by the Project will be offered for sale to Minnesota utilities and corporate purchasers that have identified a need for additional renewable energy. Red Rock Solar proposes the Project as part of the state’s first utility-scale hybrid renewable energy facility, along with the Big Bend Wind Farm proposed by Red Rock Solar’s current affiliate, Big Bend Wind, LLC (“Big Bend”).

Red Rock Solar has obtained leases and purchase options for 846 acres of privately-owned land (the “Project Boundary”). Based on preliminary design, Project facilities will cover approximately 483 acres of the Project Boundary (“Project Footprint”). There are approximately 363.8 acres of the Project Boundary for which Red Rock Solar has site control, but are currently not contemplated for occupation by solar facilities (Figure 2 – Project Boundary and Footprint). The total nameplate capacity for the proposed Project facilities is up to 60 MW AC. Red Rock Solar estimated the accredited capacity and the amount of on-peak energy the Project is expected to deliver and provided the information in Appendix A, Section 2.1, which has been designated trade secret.

The Project’s facilities are currently anticipated to be located within the Project Footprint and include solar panels and racking, inverters, security fencing, Solar Project Substation, electrical collection and communication lines, stormwater basins, laydown areas, and up to three weather stations (up to 10 feet tall). The Project will interconnect via an 18-mile 161 kilovolt (“kV”) generation tie-line (“Transmission Line”) located within Midway, Mountain Lake, Odin, and Cedar townships in Cottonwood, Watonwan, and Martin Counties, Minnesota. The Transmission Line will interconnect with the Blue Lake-Wilmarth-Interstate Junction 345 kV transmission line in Martin County. Because the proposed transmission line is 161 kV and more

than 1,500 feet in length, a Route Permit (“RP”) from the Commission will be required, pursuant to Minn. Stat. Ch. 216E and Minn. R. Ch. 7850. Big Bend Wind, LLC’s (“Big Bend”) RP Application is available in Docket No. IP7013/TL-19-621. The Transmission Line will also interconnect the up to 308 MW Big Bend Wind Farm proposed by Big Bend, currently an affiliate of Red Rock Solar, and the Transmission Line is included within the CN Application for the Big Bend Wind Farm. *See* Docket No. IP-7013/CN-408. Red Rock Solar plans to construct the Project on a schedule that facilitates an in-service date in 2022. Together, the Big Bend Wind Farm and the Project will generate up to 335 MW of renewable energy (275 MW of wind and 60 MW of solar) or up to 308 MW of only wind (*see* the Big Bend Wind Project in Docket No. IP7013/WS-19-619).

## 2.2 APPLICANT INFORMATION

Red Rock Solar is an affiliate of Apex Clean Energy Holdings, LLC (“Apex”), a utility-scale clean energy developer headquartered in Charlottesville, Virginia. Since its founding in 2009, Apex has become one of the fastest-growing companies in the industry. More than a dozen Apex-originated wind and solar facilities are now operating around the country, totaling nearly 3 gigawatts (“GW”), with another 1 GW scheduled to be brought online in the coming months. Operating assets under management have grown to 1.6 GW. Apex has signed contracts for the sale of more than 20 projects totaling over 6 GW of capacity, and our development portfolio of approximately 20 GW of wind, solar, and storage projects is one of the largest in the United States. Apex’s mission-driven team of more than 200 renewable energy experts uses a data-focused approach to create solutions for the world’s most innovative and forward-thinking customers. The Project will provide production tax payments to Cottonwood County of approximately \$208,000 annually over 35 years for a total of approximately \$7.3 million. Additionally, Midway Township will receive approximately \$52,000 annually over 35 years for a total of approximately \$1.8 million. In addition, lease and purchase payments paid to the landowners (approximately \$965,000 annually and \$34 million over 35 years) will offset potential financial losses associated with removing a portion of their land from agricultural production.

Neither Apex nor Red Rock Solar own or operate existing renewable energy facilities in Minnesota that were permitted by or otherwise subject to the jurisdiction of the Commission. Apex is also developing an up to 308 MW wind farm in Cottonwood and Watonwan Counties, Minnesota, through its subsidiary, Big Bend.

## 2.3 PROJECT CONTACTS

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## 2.4 FILING FEES AND PAYMENT SCHEDULE (MINN. R. 7849.0219)

The total fee for the CN Application and the schedule for payment are shown in Table 1. The fee determination for the Project is based on a capacity of up to 60 MW, per the requirements of Minn. R. 7849.0210, subp. 1. The payment schedule is based on Minn. R. 7849.0210, subp. 2.

**Table 1:  
 Certificate of Need Application Schedule of Payments**

Fee Calculation	Amount
Fee Calculation Equation	\$10,000 + \$50/MW
Due with CN Application	\$3,250.00
Due 45 days after CN Application submittal date	\$3,250.00
Due 90 days after CN Application submittal date	\$3,250.00
Due 135 days after CN Application submittal date	\$3,250.00
Total Calculated Fee	\$13,000.00

## 2.5 EXEMPTION REQUEST

Minn. R. Ch. 7849 sets forth the data an applicant must provide in a CN application. An applicant may be exempted from providing certain information if the applicant requests an exemption in writing that shows that the data requirement is either unnecessary to determine the need for the proposed facility or may be satisfied by submitting another document. Minn. R. 7849.0200, subp. 6.

On June 19, 2019, Red Rock Solar submitted a Request for Exemption from Certain Certificate of Need Application Content Requirements (“Exemption Request”). In its Exemption Request, Red Rock Solar requested that the Commission grant its exemptions for the Project, pursuant to Minn. Stat. § 216B.243 and Minn. R. 7849.0200, from certain CN data requirements that are not necessary to determine the need for an independent power production facility or a renewable energy facility designed to satisfy the Renewable Energy Standards (“RES”) or the Solar Energy Standards (“SES”) requirements set forth in Minn. Stat. § 216B.1691, or other clean energy standards.

On September 24, 2019, the Commission issued an order granting Red Rock Solar the exemptions it requested in its Exemption Request, as modified by the comments filed by the Minnesota Department of Commerce, Division of Energy Resources (“MNDOC”).<sup>1</sup> Where appropriate in this CN Application, Red Rock Solar will reference the specific exemptions granted by the Commission.

<sup>1</sup> Order Approving Exemptions to Certain Filing Requirements (Sept. 24, 2019).

## **2.6 REQUEST FOR JOINT PROCEEDINGS**

As described above, together, Big Bend and Red Rock Solar are proposing the state's first utility-scale hybrid renewable energy facility and shared transmission line. In addition to this CN Application, Red Rock Solar has filed a Site Permit Application in Docket No. IP-7014/GS-19-620. Big Bend has applied for a Certificate of Need for the wind project in Docket No. IP7013/CN-19-408, a Site Permit in Docket No. IP7013/WS-19-619, and a Route Permit for the Transmission Line in Docket No. IP7013/TL-19-621.

Minnesota Stat. § 216B.243, subd. 4, and Minn. R. 7849.1900, subp. 4 permit the Commission to hold joint proceedings for the CN, SP and RP in circumstances where a joint hearing is feasible, more efficient, and may further the public interest. Red Rock Solar respectfully requests that the Commission order a joint regulatory review process for the Big Bend RP, SP, and CN applications, and Red Rock Solar SP and CN applications. Holding a joint proceeding is in the public interest because it will make it easier for members of the public to participate in the proceedings, provide a comprehensive record of all benefits, impacts and minimization measures related to this hybrid renewable energy project and improve administrative efficiency.

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

### **3.1 NEED SUMMARY**

Red Rock Solar is proposing the up to 60 MW Solar Project as part of a hybrid wind/solar renewable project with the Big Bend Wind Project, also being developed by Apex. The Project will provide renewable, solar energy to help meet the clean energy goals of a utility or commercial or industrial purchaser. Minnesota has a significant and important solar resource that can and is being used for capacity services within the state's generating portfolio. Solar is a good capacity resource, whereas wind is a good energy resource. Additionally, on average, wind and solar production profiles complement each other given the inverse nature of high winds and a bright sun. Using the solar and wind hybrid generation model can raise the renewable energy penetration level more than solar or wind generation alone. As a result, these two technologies complement each other and are not true substitutes. There is a need for both wind and solar energy in Minnesota's renewable portfolio. As one of the state's first hybrid renewable projects, and one that is fairly close to the Twin Cities, the combined solar and wind project is much more attractive from a demand perspective. Pairing the solar with the larger wind farm is significantly more cost efficient than developing solar as a standalone resource. Most of the larger substation and transmission infrastructure serves both solar and wind. Hence, the capital expenditure to procure the solar panels and photovoltaic ("PV") inverters is significantly offset by the shared balance of plant facilities on a hybrid project relative to a standalone solar project.

As Minnesota's utilities strive to achieve ambitious renewable energy targets, "aggressive renewable additions"<sup>2</sup> will be necessary. For example, Xcel Energy's "Upper Midwest Integrated

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<sup>2</sup> Xcel / Northern States Power. July 1, 2019. "2020-2034 UPPER MIDWEST INTEGRATED RESOURCE PLAN". Accessible at: <https://www.xcelenergy.com/staticfiles/xcel-responsive/Company/Rates%20&%20Regulations/The-Resource-Plan-No-Appendices.pdf>. Viewed May 28, 2020.



Resource Plan” alone calls for 80 percent carbon emissions reductions by 2030, and 100 percent reductions by 2050. By Xcel Energy’s estimation, these are “some of the most ambitious carbon reduction goals of any utility in the U.S.”<sup>3</sup> Translating these goals into action, Xcel Energy’s preferred plan “proposes to add 4,000 MW of cost-effective, utility-scale solar generation and approximately 1,200 MW of cumulative wind resource additions.”<sup>4</sup>

Similarly, other Minnesota utilities are advancing efforts to transition to renewable energy. Otter Tail Power will be at 30 percent renewable energy by 2022, and ALLETE’s Minnesota Power is targeting 50 percent renewables by end of 2021.<sup>5</sup> Likewise, Southern Minnesota Municipal Power Agency (“SMMPA”) announced its plan for a 90 percent reduction in carbon dioxide (“CO<sub>2</sub>”) emissions from 2005 levels and 80 percent carbon-free energy on an annual basis in 2030.<sup>6</sup> Red Rock Solar is well-positioned to help meet the resource needs of Minnesota’s electric utilities.

Beyond aiding with utility compliance towards voluntary renewable commitments and Minnesota’s existing renewable energy standards, Red Rock Solar can also help meet other state policies and goals. For example, Minn. Stat. § 216C.05 identifies energy planning and policy goals that include “the development and use of renewable energy resources wherever possible.”<sup>7</sup> In addition, Minn. Stat. § 216H.02 sets forth greenhouse gas emissions (“GHG”) reductions goals and planning requirements. Minnesota has thus far fallen short of reaching these goals, and in the Minnesota Pollution Control Agency’s (“MPCA”) 2019 Greenhouse Gas Legislative Report, the MPCA details that Minnesota’s GHG reductions thus far have declined 12 percent versus 2005 levels. This is notably below “goal of a 15% emissions reduction by 2015,”<sup>8</sup> and suggests that Minnesota will risk missing its goal of 30 percent reduction by 2025 without significant additional progress. By providing additional, carbon-free generation, Red Rock Solar can help further eliminate CO<sub>2</sub> and other GHG from Minnesota’s power sector, where significant emissions continue to originate. Similarly, Governor Walz issued Executive Order 19-37 establishing a Climate Change Subcabinet to “[i]dentify policies and strategies that will put Minnesota back on track or meet or exceed” those goals.<sup>9</sup>

Governor Walz also outlined “One Minnesota Path to Clean Energy,” which proposes policies that are designed to help Minnesota reach 100 percent clean energy by 2050.<sup>10</sup> Given that

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<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Minnesota Power (ALLETE). No Date. “EnergyForward”. Accessible at: <https://www.mnpower.com/Environment/EnergyForward> . Viewed May 28, 2020.

<sup>6</sup> SMMPA, SMMPA plans to be 80 percent carbon-free in 2030 (Feb. 5, 2020), *available at* <https://smmpa.com/smmpa2-0>.

<sup>7</sup> Minn. Stat. § 216C.05, subd. 1.

