Application for Certificate of Public Convenience and Necessity
Koshkonong Solar Energy Center
Docket #9811-CE-100
Dane County, WI
April 15th, 2021

Koshkonong Solar

Table of Contents

TABLES

FIGURES

APPENDICES

TERMS/ACRONYMS	DEFINITIONS
AC	Alternating Current
AFR	Application Filing Requirements
APA	Asset Purchase Agreement
ASNRI	Area of Special Natural Resource Interest
ATC	American Transmission Company
AWG	American Wire Gauge
bgs	Below Ground Surface
BMP	Best Management Practice
CA	Certificates of Authority
CGP	Construction General Permit
CL	Lean Clay
CPCN	Certificate of Public Convenience and Necessity
CPR	Clean Power Research
CRP	Conservation Reserve Program
DATCP	Department of Agriculture, Trade and Consumer Protection
dBA	A-weighted decibels
DC	Direct Current
DEM	Digital Elevation Model
DNR	Department of Natural Resources
DOT	Department of Transportation
ECSWMP	Erosion Control and Stormwater Management Plan
EMF	Electromagnetic Field
EMI	Electromagnetic Interference
ER	Endangered Resource
ERR	Endangered Resource Review
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FR	Federal Regulation (Code of Federal Regulations reference)
GIS	Geographic Information System
GSU	Generator Step-up Transformer
HDD	Horizontal Direction Drilling
HSG	Hydrologic Soil Group
Hz	Hertz
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
ISO	International Standards Organization

JDA	Joint Development Agreement
kCMIL	Thousand Circular Mils (Wire Gauge Measurement)
OP	Observation Point
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt-hour
LID	Low Impact Development
LLC	Limited Liability Corporation
MFL	Managed Forest Law
MHz	Megahertz
MISO	Midcontinent Independent System Operator
MW	Megawatts
NAIP	National Agriculture Imagery Program
NEC	National Electrical Code
NESC	National Electrical Safety Code
NEXRAD	Next-Generation Radar
NHD	National Hydrography Dataset
[redacted]	[redacted]
NNWR	Necedah National Wildlife Refuge
NPDES	National Pollutant Discharge Elimination System
NRIS	Network Resource Interconnection Service
NWI	National Wetland Inventory Mapping
O&M	Operations and Maintenance
OTA TV	Over-The-Air Television
PSC	Public Service Commission
psf	Pounds per square foot
PV	Photovoltaic
REC	Renewable Energy Certificate
ROW	Right of Way
[redacted]	[redacted]
SCADA	Supervisory Control and Data Acquisition
SCS	Site Characterization Study
SER	Socio-Economic Review
SHPO	State Historic Preservation Office
SNA	State-Designated or Dedicated Natural Area
SP	Poorly-graded Sand
SPCC	Spill Prevention, Control, and Countermeasures

SPT	Standard Penetration Test
SSURGO	Soil Survey Geographic Database
TMY	Typical Meteorological Year
US	United States
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWM CRM	University of Wisconsin-Milwaukee Cultural Resources Management
VMS	Vegetation Management Strategy
W	Watts
WDNR	Wisconsin Department of Natural Resources
WGNHS	Wisconsin Geological and Natural History Survey
WHS	Wisconsin Historical Society
WisDOT	Wisconsin Department of Transportation
WPDES	Wisconsin Pollutant Discharge Elimination System
WWI	Wisconsin Wetland Inventory Mapping

1. Project Description and Overview

1.1 General Project Location and Description of Project and Project Area

(The overall size of the project area will have an impact on the amount of data and analyses required in this AFR. It is recommended that the project area be optimized so that the project retains flexibility for siting panels while at the same time reducing the total area for which data will be required.)

1.1.1 *Provide the following information about the project:*

1.1.1.1 *Project location – county and townships in the project area.*

The Project is located in the Towns of Christiana and Deerfield, Dane County. The Project Area is north and east of I-90 and intersected by Highway 12/18 and west of the Dane-Jefferson County Line. The Project covers Sections 1-4, 8-12, 14-17, 20-23, 26-27, and 33-34, Township 6N (Christiana Township), Range 12E in Dane County and Sections 35-36, Township 7N (Deerfield Township), Range 12E in Dane County (**Appendix B, Figure 1.1.2**).

1.1.1.2 *Size of project area (in acres) and size of solar arrays (in acres)*

The Project will be built within a 6,384-acre Project Area. Within the Project Area, Koshkonong Solar has approximately 4,600 acres under contract. Of the 4,600 acres under contract, 2,349 acres are proposed as Primary Array areas, and represent the approximate acreage anticipated to be required to host 300 MW of solar generating facilities. This area would include the surface area of solar panels themselves, spacing between the racking system, fence line, and access roads. The approximately 4,600 acres under contract represents all of the land that would be required to accommodate the solar panels for the 300 MW capacity plus 43 percent more land for panel siting, described as Alternative Array areas. The Alternative Array areas comprise enough land to accommodate 43 percent additional capacity, presenting Primary and Alternative Array areas that are capable of hosting a gross capacity total of 429 MW. The panel siting layout is shown in **Figures 4.1.1** and **4.1.2 (Appendix B**).

If all areas presented in the layout are deemed acceptable by the Commission for use by the Project, it may be beneficial to design the final 300 MW Project layout to use more than the 2,349 acres stated above for the following reasons:

1) Ample availability of constructible surface area allows for the most efficient Project layout. For example, adjusting spacing of aisles to avoid shading from one row to the next will ensure the highest performance of the tracking system and a higher capacity factor, which results in more energy production on a per megawatt-installed basis.

2) A higher level of approved area affords the Project the ability to increase setbacks from fences, trees, roads, houses and other features, or to adjust the layout to minimize impacts to wetlands or other areas of environmental concern.

3) As covered in more detail in Section 1.4 of this application, the proposed layout includes uniform power blocks wherever possible to reduce cost and other impacts. More acceptable and approved area increases the number of uniform arrays that could be constructed.

Of the approximately 4,600 acres under contract by the Project within the Project Area, Koshkonong Solar expects that approximately 15 acres will be purchased and utilized for collection routing, site access, the Project Substation, and an operations and maintenance ("O&M") building. Additionally, Koshkonong Solar expects to purchase approximately 25 acres to be utilized for the battery energy storage system ("BESS").

1.1.1.3 *Size (rated capacity), in both DC and alternating current (AC) MWs, of the proposed project. (If an actual panel model is not yet under contract, the applicant must provide information on at least two models that are being considered. Those panels must represent the maximum and minimum megawatt size under consideration for purchase for the project.*

The Project will have an installed capacity of up to 300 MWac. Power is generated by the panels as direct current. This direct current is then converted to alternating current by inverters. Total power production by the panels may be up to 387 MWdc (direct current).

PV panels (also referred to as solar modules) produced by several manufacturers are under consideration for the Project, including Canadian Solar, Hanwha Qcells, JA Solar, Jinko, Longi, Risen, SunPower, and Trina. The Project will analyze current market offerings to make a final selection on specific solar module, inverter and racking system equipment. An example configuration that is representative of what would be used consists of 566,037 to 730,188 high-efficiency solar PV panels with a capacity to generate approximately 350-600 watts (W) of DC power each.

Examples of specific panel models in this range are the Longi LR6-72HBD on the low wattage end and the Jinko Eagle 72HM on the higher wattage end. While these two models are typical examples of what may be installed, final engineering will utilize the best, most economical technology available, which may include higher wattage modules. It is also possible that a different manufacturer of a substantially similar product could be selected in final procurement. Examples of different modules and outputs can be found in **Appendix C.**

The marketplace for solar modules is constantly changing. Although the description above is representative of a likely choice for equipment, panels could exceed 600 W DC power output each, potentially leading to fewer total panels or other selected manufacturers. If the final selected panel is rated higher than 600 W DC, Koshkonong

Solar will notify PSC staff of this selection and provide updated estimates of the information provided above.

1.1.1.4 *Number of panel sites proposed for the project and the number of alternate panel sites that have been identified (See the discussion on page 1 regarding alternatives).*

The Primary plus Alternate Array layout has been divided into 33 fence boundary areas for identification and discussion purposes as shown in **Figures 4.1.1** and **4.1.2** (**Appendix B**). The Typical Power Block Configuration in **Appendix D** illustrates how the Project could be divided into approximately 145 power blocks utilizing 4.2 MW inverters for representative purposes. Of the 145 power blocks, 89 would comprise Primary Array areas and 56 would comprise Alternate Array areas.

1.1.1.5 *Identify any new or modified electric transmission lines or other electric transmission facilities that might be needed.*

Information regarding new or modified electric transmission lines or other electric transmission facilities is described in **Appendix AC**. This includes the facilities determined necessary by Midcontinent Independent System Operator ("MISO") and ATC for the interconnection of the 300 MW solar generation and 75 MW of the proposed BESS capacity for the Project as part of the MISO DPP-2019-Cycle study cluster. MISO Definitive Planning Phase 1 ("DPP1") study results for the MISO DPP-2020-Cycle study cluster are expected to be published 7/22/2021. The Project will provide these preliminary DPP1 results when available. In addition to the facilities identified in **Appendix AC**, Koshkonong Solar anticipates the following two facilities to be required as part of grid interconnection.

- A newly-constructed 34.5kV to 345kV Project Substation within the Project Area. The Project Substation will have an approximately 4 acre footprint. The Project Substation is shown on **Figures 4.1.4** and **4.1.5.**
- A newly-constructed 345 kV gen-tie transmission line of approximately 0.84 miles in length connecting the Project Substation to the Point of Interconnection at the Interconnection Switchyard within the Project Area. The Gen-Tie line route and existing Interconnection Switchyard footprint are shown on **Figures 4.1.1** and **4.1.2** (**Appendix B**).

1.1.2 *Provide a general map showing the location of the project area, nearest communities, townships, and major roads. Include an inset map showing where the project is located in the state. Scale should be appropriate for showing communities within at least 10 miles of the project area boundary.*

See **Figure 1.1.2** (**Appendix B**) for a map of the Project Area and surrounding area incorporating the requested information.

1.2 Ownership

Identify the corporate entity or entities that would own and/or operate the plant.

Koshkonong Solar Energy Center LLC (Koshkonong Solar), is a Delaware Limited Liability Company authorized to do business in Wisconsin. Koshkonong Solar is a wholly-owned subsidiary of Invenergy Solar Development North America LLC and an affiliate of Invenergy LLC (Invenergy) and is currently the entity anticipated to own and operate the Project.

Invenergy develops, builds, owns and operates large-scale energy facilities across four core technologies: wind (105 projects; 16,695 MW), natural gas (12 projects; 5,661 MW), solar (43 projects; 5,061 MW), and battery storage (16 projects; 300 MW / 900 MWh). Invenergy projects are mainly located in the United States, with other projects located in Japan, Poland, Scotland, Mexico, and Uruguay. Invenergy has a proven development track record of 176 large-scale projects with a capacity of over 27,000 MW.

In Fond du Lac and Dodge Counties, Wisconsin, Invenergy developed the Forward Wind Energy Center (Forward), a 129 MW wind energy generation facility that began operation in 2008 and provides wind energy to Wisconsin Public Service ("WPS"), Wisconsin Power & Light ("WPL"), and Madison Gas & Electric ("MGE"). (*See* PSC Docket No. 9300-CE-100). Invenergy constructed and operated Forward for 10 years while providing energy and renewable energy certificates (RECs) to its customers. Invenergy sold Forward to the customers and will continue to operate the project through its remaining service life. (*See* PSC Docket No. 05-BS-226).

In Iowa County, Wisconsin, Invenergy developed the Badger Hollow Solar Farm, a 300 MW solar energy generating facility that is currently under construction. (*See* PSC Docket Nos. 9697-CE-100 and 9697-CE-101). The first phase of 150 MW is owned by WPS and MGE. The second phase of 150 MW is owned by We Energies and MGE. Invenergy is managing the construction of the facility and will operate the facility on behalf of its customers.

In Kenosha County, Wisconsin, Invenergy is developing the Paris Solar and Storage Energy Center ("Paris"), a 200 MW solar energy generating facility with a proposed 110 MW BESS. The CPCN for Paris was approved in December 2020 and the project is currently preparing for construction. (*See* PSC Docket No. 9801-CE-100). We Energies, WPS, and MGE have requested Commission approval to acquire Paris. (*See* PSC Docket No. 05-BS-254). Invenergy is proposed to manage the construction of the facility and will operate the facility on behalf of its customers.

In Walworth and Rock Counties, Wisconsin, Invenergy is developing the Darien Solar and Storage Energy Center ("Darien"), a 250 MW solar energy generating

facility with a 75MW BESS that is currently pursuing a CPCN. (*See* PSC Docket No. 9806-CE-100). We Energies, WPS, and MGE have requested Commission approval to acquire Darien. (*See* PSC Docket No. 05-BS-255). Invenergy is proposed to manage the construction of the facility and will operate the facility on behalf of its customers.

1.3 Project Need/Purpose

Independent Power Producers (IPP) (merchant plants) skip to Subsection 1.3.6.

Subsections 1.3.1 thru 1.3.5 apply to utilities only. These subsections focus on compliance with Wis. Stat. § 196.374, the Renewable Portfolio Standard (RPS).

1.3.1 ***Utilities Only*** *– The utility's renewable baseline percentage and baseline requirement for 2001 2003 and the amount of renewables needed in the future.*

1.3.2 ***Utilities Only*** *– Amount of renewable energy currently owned and operated by the utility as defined by the RPS requirements for additional renewable energy.*

1.3.2.1 *Total existing renewable generation capacity.*

1.3.2.2 *Total energy produced by renewable assets in previous calendar year separated by generation type (Hydro, biomass, methane, wind etc.).*

1.3.2.3 *Amount of renewable energy acquired through purchase power agreements (separated by type, hydro, biomass, wind, solar, etc.).*

1.3.2.4 *Amount of RPS credits purchased.*

1.3.3 ***Utilities Only*** *– Expected annual energy output for the project.*

1.3.4 ***Utilities Only*** *– Other need not covered in Section 1.3.1*

1.3.4.1 *Monthly demand and energy forecast for peak and off peak periods over the next 20-25 years.*

1.3.4.2 *Describe how the availability of purchase power was analyzed.*

1.3.4.3 *Identify plant retirements forecast over the next 20-25 years.*

1.3.4.4 *Describe how the existing and expected applications for generation from IPPs have been factored into your forecast.*

1.3.4.5 *Describe how the proposed project meets the requirements the Energy Priorities Law, Wis. Stats. §§ 1.12 and 196.025(1).*

1.3.4.6 *Briefly describe utility's compliance under Wis. Stat. § 196.374 for energy efficiency.*

1.3.5 ***Utilities Only*** *– EGEAS Modeling*

1.3.5.1 *Describe the 25-year optimal generation expansion plan for all of the entities that are part of the generation plan.*

1.3.5.2 *The EGEAS modeling should include a 30-year extension period.*

1.3.5.3 *The solar resource should be modeled as non-dispatchable, using an hourly solar profile.*

1.3.5.4 *EGEAS modeling should be filed on disc as described in the PSC ERF Policy/Procedure Filing guide. (http://apps.psc.wi.gov/vs2015/ERF/documents/ERF%20Filing%20Procedure.pdf)*

[SECTIONS OMITTED, ONLY APPLY TO UTILITIES]

1.3.6 ***IPPs Only*** *– Energy Agreements*

1.3.6.1 *Identify all Wisconsin utilities under contract for delivery of energy from the proposed project.*

At this time, no Wisconsin utilities are under contract for delivery of energy from this proposed Project.

Koshkonong Solar agrees to construct the Project facilities to the stricter of the National Electrical Code ("NEC")[1] or the National Electrical Safety Code ("NESC")[2], in the event that there is overlap between the codes. The NEC applies to non-supply facilities owned by non-utility entities, and the NESC applies to supply facilities owned by utilities. While there is little overlap between the NEC and NESC, in case of conflict or overlap between code requirements, Koshkonong Solar will construct, maintain, and operate all applicable Project facilities to comply with the more restrictive code requirement.

1.3.6.2 *For each utility under contract or with which an agreement in principle for delivery of energy is in place provide the following, by utility:*

1.3.6.2.1 *Rated capacity under contract.*

Not applicable at this time.

1.3.6.2.2 *Annual energy to be delivered under contract or expected to be delivered.*

Koshkonong Solar, provided it receives a CPCN from the Commission, would directly or indirectly through its affiliates, construct and operate the Project by selling the power using long term power purchase agreements. Alternatively, Koshkonong Solar would sell or assign the Project, or a portion thereof, to a public utility or other qualified entity at any time before, during or after the Project is constructed. Any future buyer or assignee will be required to meet all permit conditions and any power purchase agreement obligations associated with the Project or portion thereof. As part of any such sale or assignment, Koshkonong Solar or an affiliate may function as the

[1] National Fire Protection Association. 2020 Edition. NFPA 70 – National Electrical Code (NEC).
[2] Institute of Electrical and Electronics Engineers. 2017 National Electrical Safety Code (NESC).

EPC contractor to construct the Project and function as the operations and maintenance services provider to operate and maintain the Project.

1.4 Alternatives

Invenergy is a private, independent developer with decades of experience identifying and vetting sites for renewable energy projects. The sections below describe the process by which Invenergy identified the Project site, starting with consideration of other possible sites across Wisconsin.

Under the PSC guidelines for renewable energy development and after discussion with PSC staff, Koshkonong Solar in this Application presents a layout of 429MWac, which is 43% greater than the desired Project size of 300MW. By offering the Commission the ability to select locations of solar panels within the greater Project Area that will comprise an approved project, Koshkonong Solar is placing before the Commission a variety of feasible alternative locations, limited only by the requirement that Koshkonong Solar be able to optimize the electrical and structural arrangement as certain areas are removed from consideration.

The Koshkonong Solar Project Area encompasses approximately 6,384 acres. This is a larger footprint than Koshkonong Solar needs to complete the Project. These boundaries can accommodate the 300 MW facility and alternatives that offer a variety of different characteristics and allow the Commission to consider multiple configurations, with unique benefits, for the Project layout. The potential impacts described in this document are based on a 429 MWac layout, which is 43% in excess of the capacity of the proposed Project. The 429 MWac layout is shown in **Figure 4.1.1** and **4.1.2** (**Appendix B**).

The proposed sites for placement of solar generating equipment were evaluated for their topography, land rights, compliance with a uniform array construction, minimal impacts to adjacent residents, minimal impacts to environmentally sensitive areas and proximity to the Project's electrical infrastructure.

1.4.1 ***Utilities (CPCN)*** – ***Supply Alternatives***. *Describe the supply alternatives to this proposal that were considered (including a "no-build" option) and present the justification for the choice of the proposed option(s).*

1.4.1.1 *Describe any alternate renewable fuel options considered and why those options were not selected.*

1.4.1.1.1 *Wind*
1.4.1.1.2 *Biomass*
1.4.1.1.3 *Hydro*
1.4.1.1.4 *Landfill Gas*

1.4.1.1.5 *Fuel Cell*

1.4.1.2 *Describe Purchase Power Agreements (PPAs) considered or explain why a PPA was not considered for this project.*

1.4.1.3 *No-Build Option.*

[SECTIONS OMITTED, ONLY APPLY TO UTILITIES]

1.4.2 *Utilities (CPCN OR CA) and IPPs (CPCN) – Project Area Selection*

1.4.2.1 *Alternative Project Areas. Describe the project area screening and selection process used to select the proposed project area. Provide the following:*

1.4.2.1.1 *List individual factors or site characteristics used in project area selection.*

Invenergy began considering development of utility-scale solar energy projects in Wisconsin in late 2016 due to the ongoing decline in the cost of solar energy that would provide Wisconsin utilities an opportunity to source clean energy and capacity within the state at an affordable price. The Project Area was selected after analyzing the entire state of Wisconsin for potential utility scale solar generation sites. In evaluating sites, Invenergy considered the solar resource, proximity to transmission infrastructure, topography, ground cover and community acceptance. Favorable results for all of these categories are found in the Koshkonong Solar Project Area.

1.4.2.1.2 *Explain in detail how brownfields were considered in the selection of sites to develop.*

The potential use of existing Brownfield sites within the region was evaluated. A comprehensive list of Brownfield sites was accessed from the US EPA website[3] covering southern Wisconsin, particularly Dane, Columbia, Dodge, Green, Jefferson, Rock, Sauk and Iowa Counties. **Table 1.4.2** summarizes the number and size range of Brownfields site in those counties. Dane County has the most Brownfields sites although all but three are less than five acres; with the largest at 42.6 acres which is insufficient to support a utility scale solar project.

Table 1.4.2. Brownfields Sites in Southern Wisconsin Counties

County	Number of Sites	Size Range (Acres)
Dane	40	0.6-42.6
Columbia	1	2.4
Dodge	1	0.1

[3] U.S. Environmental Protection Agency (US EPA). 2021. Geospatial information for Brownfield Properties with latitude/longitude data.

Table 1.4.2. Brownfields Sites in Southern Wisconsin Counties		
County	**Number of Sites**	**Size Range (Acres)**
Green	1	0.4
Jefferson	6	0.19-17.87
Rock	13	0.05-19.44
Sauk	10	0.5-4.99
Iowa	0	N/A

None of the sites reviewed were large enough to host a 300MW project nor were any deemed suitable for solar development using the tiered evaluation approach outlined in Section 1.4.2.2. Given the land requirements of the proposed Project, it was concluded that no Brownfields sites in the region would be suitable.

1.4.2.1.3 *Explain how individual factors and project area characteristics were weighted for your analysis and why specific weights were chosen.*

From the individual factors noted in Section 1.4.2.1.1 (solar resource, proximity to transmission infrastructure, topography, ground cover, and community acceptance), all are critical to the successful development of a utility scale solar generation project. Koshkonong Solar equally weighted all factors in selecting the final project location.

1.4.2.1.4 *Provide a list of all project areas reviewed with weighted scores for each siting factor or characteristic used in the analysis.*

As noted in the previous section, Koshkonong Solar views the described siting factors equally. A more detailed description of the Project's approach to site selection process is described in Section 1.4.2.2 below.

1.4.2.2 *Provide a narrative describing why the proposed project area was chosen.*

Tier One Evaluation – State Level

Koshkonong Solar reviewed several solar resource datasets to identify areas within the state with adequate solar resource necessary to make the Project economically feasible. Unlike wind energy sites, where the resource is very site specific, the solar resource can be characterized on a more expanded or regional level. Based on data collected, southern Wisconsin was identified as one of the strongest resources in the state due to its solar irradiance and favorable weather patterns. As a result of these findings, Koshkonong Solar moved ahead to further evaluate the region.

Tier Two Evaluation – Regional Level

The purpose of a second tier evaluation was to determine if specific criteria could be met within the region that would result in the identification of a viable Project Area. The key criteria were sufficient land available for this size project, market access, engineering and design considerations, environmental compatibility, and community support and acceptance. Specifically, Koshkonong Solar evaluated the following:

- Availability of land and compatibility with existing land uses including consideration of ground cover;
- Slopes;
- Project engineering and design parameters;
- Location of existing substations and transmission lines suitable for interconnection;
- Community and landowner support and acceptance of the Project; and
- Preliminary review of environmentally sensitive areas, such as parks, wetlands, waterbodies, and habitats.

The results of the evaluation identified an area of land within Dane County that met the criteria needed for further development of the Project. The following conclusions were made about the area identified during the Tier Two evaluation:

- Significant tracts of cleared land are available within the region.
- Specific areas of the region are suitably flat to allow for economical construction of solar energy generation equipment.
- The Project Area is located near an existing electric substation thought to be suitable for interconnection. Koshkonong Solar filed an interconnection request and the MISO study process has made a preliminary determination of necessary network upgrades for the project that support the preliminary conclusion that the point of interconnection is suitable for this purpose.
- Initial and ongoing community and landowner outreach indicated community support and acceptance of the Project in the proposed area. Specifically, local landowners recognized solar's economic value compared to their traditional farm operations and entered into voluntary solar easements.
- Koshkonong Solar performed preliminary environmental reviews to determine sensitive environmental resources in the Project Area to avoid or minimize any potential adverse environmental impacts. The preliminary reviews showed adverse impacts to the environment are avoidable and/or unlikely.
- Koshkonong Solar perceived the community of Dane County as generally being supportive of renewable energy development and this perception was confirmed by Dane County's April 2020 publication of the 2020 Dane County Climate Action Plan[4], that, among other ambitions, sets a goal of hosting 1200 MW of solar generation in the County, including utility scale solar projects like Koshkonong Solar. The Plan stated "The County will promote both large (utility)

[4] Dane County Office of Energy and Climate Change. 2020. Dane County Climate Action Plan.

scale and small-scale solar projects by partnering with utilities and solar developers to support and reward solar project landowner participants in instances where participation results in water quality, farmland preservation, ecosystem, and carbon sequestration benefits… In addition to critical GHG emission reductions, solar farms with native perennial plantings will replenish and build up soil fertility, retain water and reduce flooding, improve water quality by reducing runoff and nutrient loading, and improve ecosystem benefits. Maybe most interestingly, both solar and wind power will preserve farmland and preserve farms. There is no question that the high rent that solar and wind developers are able to pay farmers will give many family farms a guaranteed income that will make the difference in allowing some farmers to continue farming." Further, the Plan expressed support for energy storage developments such as Koshkonong Solar is proposing.

Tier Three Evaluation – Project Area Level

Once the Project Area was identified from the Tier Two evaluation, Koshkonong Solar continued to collect data, refine placement of the solar arrays based on engineering and design parameters, and conduct community and landowner meetings to solicit public input. Specifically, Koshkonong Solar held and participated in in-person and virtual meetings with individual residents in the project area, the Town of Christiana, the Town of Deerfield, the Village of Cambridge, and the Village of Rockdale. Most notably from the Town of Christiana and the Village of Cambridge, Koshkonong received valuable feedback that was incorporated into the layout presented in this Application. Some examples of changes made from an initial draft layout to this Application layout include the following:

- The Project Area was considerably reduced to include only the parcels thought to provide optimal opportunity for placement of solar generation facilities.
- The Project Area specifically omits two properties owned by two Town of Christiana residents who engaged early with Koshkonong Solar and clearly expressed that they did not want to host solar facilities on their properties.
- Array layouts adjacent to residences were altered to provide greater setbacks than required, with particular attention paid to residential properties that share more than one boundary with a parcel under solar easement.
- Based on feedback from the Village of Cambridge expressing concern about the aesthetics of solar on the approach to the Village on Highway 12/18, additional frontage area along the Highway was designated as Alternate Array area instead of Primary Array area, and aesthetic enhancements in these areas were incorporated into the Vegetation Management Strategy ("VMS"). (*See* **Appendix W**). In response to concerns expressed by the Village of Cambridge regarding potential future expansion into the Project Area, certain areas were either removed from consideration for solar array areas or designated as Alternate Array areas. Koshkonong Solar remains in communication with the Village of Cambridge and welcomes further

discussions on these subjects and others, and is open to negotiating an agreement with the Village.

- The Project Substation and BESS facilities were relocated to be within an existing high-voltage transmission corridor with transmission lines to the east and west of the proposed facilities. A large gravel mining operation is also located in close proximity.
- Natural corridors were extended to allow for easier wildlife and snowmobile access and movement.

In addition, to satisfy the requirement that the Project propose alternative sites, the impacts described in this document are based on a 429MWac layout, which is 43% in excess of the capacity of the proposed Project. Koshkonong Solar is seeking approval to place Project facilities for a 300 MW project on any of the participating Project land as shown in **Figure 4.1.1** (**Appendix B**) that is approved by the Commission in order to provide flexibility and efficiency in the placement of project facilities.

Within the Project Area, specific criteria for the tier three evaluation included the following:

- Land use and zoning, including applicable setback requirements;
- Site topography and slopes;
- Geology;
- Soils;
- Existing vegetative communities;
- Threatened and endangered species;
- Archaeological and historical resources;
- Surface water resources;
- Wetlands;
- Floodplains;
- Projected noise levels;
- Aviation;
- Recreation and publicly owned lands;
- Community services;
- Transportation infrastructure;
- Efficiency of construction and conformity to uniform arrays; and
- Public outreach and feedback from Project neighbors.

Koshkonong Solar believes that the most efficient construction can be attained by constructing the Project in uniform "power blocks." An ideal configuration from a constructability standpoint for 4.2 MW inverters would be rectangles with an inverter in the center and the surrounding acres being used for PV modules on the tracking system that feed electricity to that inverter. If the inverter ultimately chosen for the Project differs from 4.2 MW, the power block layout would be correspondingly impacted. Koshkonong Solar requests that the Commission recognize the merits of

constructing in uniform power block arrays. If certain portions of the designated Primary Array areas are determined to be unsuitable, Koshkonong Solar will reconfigure the remaining, approved areas to retain complete and uniform power blocks, rather than designing areas for partial and/or non-uniform power blocks.

To the extent any given area is determined by the Commission to be unsuitable for Project infrastructure, Koshkonong Solar asks the Commission to consider the practical effects of such a decision on the Project design and constructability. If a specific portion of the Primary Array area is rejected and a power block cannot be shifted, the result would be suboptimal from a construction standpoint as that particular power block would have unique wiring and racking considerations that create additional engineering, logistical and construction complications. Koshkonong Solar seeks to utilize uniform power blocks which will result in more efficient design, construction, and operation of the Project, and thus a more economical Project for the ultimate customer.

Koshkonong Solar respectfully requests that the Commission review all of the proposed Primary and Alternate Array areas and approve all locations deemed suitable for use by Koshkonong Solar. Koshkonong Solar will make final equipment and design decisions in a cost-efficient manner.

1.5 Utilities (CPCN OR CA) and IPPs (CPCN) – Site Selection

1.5.1 *List the individual factors or characteristics used to select the proposed and alternate panel sites.*

Within the Project Area, the proposed sites for placement of solar generating equipment were evaluated based on topography, land rights, FEMA floodplains and flood potential, adherence to a "power block" design, potential impact on wetlands and other protected areas, existing underground pipelines, cultural resources, existing transmission and distribution lines, shading impacts from existing vegetation, potential impacts to adjacent residents, the Village of Cambridge comments, and proximity to the Project's proposed electrical infrastructure.

1.5.2 *Provide information on how site characteristics and the type/s of panels chosen factored into the selection of the final panel sites.*

Using high efficiency modules enables the Project to minimize the footprint required to reach the desired capacity. To minimize environmental impact, the Project utilizes primarily relatively flat, open terrain, in order to minimize grading, and clearing of wooded areas. The panel sites throughout the project were selected to avoid impacts to areas designated as wetlands. In addition, where possible, the layout included symmetrical 4.2MW power blocks and sited panels on parcels in proximity to each other to maximize the electrical efficiency, simplify the design, construction, and operation, and to minimize the cost of underground collection lines.

1.5.3 *Setback distances*

1.5.3.1 *Provide the minimum setbacks for both boundary fences and solar panels from:*

- *residences*
- *property lines*
- *other buildings (e.g., animal barns, storage sheds)*
- *roads*
- *any other features.*

Table 1.5.3.1 provides an inclusive list of setbacks used for the Project layout.

Table 1.5.3.1– Koshkonong Solar Setback Matrix	
Type	**Distance to Solar Panels (feet)**
Dane County: FP-35 (Farmland Preservation), FP-1 (Farmland Preservation), RM-16 (Rural Mixed-Use), RR-4 (Rural Residential), & UTR (Utility, Transportation, and Right-of-Way)[5] [6] ** No specific setbacks have been defined from Project fence lines. All fence lines will be outside of road rights-of-way and will not encroach on any adjacent parcels.	
Yards/Property Line (participating and non-part.)	Not less than 20ft from lot lines.
Shoreland	Not less than 75 feet from the ordinary high-water mark of any navigable waterway
Wetlands greater than 2 acres in size	Not less than 75 feet
Wetlands less than 2 acres in size	Target of 50 feet where feasible
Federal and State highways	100 feet from centerline or 42 feet from the right-of-way of all Federal and State highways
County Trunk highways	75 feet from centerline or 42 feet from right-of-way for all County Trunk highways
All other road ROW	63 feet from centerline or 30 feet from right-of-way
Pipeline	Not less than 50 feet (based on assumed 50 ft operating ROW with additional 25 ft on either side during construction)
Transmission	Not less than 50 feet (based on assumed 100 ft ROW)

[5] Dane County. February 8, 2019. Rural Zoning GIS Feature Layer: Open Data Portal.
[6] Dane County. January 30, 2020. Zoning Ordinance.

Table 1.5.3.1– Koshkonong Solar Setback Matrix	
Type	**Distance to Solar Panels (feet)**
Non-participating residences	Not less than 100 feet
Participating residences	Not less than 100 feet
Other buildings	Not less than 20 feet

During final design and engineering, if right of way distances are determined to be greater than the assumptions listed in **Table 1.5.3.1** for pipelines and transmission lines, Koshkonong Solar will ensure both panels and fences are set outside of these rights of way.