<sup>8</sup> Minnesota Pollution Control Agency & Minnesota Department of Commerce. January 2019. “2019 Greenhouse Gas Legislative Report”. Accessible at: <https://www.pca.state.mn.us/sites/default/files/lraq-2sy19.pdf> . Viewed May 29, 2020.

<sup>9</sup> Executive Order 19-37 (Dec. 2, 2019).

<sup>10</sup> Minnesota Commerce Department. March 4, 2019. “Walz, Flanagan propose plan to achieve 100 percent clean energy in Minnesota by 2050.” Accessible at: <https://mn.gov/commerce/media/news/?id=17-374074> . Viewed May 29, 2020.

just over 25 percent of Minnesota’s electric generation came from clean energy at the time of Governor Walz’s announcement,<sup>11</sup> Minnesota will need additional renewable generation like that provided by the Project to meet this goal.

Further, in addition to traditional utility demand for renewable energy, a growing number of corporations are turning to renewable energy to save money on energy and meet sustainability goals. Commercial and industrial (“C&I”) customers either purchase renewable energy directly or obtain renewable benefits and cost savings through financially settled contracts, sometimes called virtual power purchase agreements (“PPAs”). In addition, many utilities are creating “green tariffs,” which allow customers to purchase up to 100 percent renewable energy from the utility. Corporations such as Apple, Google and Facebook, along with many others, have recently set goals to obtain 100 percent of their energy from renewables. These clean energy goals fuel the demand for corporate renewables procurement and subsequent PPAs.

According to Wood Mackenzie’s report titled an “*Analysis of Commercial and Industrial Wind Energy Demand in the United States*,” the United States is “at the beginning stage of a corporate renewables procurement boom,” with approximately “85 gigawatts of renewable energy demand” from the “largest U.S. companies” alone through 2030.<sup>12</sup> Another Wood Mackenzie report titled “*US Corporate Procurement of Wind and Solar 2020*” lists 2019 as “the largest year for megawatts of annual wind and solar C&I capacity additions and the largest year on record for new wind and solar C&I PPAs signed.” These growth trends are expected to continue, and 2020 has already seen an immense demand for C&I renewable energy PPAs. Corporate PPA volumes in Midcontinent Independent System Operator (“MISO”) have increased each of the past five years, and Minnesota has seen an increase in cumulative operational and in-development C&I capacity, which highlights the broader trend of increased demand for renewables across the United States. Similarly, according to a 2019 research report, corporate contracts accounted for 22 percent of 2018 PPAs for renewables in the United States.<sup>13</sup> Further, the buyers are not just large corporations; smaller companies are entering into aggregated purchasing models and further driving additional market expansion.<sup>14</sup>

Additionally, many of Minnesota’s largest companies have aggressive sustainability and carbon reduction goals, as evidenced by their participation in and support of the Minnesota Sustainable Growth Coalition’s “*Clean Energy Vision*”, which calls for “surpassing the State of Minnesota’s current economy-wide GHG targets of 30 percent reduction by 2025 and 80 percent

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<sup>11</sup> Ibid.

<sup>12</sup> Wood Mackenzie. August 20, 2019. “Corporates usher in new wave of US wind and solar growth”. Accessible at: <https://www.woodmac.com/our-expertise/focus/Power--Renewables/corporates-usher-in-new-wave-of-u.s.-wind-and-solar-growth/> . Viewed May 29, 2020.

<sup>13</sup> Emma Foehringer Merchant, *Corporate Renewables Procurement Accounted for Nearly a Quarter of All Deals in 2018* (Feb. 5, 2019) (available at <https://www.greentechmedia.com/articles/read/corporate-renewables-procurements-quarter-ppa-2018>).

<sup>14</sup> Emma Foehringer Merchant, *2018 Was Record Year for Corporate Clean Energy Contracts* (Jan. 31, 2019) (available at <https://www.greentechmedia.com/articles/read/reports-confirm-a-record-year-for-corporate-clean-energy-contracts#gs.nxat51>)/

reduction by 2050.”<sup>15</sup> To attract and retain corporate entities with Environmental, Sustainability, and Governance goals, Minnesota needs to continue to demonstrate its commitment to being a renewable energy hub. Apex Clean Energy, with an office in Lake Elmo, Minnesota, hopes to help the state do exactly that with projects like Red Rock Solar.

Given the demand for renewable energy, a market exists for independently produced electricity generated from solar and other renewables, including the up to 60 MW to be generated by the Project. In sum, Minnesota has a wide array of needs that Red Rock Solar can help address. The clean, renewable power that Red Rock Solar will produce can help meet utility commitments, achieve GHG reduction targets, address environmental justice needs, and provide much needed short- and long-term economic benefit.

### **3.2 ADDITIONAL CONSIDERATIONS**

#### **3.2.1 SOCIALLY BENEFICIAL USES OF ENERGY OUTPUT**

Energy produced by the 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 avoid environmental costs, as discussed in Sections 10 and 11 in this CN Application. Further, regional and national security and energy reliability can be enhanced through the development of diversified generation resources such as solar energy generation such as the Project.

The Project is also designed to be socioeconomically beneficial to landowners, local governments, and communities. Landowner compensation is established by a combination of voluntary lease agreements and purchase options between landowners and Red Rock. Red Rock Solar has entered into leases or purchase options with the landowners that own the land on which the Project would be constructed. Red Rock Solar will lease and/ or own the land on which the Project will be constructed after the SP is issued and prior to the start of construction. 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.

The 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, and ability to create a construction-efficient layout are some of the major benefits of the Project. Further, the Project’s status as part of the state’s first hybrid wind/solar project presents a unique opportunity to add complementary renewable generation in a cost-efficient manner.

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<sup>15</sup> Minnesota Sustainable Growth Coalition. “Clean Energy Vision”. Accessible at: <https://environmental-initiative.org/work/minnesota-sustainable-growth-coalition/>. Viewed June 3, 2020.

### **3.2.2 PROMOTIONAL ACTIVITIES GIVING RISE TO DEMAND**

Red Rock Solar was granted an exemption from Minn. R. 7849.0240, subp. 2(B), which requires that each large electric generating facility (“LEGF”) CN application contain “an explanation of the relationship of the proposed facility to promotional activities that may have given rise to the demand for the facility.” Red Rock Solar has not engaged in promotional activities which could have given rise to the need for the electricity to be generated by the Project. Thus, consistent with its determinations in past CN proceedings, the Commission granted an exemption to Red Rock Solar.

### **3.2.3 EFFECTS OF FACILITY IN INDUCING FUTURE DEVELOPMENT**

The Project is not expected to directly affect development in Cottonwood 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 Red Rock Solar for Red Rock Solar’s lease or purchase of the land. Solar energy infrastructure will also provide an additional source of revenue to the county and township in which the Project is sited. For instance, the Project will provide production tax payments to Cottonwood County of approximately \$208,000 annually over 30 years for a total of approximately \$6.2 million. Additionally, Midway Township will receive approximately \$52,000 annually over 30 years for a total of approximately \$1.6 million.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for lodging, food services, fuel, transportation, and general supplies. Red Rock Solar will use local contractors and suppliers for portions of the construction process, as available. Red Rock Solar will issue a Request for Proposal (“RFP”) to qualified Balance of Plant (“BOP”) contractors to oversee and manage the construction of the Project. In this RFP, Red Rock Solar intends to include a strong preference for bids that utilize local, union construction craft employees to the greatest extent feasible in accordance with the Project’s timeline and safety requirements. Red Rock Solar expects that the selected BOP contractor will collaborate with organized labor unions and other stakeholders to develop a workforce and hiring plan that maximizes the local economic benefits of the Project. In addition, 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.

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 because 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 because most of the assembly and wiring work for solar installations is considered electrical work under the Minnesota State Electrical Code.

On August 6, 2019, the Cottonwood County Board of County Commissioners passed Resolution 19-08-06 stating that it supports the development and construction of the Project. The

resolution noted that the Board recognizes that the Project will “provide a boost to the local economy through production tax payments to Cottonwood County and Midway Township, supporting local schools and public services.” The Board further stated that the Project is “aligned with county energy objectives” and that “solar facilities provide farms with economic security and . . . conservation benefits.”<sup>16</sup>

#### **4.0 COMPLIANCE WITH CERTIFICATE OF NEED CRITERIA (MINN. R. 7849.0120)**

The Commission has established criteria to assess the need for an LEGF in Minn. R. 7849.0120. The Commission must grant a CN to an applicant upon determining that:

- A. (T)he probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, to the applicant’s customers, or to the people of Minnesota and neighboring states;
- B. (A) more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record;
- C. (B)y a preponderance of the evidence on the record, the proposed facility, or a suitable modification of the facility, will provide benefits to society in a manner compatible with protecting the natural and socioeconomic environments, including human health; and
- D. (T)he record does not demonstrate that the design, construction, or operation of the proposed facility, or a suitable modification of the facility, will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.

As discussed further below, the Project satisfies all four of the Commission’s criteria for granting a CN for the Project.

#### **4.1 THE PROBABLE RESULT OF DENIAL OF RED ROCK SOLAR’S CN APPLICATION WOULD BE AN ADVERSE EFFECT ON THE ADEQUACY, RELIABILITY, AND EFFICIENCY OF THE REGIONAL ENERGY SUPPLY (MINN. R. 7849.0120(A)).**

The Project will provide up to 60 MW of nameplate capacity to meet the electricity needs of Minnesota and the region. Red Rock Solar plans to negotiate one or more PPAs, or the sale of the Project, with utilities who have a need to purchase or produce renewable energy to serve their customers. Red Rock Solar may also offer the Project’s output for sale on the wholesale market or to a corporate purchaser. Denying the CN Application would result in the loss of a significant amount of electricity needed to satisfy state and regional demand, and would deny utilities or other

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<sup>16</sup> Red Rock Solar Resolution, eDockets Document ID 20198-155185-02.

purchasers the opportunity to purchase clean, low-cost energy that will count toward satisfying applicable renewable energy standards and goals.

As discussed in Section 3.1, there is a significant body of state legislative policy requiring utilities to obtain a certain percentage of their total energy resources from renewable energy, which supports the need for reliable, efficient renewable resources, like the solar energy produced by the Project.

The Project has no air emissions and extremely low environmental impacts. It will displace pollutants emitted by fossil fuel-fired generating resources, including CO<sub>2</sub>, which is considered a significant contributor to climate change.

While coal generation made up 73 percent of total generation in the MISO region in 2009, due to retirements, coal facilities are expected to supply only 36 percent of MISO demand by 2030.<sup>17</sup> The generation fleet in the MISO region is in transition, and MISO is engaged in active analysis and planning to enable the transition to lower carbon resources.<sup>18</sup> The Project is only one part of the transition to less carbon intensive energy, and this shift to new generation technology will continue, even absent the Project. MISO can deploy both generation and capacity resources to support reliability, and the Project will be able to function as a generation resource to load-serving entities in Minnesota, in addition to MISO Planning Resource Zone 1. To the extent MISO implements a sub-annual resource adequacy construct, the Project's output in the winter season will be important to the reliability of the grid in Minnesota.

#### **4.2 NO MORE REASONABLE AND PRUDENT ALTERNATIVE TO THE RED ROCK SOLAR PROJECT HAS BEEN DEMONSTRATED (MINN. R. 7849.0120(B))**

Minn. R. 7849.0120(B) requires a CN applicant to examine possible project alternatives so that the Commission can determine whether a more reasonable and prudent alternative exists. Applying the factors set forth in Minn. R. 7849.0120(B), the Project has many advantages when compared to other renewable alternatives.

##### **4.2.1 SIZE, TYPE, AND TIMING**

When evaluating alternatives, the Commission examines whether the project is the appropriate size, whether it is the right type, and whether the timing is appropriate. With respect to renewable energy projects, the Commission has concluded that the proper inquiry in evaluating the size of the project is the appropriateness of the size of the project to the overall state and regional need for renewable energy. As demonstrated in Section 3.1, the need for renewable energy in the coming years far exceeds the amount of energy to be supplied by the Project.