1.5.3.2 *Identify any sites where non-participating "good neighbor" agreements are needed or have been executed.*

As of the time of the application, no good neighbor agreements have been offered or executed. Koshkonong Solar will make offers of good neighbor agreements to landowners of residential property immediately adjacent to proposed arrays and will negotiate such agreements in good faith.

1.5.3.3 *Status of easement agreements:*

1.5.3.3.1 *Identify all project sites with easement agreements that have been signed.*

1.5.3.3.2 *Identify all sites where easement agreements have not been signed and provide a short description of the status of negotiations.*

All solar easements required to construct a 300 MW solar facility have been acquired. The easement type and status are listed in **Table 1.5.3.3**.

Table 1.5.3.3 Landowner Easement Type and Status				
Number	**Landowner Name**	**Type**	**Status**	**Fence ID**
1	Duane L. Skaar and Dorothy J. Skaar Joint Revocable Living Trust	Solar Easement	Signed	M, N, P
2	Dale E. Lund, Ronald A. Lund, James E.	Solar Easement	Signed	G, M, N, S, V

Table 1.5.3.3 Landowner Easement Type and Status				
Number	**Landowner Name**	**Type**	**Status**	**Fence ID**
	Lund, and Dennis J. Lund			
3	James E. Lund, Dale E. Lund, and Ronald A. Lund d/b/a Lund Brothers Farms	Solar Easement	Signed	N, P
4	Donald T. Larson and Barbara M. Larson, and George A. Waag and Jacqueline S. Waag	Solar Easement	Signed	M, N
5	G & L Acres LLC	Solar Easement	Signed	A, B, C, D, E, F, J, K, W, X, BB, EE, FF, GG
6	G & L Acres LLC	Solar Easement	Signed	
7	G & L Acres LLC	Solar Easement	Signed	
8	Andrew R. Mikkelson, Aaron L. Mikkelson, and Melissa J. Kaashagen	Solar Easement	Signed	R
9	David W. Smithback and Tammie L. Smithback	Solar Easement	Signed	U
10	Randy R. Knickmeier	Solar Easement	Signed	P
11	Gary R. Rattmann	Solar Easement	Signed	None, between DD and Y
12	Geraldine Rattmann	Solar Easement	Signed	T, W

Table 1.5.3.3 Landowner Easement Type and Status				
Number	**Landowner Name**	**Type**	**Status**	**Fence ID**
13	Howard Lien & Sons, Inc.	Solar Easement	Signed	X, Y, Z, DD
14	Duane Hinchley and Tina Hinchley	Solar Easement	Signed	I, K, L, M, N, O, Q, DD, EE
15	Duane Hinchley and Tina Hinchley	Solar Easement	Signed	
16	F & L Rental Holdings, LLC.	Solar Easement	Signed	S
17	Katherine I. Young Irrevocable Living Trust	Collection Easement	Signed	None. South of X.
18	Katherine I. Young Irrevocable Living Trust	Purchase option	Signed	None. South of X.
19	James M. Thompson	Solar Easement	Signed	CC
20	Duane V. Hinchley and Tina M. Hinchley Revocable Trust	Collection Easement	Signed	None, between G and I
21	Hepta S, Inc.	Collection Easement	Signed	None, between Y and Z
22	Robert P. Riege and Kim D. Riege	Solar Easement	Signed	AA
23	G & L Acres LLC	Solar Easement	Signed	A, B, C, D, E, F, J, K, W, X, BB, EE, FF, GG
24	Barbara L. Melton	Solar Easement	Signed	M, N
25	Howard Lien & Sons, Inc	Collection Easement	In Negotiation	None, south of Z

Table 1.5.3.3 Landowner Easement Type and Status				
Number	**Landowner Name**	**Type**	**Status**	**Fence ID**
26	Howard Lien & Sons, Inc.	Collection Easement	In Negotiation	None, east of Z
27	David Gunnulson	Collection Easement	In Negotiation	None, between EE and GG
28	Dollie R. Birkrem	Solar Easement	In Negotiation	H
29	Arington Tree Farm LLC	Collection Easement	In Negotiation	None, east of AA
30	Coolwater Farms LLC	Solar Easement	In Negotiation	B
31	Geraldine Rattmann	Purchase Option	In Negotiation	W
32	G & L Acres LLC	Purchase Option	In Negotiation	W, X

1.6 Utilities Only – Cost

1.6.1 Provide capital cost of the completed facility organized by Plant Account Codes (PAC) found in the PSC's Uniform System of Accounts for Private Electric Utilities – 1/1/90. Provide a breakdown within each PAC and a subtotal. *Include, at least, the following PACs:*

1.6.1.1 *PAC 340 –Land and Land Rights.*

1.6.1.2 *PAC 341 – Structures and improvements (operation and maintenance (O&M) buildings, access roads).*

1.6.1.3 *PAC 344 – Generators (foundations, engineering, procurement, construction management, erection).*

1.6.1.4 *PAC 345 – Accessory Electrical Equipment (substation, meteorological towers, collector circuit system, SCADA.*

1.6.2 *Provide the complete terms and conditions of all lease arrangements.*

1.6.2.1 *Site lease*

1.6.2.2 *Neighbor or non-participant agreements*

1.6.2.3 *Provide a statement demonstrating how conditions of Wis. Stat. § 196.52(9)(a)3(b) have been met (this pertains to leased generation contracts).*

1.6.2.4 *Affiliated interest approvals required. Include those applied for or received.*

1.6.3 *Discuss and provide the comparative costs of the alternatives identified and evaluated in Section 1.4.*

1.6.4 *Describe the effect of the proposed project on wholesale market competition. Include a description of how, at the time of this filing, the proposed facility would be treated as an intermittent resource in the Midcontinent Independent System Operator, Inc. (MISO) market.*

1.6.5 *Provide an estimate of the expected life span for the power plant.*

1.6.6 *Describe how the facility would be decommissioned at the end of its life span.*

1.6.6.1 *Provide an estimate of the cost of and source of funding for decommissioning.*

[SECTIONS OMITTED, ONLY APPLY TO UTILITIES]

1.7 IPPs Only – MISO and Project Life Span

1.7.1 *MISO Market. Describe how, at the time of this filing, the proposed facility would be treated as an intermittent resource in the MISO market.*

Intermittent resources in MISO, such as solar and energy storage, may qualify to provide both energy and capacity to the MISO market so long as they are registered with MISO and deliverable to load via Network Resource Interconnection Service (NRIS) or Firm Transmission Service. Koshkonong Solar has applied to MISO for NRIS for the full 300 MW AC of proposed capacity of the solar component of the Project plus an additional 165 MW AC for the battery energy storage component of the Project.

Koshkonong Solar believes there is market opportunity for an approximately 165 MW BESS at this site to accompany the 300 MW of solar generation. Koshkonong Solar currently has two interconnection positions in the MISO 2019 cycle and one in the MISO 2020 cycle that will be utilized for this purpose. The 2019 interconnection positions, one for 300 MW of solar generation and one for a 75 MW BESS are relatively straightforward, while use of the 2020 position to build out an additional 90MW of BESS will require additional approvals from MISO outside of the traditional interconnection process. Koshkonong Solar is pursuing two paths to obtain these MISO approvals:

1) Koshkonong Solar has submitted a request to change the fuel type of its 2020 cycle request via MISO's Permissible Technological Advancement Process. This allows an interconnection customer to substitute a different technology type while retaining the same level of requested interconnection service if the interconnection customer requests this change early in the study process and can demonstrate the change will not have a material impact. Koshkonong Solar has proposed to convert the 200 MW 2020 cycle solar position to a hybrid configuration of 110 MW of solar generation and 90 MW of storage. If this is successful, the 90 MW of storage could be utilized in this Project while the 110 MW of solar capacity in the 2020 queue position would be reserved for a potential future CPCN application.

2) Alternatively, Koshkonong Solar could pursue MISO's Surplus Interconnection process to add an additional 90 MW BESS to the current 300 MW solar interconnection position. MISO's current rules do not allow interconnection customers to file a Surplus Interconnection request until a project's GIA is executed. Koshkonong Solar does not expect to execute the GIA for its 2019 queue position for 300 MW solar generation until February 18, 2022. However, MISO is pursuing an amendment to its tariff which would allow a Surplus Interconnection application after DPP2. If approved by FERC, this option may become available by September 2021. As of now, DPP2 is scheduled to be complete by May 10, 2021 and if the Permissible Technological Advancement Process is not complete by the time the new tariff is in place, Koshkonong Solar may pursue the Surplus Interconnection process in parallel with the Permissible Technological Advancement Process.

Per MISO's Business Planning Manual 11[7], Section 4.2.3.4.1, solar photovoltaic (Solar PV) projects in MISO have their capacity value determined based on the three year historical average output of the resource for hours ending 15, 16, and 17 EST for the most recent summer months (June, July, and August). Solar PV resources that are new, upgraded or returning from extended outages submit all operating data for the prior summer with a minimum of 30 consecutive days, in order to have their capacity registered with MISO. A resource with less than 30 days of metered values would receive the class average of 50% for its Initial Planning Year.

1.7.2 *Provide an estimate of the expected life span for the power plant.*

The expected life span for this solar power facility is 35 to 50 years. The base operating case for the Project is 35 years, but actual life span could be longer. The Solar Lease and Easement Agreements provide for a total operating period of 50 years.

1.7.3 *Describe how the facility would be decommissioned at the end of its life span.*

At the end of commercial operation, Koshkonong Solar will be responsible for removing all of the solar arrays and associated facilities to a depth of four feet below grade. Koshkonong Solar reserves the right to extend Commercial Operations by applying for an extension of any required permits. Should Koshkonong Solar decide to continue operation, it will evaluate whether to continue with the existing equipment or to upgrade the facility with newer technologies.

Decommissioning of the Project at the end of its anticipated 35 - 50 year useful life would include removing the solar arrays, inverters, transformers, above-ground

[7] Midcontinent Independent System Operator (MISO). December 15, 2020. Business Planning Manual 11.

portions of the electrical collection system, fencing, lighting, Project Substation, access roads, O&M facility, and the BESS from the Project Area.

The BESS will be decommissioned in an environmentally safe manner, and consistent with best practices in the industry, as recommended by the U.S. Energy Storage Association.

For other Project components, standard decommissioning practices will be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements and equipment, followed by restoration of the site.

Though Koshkonong Solar is not aware of any photovoltaic solar energy generating systems greater than 100MW that have been decommissioned, the construction methods and materials have been used in other projects for decades, and as an industry, decommissioning methods are common.

Koshkonong Solar expects to implement the following decommissioning plan:

Timeline
Decommissioning is estimated to take approximately 12 months to complete.

Removal and Disposal of Project Components

- Solar and battery modules will be inspected for physical damage, tested for functionality, and removed from racking. Functioning modules will be packed and stored for reuse. Non-functioning modules will be sent to the manufacturer or a third party for recycling or other appropriate disposal method.
- Racking, poles, and fencing will be dismantled/removed and will be sent to a metal recycling facility. Holes will be backfilled.
- Project facilities will be removed to a depth of four feet as part of decommissioning.
- Aboveground wire will be sent to a facility for proper disposal and/or recycling. Belowground wire will be cut back to a depth of four feet and abandoned in place.
- Aboveground conduit will be disassembled onsite and sent to a recycling facility.
- Junction boxes, combiner boxes, and external disconnect boxes will be sent to an electronics recycler.
- Inverters will be sent to the manufacturer or an electronics recycler as applicable and functioning parts will be reused.
- Material from concrete pads will be removed and sent to a concrete recycler.
- Computers, monitors, hard drives, and other components will be sent to an electronics recycler and functioning parts will be reused.
- Unless otherwise requested by the landowner, permanent access roads constructed for the Project will be removed.

- After all equipment is removed, the Project Area will be restored to a condition reasonably similar to its pre-construction state.
- Invenergy has experience recycling lithium-ion batteries, working with a highly qualified third-party that provides a cradle-to-grave recycling and transportation program. Invenergy will continue to develop decommissioning plans to safely reuse, recycle, and/or dispose of end-of-life batteries with industry experts. Based on Invenergy's experience recycling lithium-ion batteries, Koshkonong Solar anticipates that at the end of the life of the project, operational batteries will be considered for second-life operations and batteries that cannot be reused will be recycled or safely disposed of. Other BESS components will be disassembled and recycled, and the containers will be removed from the site.

To facilitate a return to agricultural use following decommissioning, the land would be tilled to break the new vegetative growth, which will have enhanced the topsoil condition as further discussed in section 5.13.

1.7.3.1 *Provide an estimate of the cost of and source of funding for decommissioning.*

At the 15th anniversary of the commencement of operations, Koshkonong Solar will post a form of financial security, such as a surety bond, letter of credit, escrow account, reserve fund, parent guarantee or other suitable financial mechanism, if any net cost of decommissioning exists.

Upon receipt of a CPCN and evaluation of all permit conditions, and completion of final site design and engineering, Koshkonong Solar will prepare a site-specific decommissioning cost estimate. In advance of this, Koshkonong Solar has conducted further research of third-party projects and expects the total cost of decommissioning of Koshkonong Solar at the end of its useful life would be in the range of $0 to $8.4 million net of salvage value. The figure is non-binding, and based on the evaluation of salvage value prices of the relevant equipment and facilities.

Koshkonong Solar believes that establishing a decommissioning funding source coinciding with the commencement of commercial operation is unnecessary. Establishing a fund on the project's 15th anniversary of the commencement of operations is a more reasonable approach.

1.8 Utilities and IPPs – Required Permits and Approvals

1.8.1 *Approvals and Permits. For each of the regulatory agencies listed below provide the following information:*

- *regulatory agency,*
- *the approvals/permits required,*
- *application filing date,*

- *the status of each application,*
- *agency contact name and telephone number.*

1.8.1.1 *Federal*

1.8.1.1.1 *Federal Aviation Administration (FAA)*
1.8.1.1.2 *U.S. Army Corps of Engineers*
1.8.1.1.3 *U.S. Fish and Wildlife Service*
1.8.1.1.4 *Other federal agencies not listed above*

1.8.1.2 *State*

1.8.1.2.1 *WisDOT*
1.8.1.2.2 *DNR*
1.8.1.2.3 *Other state agencies not listed above*

1.8.1.3 *Local Permits – including county, town, city, and village*

Table 1.8.1 addresses the requirements of Section 1.8.1 of the Application Filing Requirements, including all subsections, i.e., 1.8.1.1 through 1.8.1.3. The permits listed below are required as a general matter for new development based on the Applicant's review of applicable law. Permits to be applied for will be determined based on Applicant's final site plan preparation following issuance of a Final Decision on the Application.

Table 1.8.1 – Regulatory Permits and Approvals

Permit	*Regulatory Agency and Contact*	*Trigger/Notes*	*Filing Date*	*Status*
Certificate of Public Convenience and Necessity (CPCN)	*PSCW* *Gas and Energy Division* *Jennifer Hamill, PE – Engineering Supervisor* *Jennifer2.Hamill@wisconsin.gov*	*New electric generating facility over 100MW*	*4/15/21*	*Application Filed*
Engineering Plan	*WDNR* *Office of Energy* *Geri Radermacher – Wetland Regulatory/Zoning Specialist* *262-574-2153* *Geri.Radermacher@wisconsin.gov*	*CPCN*	*12/18/20*	*Response Received 1/8/21*

Table 1.8.1 – Regulatory Permits and Approvals				
Permit	*Regulatory Agency and Contact*	*Trigger/Notes*	*Filing Date*	*Status*
Wisconsin Pollutant Discharge Elimination System (WPDES) Construction Site Permit	*WDNR* *Water Quality Bureau* *Adrian Stocks* *Natural Resources Manager* *608-266-2666* *Adrian.Stocks@wisconsin.gov*	*Required due to Project size*	*Anticipated Q2 2022*	*Draft ECSWMP in Appendix L*
Pond/Artificial Waterbody/Stormwater General Permit	*WDNR* *Office of Energy* *Geri Radermacher – Wetland Regulatory/Zoning Specialist* *262-574-2153* *Geri.Radermacher@wisconsin.gov*	*Construction of a stormwater basin within 500' of a navigable waterway*	*Anticipated Q2 2022*	*To be completed*
Private Well Notification Number	*WDNR* *Bureau of Drinking and Groundwater* *Deborah Lyons-Roehl* *Operations Program Associate* *608-267-9350* *Deborah.LyonsRoehl@wisconsin.gov*	*Required if a new well is constructed for the O&M building*	*Only required if it is deemed necessary to drill a new well for the O&M facilities.*	*To be completed if deemed necessary for the O&M building.*
Utility Permit	*WisDOT –SW Region* *Bureau of Highway Maintenance* *Mark Goggin* *Permit Coordinator* *608-789-5955* *mark.goggin@dot.wi.gov* *dotdtsdswutilitypermits@dot.wi.gov*	*Utility crossing permits to construct or maintain a utility facility in Dane County (SW Region)*	*Anticipated Q2 2022*	*To be completed*

Table 1.8.1 – Regulatory Permits and Approvals				
Permit	*Regulatory Agency and Contact*	*Trigger/Notes*	*Filing Date*	*Status*
Driveway Permit	*WisDOT-SW Region* *Scot Hinkle* *Bureau of Highway Maintenance* *608-246-5334* *scot.hinkle@dot.wi.gov*	*For new driveway entrances on state roads in Dane County (SW Region)*	*Anticipated Q1 2022*	*To be completed*
Oversize-Overweight Permit	*WisDOT* *Bureau of Highway Maintenance* *P.O. Box 7980* *Madison, WI 53707-7980* *608-266-7320* *Oversize-permits.dmv@dot.wi.gov*	*For transportation of oversize-overweight loads, such as the substation*	*Anticipated Q2 2022*	*To be completed*
Burial Site Disturbance	*Wisconsin Historical Society* *Kimberly Cook, 1-800-342-7834* *kimberly.cook@wisconsinhistory.org*	*For alternate collection routed through a burial site (no impact anticipated)*	*Anticipated Q2 2021*	*To be completed*
Stormwater Permit and Erosion Control Permit	*Dane County* *Land Use & Water Resources Department* *Jeremy Balousek* *Water Resource Engineering Division Manager* *608-225-6535* *balousek@countyofdane.com*	*Land disturbance activities*	*Anticipated Q2 2022*	*To be completed*
Access (Driveway) Permit	*Dane County Department of Public Works, Highway and Transportation* *Sue LeBrun*	*Required for new connection to county right-of-way*	*Anticipated Q2 2022*	*To be completed*

Table 1.8.1 – Regulatory Permits and Approvals				
Permit	*Regulatory Agency and Contact*	*Trigger/Notes*	*Filing Date*	*Status*
	Highway Engineer *608-266-9081* *lebrun.susan@countyofdane.com*			
Permit to Work in County Trunk Highway Right-of-Way	*Dane County Department of Public Works, Highway and Transportation* *Sue LeBrun* *Highway Engineer* *608-266-9081* *lebrun.susan@countyofdane.com*	*Required for installation of utilities in county right-of-way.*	*Anticipated Q2 2022*	*To be completed*
Oversize-Overweight Permit	*Dane County Department of Public Works, Highway and Transportation* *Geral Mandli* *Commissioner/Director* *608-266-4039* *mandli@countyofdane.com*	*Use of non-divisible loads exceeding statutory sizer and/or weight on County Trunk Highways, such as for the Project Substation*	*Anticipated Q2 2022*	*To be completed*
Sanitary Permit/POWTS Plan Review	*Public Health Madison & Dane County* *Environmental Health* *608-242-6515* *privatewellseptic@publichealthmdc.com*	*Required for installation of on-site septic system. Dane County is a POWTS Designated Agent by DSPS for plumbing plan reviews (<5,000 gallons per day).*	*Anticipated Q2 2022*	*To be completed*
Well Location Permit	*Public Health Madison & Dane County* *Environmental Health* *608-242-6515* *health@publichealthmdc.com*	*Required for construction of a private well. Intended for O&M building.*	*Only required if it is deemed necessary to drill a new well for the*	*To be completed if deemed necessary for the O&M building.*

Table 1.8.1 – Regulatory Permits and Approvals				
Permit	*Regulatory Agency and Contact*	*Trigger/Notes*	*Filing Date*	*Status*
			O&M facilities.	
Building Permit	*Town of Christiana* *James Trebian* *Building Inspector* *608-745-4070* *jtrebian@generalengineering.net*	*Required for construction of any structure; intended for the O&M building*	*Anticipated Q2 2022*	*To be completed*
Driveway Permit	*Town of Christiana* *Public Works Department* *Town Garage* *608-423-3816*	*Required for construction of a new driveway on a town road*	*Anticipated Q2 2022*	*To be completed*
Driveway Permit	*Town of Deerfield* *Highway Patrolman* *Al Pulvermacher* *608-764-5615*	*Required for construction of a new driveway on a town road.*	*Anticipated Q2 2022*	*To be completed*

All direct wetland or waterway impacts will ultimately be avoided through adjustment of Project design to avoid field-verified resources, or through construction methods (i.e., directional boring of collection line and siting of surface disturbance outside boundaries of wetlands and waterways). As such, USACE Section 404 and DNR Section 401 permits related to wetland or waterway impacts will not be required.

No endangered species impacts are anticipated that would necessitate permits from the US Fish and Wildlife Service (USFWS) or WDNR. Agency feedback received during the November 18, 2020, January 14, 2021, and February 25, 2021 meetings to discuss environmental resources and project plans indicated the Project design and construction/operational plans reasonably avoided impacts to special-status species and resources.

Because the Project is not proposed to be developed on or near an airport, the Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated

Airports (78 FR 63276)[8] does not apply. Similarly, because no proposed structures will exceed listed height thresholds, Notice of Construction is not required under 14 FR Part 77[9], nor are WisDOT high structures permits required[10]. Section 5.14.3 provides further discussion regarding FAA and WisDOT permits.

The DATCP Agricultural Impact Statement is not required, since Koshkonong Solar is not a public utility and will not be utilizing eminent domain.

1.8.2 *Correspondence with Permitting Agencies. Provide copies of correspondence to and from state and federal agencies that relate to permit approval, compliance approval, or project planning and siting. Provide copies of any correspondence to or from local governments. This should continue after submittal of the application.*

Copies of official correspondence to and from state and federal agencies that relate to permit approval, compliance approval, or Project planning and siting are listed below and included in **Appendix A**, with the exception of the WDNR Endangered Resource Review ("ERR"), which is included as confidential information in **Appendix K**. A log of meetings with agencies, local governments, and other interested parties is also included in Section 7.2. **Table 1.8.2** summarizes the correspondence with permitting agencies.

Table 1.8.2 Correspondence with Permitting Agencies

Correspondence	Regulatory Agency	Trigger / Notes	Filing Date	Meeting Date	Status
Endangered Resources Review	DNR	CPCN	ERR 10/8/19; Updated 11/2/20 and 3/10/2021	11/18/20, 1/14/21, and 2/25/2021	Completed (Confidential **Appendix K**)
Engineering Plan	DNR	CPCN	12/18/20	11/18/2020 and 1/14/21	Response Received 1/8/21 (**Appendix A**)

[8] Federal Aviation Administration (FAA). October 23, 2013. Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports (78 FR 63276).
[9] FAA. July 21, 2010. CFR Part 77 for the Safe, Efficient Use and Preservation of the Navigable Airspace.
[10] Wisconsin Department of Transportation. 1994. Chapter Trans 56 – Erection of High Structures.

Federal Threatened and Endangered Species Consultation	USFWS	CPCN	IPaC 10/15/19; Updated 11/5/20 and 3/10/2021	1/14/21	Completed (Confidential **Appendix A**)
Noise Receptors Location Review	PSC	CPCN	Provided 3/5/2021	Approved 3/8/2021	Completed via email. **(Appendix A)**
Visual Simulation Location Review	PSC	CPCN	Provided 3/9/2021	Approved 3/16/2021	Completed via email. **(Appendix A)**

2. Technical Description – Project Area, Arrays, Panels, and Ancillary Facilities

2.1 Estimated Solar Resource and Projected Energy Production

Provide a complete energy production assessment for the project. This report should include, at a minimum:

2.1.1 *Solar resource data used in analysis.*

The solar resource data used to estimate energy output was determined internally using a resource assessment, the results of which are included in Confidential **Appendix Y**. Koshkonong Solar evaluated several public and private datasets, including satellite modeled datasets such as the NREL National Solar Radiation Database (NSRDB) dataset[11], Clean Power Research (CPR) Solar Anywhere data[12], and data from 3Tier[13], as well as publicly available measurements from nearby weather stations.

2.1.2 *Gross and net capacity factor (explain the method used to calculate the capacity factors and provide the data used).*

Koshkonong Solar will have an estimated gross capacity factor of between 22 and 35 percent and an estimated net capacity factor of between 20 to 30 percent. These values were determined utilizing the PVSyst modeling software[14] (the industry standard) and realistic loss assumptions based on many years of solar generation facility operational experience. The PVSyst output report is attached as Confidential **Appendix Y**. These loss assumptions align with those observed throughout the industry.

[11] National Renewable Energy Laboratory. National Solar Radiation Database (NSRDB). Accessed 2021.
[12] Clean Power Research. Solar Anywhere data. Accessed 2021.
[13] 3Tier. Solar Online Tools. Accessed 2021.
[14] PVSyst. PVSyst Modeling Software. Accessed 2021.

2.1.3 *Estimated energy production of project.*

2.1.3.1 *Estimated production losses.*

Gross to net calculations take into account, among other factors, energy losses in the electrical collection system, mechanical availability, array losses, and system losses. Industry-wide, energy losses typically range from fifteen to twenty percent (15 to 20 percent) of maximum output for utility-scale solar.

2.1.3.2 *Estimated net energy production.*

Koshkonong Solar estimates an average annual output of between approximately 500,000 and 700,000 MWh. Annual energy production output will depend on final design, site specific features, and annual variability in the solar resource. The energy production modeling report is attached as Confidential **Appendix Y.**

2.2 Solar Panel Type and Characteristics

2.2.1 *Identify the manufacturer and model of solar panel to be used. (If no Panel Purchase Agreement has been signed, applicants should identify the panel or panels being considered. It is acceptable to identify a range by providing information on the largest and smallest panel being considered, however, consult with Commission staff prior to preparing the application).*

Solar modules or panels are more of a commodity than wind turbines or other forms of power generating equipment, and the market is more easily impacted by outside forces, such as imposition of import tariffs. In addition, new product variants (e.g. higher efficiency or higher wattage per module options) are being introduced to the market at a rapid pace. As such, it is important to maintain as much flexibility in the individual supplier and technology choice as possible until just before procurement to maintain economic viability.

PV panels produced by a number of manufacturers are under consideration for the Project, including Canadian Solar, Hanwha Qcells, JA Solar, Jinko, Longi, Risen, SunPower, and Trina. All modules under consideration are monocrystalline models. The module selected may use bifacial technology, which, unlike a monofacial module, contains a clear backsheet instead of an opaque backsheet, allowing the solar cells to absorb light entering from the back as well as from the front side of the cells.

Bifacial modules have been shown to increase production by as much as 30% at a point in time. This results in a higher annual energy yield and thus improved project economics. No material change in the Project footprint is anticipated based on the decision between utilizing bifacial panels and monofacial panels.

Koshkonong Solar will consider the costs and performance of each technology option as well as environmental and safety standards when making its final selection. This process has been included in the proposed Project timeline and the final selection should not alter the Project scope, time frame, or budget.

Modules under consideration range from 350 to 600 W DC per module. Examples of specific panel models in this range are the Longi LR6-72HBD on the low wattage end and the Jinko Eagle 72HM on the higher wattage end. While these two models are typical examples of what may be installed, final engineering will utilize current technology available, which may include higher wattage modules, to optimize project economics. It is also possible that a different manufacturer of a substantially similar product could be selected in final procurement. Examples of a wide range of modules and outputs can be found in **Appendix C.**

2.2.2 *Panel delivery date – Indicate whether or not this date is firm.*

The current construction schedule calls for panel delivery to begin in the second half of 2022. This date is not firm.

2.2.3 *Total number of panels required for project.*

Based on the module wattages under consideration the final count could range from 645,000 to 1,105,715 high efficiency solar PV panels.

2.2.4 *Technical characteristics of panels.*

2.2.4.1 *Panel physical dimensions.*

Dimensions for current panel options under consideration are approximately 1052 mm x 2131 mm (41.4 in. x 83.9 in., or about 3.5 ft. x 7.0 ft) for a typical monocrystalline module as shown on the data sheets in **Appendix C**. Total PV module surface area for the primary array areas is expected to be approximately 600 acres, pending final engineering design. If solar panels are purchased from a company other than the ones previously mentioned, the panel dimensions should be close to the size range provided. As technology changes the form factor may also vary in height or width, but no material changes to the site plan would be expected.

2.2.4.2 *Panel material/type.*

Each panel is made from crystalline silicon, anti-reflective glass, aluminum frames, copper electrical wires with plastic sheathing, and weather-resistant “quick connect” wire connectors.

2.2.4.3 *Highest and lowest points during daily rotation.*

At 60 degrees (tilted to the highest position), the highest point of the modules will be no more than 15 feet above ground and the lowest point of the modules will be at least 18 inches from the ground. Final determination of PV module heights will be made by Koshkonong Solar during final detailed project design and will be based on factors such as PV system installation cost, capital cost, construction preference, tracker mounting configuration, and site constraints.

2.2.4.4 *Any surface treatment of panels.*

During the manufacturing process, all solar panel manufacturers listed in the preceding sections treat the surface of each panel with an anti-reflective coating to minimize glare and increase efficiency. Ongoing maintenance of the solar modules is not expected to include periodic washings due to the typical precipitation levels in the area.

2.2.4.5 *Panel power curve (provide actual data – solar resource and rated output needed to create the curve).*

Appendix C (following the module data sheets) contains power curves for a variety of modules under consideration. Koshkonong Solar will provide the power curve of the final module after selection.

2.2.4.6 *Panel tolerances for extreme weather events. Include any operational actions for extreme weather events.*

Koshkonong Solar has reviewed the closest weather station's climate history (AgACIS WETS Station Stoughton, WI), as verified by the Solar America Board for Codes and Standards. Koshkonong Solar intends to purchase equipment designed to ensure the highest level of operability and reliability across the range of anticipated environmental conditions for the lifetime of the project.

Final tracking system components and pile sizes and depths will be designed to meet local building codes for wind and snow loads. Potential tracking technologies will be assessed in the context of other Project attributes, such as resource forecast and expected operating profile. A standard safety feature included in most modern solar tracking systems includes a setting or mode known as “stowing.” During extreme weather events, the trackers can enter this setting and rotate the modules to reduce the degree of load experienced on them and racking structures from high directional winds.

Likewise, the trackers can be rotated to avoid snow loading if warranted. For example, if the modules are normally stowed flat in the evenings, a snowstorm is predicted, and wind conditions are conducive (that is to say, calm), the trackers could tilt the solar modules to a maximum angle to reduce snow accumulation. Koshkonong Solar intends to purchase trackers that have the ability to rotate as described. The final selection will consider operating scenarios where equipment can operate in the

design temperature and environmental conditions. Any PV modules selected will meet international standards for hail ratings and operating temperature ranges (**Appendix C**).

2.2.5 *Technical characteristics of inverters.*

Data sheets for inverters currently being considered are provided in **Appendix C**. Typical inverter enclosures are 15 to 20 feet long by 6 to 7 feet wide by 7 to 8 feet tall. Typical pad mounted transformers that will be located on the inverter skids are approximately 10 feet wide and long, and approximately 8 to 10 feet tall. Example photos and diagrams are included on the TMEIC, SMA, GE, and Sungrow Inverter skid datasheets in **Appendix C,** which also includes typical profile views of the trackers and inverter skid equipment.

2.2.6 *Technical characteristics of any tracking systems, panel supports, and racking.*

2.2.6.1 *Type of material used for supports and racking.*

Typically, the panel mounting system consists of a steel bracket on top of the steel pile bolted to the racking superstructure.

2.2.6.2 *Tracking system used.*

The solar modules will be mounted to a horizontal single-axis tracking system. In this type of system, the panel arrays are arranged in north-south oriented rows. An electric drive motor rotates the horizontally mounted solar modules from east to west to follow the sun (on a single axis) throughout the day. The tracker rows will follow the sun from approximately 60 degrees east to 60 degrees west through the course of the day. When the sun is directly overhead, the PV modules will be at a zero-degree angle (level to the ground).

Horizontal single-axis tracking systems are typically comprised of aluminum or galvanized or stainless steel.