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<sup>17</sup> NRDC Issue Paper, *Clean Energy and Efficiency Can Replace Coal For a Reliable, Modern Electricity Grid* (Mar. 2017) (available at <https://www.nrdc.org/sites/default/files/clean-energy-replace-coal-modern-electricity-grid-ip.pdf>). See also Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5, 2020-2034 Upper Midwest Integrated Resource Plan Docket No. E002 /RP-19-368 (planning for Minnesota-based retirements).

<sup>18</sup> See MISO, *Aligning Resource Availability and Need: Changing Reliability Requirements for an Evolving Fleet* (Aug. 2020).

Regarding the type of facility, the Commission granted Red Rock Solar an exemption from Minn. R. 7849.0250(B) with respect to evaluating non-renewable alternatives because such alternatives do not meet the Project's objective of providing energy that will satisfy the RES and other clean energy standards.

With respect to timing, the Project is expected to be on-line and operational by the end of 2022, depending on completion of regulatory approvals and the MISO interconnection process. This will help Minnesota, utilities, consumers, and the region achieve the necessary renewable energy levels required to meet pending clean energy standards milestones.<sup>19</sup>

#### **4.2.2 COST ANALYSIS**

The Project will also generate electricity at a lower cost per kWh than would other possible fossil fuel and renewable energy options, such as coal and biomass.<sup>20</sup> Even though the Solar Investment Tax Credits ("ITC") phase down over the next several years, solar generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.<sup>21</sup> In addition, although the Project has yet to secure arrangements for the sale of the energy it will produce, Red Rock Solar is confident it will be able to secure long-term purchasers at attractive prices and terms. Importantly, as an IPP, Red Rock Solar, rather than the state or its ratepayers, bears the risk of not securing a PPA or otherwise not selling the Project's output.

#### **4.2.3 POTENTIAL ENVIRONMENTAL AND SOCIOECONOMIC IMPACTS**

The purpose of this analysis is to compare the potential impacts of various renewable generation options. As demonstrated in Sections 10 and 11 of this CN Application, 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 release CO<sub>2</sub>, 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 so as 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.<sup>22</sup> At the same time, the socioeconomic benefits of a utility-scale solar power project are considerable, as described in Section 4.3 below.

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<sup>19</sup> *Id.*

<sup>20</sup> See Energy Information Agency, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2019*, [https://www.eia.gov/outlooks/aeo/pdf/electricity\\_generation.pdf](https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf).

<sup>21</sup> U.S. Energy Information Administration, *Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2020* (Jan. 2020), at 2 (available at [https://www.eia.gov/outlooks/aeo/assumptions/pdf/table\\_8.2.pdf](https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf)).

<sup>22</sup> See J. S. Briberg, J.S. "Utility & Community Solar Should Use Native Landscaping" Clean Technica blog. Available online at: <https://cleantechnica.com/2016/03/15/utility-and-community-solar-should-use-native-landscaping/>. Accessed August 2019.

#### **4.2.4 RELIABILITY**

The Project will be available at least 20 percent of the time, consistent with other utility-scale solar projects.

#### **4.3 THE RED ROCK SOLAR PROJECT WILL BENEFIT SOCIETY IN A MANNER COMPATIBLE WITH THE NATURAL AND SOCIOECONOMIC ENVIRONMENTS (MINN. R. 7849.0120(C))**

Minn. R. 7849.0120(C) requires a CN applicant to address whether the proposed project will benefit society in a manner that is compatible with protecting natural and socioeconomic environments, including human health. Applying the factors set forth in Minn. R. 7849.0120(C), the energy produced by the Project will provide significant, numerous, and varied societal benefits, with minimal negative impacts.

#### **4.3.1 OVERALL STATE ENERGY NEEDS**

As discussed in Section 3.1 above, utilities continue to require renewable energy to meet the RES, SES and other clean energy and greenhouse gas reduction standards, as well as to meet consumers' energy demands.

Minn. Stat. § 216B.243, subd. 2(3) requires that the Commission consider the relationship of the proposed facility to other state energy needs as described in the most recent state energy policy and conservation report prepared under Minn. Stat. § 216C.18 (the "Quadrennial Report"). The most recent Quadrennial Report states:

Minnesota is a leader in greenhouse gas emission reduction and other clean energy policies, and adding low-cost, no emission renewable resources such as wind energy have been identified as a means to achieve these environmental quality policies. As stated by DOC-DER in its most recent Quadrennial Report:

Readily available, reliable, clean and competitively priced electricity is critical for the economic vitality, public health, and well-being of all Minnesotans. Because it has no natural deposits of coal, natural gas, or oil products, state policy makers have a long history of supporting local, efficient, and clean electricity to reduce dependence on, and offset economic and environmental effects from, fossil fuel imports.

Ensuring that Minnesotans have reliable, reasonably priced and environmentally sensitive electric service is one of the guiding



principles of Minnesota’s energy policy and will remain among the Department’s top priorities in the coming years.<sup>23</sup>

The Quadrennial Report discusses not only utility efforts to meet RES requirements, but also voluntary green pricing programs. Green pricing programs provide Minnesota ratepayers the option to voluntarily purchase energy from renewable sources to meet all or a portion of their energy requirements. The Quadrennial Report also describes the GHG reduction goals in Minn. Stat. § 216H.02 and the role renewable energy has and continues to play in driving down the carbon intensity of electricity generated in Minnesota.

Thus, the Project is not only compatible with Minnesota’s energy needs, but it is wholly consistent with it.

#### **4.3.2 POTENTIAL ENVIRONMENTAL AND SOCIOECONOMIC IMPACTS COMPARED TO NO-BUILD ALTERNATIVE**

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 Cottonwood County’s tax base. In addition, lease and purchase payments to landowners will offset potential financial losses associated with removing a portion of their land from agricultural production. The Project will impact approximately 479 acres of agricultural land within the Project Boundary and will not result in a significant impact to land-based economies in the Project vicinity. Of the 415,360 acres in Cottonwood County, approximately 89 percent (approximately 370,389 acres) are classified as agricultural land. Impacts to 479 acres of agricultural land within the solar facility would reduce the amount of agricultural land in the County by less than one percent.

Agricultural production would be allowed to continue in the area outside of the fence line of the solar facility during construction and operation of the Project. In addition, Red Rock Solar has voluntarily developed an Agricultural Impact Mitigation Plan (“AIMP”) detailing methods to minimize soil compaction, preserve topsoil, and establish and maintain appropriate vegetation that will help to ensure the Project is designed, constructed, operated and ultimately decommissioned and restored in a manner allowing the land to be returned to its original agricultural use in the future. Moreover, conversion of the Project Footprint to non-row-crop uses for the life of the Project may also have beneficial environmental impacts such as soil building, erosion control, habitat for wildlife, and protection of groundwater and surface water resources from nitrogen pollution.

One of the greatest attributes of solar energy is its minimal impact on the environment. The Project will not release CO<sub>2</sub>, 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,

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<sup>23</sup> Quadrennial Report, available at: <https://mn.gov/commerce/policy-data-reports/energy-data-reports/?id=17-313072> at 49-50 (accessed Oct. 21, 2020).

transportation, or combustion of fossil fuels. The Project will be sited so as to minimize environmental impacts.

The development of solar energy has recently become and will continue to be important in diversifying and strengthening the economic base of Minnesota. Local contractors and suppliers will be notified with adequate time prior to the commencement of construction to participate in and receive priority hiring and supplier opportunities for positions or products that meet safety standards and keep the Project competitive. 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 requires Minnesota-licensed electricians to complete. Wages and salaries paid to contractors and workers in Cottonwood 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 offset 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 Project will provide production tax payments to Cottonwood County of approximately \$208,000 annually over 30 years for a total of approximately \$6.2 million. Additionally, Midway Township will receive approximately \$52,000 annually over 30 years for a total of approximately \$1.6 million. In addition, the property on which the Project will be sited will likely be reclassified from agricultural land to commercial land, which has a higher tax rate than agricultural land and therefore will result in higher real estate taxes being paid to the county than before the Project was constructed.

Not building an electrical generation facility would result in no physical impact to the environment in Cottonwood County. 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 residences and businesses, 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.

### **4.3.3 INDUCING FUTURE DEVELOPMENT**

Although the Project is not expected to directly affect development in Cottonwood County, the Project will provide significant benefits to the local economy and local landowners. Landowners in the Project area will benefit from the lease and purchase payments, and installation of solar energy infrastructure will increase the local tax base in the county and township in which the Project is sited. The Project will also provide significant income opportunities for local residents through the creation of temporary construction positions.

#### **4.3.4 SOCIALLY BENEFICIAL USES OF OUTPUT**

The Project will produce affordable, clean, renewable energy that will help meet energy demands for the RES, the SES, and other clean energy and carbon reduction standards. By way of example, it will produce enough energy to meet the energy needs for approximately 12,000 average homes annually. In addition, the local economy will benefit from the landowner lease and purchase payment for the Project, production taxes, income from jobs created, and local spending. It will also provide carbon-free energy that will assist in meeting Minnesota's carbon and greenhouse gas reduction goals.

#### **4.4 THE RED ROCK SOLAR PROJECT IS CONSISTENT WITH FEDERAL, STATE, AND LOCAL RULES AND POLICIES (MINN. R. 7849.0120(D))**

##### **4.4.1 THE PROJECT IS CONSISTENT WITH MINNESOTA ENERGY POLICY**

The Project will provide a significant amount of renewable energy, which is consistent with Minnesota's policy to increase renewable energy use. Solar, as renewable energy, is a favored energy resource under Minnesota law.<sup>24</sup> In addition, as discussed previously, the SES mandates increased electric generation from solar resources.<sup>25</sup> The state has also set a goal to reduce statewide GHG across all sectors producing those emissions to a level at least 30 percent below 2005 levels by 2025 and to a level at least 80 percent below 2005 levels by 2050.<sup>26</sup> Adding new sources of electric energy with no emissions, like solar energy, is essential to meeting these goals.

Further support for the conclusion that the Project is consistent with state energy policy can be found in the favorable tax treatment that solar energy facilities receive. The state legislature has exempted all real and personal property of solar energy conversion systems from property taxes.<sup>27</sup> Solar energy conversion systems are also exempt from state sales tax.<sup>28</sup>

##### **4.4.2 THE PROJECT IS CONSISTENT WITH APPLICABLE MINNESOTA STATUTORY PROVISIONS**

In addition to the criteria set forth in Minn. R. Ch. 7849, there are a number of statutory provisions that may apply to a CN application. As discussed below, the Project is consistent with these statutory requirements.

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<sup>24</sup> See Minn. Stat. § 216B.243, subd. 3a (“The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, “renewable energy source” includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.”)

<sup>25</sup> Minn. Stat. § 216B.1691, sub. 2f.

<sup>26</sup> Minn. Stat. § 216H.02.

<sup>27</sup> Minn. Stat. § 272.02, subd. 24.

<sup>28</sup> Minn. Stat. § 297A.67, subd. 29.

#### **4.4.2.1 RENEWABLE PREFERENCE**

Minn. Stat. § 216B.243, subd. 3a provides a preference for renewable resources:

The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.

Minn. Stat. § 216B.2422, subd. 4, is also applicable:

The commission shall not approve a new or refurbished nonrenewable energy facility in an integrated resource plan or a certificate of need, pursuant to section 216B.243, nor shall the commission allow rate recovery pursuant to section 216B.16 for such a nonrenewable energy facility, unless the utility has demonstrated that a renewable energy facility is not in the public interest.

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.

#### **4.4.2.2 DISTRIBUTED GENERATION**

Minn. Stat. § 216B.2426 states that:

The commission shall ensure that opportunities for the installation of distributed generation, as that term is defined in section 216B.169, subdivision 1, paragraph (c), are considered in any proceeding under section 216B.2422, 216B.2425, or 216B.243.

Pursuant to Minn. Stat. § 216B.169, subd. 1(c), "distributed generation" references projects of no more than 10 MW. Red Rock Solar is a utility-scale Project and will not provide distributed energy to the system as defined in Minnesota Law. However, Red Rock Solar 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, including co-location with the Big Bend Wind Project, make it an exceptional electric resource that will provide great benefits to the state and the local economy.