Multiple tracking system technologies are currently being evaluated from Tier 1 manufacturers such as Soltec, Array Technologies, and Nextracker; a similar system from a different vendor may also be selected. Models from Nextracker contain electric motors on each individual tracker row throughout the Project; Array Technologies uses a linked row system with one motor per multiple racks.

Tracking systems being considered include a “one in portrait” configuration that would consist of north-south rows of single modules in a portrait, or vertical, configuration when viewed at an angle perpendicular to the axis of the tracking system, and a “two in portrait” configuration that would consist of north-south rows of two modules. The one in portrait system would require foundations with

approximately 4 feet of "reveal" height out of the ground, an overall tip height of approximately 8 feet when the modules are tilted at maximum angles, ground clearance of about 18 inches and would have aisles with foundations spaced approximately every 20 feet. The two in portrait system would require foundations with approximately 8 feet of reveal, an overall tip height of approximately 15 feet, the same 18 inches of ground clearance and aisles with spacings of about 40 feet. A final decision will be made based on engineering, economic and reliability considerations.

2.2.6.3 *Dimensions and number of sections required.*

The Project is designed in 4.2 MW-AC power blocks, which are typically comprised of approximately 140 tracker rows, with the final number dependent on the final electrical design.

Based on the information provided in the Technical Data Sheets for the mounting systems under consideration, the tracker widths range from 6.4 feet to 12.8 feet but may fall outside this range during final engineering design. The number of sections required are dependent upon the manufacturer and type of panels installed, and the location that they are being constructed. The tracking systems under consideration have different specifications and maximum capacities of solar panels that can be installed. Estimates of the number of sections required will be provided to the Commission after a manufacturer(s) has been selected.

Additionally, a typical solar tracker may range from 100 to 350 feet long.

2.2.6.4 *Typical distances between rows, access roads, and fences.*

Distances between array rows when panels are horizontal may range from 15 to 30 feet wide. A usual minimum distance from array edges to internal access roads is 4 feet. Distance from tracker array edges to fences is typically a minimum of 20 feet.

While the information above pertains to a typical solar array, the final distances will depend on the tracker and array technology utilized following final engineering design specifications.

2.2.7 *Scale drawings of a typical panel row including inverter pad and transformer box.*

Appendix D includes an exhibit depicting a typical array configuration.

2.2.8 *Provide information on any perimeter fencing that would be used around the solar PV arrays. Describe any requirements on the fencing around the PV sites.*

The perimeter fence around the solar arrays will be up to 8-feet-high and comply with applicable electrical codes[1] [2]. No barbed wire will be used on the perimeter fence, and "deer fence" will be used, unless required otherwise by applicable codes, standards, rules, or regulations. Fencing around the Project Substation will likely be a chain link design with barbed wire to satisfy applicable security requirements for those Project components.

The NESC[2] applies only to the high-voltage portions of solar projects. This includes the Project Substation, which is addressed in NESC Part 1 and overhead transmission lines which is addressed in NESC Part 2. The NESC does not address PV Solar arrays.

Generally, the NEC[1] addresses the requirements for PV solar arrays in Section 691 for projects greater than 5 MW. Fencing requirements are in Section 110.31.

2.3 Other Project Facilities

2.3.1 *Site Construction Area. Describe the site construction area. Include location and dimensions for:*

2.3.1.1 *Solar arrays.*

A typical solar array area construction layout is provided in **Appendix D**.

2.3.1.2 *Lay-down areas.*

The temporary 19-acre general construction laydown yard is currently proposed in the central portion of the Project Area and will be located inside of the proposed fenced area, as shown on **Figures 4.1.1** and **4.1.2** (**Appendix B**). Racking materials, modules, cables and other materials would initially be stockpiled, and distributed in the field as construction sequencing progressed. This area would also host temporary construction offices and parking for personal and construction vehicles and equipment. An example of a typical laydown yard configuration is included in **Appendix D**.

Any additional temporary laydown yards that may be used during construction would be located in areas within the array fence boundaries shown in **Figures 4.1.1** and **4.1.2** (**Appendix B**), and are not anticipated to exceed 50 acres, total. A typical solar array area layout with a temporary laydown yard is shown in **Appendix D**.

2.3.1.3 *Parking area.*

Construction parking will be contained within the laydown yards described above.

2.3.1.4 *Provide a scale drawing showing the general construction setup for the solar array sites.*

A scale drawing of a typical solar array area layout with temporary laydown yard is provided in **Appendix D**.

2.3.2 *Collector Circuits.*

2.3.2.1 *Total number of miles of collector circuits required – separated by circuit type (overhead vs. underground).*

Approximately 75 miles of underground collection lines will be required for the Project's Primary Arrays. Depending on the final design, approximately 10 to 15 collector circuits are expected to be needed to connect 300 MW of solar arrays to the Project Substation. There are no overhead collector circuits planned for the Project.

2.3.2.2 *Specify the collector circuit voltage to be used.*

The collection system will operate at a nominal voltage of 34.5 kV.

2.3.2.3 *Transformer type, location, and physical size of transformer pad at each site.*

Pad mounted transformers that will be located on the inverter skids will be 3-phase, up to 4600 kVA, 34.5 kV high side, and be air cooled. The transformers are approximately 10 feet wide and long, and 8-10 feet tall. Examples of pad-mounted transformers on inverter skids are included in the TMEIC, SMA, GE and Sungrow inverter skid datasheets in **Appendix C**.

2.3.2.4 *Underground collector circuits.*

2.3.2.4.1 *Conductor to be used.*

The 34.5 kV medium voltage underground collector circuits from the Project Substation low side bus will be daisy chained to up to approximately 7 inverter stations (depending on final inverter size) per circuit. Properly sized surge arrestors will be placed at the end of each medium voltage circuit. Conductor sizes up to 1500 KCMIL will be used.

2.3.2.4.2 *Describe installation type and how lines would be laid (open-cut trench, vibratory plow, directional bore, etc.). Provide scale drawing of underground circuit.*

Collector circuits will be installed using open-cut trenches, directionally bores, or plows depending on conditions and location. Construction details for these

installation methods and a scale drawing of the underground circuit for a typical array are provided in **Appendix D**.

2.3.2.4.3 *Depth and width of trench, and minimum depth of soil cover over circuits (if applicable).*

The medium voltage cables will typically be direct buried in native soil arranged in a triangular configuration with 36" – 60" of cover in a 12" – 18" wide trench pending final engineering. Parallel trenches will be separated to maintain cable ampacity.

Underground AC collector circuit burial depths must comply with the NEC[1] 300.50 or, in certain instances, Part 3 of the NESC[2] if applicable to the Authority Having Jurisdiction (AHJ). The NEC[1] states that cables shall be installed in accordance with 300.50(A)(1), (A)(2), or (A)(3), and the installation shall meet the depth requirements of table 300.50.

2.3.2.5 *Overhead collector circuits.*

2.3.2.5.1 *Size of pole to be used.*

2.3.2.5.2 *Engineering drawing of structure to be used.*

Not applicable.

2.3.3 *Site Foundations. Describe the type of foundation or foundations to be used for each part of the project. If more than one type of foundation may be needed describe each and identify under what circumstances each foundation type would be used. Include the following:*

2.3.3.1 *Describe how the panel and inverter foundations would be installed (e.g. direct imbed, excavation for pouring of concrete footings, etc.).*

Per the preliminary geotechnical report (**Appendix T**), Koshkonong Solar expects to use steel, driven piles, with a minimum embedment depth of 5 feet for both panel foundations and inverter foundations pending final engineering. Piles will vary in size and embedment depth and may or may not be galvanized. If pile refusal is expected or encountered due to shallow bedrock or other subsurface obstructions, alternate foundation installation techniques or designs such as pre-drilled, cast-in-place or helical piles may be needed. Alternate foundation types for inverters, such as concrete footings, may be considered during final design.

2.3.3.2 *Dimensions, surface area and depth required for each foundation.*

The preliminary report recommends typical driven pile foundations be W6x8.5 to W8x31 steel sections with approximately 15-foot embedment depths. Construction details for driven, cast-in-place, and helical piles as well as pile refusal plans are

provided in **Appendix D**. Koshkonong solar will conduct additional geotechnical testing as part of final site design and engineering.

2.3.3.3 *Amount of soil excavated for each foundation type.*

No soil excavation is required for the planned driven piles, nor would it be required if helical piles are used. If a pile location requires pre-drilling or cast in place, then the hole will be augured with a negligible amount of material removed.

For shallow concrete inverter pad foundations, a typical excavation method could displace approximately 16 cubic yards of soil pending final engineering.

2.3.3.4 *Describe how excavated soils would be handled including disposal of excess soil.*

Koshkonong Solar will approach grading with the objective to achieve a balanced site, meaning a target of zero net cut and fill (cut materials are used for fill where required, with no need to import or export off site). Grading depths will vary across the site. In areas where grading is expected to exceed the depth of top soil coverage based on the geotechnical exploration, top soil will be stripped off and replaced following subsoil material grading. If grading activities do not exceed the depth of top soil cover, topsoil may be used as fill material across the site. In the scenario where excess soils are generated on site, they will be thin-spread in a nearby location. Spreading subsoil on cropland/pasture will require topsoil BMPs.

2.3.3.5 *Materials to be used for the foundation. Include:*

2.3.3.5.1 *Approximate quantity and type of concrete required for typical foundation.*

No concrete is needed for driven or helical piles. Generally, less than half a cubic yard of concrete or flowable fill is needed for cast-in-place foundations. For shallow concrete inverter pad foundations, a typical excavation method could displace approximately 16 cubic yards of soil pending final engineering.

2.3.3.5.2 *Materials required for reinforcement.*

Sacrificial steel or galvanization may be needed to reinforce piles against corrosion.

2.3.3.5.3 *Description of the panel mounting system.*

Typically, the panel mounting system consists of a steel bracket on top of the steel pile bolted to the racking superstructure. A torque tube is then fixed to pile foundations via steel brackets or other mechanisms, the modules are then fixed to the torque tube via steel mounting brackets or another similar mechanism.

2.3.3.6 *Provide technical drawings of each foundation type to be used showing foundation dimensions.*

Typical drawings of the foundation types under consideration are included in **Appendix D**. Exact dimensions, surface area, depth implications, and final quantity will be determined upon final engineering after permitting and prior to construction. Up to 140,000 foundations are being considered for the solar array.

2.3.3.7 *Describe how foundation or support installation would address the risk of frost heave on facilities.*

A preliminary geotechnical investigation performed by Terracon **(Appendix T**) included fifteen (15) borings within and nearby the Project Area.

Per the preliminary geotechnical report, the soils on this site are frost susceptible, as with most or all sites in Wisconsin. The typical frost depth for southern Wisconsin for foundation design considerations is 48 inches (4 feet). Terracon recommends an ultimate adfreeze (frost heave) of 1,000 psf acting along the pile perimeter to a depth of 3.1 ft bgs. Helical pile design may be considered as a more economical approach to mitigating the effects of frost heave compared to deep driven or grouted pile foundations, to be determined during the design process.

A final geotechnical study, including pile load testing, will be completed prior to construction which will be used to determine final engineering pile requirements. The final engineering design will be approved by a structural engineer to ensure compliance with all applicable regulations, the safety and durability of the Project, and with frost heave risk considered and mitigated.

2.3.4 *Access Roads*

2.3.4.1 *Provide the total number and total miles required for access roads. Provide the amounts for both temporary access (used during construction only) and permanent access (for long-term facility operation and maintenance) roads. State if any temporary access roads would be converted into permanent access roads.*

Suitable access roads, typically gravel 12 feet wide with 4-foot shoulders, will be constructed within the Project Area and are shown in **Appendix B**. Approximately 21 miles of permanent access roads are anticipated for the proposed Primary Arrays of the Project based on current design estimates. Access roads are predominantly within the array fence boundaries. All access roads are subject to final design engineering, input from landowners, and input from local road authorities. As such, the exact number and width of temporary, permanent, or temporarily widened access roads will not be known until the time of construction, when final determinations can be made.

Roads will be located primarily to provide access to power conversion equipment at the center of power blocks, provide access to the solar equipment, and accommodate ongoing maintenance of the Project components. Roads will not be constructed within every aisle. Roads will provide access to the array for emergency vehicles under emergency circumstances. As the final array configuration will be determined following PSC approval, the access road design and locations depicted in **Appendix B** are preliminary. Koshkonong Solar will incorporate the input from landowners and local road authorities when feasible in the final design considerations.

Temporary roads may be constructed for strategic laydown areas throughout the project as needed. If used, any temporary roads will avoid all impacts to delineated wetlands, waterways, sensitive species habitat and cultural resources. No temporary roads will be converted into permanent access roads. Temporary widening of roads to approximately 24 feet may be required in certain areas to accommodate construction traffic and deliveries. This temporary widening would be within the construction disturbance limits for the permanent access roads as described in Section 5.3.3.3.

Vehicular access within the arrays away from access roads will primarily be done by construction workers driving side-by-side utility vehicles that are significantly lighter and have lower ground pressures than pickup trucks or larger vehicles. Some compaction from construction will be unavoidable, but it will be removed by natural processes throughout the operating life of the project. Those natural processes include freeze/thaw cycles and the work of the deep-rooted perennial vegetation proposed as part of the VMS. At the conclusion of construction, if areas require re-seeding to establish vegetation, local de-compaction activities with equipment such as normal agricultural plows will be performed to allow for the establishment of vegetation.

2.3.4.2 *Describe materials to be used and methods for construction of temporary and permanent access roads, including road bed depth.*

Access roads are constructed with a subgrade base and an aggregate course on top of the subgrade. The subgrade work completed to support the roads will vary depending on soil types, weather conditions, etc., but generally range from simple compaction of the native soils starting at a depth of 6-12 inches below grade to cement stabilization or other treatments to the subgrade soils to create a suitable base. Subgrade treatment can be as deep as 2-3 ft below grade in some scenarios. The aggregate depth of the road will also vary but is typically 6-12 inches in depth and may be in excess of 18 inches in specific scenarios. Shoulders are compacted and seeded, and not expected to require subgrade treatment or aggregate.

2.3.4.3 *Specify the required width of temporary and permanent access roads. Fully describe any differences between final road size and that required during construction.*

Suitable permanent access roads are typically 12 feet wide with 4 foot shoulders. During Project construction, permanent access roads may be temporarily widened to approximately 24 feet in necessary scenarios. Temporary road improvements will consist of temporarily widening a permanent access road to support additional traffic or off-loading activities, increased turn radius areas to support turning or larger equipment, and placement of temporary aggregate roads in places that may not have a permanent road if conditions require further stabilization to support construction activities.

2.3.4.4 *Describe any site access control (e.g. fences or gates).*

The perimeter fence around the solar arrays and O&M area will be up to 8-feet-high to minimize intrusion into the facility and comply with applicable electrical codes. No barbed wire will be used on the perimeter fence, and "deer fence" will be used. Fencing around the Project Substation will likely be a chain link design with barbed wire to satisfy applicable security requirements for those Project components. Fencing around the BESS facility will likely be a solid wall or chain link design and will satisfy applicable security requirements for those Project components. Access to the Project is only for Project personnel and approved contractors and gates will be installed at access road entrances at public roads. Landowners will not have access to or use of access roads within the secured array areas.

2.3.5 *General Construction Areas*

2.3.5.1 *Identify size and location of laydown areas outside of those found at the array sites and any other areas used for material storage.*

An approximately 19-acre general construction laydown yard is described in Section 2.3.1.2 and shown on **Figures 4.1.1** and **4.1.2** (**Appendix B**). Racking materials, modules, cables and other materials would initially be stockpiled, and distributed in the field as construction sequencing progressed. An example of a general construction laydown yard configuration is included in **Appendix D**. Additional laydown and staging areas may be located inside the array sites. No additional laydown areas or materials storage outside of the array sites are planned for the Project.

2.3.5.2 *Identify size and location of construction parking areas.*

Construction parking will be contained within the general construction laydown yard described above.

2.3.5.3 *Describe the expected use of these areas after project completion.*

Areas that are used for laydown yards and/or parking during Project construction that are not incorporated in the final Project layout will be returned to agricultural use and seeded by landowners in accordance with their crop management program. After

construction is complete, the gravel surface placed within the temporary laydown yards/parking areas would be removed and the soil would be de-compacted.

Areas that are used for laydown yards and/or parking during Project construction that are incorporated in the final Project layout will be seeded consistent with the final designated ground cover for that area. Seed mixes will be materially similar to the conceptual array mix described in the VMS **(Appendix W)**.