#### **4.4.2.3 INNOVATIVE ENERGY PREFERENCE**

Minnesota also requires the Commission to consider an innovative energy project<sup>29</sup> before authorizing construction or expansion of a fossil-fueled generation facility. Minn. Stat. § 216B.1694, subd. 2(a)(4). Because the Project is not a fossil-fuel facility, this requirement is not applicable.

#### **4.4.2.4 RES AND SES COMPLIANCE**

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to evaluate whether a CN applicant is in compliance with Minnesota’s RES and SES. Red Rock 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.

#### **4.4.2.5 ENVIRONMENTAL COST PLANNING**

Minn. Stat. § 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 MNDOC have determined, this statute does not apply to renewable generation facilities such as the Project.<sup>30</sup>

#### **4.4.2.6 TRANSMISSION PLANNING COMPLIANCE**

Minn. Stat. § 216B.243, subd. 3(10) requires the Commission to consider whether a utility seeking a CN is in compliance with certain transmission planning requirements. As an IPP, this statute does not apply to Red Rock Solar.

### **4.4.3 THE PROJECT IS CONSISTENT WITH FEDERAL ENERGY POLICY**

The Project is consistent with federal policy interests, including in affordable and secure domestic energy production, as well as conservation of environmental resources.<sup>31</sup> For example, federal energy policy provides significant U.S. federal tax incentives to attract investment in renewable energy projects, including solar projects like the Project.

The solar ITC provided by Section 48 of the Internal Revenue Code permits qualifying entities to elect to claim a credit of 30 percent of qualifying costs for a project that has begun construction through 2019, with a step down of the credits through 2021. In December 2015, the Consolidated Appropriations Act extended the expiration date for the ITC for solar facilities to December 31, 2019. As modified, Section 48 phases down the ITC for solar energy property the

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<sup>29</sup> An “innovative energy project” is defined as a coal-burning facility employing innovative technology and located on the Iron Range. Minn. Stat. § 216B.1694, subd. 1.

<sup>30</sup> *Elm Creek*, Docket No. IP6631/CN-07-789, Commission Order Granting Certificate of Need (Jan. 15, 2008), at 12.

<sup>31</sup> Congressional Research Service, *Energy Policy: 114th Congress Issues* (2016), at Summary (available at <https://fas.org/sgp/crs/misc/R42756.pdf>) (“Energy policy in the United States has focused on three major goals: assuring a secure supply of energy, keeping energy costs low, and protecting the environment”).

construction of which begins after December 31, 2019, and before January 1, 2022. Red Rock Solar expects to utilize the ITC as part of the Project's long-term financing structure.

#### **4.4.4 THE PROJECT COMPLIES WITH FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATION**

The Project will meet or exceed the requirements of all applicable federal, state, and local environmental laws and regulations. Table 10 in Section 12.3 provides a list of approvals the Project may need to obtain from governmental entities to demonstrate full compliance. Red Rock Solar is committed to obtaining all necessary environmental and other approvals required under federal, state, and local requirements.

The Project will comply with all relevant requirements and, in addition, will fulfill important state energy policies with respect to renewable energy and environmental protection. In particular, the facility meets the requirements of Minn. Stat. §§ 216B.2422, subd. 4 and 216B.243, subd. 3a, which state that the Commission may not approve a nonrenewable energy facility unless it determines that a renewable facility is not in the public interest, or more expensive than the nonrenewable facility including consideration of environmental costs. It is further consistent with state policies relating to the reduction of greenhouse gasses.

The Project offers a cost-competitive and environmentally superior alternative to fossil fuel generators that is clearly in the public interest and can reliably deliver accredited capacity, energy, Renewable Energy Credits ("RECs") and other environmental attributes. Approval of the Project is in the public interest because it meets all of Minnesota's laws supporting acquisition of clean, renewable energy and provides an opportunity for utilities and other customers seeking to diversify and build their energy generation portfolios.

## **5.0 DESCRIPTION OF PROJECT AND ALTERNATIVES (MINN. R. 7849.0250)**

### **5.1 PROPOSED PROJECT**

Red Rock Solar is proposing to construct an up to 60 MW AC solar PV facility located in Midway Township, Cottonwood County. The Project is proposed to interconnect to the grid via a proposed 18-mile, 161 kV transmission tie line that will connect with the Blue Lake-Wilmarth-Interstate Junction 345 kV transmission line at Xcel Energy's Crandall switching station.

The Project will convert sunlight into direct current electrical energy within PV modules (also referred to as panels). The tempered glass PV panels will be approximately three feet long by seven feet wide, and one to two inches thick. The panels will be installed on a tracking rack system that utilizes galvanized steel and aluminum for the foundations and frame with a motor that allows the racking to rotate from east to west throughout the day. Each tracking rack will contain multiple panels. On the tracking rack system, panels, based on manufacturer, topography, and vegetation constraints could be up to 20 feet in height from the ground to the top of the panels when at a 45-degree angle. Depending on the technology selected, the PV panels may have an aluminum frame, silicon, and weatherized plastic backing or a side-mount or under-mount aluminum frame, heat strengthened front glass, and laminate material encapsulation for weather protection.

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

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

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

Inverters and transformers are housed together on a “skid.” This equipment converts approximately 1,500 volts of DC output of the PV panels to 34.5 kV of AC. Inverter skids will be utilized at locations throughout the Project Footprint and include a transformer to which the inverters will feed electricity. The final number of inverters for the Project will depend on the inverter size, as well as inverter and panel availability. The Project’s preliminary design includes 16 central inverter skids (one inverter is required for every 3-4 MW). These skids provide the foundation for the inverter, transformer, and Supervisory Control and Data Acquisition (“SCADA”) system. The skids will be placed atop a concrete slab or pier foundations and typically measure 15 feet wide by 20 feet long, with a structure height of approximately 12 feet above grade. Concrete foundations will be poured onsite or precast and assembled off-site. The inverters are within the interior of the Project along access roads.

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

The Solar Project Substation will be a 34.5/161 kV step-up substation with metering and switching equipment. It will be designed according to regional utility practices, Midcontinent Independent Transmission System Operator Standards, Midwest Reliability Organization Standards, National Electrical Safety Code, and the Rural Utility Service Code. The area within the substation will be graveled to minimize vegetation growth in the area and reduce fire risk. The substation will be fenced with a 6-foot chain-link fence, topped with one foot of barbed wire for

security and safety purposes. The substation's area will be approximately 300 feet by 200 feet once construction is complete. The Big Bend Wind Project and Red Rock Solar Project have separate but collocated project substations.

If needed, the operations and maintenance ("O&M") facility may be a shared facility with the Big Bend Wind Project. As such, this facility is permitted with the Big Bend Wind Project. A description of the O&M facility, including size, location, and associated footprint of impacts are included in the Big Bend Wind Project Site Permit Application in Docket No. IP7013/WS-19-619.

Power generated by the Project will reach the electric grid by traveling through approximately three 34.5 kV feeder lines to the substation. The Project will then interconnect via the proposed 18-mile transmission line to the Blue Lake-Wilmarth-Interstate Interconnection 345 kV transmission line at the Xcel Energy Crandall Switching Station. The Big Bend Wind Farm and associated transmission line are being permitted separately by Red Rock's current affiliate in Docket Nos. IP-7013/CN-19-408, IP7013/WS-19-619, and IP7013/TL-19-621. Final electrical system design and interconnection details will be determined as a result of studies currently being conducted by, and agreements with, MISO.

#### **5.1.1 NOMINAL GENERATING CAPABILITY AND EFFECT OF ECONOMIES OF SCALE**

The total nameplate capacity for the proposed Project facilities is up to 60 MW AC. The facility will be designed utilizing a DC to AC ratio that optimizes the accredited capacity of the array according to MISO guidelines, the site-specific interconnection capacity and the losses associated with cable losses, thermal losses and other associated derates. The Project will generate up to 60 MW, enough energy to provide electricity for approximately 12,000 homes annually and avoid the emission of approximately 95,474 metric tons of carbon annually.<sup>32</sup> 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 kWh of electricity produced.

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

The total installed capital costs for the Project are estimated to be approximately \$86 million, with Project cost depending on variables including, but not limited to, construction costs, taxes, tariffs, and panel selection, along with associated electrical and communication systems, and access roads.

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<sup>32</sup> Based on EPA Greenhouse Gas Equivalencies Calculator available at <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references> (accessed Sept. 25, 2020) and 135,034,000 kWh annual production.



### **5.1.2 ANNUAL CAPACITY FACTOR**

A net capacity factor of between approximately 24 percent and 27 percent, with projected average annual output of between approximately 115,632 and 135,034 MWhs, is anticipated for the Project.

### **5.1.3 FUEL**

The Project will generate electricity from sunlight; therefore, no fuel is required.

### **5.1.4 ANTICIPATED HEAT RATE**

The conversion of solar to electricity does not generate heat as combustion or nuclear electricity generation facilities would when generating electricity. Therefore, heat rates are not applicable to a solar project.

### **5.1.5 FACILITY LOCATION**

The Project will be located within Midway Township in Cottonwood County. The closest city to the Project Area is Mountain Lake, Minnesota. Red Rock Solar has entered into lease agreements with the landowners for the Solar Project site; Red Rock Solar has a purchase option for the Solar Project Substation area.

Included as Figure 3 is a preliminary layout of the Project. The Project's facilities will include solar panels and racking, inverters, security fencing, laydown areas, substation, electrical collection and communication lines, and at least one weather station. This preliminary layout reflects Red Rock Solar's effort to maximize the Project's energy production, follow applicable setbacks, and minimize impacts to the land, environment, and surrounding community. Although Red Rock Solar expects that final layout will remain similar to the preliminary layout, changes may occur as a result of ongoing site evaluation, permitting processes, landowner preferences, and micro-siting activities.

## **5.2 AVAILABILITY OF ALTERNATIVES (MINN. R. 7849.0250(B))**

Minn. R. 7849.0250(B)(4) requires an applicant to discuss the availability of new generating facilities of a different size or using a different energy source as an alternative to the proposed facility. The objective of this alternatives analysis is to determine whether there are other energy sources that can better satisfy the need identified for the Project. The Commission granted Red Rock Solar a partial exemption from this data requirement, and Red Rock Solar will discuss only renewable alternatives.

Developing and operating generating sources that are cost-effective and use proven technology is particularly important to an IPP like Red Rock Solar. Red Rock Solar does not have access to ratepayer funds that could provide a resource for retirement of capital investments. In addition, Red Rock Solar must keep its prices – and, thus, its costs – low enough to remain competitive. For these reasons, Red Rock Solar must exercise diligence in deciding where and when to pursue opportunities for capital investment in new power-generating facilities. As

indicated in this CN Application, the current pricing for solar energy is cost effective when compared to other renewable and non-renewable sources of electricity.

Commercial feasibility and reliability with respect to the generation output needed are important considerations in selling the power generated, and solar is a reliable resource. However, with respect to the alternatives discussed below, without a guaranty of long-term reliability and cost-effectiveness, it is difficult or impossible to convince customers that an unproven technology should be selected for purchase.

## **5.2.1 ALTERNATIVES CONSIDERED**

### **5.2.1.1 PURCHASED POWER**

Red Rock Solar is an IPP and does not purchase power. Instead, Red Rock Solar will sell power to utilities or other potential customers. As such, this data requirement is not applicable, and the Commission granted Red Rock Solar an exemption.

### **5.2.1.2 UPGRADES TO EXISTING RESOURCES**

Red Rock Solar has no existing facility in Minnesota for which it might seek improved operating efficiency. As such, this data requirement is not applicable, and the Commission granted Red Rock Solar an exemption.

### **5.2.1.3 NEW TRANSMISSION**

Red Rock Solar has no plans to become involved in owning or operating transmission lines beyond what would be needed for interconnection of the Project. The development, construction, and operation of transmission and distribution lines designed to deliver power to end use customers will be left to utilities with defined service area obligations to retail customers. As such, this data requirement is not applicable, and the Commission granted Red Rock Solar an exemption.

### **5.2.1.4 WIND POWER**

Minnesota has a significant and important wind resource that can and is being used for energy and capacity services within the state's generating portfolio. Although wind is a good energy resource, solar is a good capacity resource. As a result, these two technologies complement each other and are not true substitutes. There is need for both wind and solar energy in Minnesota's renewable portfolio, and Red Rock Solar will be increasing the state's solar generation as part of an effort to increase solar's contribution to that portfolio. Further, the Project is part of the state's first hybrid wind/solar project and, as such, will also contribute to the addition of wind generation in Minnesota.

### **5.2.1.5 HYDROPOWER**

Hydropower is also not an alternative to the Project. In 2015, hydropower in Minnesota produced 849,054 MWh of power, up slightly from 840,410 MWh in 2010, and compared to

774,729 MWh in 2005.<sup>33</sup> According to the 2016 Quad Report, issues with hydropower relate to “[c]osts of maintaining and operating dams compared to other sources of energy . . . as well as increased concern about the potential negative effect dams can have on Minnesota’s river ecosystems.”<sup>34</sup> There is not sufficient new hydro resources in Minnesota to replace the output of Red Rock Solar.

#### **5.2.1.6 BIOMASS**

Minnesota communities do have accessible and low-value biomass feedstocks. However, the costs of these feedstocks vary widely, and the supply of biomass feedstock is limited.<sup>35</sup> Further, the environmental impacts of a biomass facility may be greater than those of the Project, due to both the facility itself and the machinery and equipment needed to gather and transport the biomass fuel. For these reasons, a biomass plant is not a good alternative to the Project.

#### **5.2.1.7 EMERGING TECHNOLOGIES**

New renewable emerging power generation technologies are being developed, and Red Rock Solar believes that the current approaches are not sufficiently mature to provide the output needed to match the nameplate capacity of the Project or to be cost-effective and reliable.

##### **5.2.1.7.1 PUMPED STORAGE**

The proposed site is not suited to a pumped storage application because the topography of the site is relatively flat and pumped storage requires the storage of large amounts of water in an elevated reservoir. Therefore, pumped storage is only commercially and technically viable in locations with certain existing geology for water storage and large (i.e., steep) elevation changes. In addition, there is currently no net new generation from pumped storage in Minnesota.<sup>36</sup> Accordingly, this technology is not an alternative to the Project.

##### **5.2.1.7.2 COMPRESSED AIR**

Highly specialized geological sites are needed to make use of compressed air technology. Such sites are scarce in Minnesota. This technology has been implemented on a limited basis and creates no net new energy generation. Accordingly, it is not an alternative to the Project.<sup>37</sup>

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<sup>33</sup> Minnesota Department of Commerce, Energy Policy and Conservation Quadrennial Report 2016 (hereinafter, “2016 Quad Report”), at 28.

<sup>34</sup> *Id.*

<sup>35</sup> *Id.*, at 27.

<sup>36</sup> EIA, Net Generation from Hydroelectric (Pumped Storage) Power by State by Sector (available at [http://www.eia.gov/electricity/monthly/epm\\_table\\_grapher.cfm?t=epmt\\_1\\_12\\_a](http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_12_a)) (accessed Aug. 30, 2019).

<sup>37</sup> *See e.g.*, <http://www.powersouth.com/wp-content/uploads/2017/07/CAES-Brochure-FINAL.pdf> (accessed Aug. 30, 2019).

### **5.2.1.7.3 THERMAL STORAGE**

This technology, which makes use of accumulated heat transferred to insulated repositories, is not yet commercially-proven. Moreover, the Project is intended to generate electricity, not store energy. The storage of energy is not being considered as a part of the Project. Accordingly, it is not an alternative to the Project.

### **5.2.1.7.4 HYDROGEN AND FUEL CELLS**

Hydrogen, and its use in fuel cells, has received a lot of attention for its potential to impact energy production and use. Fuel cells can be used to produce energy in the form of electricity and heat. This energy can be applied to power vehicles and buildings. Fuel cells use a chemical reaction rather than a combustion reaction. Fuel cells have a similar level of efficiency as natural gas combustion sources, and, when using hydrogen as fuel, have nearly no pollution. Hydrogen, however, is expensive, as it requires substantial amounts of energy to produce. While much research is being done regarding hydrogen and fuel cells, the technology is not yet available on a commercial scale.

### **5.2.1.7.5 NON-CN FACILITIES (MINN. R. 7849.0120(A)(4))**

Under Minn. Stat. §§ 216B.2421 and 216B.243, subd. 2, and Minn. R. Ch. 7849, a CN is required for the Project because it is a “large energy facility,” *i.e.*, larger than 50 MW. As an IPP, Red Rock Solar must compete with other available technologies to sell power on the wholesale market, if necessary. Due to the size of the Project, Red Rock Solar has the advantage of additional economies-of-scale not available to smaller, non-CN facilities.

### **5.2.1.8 NO FACILITY ALTERNATIVE (MINN. R. 7849.0340)**

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0340, which requires an applicant to submit data for the alternative of “no facility,” including a discussion of the impact of this alternative on the applicant’s generation and transmission facilities, system, and operations. The Rule also requires an analysis of “equipment and measures that may be used to reduce the environmental impact of the alternative of no facility.” Minn. R. 7849.0340(C).

Red Rock Solar does not have a “system,” nor does it have other generation and transmission facilities in Minnesota. As such, the requirements of Minn. R. 7849.0340 are not applicable to the Project and are not necessary to determine need for the facility. Instead, Red Rock Solar will provide data regarding the impact of the “no facility” alternative on its potential customers and the region.

Given that the Project is designed to increase the amount of energy available for purchase on the wholesale market that will satisfy clean energy standards, not building the facility is not an alternative. Not building the facility would result in no increase in renewable energy and, in turn, no opportunity for utilities and non-utility customers to purchase the Project’s output to satisfy clean energy standards. Such an outcome is contrary to Red Rock Solar’s objective for the Project and will not satisfy the state and regional need for renewable energy.

### 5.2.1.9 FACILITY INFORMATION FOR ALTERNATIVES INVOLVING CONSTRUCTION OF A LHVTL (MINN. R. 7849.0330)

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0330, which requires the applicant to provide certain data for each alternative that would involve construction of a large high voltage transmission line (“LHVTL”). Transmission facilities are not true alternatives to the Project, since the purpose of the Project is to increase the supply of available renewable energy. The Project will be connected to the grid via the 161 kV transmission line proposed with the Big Bend Wind Farm, and the sole purpose of that line will be to connect the Project and the Big Bend Wind Farm to the grid. For these reasons, Minn. R. 7849.0330 is not applicable, and the Commission granted Red Rock Solar an exemption from this data request.

### 5.2.1.10 COMBINATIONS

No combination of the aforementioned alternatives would be appropriate because, as compared to the Project, they would not enable Red Rock Solar to more efficiently or cost-effectively produce electric output to be purchased by utilities or private corporations to provide needed energy and satisfy the RES and other clean energy and carbon reduction standards. The Commission granted Red Rock Solar an exemption from this data request.

## 5.2.2 ECONOMIC COMPARISON

Table 2 below, taken from the EIA, demonstrates that solar energy generated by a PV tracking facility has a competitive capital cost and a lower operating cost than other types of renewable resources. The Project will generate electricity at a lower cost per kWh than would other possible fossil fuel and renewable energy options, such as coal and biomass.<sup>38</sup> As discussed in Section 4.2.2, even though the ITC will phase down over the next several years, solar generation growth is anticipated to continue because the costs for solar continue to fall faster than for other sources.<sup>39</sup>

**Table 2:  
Renewable Technology Costs<sup>40</sup>**

Technology	Size (MW)	Total Overnight Cost (2019 \$/kW)	Variable O&M (2019 \$/mWh)	Fixed O&M (2019 \$/kW/yr.)
Fuel Cells	10	7,339	0.56	30.65

<sup>38</sup> See Energy Information Agency, *Levelized Cost and Levelized Avoided Cost of New Generation Resources in the Annual Energy Outlook 2019*, [https://www.eia.gov/outlooks/aeo/pdf/electricity\\_generation.pdf](https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf).

<sup>39</sup> See Energy Information Agency, *Annual Energy Outlook 2019* (January 2019), at 22, <https://www.eia.gov/outlooks/aeo/pdf/aeo2019.pdf>.

<sup>40</sup> The figures in this table are taken from a report of the U.S. Energy Information Administration, *Cost and Performance Characteristics of New Generating Technologies, Annual Energy Outlook 2020* (Jan. 2020), at 2 (available at [https://www.eia.gov/outlooks/aeo/assumptions/pdf/table\\_8.2.pdf](https://www.eia.gov/outlooks/aeo/assumptions/pdf/table_8.2.pdf)). See also Lazard, *Lazard’s Levelized Cost of Energy Analysis—Version 13.0* (Nov. 2019), available at <https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf>.

<b>Technology</b>	<b>Size (MW)</b>	<b>Total Overnight Cost (2019 \$/kW)</b>	<b>Variable O&amp;M (2019 \$/mWh)</b>	<b>Fixed O&amp;M (2019 \$/kW/yr.)</b>
<b>Biomass</b>	50	4,104	4.81	125.19
<b>Conventional Hydropower</b>	100	2,752	1.39	41.63
<b>Wind</b>	200	1,319	0.00	26.22
<b>Solar Thermal</b>	115	7,191	0.00	85.03
<b>Solar PV-Tracking</b>	150	1,331	0.00	15.19

### 5.2.3 ALTERNATIVES SUMMARY

The Project is the best alternative for meeting the capacity and renewable energy needs in Minnesota and the region in the near term. All other potential alternatives reviewed by Red Rock Solar fall short in one or more categories. Red Rock Solar’s analysis demonstrates that the Project is a cost-effective energy resource; the Project uses commercially proven and reliable generating technology for the electrical generation output needed; and, the Project is the energy source appropriate for the site selected for the Project.

### 5.3 DISCUSSION OF PROPOSED FACILITY AND ALTERNATIVES (MINN. R. 7849.0250(C))

The Commission granted Red Rock Solar a partial exemption from Minn. R. 7849.0250(C)(1) – (9), which requires a discussion of various details regarding both the proposed facility and each of the alternatives discussed in response to Minn. R. 7849.0250(B). Consistent with the Commission granting Red Rock Solar a partial exemption from the data requirements in Minn. R. 7849.0250(B), thereby limiting the discussion required to only renewable alternatives, the Commission also limited the information required under this data requirement to only those renewable alternatives discussed in response to Minn. R. 7849.0250(B)(4). As discussed above, no good alternatives exist. Therefore, only information regarding the Project is applicable.

#### 5.3.1 CAPACITY COST

Solar energy projects are accredited by MISO at a medium to high percentage of nameplate capacity. MISO provides accreditation of 50 percent of nameplate capacity for projects with no operating history. Once operating data is obtained, the Project receives capacity credit based on its output in the peak months of June, July and August. Nevertheless, costs for renewable energy facilities are typically not expressed in terms of capacity costs. The Project will deliver energy and accredited capacity to the off-taker on an as-generated basis and will receive payment for both in the form of a single \$/MWh payment. Red Rock Solar’s estimated total cost for the Project per kW is provided in Appendix A, Section 5.3.1, which has been designated trade secret. The largest component in the total cost of the Project will be the solar panels and tracking rack system; however, infrastructure costs for access roads and electrical collection systems also are factors.

### **5.3.2 SERVICE LIFE**

With proper maintenance, service, and replacement of parts, the expected life of the Project is at least 30 years. Red Rock Solar is confident that its maintenance program will result in excellent longevity for the Project.

### **5.3.3 ESTIMATED AVERAGE ANNUAL AVAILABILITY**

Red Rock Solar estimates that the Project facilities will be available approximately 99 percent of the year, which is consistent with industry standards.

### **5.3.4 FUEL COSTS**

There are no fuel costs associated with the Project. Rights to the land on which the Project will be located will require annual lease payments. Nominal purchases of electricity will be necessary to run the Project, and that power will be acquired from local electricity utility, similarly to any other commercial or industrial business.

### **5.3.5 VARIABLE OPERATING AND MAINTENANCE COSTS**

Variable maintenance costs are provided in Appendix A, Section 5.3.5. An advantage of solar energy facilities is that they typically are not required to go completely offline for maintenance. Small sections of the solar array can be serviced while the rest of the facility continues to deliver energy.