2.3.5.4 *Provide a list of all hazardous chemicals to be used on site during construction and operation (including liquid fuel).*

The primary hazardous chemicals that will be present on site are fuel for vehicles and construction equipment, oil in the transformers at the Project Substation and inverter pads, and heating fuel for the O&M building. Smaller quantities of additional chemicals will also be used on site, including paints, lubricants, and cleaning products. Koshkonong Solar's ECSWMP lists these and other potentially hazardous substances in **Appendix L**.

Potentially hazardous materials in fire suppression agents used for the battery system are listed below. The fire suppression agents proposed by Koshkonong Solar are common to many industrial, military, and healthcare applications.

- Potassium Nitrate (used in fertilizers)
- DCDA - Dicyandiamide or Cyanoguanidine (used as curing agent for resins)
- Organic Resin
- Heptafluoropropane

The following are hazardous materials found in common Lithium Ion batteries. Final materials will be dependent on final battery selection, but the list below is representative of similar batteries Koshkonong solar will use.

- Graphite (used in pencils)
- Lithium Iron Phosphate
- Acetylene (used for welding and cutting)
- Fluoride polymers (used in high purity plastics applications such as wiring insulation and piping)
- Lithium Hexafluorophosphate
- Various organic solvents

2.3.5.5 *Discuss spill containment and cleanup measures including the Spill Prevention, Control, and Countermeasures (SPCC) and Risk Management planning for the chemicals proposed.*

A Spill Prevention, Control, and Countermeasures (SPCC) Plan complying with all EPA and state law requirements will be developed for both construction and

operation of the facility. Spill kits will be available on site, and training, inspection protocols, and response procedures will be established in the SPCC Plan. The SPCC plan will be developed and implemented after initial construction mobilization to the site, but prior to storage of materials at the site that would require it. All approved contractors will be responsible for their own SPCC plans that will be tailored to the specific work items being conducted, such as secondary containment measures for fuel tanks and the Project Substation transformer(s). Details pertaining to these specific work items will be contained in each contractor's plan. Each plan will be continually updated through the course project construction and adjusted accordingly.

2.3.6 *Construction Site Lighting.*

2.3.6.1 *Describe the site lighting plan during project construction.*

The Project does not anticipate using any permanent lighting on site during construction. During potential extended working hours, temporary lighting may be used in the construction and laydown areas. If work extends into the evening, Koshkonong Solar intends to utilize portable light plants if necessary during Project construction. Lights will be turned to focus on work activities, so as not to shine on neighboring property or on-coming traffic. The O&M area will include down-shielded lighting for security purposes and also to ensure that the nearby residence will not experience disturbance from constant, 24-hour lighting. The only lights that would remain on outside of construction periods would be office lights for administrative tasks, vehicle lights for transport, or possible security lights for the laydown yard.

2.3.6.2 *Provide copies of any local ordinances relating to lighting that could apply.*

Dane County does not administer any lighting ordinances. No lighting ordinances are administered by the Town of Christiana. The Project will operate in compliance with general zoning provisions and ordinances administered by the Town of Deerfield[15].

2.4 Substation

If the project includes the construction of a substation or modifications to an existing substation, provide the following information:

2.4.1 *A complete electrical description of required substation facilities including a list of transformers, busses, and any interconnection facilities required.*

The preliminary Project Substation design includes three transformers, which may not be identical, ranging in size from 111/148/185MVA to 120/160/200MVA that

[15] Town of Deerfield. Ordinances and Resolutions. Accessed 2021.

will transform voltage from the 34.5kV collection system to the 345kV interconnection system. Final design and engineering will dictate the number and size of the final transformer combination. A drawing of a typical transformer is included in **Appendix C**. Each transformer will have its own 345kV circuit breaker tied to a common 345kV bus before exiting the Project Substation with an overhead 345kV transmission line. There will be two independent 34.5kV collection system buses with individual 34.5kV feeder breakers for each collection feeder. All breakers will be supplemented with disconnect switches according to industry practices. A control enclosure will be installed on-site that will house the protection, communication, and SCADA equipment necessary to safely operate the Project Substation. The facility will be fenced-in and protected according to the NESC[2].

A discussion of interconnection facilities is covered in Section 2.5.5 and **Appendix AC**.

2.4.2 *Indicate the size (in acres) of the land purchase required for the new substation or substation expansion.*

Koshkonong Solar anticipates purchasing approximately 15 acres to accommodate the Project Substation, collection lines, stormwater infrastructure and the O&M building. The Project Substation is anticipated to occupy approximately 4 acres of land, as depicted in **Figures 4.1.4** and **4.1.5 (Appendix B)**. The ultimate location of the Project Substation may be adjusted based on final engineering, layout considerations, and design inputs.

2.4.3 *Indicate the actual size of the substation or substation addition in square feet, the dimensions of the proposed substation facilities, and the orientation of the substation within the purchase parcel.*

The preliminary Project Substation design assumes the footprint will be approximately 325 x 500 feet, or 162,500 square feet or just under 4 acres. The proposed layout on the parcel is depicted on **Figure 4.1.4 (Appendix B)**. The Project Substation likely will be located in the eastern portion of the Project Area, as depicted in **Figure 4.1.1 (Appendix B)**.

2.4.4 *Identify current land ownership and whether applicant has control of property or whether or not an option to buy has been signed.*

The land is currently privately owned and subject to a solar lease, and Koshkonong Solar expects that approximately 15 acres will be purchased and utilized for collection routing, site access, the Project Substation, and the O&M building. Koshkonong Solar expects to purchase approximately 25 additional acres to be utilized for the BESS.

2.4.5 *Describe substation construction procedures (in sequence as they would occur) including erosion control practices (see Section 3.1).*

The construction sequence for the Project Substation will likely involve, in the following order: driveway and access road installation, site grading work, foundation and fence installation, grounding and conduits, rock surfacing, above grade physical construction of bus work and installation of major electrical equipment, wiring and completion of all terminations, testing, commissioning, energization, then site area reclamation and finishing. A site-specific construction specification and schedule will be developed but is not yet available. All contractors will be required to follow the Erosion Control and Stormwater Management Plan ("ECSWMP") as well as adhere to any site specific environmental requirements, including erosion and dust control. The ECSWMP is included in **Appendix L.**

2.4.6 *Describe any security requirements for the substation site and provide information on how these would be met.*

A control enclosure will be installed on-site that will house the protection, communication, and SCADA equipment necessary to safely operate the Project Substation. The facility will be fenced-in and protected according to the NESC[2]. Access to the control enclosure is typically operated via key control or badge reader systems.

2.5 Transmission and Distribution Interconnection

If the project includes the construction of an electric generator tie line, that is not the subject of a separate application before the Commission, provide the following information:

2.5.1 *Describe any transmission or distribution grid interconnection requirement.*

Koshkonong Solar anticipates the following two facilities to be required as part of grid interconnection.

- A newly-constructed 34.5kV to 345kV Project Substation within the Project Area. The Project Substation will have an approximately 4 acre footprint. The Project Substation is shown on **Figures 4.1.4** and **4.1.5 (Appendix B**).
- A newly-constructed 345 kV gen-tie transmission line of approximately 0.84 miles in length connecting the Project Substation to the Point of Interconnection at the Interconnection Switchyard within the Project Area. The Gen-Tie line route and existing Interconnection Switchyard footprint are shown on **Figures 4.1.1 and 4.1.2** (**Appendix B**).

2.5.2 *Provide details on the types of structures and lines that would be constructed as part of any necessary electric transmission generator tie line.*

A 345kV Gen-Tie line will be located between the Koshkonong Solar Project Substation and the Interconnection Substation to span approximately 0.84 miles. The Gent-Tie line will consist of eight monopole steel structures, either on concrete pier foundations or directly embedded. Final engineering for the Project Substation and Gen-Tie line have not been completed. However, the structure height is anticipated to be approximately 95 to 130 feet above ground. Gen-tie facilities will be designed and built in compliance with the NESC[2].

Koshkonong Solar will own, construct, and maintain the proposed Gen-Tie line. If Koshkonong Solar is acquired by one or more public utilities, as outlined in Section 1.2 of the CPCN Application, those entities would also acquire ownership of the Gen-Tie line.

2.5.3 *Describe the right-of-way needed for the tie line and the status of any easements or other land agreements with property owners.*

Transmission line engineering has not been completed but the right-of-way width is anticipated to be less than 120ft. The right-of-way would be located on the property Koshkonong Solar intends to purchase for the Project Substation, properties currently under solar easement or purchase option, and the parcel upon which the ATC 345kV Rockdale Substation is situated. One additional private landowner easement may be sought to convert an existing purchase option to a transmission easement agreement.

2.5.4 *Describe all communications and agreements, official or otherwise, with the transmission or distribution owner.*

Koshkonong Solar has requested interconnection approval for 300 MW of solar generation and 75 MW of the BESS from MISO as part of the MISO DPP-2019-Cycle study group. In addition, Koshkonong Solar has requested interconnection approval for 200 MW of solar generation from MISO as part of the MISO DPP-2020 study group, 90 MW of which may be converted to energy storage for the Koshkonong Solar BESS. With that process there have been discussions with the transmission owner, ATC, and MISO as regular course of business for an interconnection request. These communications include those organized by MISO to facilitate the interconnection process. In addition, there have been calls and emails with MISO and ATC in which ongoing studies have been discussed.

The kick-off call for DPP1 for the DPP-2019-Cycle queue positions was held on 5/22/2020.

On 2/11/2021 Koshkonong Solar participated in a call with ATC to discuss routing collection lines and the gentie line across the parcel owned by ATC that also hosts the Rockdale Substation.

The kick-off call for DPP2 for the DPP-2019-Cycle queue positions was held on 2/17/2021.

The kick-off call for DPP1 for the DPP-2020-Cycle queue position was held on 2/24/2021.

On 3/2/2021 Koshkonong Solar participated in a call with ATC to discuss the potential conversion from solar generation to BESS for the 2020 queue position.

On 3/12/2021 Koshkonong Solar emailed MISO to formally request re-allocation of the 2020 queue position to be 90 MW of energy storage and 110 MW of solar generation.

2.5.5 *For transmission interconnections, indicate where the project is in the MISO Queue and provide copies of the latest draft or final MISO report for the project interconnect. During the PSC review process applicant must continue to supply the latest reports from MISO.*

The Project consists of two interconnection positions from the MISO DPP-2019 Cycle and may include a portion of a third interconnection position from the MISO DPP-2020-Cycle.

Interconnection position J1214 requests the interconnection of 300 MW of solar generation to the existing Rockdale 345kV ATC substation. Interconnection position J1410 requests the interconnection of 75MW of battery storage to the existing Rockdale 345kV ATC substation. These queue positions are in the MISO DPP-2019-Cycle-East (ATC) study cluster.

Koshkonong Solar has an interconnection queue position in the 2020 cycle, J1779, which may be used to support a 165 MW BESS, as described in Section 1.7 above. Interconnection position J1779 requests the interconnection of 200 MW solar to the existing Rockdale 345kV ATC substation in the MISO DPP-2020-Cycle-East (ATC) study cluster. Koshkonong Solar is pursuing MISO's Permissible Technological Advancement Process to alter the additional queue position it filed in MISO's 2020 cycle from 200 MW solar to a hybrid configuration of 110 MW solar and 90 MW storage. If that proceeds, the 90 MW of storage could be utilized in this project to support 165 MW of total storage in sum with the 75 MW queue position in the 2019 cycle). The 110 MW of solar capacity in that queue position would not be subject to this Application but a potential future Application.

Projects in the MISO DPP-2019-Cycle-East (ATC) study cluster have concluded Definitive Planning Phase 1 (DPP1) and are now in Definitive Planning Phase 2 (DPP2). A public copy of DPP1 results is included in **Appendix AC**.

Projects in the MISO DPP-2020-Cycle-East (ATC) study cluster are currently in DPP1. MISO DPP1 study results for the MISO DPP-2020-Cycle-East (ATC) study cluster are expected to be published by 7/22/2021. The Project will provide these preliminary DPP1 results when available.

2.6 Operations and Maintenance (O&M) Building

2.6.1 *Describe the purpose and use of the proposed O&M building.*

The O&M area would accommodate a permanent O&M building, parking area, storage area, and other associated facilities such as drinking water well (if necessary), aboveground water storage tanks, septic system, security gate, lighting, and signage. The permanent O&M building would house administrative and maintenance equipment and personnel.

The Project's O&M building is expected to be 4,000-5,000 square feet to accommodate the following:

- 2700 sq. ft. warehouse space,
- three offices, including one shared workspace for up to 7 technicians,
- a control center/library,
- a bathroom with shower, and
- a breakroom/kitchen.

2.6.2 *Number of full-time employees that would be working at the facility.*

The Project expects the facility will employ up to five (5) permanent employees and have additional office space for traveling workers.

2.6.3 *Provide the size (in acres) of the land purchase required for the facility.*

Koshkonong Solar expects that the 15-acre land purchase described in section 2.4.2 will be adequate for collection routing, site access, Project Substation, O&M building, parking and storage areas.

2.6.4 *Building and Building Footprint.*

2.6.4.1 *Provide a drawing or diagram of the O&M building with dimensions including square feet.*

A diagram of the preliminary O&M building is shown in **Figure 4.1.4** and **4.1.5** (**Appendix B**).

2.6.4.2 *Indicate the actual size of the building in square feet.*

The O&M building is anticipated to be 4,000-5,000 square feet.

2.6.4.3 *Describe the type of building to be constructed (metal, frame, etc.).*

A diagram of a typical O&M building is shown in in **Figure 4.1.4** and **4.1.5** (**Appendix B**). As Koshkonong Solar gets closer to construction and final engineering, the design of the O&M building will continue to be refined. The major material components would consist of metal, brick, wood, concrete, or other forms of structural materials. The final design and construction of this building would be consistent with applicable Wisconsin State Building Code[16] and County Building Standards[15] and may include materials not identified in this list.

2.6.5 *Lighting and Security Plan for O&M Property*

2.6.5.1 *Describe how the building property would be lit and how the lighting plan minimizes disturbance to nearby residences.*

The O&M area will include down-shielded lighting for security purposes. These lights will be turned on either by a local switch, as needed, or by motion sensors that will be triggered by movement. This will ensure that the nearby residence will not experience disturbance from constant, 24-hour lighting.

2.6.5.2 *Describe any security plans for the property (fences etc.).*

The perimeter fence around the solar arrays and O&M area will be up to 8-feet-high to minimize wildlife intrusion into the facility and comply with applicable electrical codes[1] [2]. No barbed wire will be used on the perimeter fence, and "deer fence" will be used, unless required otherwise by applicable codes, standards, rules, or regulations. The rest of the Project will be enclosed by fencing as described in section 2.3.4.4.

2.6.6 *Describe any other facilities needed, including:*

2.6.6.1 *Parking lots.*

The O&M building would have an adjacent parking area of approximately ten parking spots to anticipate a maximum load of five permanent employees' vehicles and five visitors' vehicles.

2.6.6.2 *Sheds or storage buildings.*

The approximate 2,700 square feet of warehouse space inside the O&M building is the only permanent storage building expected. The O&M area will include an outdoor

[16] Wisconsin Administrative Code. April 2018. Department of Safety and Professional Services (SPS). Chs. SPS 301-399; Safety, Buildings, and Environment. Chs. SPS 361-366; Commercial Building Code.
[15] Dane County Code of Ordinances. Accessed 2021.

gravel storage area approximately 2 acres in size as shown in **Figure 4.1.4** and **4.1.5** (**Appendix B**).

2.6.6.3 *Supplies of water.*

Koshkonong Solar will work with the applicable local regulatory authorities to either drill a new water well or connect with the municipal water service to supply the facility's needs.

2.6.6.4 *Sewer requirements.*

Koshkonong Solar will work with the applicable local regulatory authorities to either install a new septic system or connect with municipal wastewater systems to service the facility's needs.

2.6.6.5 *Construction of any stormwater management facilities.*

A stormwater management plan will be developed in accordance with Wisconsin statutes and guidelines as part of the final site design. The stormwater plan will incorporate the entire site layout, including final panel site design with appropriate best management practices. The stormwater plan is described in greater detail in Section 8.4.

2.7 Battery Storage

If the proposed project would include a large-scale Battery Energy Storage System (BESS) or plans to include one in the future, provide the following information.