### **5.3.6 TOTAL COST**

Red Rock Solar's estimated total capital cost per kWh for the Project is provided in Appendix A, Section 5.3.6, which has been designated trade secret. This estimate assumes typical solar farm design, construction, and operational data for a 30-year estimated service life. The price for which Red Rock Solar will sell the energy will be determined as a result of negotiations with purchaser(s).

### **5.3.7 ESTIMATE OF FACILITY'S EFFECT ON RATES**

Minn. R. 7849.0250(C)(7) requires an applicant to estimate its proposed project's "effect on rates system-wide and in Minnesota, assuming a test year beginning with the proposed in-service date." The Commission granted Red Rock Solar a partial exemption from this requirement because it does not have a "system" as defined by Minnesota Rules, and it is not a utility with retail rates for the power it plans to generate. As such, the data are neither available to Red Rock Solar nor necessary to determine the need for the Project. Instead, Red Rock Solar proposes to submit data on the Project's impact on state or regional wholesale prices.

The Project's energy production will be modest in comparison to the annual energy consumption of Minnesota and the region and will likely not have a measurable effect on rates. However, the Project could ultimately play a role in stabilizing or even lowering rates by offering

an alternative to conventional generation sources.<sup>41</sup> For instance, utilities could purchase output from the Project to partially replace energy from generation sources with higher or more volatile pricing, such as natural gas plants. In addition, the Project will not face the same cost-increasing hurdles to construction (*e.g.*, potential carbon regulation and higher permitting costs due to increased regulatory scrutiny) faced by conventional fossil-fuel generation sources. For example, the Project is consistent with the State of Minnesota’s goal of reducing carbon emissions. Minnesota and other states are moving forward with implementing clean energy policies, and it is anticipated that existing coal plants will be retired in an effort to comply with the state’s clean energy policies.

### **5.3.8 EFFICIENCY**

Because no fuel is burned in the production of energy at the Project, this information is not applicable.

### **5.4 MAP OF SYSTEM (MINN. R. 7849.0250(D))**

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0250(D), which requires an applicant to include a map showing the applicant’s system. As an IPP, Red Rock Solar does not have a “system.” The information requested is not available to Red Rock Solar or relevant to the determination of need for the Project. Instead, maps showing the proposed site of the Project and its location relative to the power grid are included as Figure 4.

### **6.0 PEAK DEMAND AND ANNUAL CONSUMPTION FORECAST (MINN. R. 7849.0270)**

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0270, subs. 1-6, which require the applicant to provide “data concerning peak demand and annual electrical consumption within the applicant’s service area and system.” Red Rock Solar does not have a “service area” or “system” and, as such, the requested data are inapplicable.

As an alternative to the requested data, Red Rock Solar provides the following data regarding the regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be generated by the Project. If a PPA is executed for the Project’s output, Red Rock Solar will also provide the Commission with additional system-specific information.

A review of utilities’ integrated resource plans (“IRPs”), requests for proposals, and similar documents demonstrates that utilities will seek additional renewable generation resources in the next several years.<sup>42</sup> Xcel Energy has announced plans to reduce carbon emissions 80 percent

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<sup>41</sup> See *e.g.*, “Clean Power Green Jobs,” Union of Concerned Scientists (2009) (analyzing impacts of meeting “25 by ‘25” nationally on consumer electric rates); “Wind and solar reducing consumer bills,” Good Energy (Oct. 2015) (analyzing impact of renewable energy usage on electric rates in the United Kingdom).

<sup>42</sup> Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5, 2020-2034 Upper Midwest Integrated Resource Plan Docket No. E002 /RP-19-368. See also Minnesota Power, 2015 Integrated Resource Plan (available at



Company-wide by 2030, and to provide 100 percent carbon-free electricity across its service territory by 2050.<sup>43</sup> To reach this goal, Xcel Energy plans to eliminate all coal generation on its system by 2030, and to add 4,000 MW of renewable energy, in addition to approximately 1,200 MW of cumulative wind by 2034 to replace wind that is set to retire. Similarly, in an August 14, 2020, compliance filing, the Minnesota Transmission Owners summarized their publicly-stated clean energy goals, which generally included increasing carbon-free energy and a discussion of the transmission system that will be needed to do so.<sup>44</sup>

More broadly, retirements of coal-based generating units are expected across the MISO region, and renewable generation resources are expected to fill the resulting capacity needs.<sup>45</sup> Additional demand is being driven by corporate and industrial consumers, who are increasingly entering into longer power purchase agreements for renewable energy.<sup>46</sup>

## **7.0 SYSTEM CAPACITY (MINN. R. 7849.0280)**

Minn. R. 7849.0280 requires a CN applicant to provide information on the ability of its existing system to meet the forecasted demand. As an IPP, Red Rock Solar does not have a “system” as defined by the Rules. Accordingly, the Commission granted Red Rock Solar an exemption from this requirement and permitted Red Rock Solar to instead provide regional demand, consumption, and capacity data from credible sources to demonstrate the need for the independently produced renewable energy that will be provided by the Project. This information is provided in Section 3.0.

## **8.0 CONSERVATION PROGRAMS (MINN. R. 7849.0290)**

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0290, which requires an applicant to describe its energy and conservation plans, including load management, and the effect of conservation in reducing the applicant’s need for new generation and transmission facilities.

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<http://www.mnpower.com/Content/documents/Environment/2015-ResourcePlan.pdf>) (approved by the Minnesota Public Utilities Commission on June 10, 2015); Otter Tail Power Company, Application for Resource Plan Approval 2017-2031 (available at <https://www.otpc.com/media/838904/resource-plan.pdf>).

<sup>43</sup> Xcel Energy, Upper Midwest Resource Plan 2020-2034, at 5.

<sup>44</sup> Compliance Filing, *In the Matter of the Minnesota Transmission Owners’ 2019 Biennial Transmission Projects Report*, Docket No. E002/M-19-205 (Aug. 14, 2020).

<sup>45</sup> U.S. Energy Information Administration, *Annual Energy Outlook 2017*, at 22 (available at [https://www.eia.gov/outlooks/aeo/pdf/0383\(2017\).pdf](https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf)); NRDC Issue Paper, *Clean Energy and Efficiency Can Replace Coal For a Reliable, Modern Electricity Grid* (Mar. 2017) (available at <https://www.nrdc.org/sites/default/files/clean-energy-replace-coal-modern-electricity-grid-ip.pdf>).

<sup>46</sup> American Wind Energy Association, *Consumer demand drives record year for wind energy purchases* (Jan. 30, 2019) (available at: <https://www.awea.org/resources/news/2019/consumer-demand-drives-record-year-for-wind-energy>); see also Business Renewables Center, *Corporate Renewable Deals 2014-2018* (available at <https://businessrenewables.org/corporate-transactions/#wpcf7-f942-p471-o1>).

## 9.0 CONSEQUENCES OF DELAY (MINN. R. 7849.0300)

The Commission granted Red Rock Solar an exemption from Minn. R. 7849.0300, which requires the applicant to “submit data on the consequences of delay on the potential customers and the region.” Red Rock Solar is not a utility and has no “system” as defined by the Rules. Thus, this data requirement is inapplicable to Red Rock Solar and is unnecessary to determine the need for the Project. Instead, Red Rock Solar provides the following data on the consequences of delay to Minnesota and the region.

The primary consequences of delaying construction of the Project would be the failure to capture the investment tax credit, which allows the Project to offer even more competitive rates for its likely utility customer, which helps keep a utility’s rates low to its end user customers. As set forth in Section 4.2.2, the investment tax credit is phasing down to 10 percent beginning in 2022. In addition, delay negatively impacts the state’s interest in achieving its renewable energy and climate change goals as quickly as possible.

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

### 10.1 VISUAL IMPACTS

The topography of the Project Boundary is generally flat with elevations ranging from 1,190 to 1,240 feet above sea level. As discussed in Section 4.1, land use within the Project Boundary is predominantly agricultural, with corn and beans being the most common crops. There are windbreaks around most farmsteads and former farmsteads with agricultural buildings still present in the Project vicinity.

There is one residence in the northeast corner of the Project Boundary and one residence and several agricultural buildings on parcels adjacent to the Project Boundary (*see* Figure 3 – Preliminary Project Layout). Table 3 provides distances to the nearest homes to the Project, including approximate distance to the Project Footprint boundary and approximate distance to the edge of solar arrays (per preliminary design). There are no residences on parcels that the collection line corridor crosses (*see* Figure 3 – Preliminary Project Layout).

**Table 3:  
 Proximity of Residences to Red Rock Solar Project**

Residence	Distance to Project Footprint (feet)	Distance to Solar Arrays (feet) <sup>1</sup>	Distance to Nearest Inverter (feet) <sup>1</sup>
A	364	506	1,122
B	498	613	1,370

<sup>1</sup> Based on preliminary design.

Residence A is located in the northeast corner of the Project Boundary along 610th Avenue facing east. This residence has existing vegetative screening around three sides of the farmstead, including north, west, and south adjacent to the Project. The property owner is a Project participant.

Residence B is located adjacent to the western portion of the Project Boundary. The residence faces east and has existing vegetative screening along the east, north, and west sides of the farmstead. This property owner is a Project participant.

The Project will convert approximately 451.8 acres of predominately agricultural land to a solar facility characterized by complex geometric forms, lines, and surfaces that may be divergent from the surrounding rural landscape. Most of the Project Footprint will be utilized with rows of solar PV panels. Solar PV employs glass panels that are designed to maximize absorption and minimize reflection to increase electricity production efficiency. The images below provide a reference for how the Project will appear during operation. To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings.

The solar arrays will occupy most of the disturbed area for the solar facility. The electrical transformers and inverters, a substation, and access roads will utilize the rest of the disturbed area. Most of the facility, including the solar arrays, will be low-profile. The Solar Project Substation will have a more vertical profile with equipment ranging in height from 80-120 feet.

The solar arrays will be visible from adjacent roadways and parcels but given their relative low profile and the fact that all the facilities will be fenced for security, they will not be visible from long distances. Additionally, Red Rock Solar has designed the Project to avoid tree clearing. As previously mentioned, the closest residence to preliminary design is approximately 364 feet north of the northeast corner of the Project Footprint. Red Rock Solar has coordinated with the owners of Residences A and B, and they have not expressed concerns with the Project.

Current conditions and a rendering of the proposed Project from 610th Avenue on the east side of the Project near Residence A is provided below in Images 1 and 2. Current conditions and an additional rendering along 600th avenue in the central portion of the Project Boundary is displayed in Image 3 and 4, respectively.

Operation of the Project will require down lit security lighting at the entrance of the Project and there will be down lit, switch controlled lights 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 operations.

**Image 1:**  
**Current Conditions from 610<sup>th</sup> Avenue near Residence A Looking Southwest**



**Image 2:  
Visual Rendering of Red Rock Solar Project from 610<sup>th</sup> Avenue  
near Residence A Looking Southwest**



**Image 3:**  
**Current Conditions from CSAH 8 (600<sup>th</sup> Avenue) Looking Northeast**



**Image 4:  
Visual Rendering of Red Rock Solar Project from CSAH 8  
(600<sup>th</sup> Avenue) Looking Northeast**



## **10.2 WILDLIFE**

Given that the Project is comprised primarily of agricultural lands, occurrence of wildlife within the Project Boundary is limited. As a result, impacts on wildlife are expected to be minor. Restoration of the Project Footprint after construction to native grasses may result in wildlife benefits because it will be revegetated with a seed mix that includes native plants that are benefits pollinators. Common species of wildlife adapted to agricultural land use may be present in the Project such as white-tailed deer, red fox, striped skunk, wild turkey, ring-necked pheasant, sandhill crane, passerines, rodents, snakes, and insects. During construction, highly mobile species of wildlife including deer, birds, and snakes are expected to divert to areas surrounding the Project. Less mobile species and ground nests of birds, eggs, and chicks may be impacted; however, given that the Project area is cropland, these impacts may have occurred regardless of the Project. Overall, construction of the Project is expected to have minimal impacts on individuals of common wildlife species, and no impact on populations of these species. During operations, any potential impacts on wildlife are also expected to be minimal and insignificant. These impacts may be related to vehicle traffic and parking or mowing. Because any potential impacts on wildlife are anticipated to be minimal and insignificant, no species-specific mitigation is proposed.

After construction and during operations, the Project may provide more wildlife habitat than the current land use provides. Red Rock Solar will restore with a seed mix that may provide habitat for wildlife, including grassland birds, rodents, reptiles, and insects. In sum, although 15.2

acres within the Project would have permanent facilities (i.e., access roads, Solar Project Substation and inverters) and would not serve as wildlife habitat during operations, 451.8 acres would be restored as herbaceous cover, including a seed mix with some native plants, thereby potentially benefitting and increasing the overall populations of wildlife species in the area, including birds, small mammals, reptiles, and pollinator insects.

Red Rock Solar reviewed the United States Fish and Wildlife Service (“USFWS”) Information for Planning and Conservation (“IPaC”) website for the federal endangered and threatened species, candidate species, and designated critical habitat that may occur within the Project Boundary in Cottonwood County, Minnesota (USFWS, 2020b). Red Rock Solar also reviewed the Minnesota Department of Natural Resources (“MNDNR’s”) Natural Heritage Information System (“NHIS”) for documented occurrences of federally-listed species, state-listed species, and state species of concern within one mile of the Project Boundary (MNDNR, 2020c). Red Rock Solar also requested NHIS information from MNDNR for the Project Boundary and one-mile buffer on September 28, 2020. Although these reviews do not represent a comprehensive survey, they provide information on the potential presence of protected species and habitat (refer to Table 4 below).

**Table 4:  
 Federal and State-Listed Species Documented within One Mile of the Project Boundary**

Common Name	Scientific Name	Habitat	Within One Mile of Project Boundary	Within Project Boundary	Status <sup>1</sup>	
					State <sup>2</sup>	Federal <sup>3</sup>
<b><i>Mammals</i></b>						
Northern Long-eared Bat (NLEB) <sup>4</sup>	<i>Myotis septentrionalis</i>	In winter, hibernates in caves and mines. In fall, swarms in forested areas surrounding hibernation sites. During late spring and summer, forages, and roosts in upland forests (USFWS, 2020c)	No	No	SC	T
<b><i>Plants</i></b>						
Prairie Bush Clover <sup>4</sup>	<i>Lespedeza leptostachya</i>	Dry to mesic tallgrass prairies with gravelly soils (USFWS, 2009)	No	No	T	T



**Table 4:  
 Federal and State-Listed Species Documented within One Mile of the Project Boundary**

Common Name	Scientific Name	Habitat	Within One Mile of Project Boundary	Within Project Boundary	Status <sup>1</sup>	
					State <sup>2</sup>	Federal <sup>3</sup>
<i>Invertebrates</i>						
Abbreviated Underwing	<i>Catocala abbreviatella</i>	Dry to mesic prairies and savanna communities where leadplant occurs (MNDNR, 2018a)	Yes	No	SC	N/A
<sup>1</sup> E = Endangered, T = Threatened, SC = Special Concern <sup>2</sup> MNDNR, 2013; MNDNR, 2020c <sup>3</sup> USFWS, 2020b <sup>4</sup> Red Rock Solar’s review of the NHIS did not indicate any records of the NLEB or prairie bush clover within a mile of the Project Boundary or within the Project Boundary; however, review of the USFWS’ IPaC indicated that these two species have the potential to occur in Cottonwood County.						

According to Red Rock’s review of the USFWS IPaC, two species that are listed as threatened or endangered under the federal Endangered Species Act (“ESA”) may occur in Cottonwood County, Minnesota: northern long-eared bat (“NLEB”) and prairie bush clover. There is no designated critical habitat within the Project Boundary (USFWS, 2020b).

The USFWS published a final 4(d) rule for the NLEB on January 14, 2016. In the Final 4(d) rule, the agency limited prohibitions for the species to those that would protect the bat in white-nose syndrome (“WNS”)-affected geographic areas during the most vulnerable stages in the species’ life history—specifically, during hibernation, spring staging, fall swarming, and pup rearing (USFWS, 2016). Per the USFWS’ Final 4(d) rule for NLEB, within the WNS Zone, incidental take due to tree removal is prohibited as follows:

- If it occurs within 0.25 mile of a documented hibernaculum, or
- If it involves a documented maternity roost tree or other trees within 150 feet of the documented maternity roost tree during June or July.

In addition, all take within known hibernacula is prohibited (USFWS, 2016).

Records of documented hibernacula and roost trees are maintained in the MNDNR’s NHIS. Based on a review of NLEB NHIS records, Red Rock Solar determined that there are no documented NLEB maternity roost trees within 150 feet of the Project Boundary or documented hibernacula within 0.25 mile of the Project Boundary. Although there are no records of NLEB in

the MNDNR's NHIS, and the species was not documented during acoustic surveys completed for the Big Bend Wind Project, the species may still be present in the Project Boundary.

Overall, Red Rock Solar does not anticipate that the Project will impact NLEB during construction or operations. Construction of the Project will not require tree clearing; thus, Red Rock Solar will not impact NLEB, if present, during the species' active window (April 1–October 31). NLEB may be temporarily disturbed during construction activities due to human presence or noise if they are roosting in the trees within the Project Boundary, but Red Rock Solar anticipates that any impacts due to noise and human presence would be insignificant and similar to existing noise associated with farmsteads and agricultural activities.

The prairie bush clover is a tallgrass prairie endemic. No impacts on prairie bush clover are expected during Project construction and operations because no tallgrass prairie habitat is present within the Project Boundary.

Based on Red Rock Solar's NHIS review, no records of state-listed species were documented within the Project Boundary. A record of one state-listed species, the abbreviated underwing, a state species of special concern was documented within one mile of the Project Boundary. The habitat for the abbreviated underwing is dry to mesic prairies and savanna communities where leadplant occurs; sites in western counties are relatively level to gently hilly mesic to dry prairies. Suitable prairie habitat is not present in the Project Boundary. Therefore, Red Rock Solar expects that there will be no impacts on these species due to the construction and operation of the Project.

Red Rock Solar sent a Project introduction letter to MNDNR staff in May 2020 and followed up in June 2020 with an updated Project description. On July 7, 2020, the MNDNR responded to Red Rock Solar with the following recommendations:

- Submit a Project-specific NHIS request;
- Avoid wetland areas with design;
- Review the MNDNR's Commercial Solar Siting Guidance (MNDNR, 2016a);
- Follow the Prairie Establishment & Maintenance Technical Guidance for Solar Projects (Revised July 2020; MNDNR, 2020f); and
- Use wildlife-friendly erosion control and invasive species prevention best management practices ("BMPs").

Red Rock Solar reviewed the MNDNR Commercial Solar Guidance for the Project. Additionally, Red Rock Solar will implement MNDNR guidance of wildlife-friendly fencing by installing agricultural woven wire fence that will extend approximately seven feet above grade. At the request of MNDNR, barbed wire will not be used around the perimeter of the Project, and instead one foot of three to four strands of smooth wire will be used.

Red Rock Solar reviewed licensed NHIS data and has submitted an NHIS request for concurrence from MNDNR. Additionally, the Project design avoids impacts to wetlands. Lastly, Red Rock Solar has developed a Vegetation Management Plan which was designed using the Prairie Establishment & Maintenance Technical Guidance for Solar Projects.

## **11.0 FACILITY INFORMATION FOR PROPOSED PROJECT AND ALTERNATIVES INVOLVING CONSTRUCTION OF A LEGF (MINN. R. 7849.0320)**

### **11.1 LAND USE AND REQUIREMENTS (MINN. R. 7849.0320(A))**

The Project is located within a rural landscape, and as such the primary land use in the Project Boundary is cultivated cropland (95.2 percent; MRLC, 2016; Table 5).

The remaining land within the Project Boundary consists of developed land (4.4 percent), a small amount of deciduous forest (0.2 percent), hay/pasture (0.1 percent), and barren land (0.1 percent). Most of the agricultural land is in row crops, specifically corn and soybeans. Developed land within the Project Boundary generally consists of public roads, including 610th Avenue, 330th Street, 600th Avenue, 340th Street, and 590th Avenue. The areas in the Project Boundary identified as deciduous forest by the U.S. Geological Survey (“USGS”) National Land Cover Database (“NLCD”) consist of windbreaks near an existing farmstead and two separate clusters of farm outbuildings. There are no wetlands or open water identified in the Project Boundary by the NLCD data.

**Table 5:  
 Land Use Within the Project Boundary**

<b>Land Use Type</b>	<b>Acres in Project Boundary</b>	<b>Percent of Total Acreage</b>
Cultivated Crops	805.4	95.2
Developed (all categories)	37.7	4.4
Deciduous Forest	2.0	0.2
Hay/Pasture	0.7	0.1
Barren Land	0.4	0.1
<b>Total</b>	<b>846.2</b>	<b>100.0</b>

Farmsteads are sparsely scattered in this area of Cottonwood County, and generally situated near public roads. Based on review of available aerial photography, there is one occupied residence within the Project Boundary and one occupied residence adjacent to the Project Boundary; however, the Project will not cause displacement or relocation of residences.

Table 6 provides the total acreage by land use type within the Project Footprint. Based on the USGS NLCD data, the Project would affect predominately cultivated cropland (99.2 percent). However, of the 479.4 acres of cultivated cropland within the Project Footprint, only 451.8 acres will be within the fence line of the solar facility and the Solar Project Substation. The remaining 27.6 acres would be temporarily impacted during installation of the collection lines and use of the two laydown areas outside the fence line of the solar facility. After construction, these 27.6 acres will be available to return to row crop production.

**Table 6:  
 Land Use Impacts**

Land Use Type	Acres in Project Footprint	Percent of Total Acreage
Cultivated Crops	479.4	99.2
Developed (all categories)	3.7	0.8
Deciduous Forest	0.1	< 0.1
<b>Total</b>	<b>483.3</b>	<b>100.0</b>
Source: MRLC, 2016		

Agricultural land will be converted from an agricultural use to a solar energy use for the life of the Project. The conversion of agricultural land to solar energy production within the Project Footprint will have a minimal impact on the rural character of the surrounding area or Cottonwood County. As discussed further in Section 4.3, Land-based Economies, of the 415,360 acres that comprise Cottonwood County, approximately 370,389 acres (89 percent) are classified as agricultural land. Converting 451.8 acres of cultivated cropland to a solar facility would reduce the amount of agricultural land in the county by less than one percent.

Due to the amount of agricultural land impacted by the Project, Red Rock Solar has coordinated with MDA on an AIMP. This AIMP has been designed to incorporate BMPs into siting procedures; pre-construction, construction, and post-construction methods; operational procedures; and decommissioning and restoration procedures to avoid and minimize impacts to soil and site productivity such that pre-construction agricultural productivity (anticipated use, appropriate management) is rapidly returned to the site following decommissioning. Red Rock Solar met with the Minnesota Department of Agriculture (“MDA”) in November 2019 to discuss the AIMP’s contents and site-specific characteristics. MDA reviewed and approved the AIMP for the Project.

Developed and deciduous forest land use types total about 0.8 percent of the Project Footprint. Red Rock Solar has designed the Project to avoid impacts on developed land within the Project Footprint by setting solar facilities back 25 feet from the road rights-of-way. The electrical collection lines between the solar facilities and the Solar Project Substation will be directionally bored under county roads. Similarly, areas categorized as deciduous forest land will not be impacted by the solar facilities. Red Rock Solar has designed the solar facility to avoid tree clearing.

As noted above, development of solar energy systems within the Cottonwood County agricultural district is a conditionally permitted use (Cottonwood County, 2016). As the Project is subject to siting and oversight by the State of Minnesota under the Minnesota Power Plant Siting Act, the Site Permit will serve as the land use permit.

**11.2 TRAFFIC (MINN. R. 7849.0320(B))**

The major roadway in the area is Highway 60, approximately 1.5 miles south of the Project Boundary. The roads that surround the Project Boundary are local county or township roads. The nearest road to the northern limits of the Project Boundary is 320th Street and the nearest road to

the southern Project Boundary is 360th Street. The Project Boundary is bordered on the east by 610th Avenue and on the west by 590th Avenue. The portion of the Project Boundary that will host the solar arrays is bisected by 330th Street (traveling east to west) and County State Aid Highway (“CSAH”) 8 (600th Avenue; traveling north to south). The portion of the Project Boundary that will host the collection line crosses 340th Street, 350th Street, and 590th Avenue before connecting into the Solar Project Substation, just north of 360th Street.