2.7.1 *Describe the location of the proposed BESS, including a map that shows its placement within the other project facilities.*

The Project includes a 165 MW BESS. The BESS will either be located throughout the field to utilize the same inverters as the solar arrays (called "DC-coupled") or centralized nearby the O&M building and Project Substation (called "AC-coupled"). In either scenario, the BESS will likely be housed in standard ISO shipping containers or smaller outdoor-rated modular enclosures. For a DC-coupled system, one or more enclosures will be installed at each solar inverter skid. Utilizing smaller, additional transforming equipment, the BESS enclosures will connect to the solar inverters and utilize the same collection system as the solar plant to connect to the Project Substation. In the centralized scenario, a 165 MW/165-660 MWh AC-coupled storage system would consist of ISO containers, outdoor-rated modular enclosures, or similar with a total footprint of approximately 500,000-800,000 square feet. These enclosures would be fully outfitted with auxiliary systems (such as HVAC, controls, and fire suppression). Adjacent to the enclosures would be rows of pad-mount transformers and inverters. The inverters will be connected to the pad-mount transformers, which will then connect to a common bus which will connect

directly to the Project Substation. **Figure 4.1.4/4.1.5** (**Appendix B**) depicts an AC-coupled BESS nearby the O&M building and Project Substation.

2.7.2 *Explain what criteria was used to decide whether to use a BESS, and provide information on how its inclusion would affect the electrical design of the project and MISO interconnection process.*

The criteria to decide whether to include a BESS will incorporate an analysis of the following criteria: the capital and operating costs of the systems, regulatory and permitting considerations, the wholesale electricity market conditions, prices for energy, capacity, ancillary services and MISO tariff provisions for the utilization of the BESS.

The effects of inclusion of a BESS on the electrical design of the project are described above. A DC-coupled system would include battery enclosures near the solar inverters with additional equipment as needed. An AC-coupled system will include the aforementioned BESS yard that the solar collection system will need to be routed around. In either scenario, the appropriate considerations will be made within the Project Substation for accepting power from the BESS and transforming it to 345 kV. The Gen-Tie line will be sized appropriately to handle 300 MW of solar generation and 165 MW of BESS output.

The impact to the MISO grid from the integration of a BESS at Koshkonong Solar will be positive, as the BESS can act to shift the output of the solar generation from the likely peak at solar noon to a potential peak of electrical demand in the early evening. Depending upon project design, the system can furnish other grid services such as frequency response and voltage support, and could act as an electrical "suspension" to smooth the output of the project on partly cloudy days that periodically interrupt solar generation.

2.7.3 *Provide information on how the BESS would be installed, any changes to project impacts through its inclusion, and ongoing operations and maintenance actions it would require.*

If a battery storage system is added to the Project, the batteries will be housed in one or more ISO-style steel containers, outdoor-rated modular enclosures, or similar. Enclosures will be populated with battery racks that are bolted to the floor and strung together electrically. Racks are typically loaded by forklifts. The enclosures will be installed on concrete foundations in the manner described above. Examples of battery modules and outputs can be found in **Appendix C**.

In an AC-coupled or DC-coupled system, the power delivered at the point of transmission interconnection resulting from generation and battery storage, would not increase beyond limits allowed pursuant to MISO agreements, as the batteries will

serve to compliment the solar facility by smoothing, shifting, or firming the solar generation.

In either an AC-coupled or DC-coupled system, there would be an increase in impervious surface added by the project, which would be addressed in the ECSWMP. The visual impact would increase in both scenarios, but in a landscape currently dominated by existing transmission lines, a large high-voltage substation, a large gravel mining operation, and a natural gas powerplant, the BESS's enclosures and external electrical yard would not be entirely out of character. The visual impact in the DC-coupled scenario would also slightly increase by the addition of one or more steel shipping containers or outdoor rated modular enclosures adjacent to inverters throughout the site. These are relatively low height and this would be a very minor change relative to the base case of the proposed solar facility installation as the inverter locations are generally several hundred feet into the interior of the solar arrays and will be minimally visible to people viewing them from public roads or neighboring properties. Koshkonong Solar has attempted to mitigate potential visual and noise impacts by locating the AC-coupled BESS over one quarter mile away from the nearest public road and from the nearest occupied residence.

Finally, the BESS components will contribute additional noise, but Koshkonong Solar believes that overall noise levels from the Project will remain relatively low. As documented in the Koshkonong Solar pre-construction noise report (**Appendix P** to the Application), noise emissions from the Project are predicted to be less than 41 dBA at night and less than 42 dBA during the day. Potential mitigation measures included in **Appendix P** involve the construction of a noise wall at the BESS location. A final determination on noise mitigation actions will be made once Koshkonong Solar has completed final design engineering and has selected final project equipment. Based on final design engineering and final project equipment selection, an updated model of noise emissions from the Project will be created and used to determine if noise mitigation measures need to be included in the Project as designed. If mitigation measures are deemed necessary, Koshkonong Solar would consider and implement as needed a variety of feasible and achievable approaches such as: constructing a noise wall, adjusting the location of the Project Substation and BESS further from receptors, specifying lower noise equipment or enclosing equipment. Koshkonong Solar will update the noise analysis as part of final design to ensure that noise levels at all non-participating, noise-sensitive receptors continue to be predicted to be less than 50dBA daytime and 45dBA nighttime.

The storage enclosures or containers will have a fire protection system that will contain and extinguish fires. The typical fire suppression agents are FM200, Stat-X, or F-500. As part of regular maintenance, Koshkonong Solar will monitor and refill/replace the suppression agent and other parts of the fire suppression system. With this fire suppression system, the fire risk for the project will not appreciably change due to the addition of the battery energy storage system.

Operations and maintenance for the battery site will be performed in coordination with the solar facility. The largest maintenance items for the BESS will be the annual capacity test, regular inverter maintenance (if the BESS has its own inverters), and data monitoring from a remote project operations control center. Through remote monitoring, Koshkonong Solar will ensure the battery stays within optimal operating bands to ensure both safety and long-term performance. Critical information such as battery temperature, battery state of charge, and any system warnings are monitored on a 24/7 basis. Any anomaly is identified immediately and is able to be addressed by action from a remote control center or by dispatching local solar and storage technicians to site. In addition to real time monitoring and support, analysts can analyze trends in operating data to predict anomalies or failures before they arise.

The energy capacity of lithium ion battery systems degrades over time at a fairly predictable rate. It is likely Koshkonong Solar will wish to maintain a certain energy storage capacity during the operating life of the Project. Therefore, Koshkonong Solar will likely augment the system periodically. "Augmentation" is a process where additional battery racks within existing containers or enclosures, or new containers or enclosures are added to the system at pre-prepared locations to maintain the initial energy capacity of the system. The proposed 15 acre footprint of the 165 MW/660 MWhr BESS is adequate to enable augmentation throughout the project's life.

3. Construction Sequence and Workforce

3.1 Construction Sequence

3.1.1 *Provide the construction schedule for the proposed project. Include a timeline showing construction activities from beginning of construction to in-service. Identify all critical path items.*

Appendix H includes a preliminary project schedule for the construction process including an approximate timeline of construction items. Koshkonong Solar considers all items as critical path items. If the Project is authorized, construction would commence in Spring 2022 after frost leaves the ground. If construction is delayed, Koshkonong Solar still expects to commence construction within twelve months of a CPCN Order. Onsite construction activities are expected to continue for 18 – 24 months and conclude with a commercial operations date on or before December 31, 2024.

3.1.2 *Provide a description of the staging and construction sequence required for building a typical solar array. Include the delivery of materials.*

Below is a typical staging and construction sequence:

1. Mobilize equipment and personnel to site

2. Installation of sensitive resource/impact avoidance signage/flagging, survey staking, and stormwater protection/wildlife exclusion measures (e.g., silt fence)
3. Construct laydown yard(s) and office trailers.
4. Access road construction and grading of the array areas, including delivery of aggregate for roads
5. Racking pile deliveries behind the grading crews as they progress through site
6. Delivery and installation of inverters
7. Delivery of medium voltage cable
8. Installation of medium voltage cable underground
9. Installation of the racking piles
10. Delivery of the racking system components
11. Installation of the racking system
12. Delivery of the solar panels
13. Installation of the solar panels
14. Installation of miscellaneous equipment such as DC collection
15. Commissioning the plant
16. Commercial operation

Fencing surrounding array areas may be installed at any point between items 3 and 14.

3.1.3 *Provide an estimate of time required to complete construction at a typical solar array.*

The solar array blocks will be constructed on a rolling basis with simultaneous activities occurring in multiple blocks. If a single power block was constructed independently, in its entirety, it would require an estimated construction duration of 12-16 weeks.

3.1.4 *Provide a description of the staging and construction sequence for any other facilities to be constructed*

The Project will include interconnection, transmission line, Project Substation, and BESS facilities. Those facilities will be constructed at any point between the staging items listed above at section 3.1.2, items 3 and 13. Minimal large deliveries will be required for the Generator Step-up Transformers (GSU), the control enclosure, off-load cranes, and transmission structures.

General site improvements will be made such as access improvements and preparation of the staging/laydown area(s). The temporary staging/laydown area(s) will be approximately 50 acres in total and located at various locations within the Project Area. The staging/laydown areas will be used for storage of construction

materials and shipped equipment containers, receiving construction deliveries, and temporary parking for Project-related vehicles.

3.2 Workforce

3.2.1 *Provide information on the workforce size and skills required for project construction and operation.*

The Project's construction workforce will consist of craftworkers, laborers, and electricians, along with onsite management personnel. The Project's contractor may use a traveling workforce for items that are self-performed. During peak construction periods, approximately 600 workers are anticipated. However, this is for an ideal construction schedule and peak workforce may vary based on the final schedule.

During the Project's operational period, Koshkonong Solar will likely be staffed with up to five full time, certified maintenance technicians for the life of the Project. These technicians have a wide variety of skill sets such as: electrical proficiency, software knowledge, general maintenance skills, safety, and solar-specific problem-solving abilities.

3.2.2 *Estimate how much of the expected workforce would come from local sources.*

The estimated local, meaning Dane County workforce for the Project during construction is an estimated 74 jobs. An estimated 308 jobs are anticipated to be sourced within the State of Wisconsin during construction. During the Project's operational life, up to five full-time employees are anticipated to reside locally in Dane County.

3.3 Construction Equipment and Delivery Vehicles

Provide a description of the types of construction equipment needed to build the project and the types of delivery vehicles that would be used to deliver panels and equipment to array sites. For large equipment and vehicles include:

3.3.1 *Types of construction equipment and delivery vehicles.*

Koshkonong Solar estimates that there will be between 25 and 35 trucks used daily for equipment delivery during construction. Light duty trucks will also be used on a daily basis for transportation of construction workers to and from the site. Most panels and other site equipment and materials will be delivered by standard, legal load weight semitrucks. Typical construction equipment such as scrapers, bulldozers, dump trucks, watering trucks, motor graders, vibratory compactors, and backhoes will be used during construction. Specialty construction equipment that may be used during construction will include:

- Skid steer loader;
- Vibratory pile driver;
- Medium duty crane;

- All-terrain forklift;
- Concrete truck and boom truck;
- High reach bucket truck; and
- Truck-mounted auger or drill rig.

3.3.2 *Gross vehicle weight (loaded and unloaded) for all vehicles using local roads.*

Other than delivery vehicles for the main step-up transformers in the Project Substation, cranes used for offloading activities, and trucks delivering grading machines to the site such as bulldozers and excavators, Koshkonong Solar believes all of the vehicles using local roads will be legal loads in terms of size and weight. If there becomes a need for a larger vehicle, Koshkonong Solar's construction contractor will work with state and local authorities to obtain the applicable oversize-overweight permits and provide more vehicle details closer to delivery dates. The anticipated delivery vehicle for the main step-up transformers at the Project Substation is estimated to have a gross vehicle weight of approximately 300,000 pounds.

3.3.3 *For vehicles used for delivery (diagrams or drawings of vehicles are acceptable). Include:*

As mentioned above, the solar equipment delivery vehicles will primarily use standard size and weight semitrucks and trailers. The delivery vehicle for the main Project Substation transformers can vary and drawings will be provided during the overweight/oversize permit approval process.

The information provided in Sections 3.3.3.1, 3.3.3.2, 3.3.3.3, and 3.3.3.4 below is for a typical transformer delivery vehicle. Final delivery vehicle information will be provided to the correct authorities once finalized closer to delivery dates. In the event the delivery vehicle for the main Project Substation transformers varies greatly from the information provided, Koshkonong solar will coordinate with local affected parties to relay updated information regarding the vehicle and plan for transport off the highway.

3.3.3.1 *Overall vehicle length.*

The expected maximum length of the vehicle is 75 feet.

3.3.3.2 *Turning radius.*

The typical front turn radius of the delivery vehicle is 52 feet.

3.3.3.3 *Minimum ground clearance.*

Minimum ground clearance is 6-inches, though if no overhead obstructions are present the deck can be raised and lowered to accommodate bumps and dips in the road surface.

3.3.3.4 *Maximum slope tolerance.*

The maximum allowable slope is 7%.

3.3.4 *Roads and Infrastructure. Estimate the potential impacts of construction and delivery vehicles on the local roads. Provide the following:*

3.3.4.1 *Describe methods to be used to handle heavy or large loads on local roads.*

Solar projects do not require the large volume of concrete trucks, large mobile cranes, or extreme oversized vehicles that are common on wind projects. Typical construction and delivery vehicles such as dump trucks (e.g. for aggregate delivery), and flat bed and enclosed tractor-trailer for equipment and material deliveries will constitute the majority of Project traffic. The Project will also use light-duty pickup trucks or cars for personnel access to the Project site. A small number of oversized/overweight deliveries will be required for main Project Substation transformers. As such, the potential impact of construction and delivery on the local roads is minimal and will be addressed with the local government entities as part of a JDA process. Permits for overweight and oversize loads will be sought from the relevant local authorities.

3.3.4.2 *Probable routes for delivery of heavy and oversized equipment and materials.*

The main haul route for construction materials into the Project Area will likely be on US Interstate 90, US Highway 12/18, and State Highway 73 as shown on **Figure 8.5.1** (**Appendix B)**. County and Township roads within the Project Area will be used to deliver equipment and materials to the general construction laydown area and directly to construction sites. The heavy equipment for the Project Substation would likely be delivered directly to the Project Substation location via Koshkonong Road and Highland Drive. Applicable State/County oversize/overweight permits will be obtained for the final route prior to delivery.

Final road use and haul routes will be determined after consultation with local governments.

3.3.4.3 *Potential for road damage and any compensation for such damage.*

Koshkonong Solar will negotiate in good faith with the local government entities to reach appropriate arrangements regarding road use. Koshkonong Solar will have an

obligation to repair any road damaged caused by Project construction. Koshkonong Solar believes one of the fundamental components of such an agreement will be an objective standard of repair for public infrastructure.

3.3.4.4 *Probable locations where local roads would need to be modified, expanded, or reinforced in order to accommodate delivery of equipment.*

Koshkonong Solar is not currently aware of any locations where road improvements will be necessary to accommodate construction.

3.3.4.5 *Include an estimate of whether or not trees near or in road right-of-way (ROW) might need to be removed.*

It is not expected that trees in the road ROW would need to be removed to accommodate Project deliveries or construction.

3.3.4.6 *Provide an estimate of likely locations where local electric distribution lines would need to be disconnected in order to allow passage of equipment and materials.*

No disruption of existing distribution lines is anticipated to allow for passage of Project equipment or materials.

3.3.4.6.1 *Describe how residents would be notified before local power would be cut.*

Not applicable.

3.3.4.6.2 *Estimate the typical duration of a power outage resulting from equipment or materials delivery.*

Not applicable.

3.3.5 *Construction Traffic. Describe any anticipated traffic congestion and how congestion would be managed, minimized or mitigated. Include:*

3.3.5.1 *List of roads most likely to be affected by construction and materials delivery.*

See **Figure 8.5.1** (**Appendix B**) for preliminary Project haul routes which depicts the roads most likely to be affected by construction and materials delivery. A majority of local roads in the Project Area will be used. Every town or county road that is planned for a solar array access road entrance will be affected by construction. In addition to the County and State Highways noted under Section 3.3.4.2, local roads including Koshkonong Road, Highland Drive, State Farm Road, Prairie Queen Road,

Clear View Road, Evergreen Drive, Smithback Road, and others will also likely be used for the Project.

Traffic congestion will be minimal, and any traffic congestion will be managed, minimized, or mitigated. To the extent site conditions allow, delivery trucks will be off loaded near the point of use to minimize double handling and the amount of trucking. Prior to any deliveries, a traffic control plan will be developed and reviewed with the town, county, or WISDOT officials as appropriate. Signage will be installed to guide trucks to the appropriate roads, after conferring with local officials. Trucks will not be allowed to stage or block public roads. If trucks cannot exit the road in a timely fashion, they will be directed to a designated staging area. Major component deliveries will be required to stagger delivery times and dates, so the site teams are not overwhelmed with a surge of trucks at one time.