The Minnesota Department of Transportation (“MNDOT”) conducts traffic counts on roads in Minnesota. The functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day, or Annual Average Daily Traffic (“AADT”). Based on 2018 data, the highest existing AADT for roads near the Project Boundary is 5,881 vehicles per day along Highway 60; traffic volumes along the other county and township roads range from 65 to 330 vehicles per day (MNDOT, 2019). Traffic volume data for roads near the Project Boundary are provided in Table 7 and displayed on Figure 4 – Existing Infrastructure and AADT.

**Table 7:  
 Average Annual Daily Traffic in the Project Vicinity**

Roadway	Year	AADT Traffic Volume Total
Highway 60	2019	5,881
330th Street	2016	330
600th Avenue	2014	65
Source: MNDOT, 2019		

There will be seven access points to the solar facilities and one access point to the Solar Project Substation. Six of the access points to the solar facilities will be from 600th Avenue and one access point will be from 610th Avenue; access to the Solar Project Substation will be from 590th Avenue.

There are no railroads within one mile of the Project Boundary. There is a Chicago & Northwestern Railroad that runs between Mountain Lake and Butterfield approximately 1.5 miles south of the Project Boundary that parallels Highway 60.

The nearest Federal Aviation Administration (“FAA”)-registered airport to the Project is the Windom Airport located approximately 10 miles southwest of the Project. This airport operates one runway.

Access to the Project will be via existing county and township roads. With the limited possible exception of minor field access or driveway changes depending on final design, no changes to existing roadways will occur. During the construction phase, temporary impacts are anticipated on some public roads within the vicinity of Project facilities, primarily through additional traffic and slow-moving construction vehicles.

Construction traffic will use the existing county roadway system to access the Project facilities and deliver construction materials and personnel. Traffic during construction is estimated to be approximately five truck trips/day during site preparation, 15 truck trips/day during solar panel installation, and three truck trips/day during the mechanical/electrical/commissioning stage. It is anticipated that there will be an average of 100–150 workers on site during the construction period with a maximum 200 workers for limited periods. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. Overweight or oversized loads are unlikely. If they are required, Red Rock Solar will obtain the appropriate approvals prior to construction. 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. Slow-moving construction vehicles may also cause delays on smaller roads, like the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period.

After construction is complete, traffic impacts during the operations phase of the Project will 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, but traffic function will not be impacted as a result.

The Project is not expected to impact rail or barge traffic.

### **11.3 INFORMATION PERTAINING TO FOSSIL-FUELED ACTIVITIES (MINN. R. 7849.0320(C)-(D))**

#### **11.3.1 FUEL**

The Project is not a fossil-fueled facility. The Project will be fueled by the sun.

#### **11.3.2 EMISSIONS**

The Project is not a fossil-fueled facility and will not release any emissions from the power generation process.

When necessary, dust from construction traffic will be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, and reduced speed limits. Emissions from construction vehicles will be minimized by keeping construction equipment in good working order. Overall, dust emissions currently experienced annually in the area through farming activities will be reduced for the life of the Project through the establishment of perennial vegetative cover.

Soils at the Project are not susceptible to wind erosion, which may create dust. Therefore, construction-specific mitigation measures and BMPs related to dust control have not been identified. If wind erosion becomes an issue during construction, standard industry practices may be implemented, including mulching exposed soils, wetting exposed soils, maintaining vegetative cover (both cover crops and permanent vegetation), and reduced speed limits. Emissions from

construction vehicles will be minimized by keeping construction equipment in good working order. Overall, dust emissions currently experienced annually in the area through farming activities will be reduced for the life of the Project.

The Project will have no air emissions and will avoid emissions associated with fossil generation facilities. Red Rock Solar undertook analysis using U.S. Environmental Protection Agency (“EPA”) data for emissions and generation data for the MISO-Minnesota Zone to calculate avoided emissions related to the Project. Table 8 provides a summary of the estimated reduction in pollutants from the Project based on the EPAs avoided emissions and generation tool calculator.<sup>47</sup>

**Table 8:  
Estimated Avoided Pollutants**

<b>Pollutant</b>	<b>Tons or Pounds/Year</b>
CO <sub>2</sub>	7,536 tons
NOX	8,874 pounds
PM2.5	654 pounds
SO <sub>2</sub>	5,339 pounds

#### **11.4 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.

#### **11.5 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 dewatering may be required during construction for electrical trenches. 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 National Pollutant Discharge Elimination System (“NPDES”) permit program and addressed by the Project’s Storm Water Pollution Prevention Plan (“SWPPP”), as required. Temporary sanitary facilities will be provided during construction, which will be installed in accordance with applicable regulations.

#### **11.6 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.

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<sup>47</sup> Located at <https://www.epa.gov/statelocalenergy/avoided-emissions-and-generation-tool-avert>.

### 11.7 SOLID WASTE (MINN. R. 7849.0320(H))

The Project is not expected to generate significant quantities of solid waste during operation. The Project will 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.

### 11.8 NOISE (MINN. R. 7849.0320(I))

During construction, noise will be emitted by the construction vehicles and equipment. The amount of noise will vary based on what type of construction is occurring at the Project on a given day. Construction associated noise will likely be perceptible at adjacent residences (*see* Section 4.2.4 for locations). Grading equipment, bobcats, and other construction equipment are anticipated to emit noise between 76-85 dBA at 50 feet (USDOT, 2017). Noise associated with these types of equipment will primarily occur during the initial site set up – grading and access road construction which is expected to last approximately four weeks. Red Rock Solar anticipates pile driving of the rack supports to create the most noise measured at 101 dBA at 50 feet (USDOT, 2017). Installation of each rack support takes between 30 seconds to two minutes depending on the soil conditions; Red Rock Solar anticipates this activity will take up to six weeks across the site. Finally, installation of the solar panels on the tracking similar would emit noise levels similar to general construction equipment described above. Typically, a forklift is used to place individual panels on the tracking rack system. The noise from any of these construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor. Note that construction activities will be sequenced; site preparation may occur at a portion of the site while pile driving occurs at a different location. As stated above, these noise impacts will be temporary and limited to daytime hours.

The main source of noise from the Project during operation will be from the inverters, which includes the air conditioners housed in each, and to a lesser extent from the transformers and rotation of the tracking system. Table 9 summarizes the anticipated distance to reach the most stringent MPCA noise standard (50 dBA) from a range of inverters and trackers under consideration for use at the Project. Table 9 also provides the dBA at 50 feet so noise levels can be calculated at greater distances.

**Table 9:  
 Inverter and Tracker Noise Levels**

Facility Type	Equipment Model	Distance to 50 dBA	dBA at 50 feet
Inverter	SMA SC 4.0MVA	233	63.3
Tracker	Nextracker Gemini	130	64.3

The results of noise modeling conducted by technology manufactures outlined in Table 9 show that noise levels will be less than 50 dBA at 233 feet from the inverter, depending on which model is selected. Similarly, noise levels will be less than 50 dBA at 130 feet from the trackers. As such, the Project has been designed to meet the nighttime L<sub>50</sub> dBA noise standard, as the closest



home to the facility is 506 feet away from the edge of a solar array. Further, because the inverters are typically located within the middle of the solar arrays, the noise levels from Project equipment are not expected to be discernible from background noise levels at homes in the vicinity. The distance of the nearest inverter to a residence is 1,122 feet.

During construction, Red Rock Solar plans to limit construction to daylight hours to the extent practicable. No noise impacts are anticipated during operation; therefore, no mitigation measures are proposed.

### **11.9 CONSTRUCTION AND OPERATION WORK FORCE (MINN. R. 7849.0320(J))**

The Project will create approximately 200 construction related jobs and up to 2 permanent positions to operate and maintain the Project. Additional, non-construction jobs such as engineering and surveying will be needed prior to and during construction. Red Rock Solar used the National Renewable Energy Laboratory's ("NREL") Jobs and Economic Development Impacts ("JEDI") PV tool<sup>48</sup> to calculate jobs associated with the design construction and installation of the Project and estimated a total of four Full Time Equivalent jobs created during the construction cycle.

### **11.10 RED ROCK SOLAR WILL MANAGE THE OVERALL OPERATIONS AND MAINTENANCE OF THE PROJECT.**

Red Rock Solar anticipates having an operations agreement with another entity for performance of BOP O&M. The BOP O&M provider will be an experienced third party. Red Rock Solar and its O&M contractors will hire employees or other appropriate contractors to complete operations and maintenance tasks.

### **11.11 NUMBER AND SIZE OF TRANSMISSION FACILITIES (MINN. R. 7849.0320(K))**

Electrical wiring will connect the panels to inverters, inverters will transform the power from DC to AC current. The AC current will be stepped up through transformer to 34.5 kV and brought via the collection cables to the Project substation. These cables may be installed in an above-ground or below-ground system. Below-ground systems will be installed per the National Electrical Code that requires specific burial depths. Cables connecting each unit of solar arrays may be directionally bored under or spanned over county roads. The Project will interconnect via the 18-mile 161 kV Transmission Line to the Blue Lake-Wilmarth-Interstate Junction 345 kV transmission line at Xcel Energy's Crandall switching station.

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.

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<sup>48</sup> <https://jedi.nrel.gov/>.

## 12.0 OTHER FILINGS AND PERMITS

### 12.1 ENVIRONMENTAL REPORT

Pursuant to Minn. R. 7849.1000 - .2100, the Department of Commerce is required to prepare an Environmental Report for any large energy facility for which a CN must be obtained.

### 12.2 SITE PERMIT

Red Rock Solar will also submit to the Commission a Site Permit application pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes Chapter 216E) and Minnesota Administrative Rules Chapter 7850.

### 12.3 OTHER PROJECT PERMITS

Red Rock Solar will obtain all permits and licenses that are required for the Project, following issuance of the Site Permit. The permits or approvals that Red Rock Solar has identified as potentially being required for the construction and operation of the Project are shown in Table 10.

**Table 10:  
 Potential Permits and Approvals for the Red Rock Solar Project**

Agency	Permit	Applicability	Permit Status and Timing
<b>Federal</b>			
U.S. Army Corps of Engineers (USACE)	Section 404 Permit for wetland impacts.	Dredging or filling jurisdictional waters of the United States	To be obtained prior to construction, if necessary
<b>State</b>			
Minnesota Public Utilities Commission	Site Permit	Construction of energy conversion facility	Filed concurrent with CN application
	Certificate of Need	Required for generating plants larger than 50 MW	To be obtained prior to construction
Minnesota Pollution Control Agency	Section 401 Certification	Required for filling in jurisdictional waters of the United States and if a Section 404 permit is required from the USACE	To be obtained prior to construction, if necessary

**Table 10:  
 Potential Permits and Approvals for the Red Rock Solar Project**

Agency	Permit	Applicability	Permit Status and Timing
	National Pollutant Discharge Elimination System General Permit (includes Stormwater Pollution Prevention Plan)	For stormwater discharges from construction activities with disturbances greater than one acre	To be obtained prior to construction
Minnesota Department of Natural Resources	Water Appropriation Permit	Required if trench dewatering is necessary	To be obtained prior to construction, if necessary
Minnesota Department of Labor and Industry	Request for Electrical Inspection	Required to comply with the state electrical code	To be obtained during construction.
State Historic Preservation Office	Review and Coordination	Provide concurrence on Phase I inventory	To be submitted 4th Quarter 2020
<b>County/Local</b>			
Cottonwood County	Floodplain Development Permit	Required for development within a floodplain	Not applicable. There are no Federal Emergency Management Agency mapped floodplains in the Project Boundary
	County Entrance Permit	Required for access from county roads	To be obtained prior to construction
	Utility Permit	Required to place facilities within public road right-of-way	To be obtained prior to construction, if necessary
	Local government unit for Minnesota Wetland Conservation Act	Required for wetland impacts	To be obtained prior to construction, if necessary