3.3.5.2 *Duration of typical traffic disturbance and the time of day disturbances are most likely to occur.*

Construction delivery traffic will mostly occur daily during daylight hours. Deliveries will begin in the early morning and continue to mid-late afternoon. Smaller vehicles for personnel arriving onsite may occur prior to or after daylight hours. Trucks will be directed off major roads, onto secondary roads or the construction site to minimize the potential for traffic congestion. Traffic delays should be limited to the time it takes for delivery trucks to turn on or off public roads. The delivery and construction timing may be adjusted as needed to maintain the Project's construction schedule.

4. Project Maps, Aerial Photography, Photo Simulations, and GIS Shapefiles

The required maps are included in **Appendix B**.

4.1 Project Area Maps

4.1.1 *General Project Area Map. (The extent of this map should show the entire project area and reach at least 1 mile beyond the project area boundary. Approximate scale 1:4800.)*

Figure 4.1.1 is provided in **Appendix B**.

4.1.2 *Detailed Project Area Map. (The scale for this map should be larger than that of the general project map so that the added detail is clearly visible. This usually necessitates a series of maps.)*

Figure 4.1.2 is provided in **Appendix B**.

4.1.3 *Topographic Maps*

Provide topographic maps at 1:24,000 or larger scale showing: Project Area, all solar array sites (proposed and alternate), substation facilities, collector circuits, access roads, and O&M building.

Figure 4.1.3 is provided in **Appendix B**.

4.1.4 *Substation*

4.1.4.1 *Provide a map showing the following features:*

- *The location, dimensions (in feet and acres), and layout of any new substation or proposed additions to an existing substation.*
- *Recent aerial photos of the substation site.*
- *The location of all power lines entering and leaving the substation, including any turning structures. Show details in a separate diagram of any turning structures that might impact adjacent land owners (size, type of structure, guying, etc.).*
- *For new substations, show the location of the access road and the location of any new stormwater management features (i.e. pond, swale, etc.). For expansion of existing substations, show details on changes to access roads that may be required (width, length, location, etc.), as well as any other ground disturbing construction activities.*
- *Show parcel data including the name of landowners for the substation site or substation addition. Include adjacent landowners.*
- *Show topographic contours of the property.*

4.1.4.2 *Provide an engineering diagram/s of the substation and substation equipment including any turning structures and interconnection facilities.*

Figure 4.1.4/4.1.5 is provided in **Appendix B** and includes the information identified in 4.1.4.1 and 4.1.4.2.

4.1.5 *O&M Building*

4.1.5.1 *Provide a map showing the O&M building, parking area, roads, and any other facilities. Include, as a background, a recent aerial photograph of the property.*

4.1.5.2 *Provide an engineering drawing of the O&M building.*

Figure 4.1.4/4.1.5 is provided in **Appendix B** and includes the information identified in 4.1.5.1 and 4.1.5.2.

4.1.6 *Natural Resources and Land Use/Ownership Maps*

4.1.6.1 *Wetland and waterway maps.*

Figure 4.1.6.1 (**Appendix B**) depicts desktop- and field-delineated wetlands, and waterways in the Project Area.

4.1.6.2 *Land ownership maps, minimum scale 1:10,000 (map extent to one mile from the Project Area).*

Figure 4.1.6.2 is included in **Appendix B**.

4.1.6.3 *Public lands.*

Figure 4.1.6.3 is included in **Appendix B.**

4.1.6.4 *Land cover.*

Figure 4.1.6.4 is included in **Appendix B**.

4.1.6.5 *Flood Insurance Rate maps (FIRMs) (within the Project Area). Provide flood insurance maps if the site is within one-half mile of a floodplain.*

Figure 4.1.6.5 is included in **Appendix B**.

4.1.6.6 *Soil survey maps (within the Project Area)*

Figure 4.1.6.6 is included in **Appendix B**.

4.1.6.7 *Bedrock maps (within the Project Area). Map showing depth to bedrock for the entire project area.*

Figure 4.1.6.7A, Depth to Bedrock and **Figure 4.6.6.7B**, Bedrock Geologic Map are included in **Appendix B.**

4.1.7 *Community Maps*

4.1.7.1 *Zoning maps. Provide a map or maps of the project area showing existing zoning (e.g. agriculture, recreation, forest, residential, commercial etc.). Map should show existing zoning out to 0.5 miles beyond the boundaries of the project area.*

Figure 4.1.7.1 is included in **Appendix B**.

4.1.7.2 *Sensitive sites. Additional map (if necessary) showing proximity to schools, day care centers, hospitals, and nursing homes up to 0.5 miles from the substation site.*

Figure 4.1.2 is included in **Appendix B** and includes sensitive sites identified in section 4.1.7.2.

4.1.7.3 *Airports.*

Figure 4.1.7.3 is included in **Appendix B.**

4.1.8 *Communication Infrastructure*

4.1.8.1 *Identify radio, television, microwave towers, and any NEXRAD or Doppler weather radar installations on a map and show the results of the line of site analysis. Include communications and NEXRAD/Doppler installations within a 50-mile radius of the project area.*

Figure 4.1.8.1 is included in **Appendix B** and depicts the information requested in section 4.1.8.1. Communications studies conducted for the Project Area are included in **Appendix O** and contain the relevant maps within the studies.

4.2 GIS shapefiles – Provide GIS shapefiles and attributes as listed below. GIS attribute table information should be clearly labeled to identify fields and feature names.

A list of provided GIS shapefiles is included in **Appendix V** as listed below. All digital files are provided via SFTP delivery to the PSC.

4.2.1 *Project area boundary.*
4.2.2 *Proposed solar array sites identified by number.*
4.2.3 *Alternate solar array sites identified by number.*
4.2.4 *Access roads (permanent and temporary) for proposed solar array sites (include road width).*
4.2.5 *Access roads (permanent and temporary) for alternate solar array sites (include road width).*
4.2.6 *Underground collector circuits (include number of conductors and voltage, and the installation method).*
4.2.7 *Overhead collector circuits (include voltage).*
4.2.8 *Generator tie line (include voltage and likely structure locations).*
4.2.9 *Electric distribution lines.*

4.2.9.1 *All electric distribution lines within the entire project area (include voltage of each line and phases present (A, B, and/or C).*

Voltage and phase of existing distribution is currently unknown. Distribution line locations have been provided based on aerial photos and are depicted in **Figure 4.1.2** (**Appendix B**).

Typical distribution lines in Wisconsin range from 4 to 35kV and can be either one or three-phase lines. Because the Applicant is an IPP, not the local distribution owner, specific phase and voltage information is not readily available.

4.2.9.2 *All electric distribution lines within one mile of the Project Area (include voltage of each line and phases present (A, B, and/or C).*

Voltage and phase of existing distribution is currently unknown. Distribution line locations have been provided based on aerial photos and are depicted in **Figure 4.1.2** (**Appendix B**).

Typical distribution lines in Wisconsin range from 4 to 35kV and can be either one or three-phase lines. Because the Applicant is an IPP, not the local distribution owner, specific phase and voltage information is not readily available.

4.2.10 *Transmission lines within the project area identified by voltage.*

4.2.11 *New substation – provide shapefiles showing:*

4.2.11.1 *Perimeter of entire parcel acquired or to be acquired,*

4.2.11.2 *Perimeter of substation,*

4.2.11.3 *Access road,*

4.2.11.4 *Other facilities such as a retention pond or storm water management,*

4.2.11.5 *All collector circuits entering the substation,*

4.2.11.6 *Transmission interconnect.*

4.2.12 *Expansion of an existing substation:*

4.2.12.1 *Perimeter of expanded area,*

4.2.12.2 *Boundary showing any new land acquisition,*

4.2.12.3 *Location of all new power lines and reconfigured lines,*

4.2.12.4 *Location of all collector circuits entering the substation,*

4.2.12.5 *Location of any modified interconnection.*

4.2.13 *O&M Building:*

4.2.13.1 *Perimeter of property acquired,*

4.2.13.2 *Perimeter of building,*

4.2.13.3 *Location and perimeter of other buildings,*

4.2.13.4 *Location and perimeter of parking lot,*

4.2.13.5 *Location of access road.*

4.2.14 *Wetlands and waterways in the project area:*

4.2.14.1 *Wisconsin Wetland Inventory (WWI) wetlands,*

4.2.14.2 *NRCS hydric soils,*

4.2.14.3 *Delineated wetlands (See Section 8),*

4.2.14.4 *DNR mapped waterways,*

4.2.14.5 *Field identified waterways (See Section 8).*

4.2.15 *Land owners/buildings:*

4.2.15.1 *Residences on all participating parcels,*

4.2.15.2 *Non-participating residences inside the Project Area,*

4.2.15.3 *Land ownership and parcels within the project area,*

4.2.15.4 *Land ownership and parcels within one mile of the project area boundary,*

4.2.15.5 *Confined animal operations – provide shapefiles showing:*

- *The locations of any confined farm animals within the project area,*
- *All confined animal operations within one mile of the project area boundary,*
- *For each confined animal shapefile provide attribute data that identifies the type of animal, the number of confined animals, and the name of the land owner.*

4.2.16 *All public lands within the Project Area and public lands within two miles of the Project Area.*

4.2.17 *All public airport runways within 10 miles of the Project Area. Show runway orientation and length.*

4.2.18 *All private airports and landing strips inside and within two miles of the proposed Project Area. Show runway orientation and length.*

4.2.19 *Land cover/Vegetative communities. (Do not use obsolete DNR Land Cover data.) See section 5.3.*

4.2.20 *Provide a GIS shapefile showing the locations of properties enrolled in the Conservation Reserve Program.*

At this time, Koshkonong Solar has requested CRP shapefiles from the local conservation office and a request has been made to the regional office to distribute the files. Once the CRP shapefiles are received, Koshkonong Solar will provide them to the PSC staff.

4.2.21 *FEMA flood plains within the project area.*

4.2.22 *Aerial Photos (no older than three years) of project area and surrounding landscape (10-mile radius of the project area).*

In response to 4.2.22, aerial photos of the Project Area and surrounding landscape are provided with the requested shapefiles in **Appendix V** for a 2-mile radius from the Project Area. This reduced radius was approved by PSC staff for previous CPCN applications.

A list of provided GIS shapefiles is included in **Appendix V**. All digital files will be provided via file transfer to a PSC SFTP site.

4.3 Topography – Raster files of topographic features within the project area and surrounding landscape (10-mile radius of the project area).

Raster files of topographic features within the Project Area and 2-mile radius from the Project Area are provided with the other requested shapefiles in **Appendix V.** This reduced radius was approved by PSC staff for previous CPCN applications.

4.4 Photo Simulations

Photo simulations are required. Simulations should seek to provide an accurate representation of what the project area would most likely look like after the project is completed. In order to be certain that any photo simulations provided in an application will be useful, please consult with PSC staff before preparing and submitting photos.

Photo simulations for seven locations around the Project Area are included in **Appendix E**. Commission staff consultations were conducted electronically and photo simulation locations were approved 3/16/2021.

Photo locations were selected to represent areas frequented by the public and provide a representative view of the project from different parts of the site. The selected locations include the edge of the Village of Cambridge, well-traveled highways, areas near residential developments and one location near the Cambridge elementary school. The specific vantage point for each photo was selected for good visibility of the proposed Project.

Photos were taken at each location using a digital camera set to an effective focal length of approximately 50mm to best reflect the experience of a person standing at the photo location. A model of the existing topography and proposed infrastructure was then used to generate renderings simulating the view after construction of the Project. A map of the photo locations, and both the raw images (existing conditions) and rendering of the proposed condition are included in **Appendix E**. High-resolution raster image files have been provided to the PSC via SFTP file transfer.

5. Natural and Community Resources, Description and Potential Impacts

5.1 Site Geology

5.1.1 *Describe the geology of the project area.*

The Wisconsin Geological and Natural History Survey (WGNHS) Bedrock Geology Map of Dane County[16] and Wisconsin maps[17] the bedrock of the northern part of the Project Area as the Ancell Group of Ordovician Sandstone with areas of the Prairie du Chien Group of Ordovician Dolomite. The southern part of the Project Area is mapped as the Sinnipee Group of Ordovician Dolomite (**Figure 4.1.6.7 B, Appendix B**). Based on a WGNHS Depth to Bedrock Map of Dane County Wisconsin[18], the depth to bedrock at the Project can generally be expected to range from 0-150 feet below ground surface (bgs) (**Figure 4.1.6.7 A, Appendix B**). Furthermore, according to the WGNHS Karst and Shallow Carbonate Bedrock in the Wisconsin map[19], shallow carbonate bedrock, as categorized between the ranges of 0-50 bgs and greater than 50 feet bgs, covers nearly all of the Project Area; this suggests the potential presence of karst features. No fault lines are mapped within the Project Area, and southeastern Wisconsin is generally considered an area without notable risk of seismic activity[20].

According to the Natural Resources Conservation Service[21], the major soil units in the Project Area are Plano silt loam (gravelly and till substratum, 1,599 acres), Ringwood silt loam (1,350 acres), and Elburn silt loam (685 acres).

5.1.2 *Geotechnical report on soil conditions.*

5.1.2.1 *Provide a summary of conclusions from any geotechnical report or evaluation of soils in the project area including:*

- *Results of soil borings including a review of soil bearing capacity and soil settlement potential.*
- *Identify any soil conditions related to site geology that might create circumstances requiring special methods or management during construction.*

A preliminary geotechnical engineering report was performed by Terracon, dated March 30, 2021 (**Appendix T**). Fifteen (15) borings were performed within and nearby the Project Area. The borings were advanced via hollow stem augers to planned depths of 20 feet bgs within the proposed PV array. Per the preliminary geotechnical report, ultimate end bearing capacity across the boring locations was approximately 500 lbs, and total foundation settlements are not anticipated to exceed one (1) inch. Two of the borings reached refusal due to possible bedrock and/or boulder at depths of 3 feet and 6.5 feet bgs. Possible cobbles or boulders are also noted in several borings at or beneath 3 feet bgs. Subsurface conditions encountered

[16] Brown, B. A., Massie-Ferch, K., and R. M. Peters. 2013. Preliminary Bedrock Geology of Dane County, Wisconsin. WGNHS Open-File Report 2013-01.
[17] WGNHS. 2005. Bedrock Geology of Wisconsin. Accessed on: March 4, 2021.
[18] Trotta, L. C. and R. D. Cotter. 1973. Depth to Bedrock in Wisconsin. Accessed on: March 4, 2021.
[19] Bradbury, K. R. 2009. Karst and Shallow Carbonate Bedrock in Wisconsin.
[20] Mudrey, Jr., M. G., B. A. Brown, and J. K. Greenberg. 1982. Bedrock Geologic Map of Wisconsin. Accessed on: March 4, 2021.
[21] National Resources Conservation Service. Web Soil Survey. Accessed 2021.

generally consist of 0 to 36 inches of clayey topsoil over stiff to hard, lean, sandy, and silty clay with variable but generally trace amounts of sand and gravel. Silty sand and sandy silt with variable but generally little to some amounts of gravel was observed beneath the clay soils. Groundwater was encountered in 12 of 15 borings during drilling at depths between 3 and 17 feet bgs. After drilling, groundwater was observed in 5 of the 15 borings at depths between 6 and 10 feet bgs.

5.1.2.2 *Depth to bedrock*

- *Identify any sites where panel supports or foundation construction must be modified because of the presence of bedrock.*
- *Describe construction methods and foundation issues associated with situations where bedrock formations are near the surface.*
- *Discuss the likelihood or potential that construction on bedrock formations may negatively impact private wells within two miles of solar array sites.*

Koshkonong Solar expects to experience bedrock, boulders, gravel, or other refusal conditions requiring additional construction methods and techniques, such as but not limited to pre-drilling. Further geotechnical exploration will be conducted prior to final engineering design and site construction, to further inform soil characteristics across the Project Area. Private wells are not anticipated to be impacted by foundation construction.

5.2 Topography

5.2.1 *Describe the general topography of the project area.*

The existing topography within the Project Area can be described as flat to gently rolling hills with some streams and drainages present. Surface elevations range from 843 to 1,033 feet above mean sea level (**Figure 4.1.3, Appendix B**). The lowest elevations are along the few streams and drainages present, particularly toward Mud Creek, north-northwest of the Project Area and unnamed tributaries to Koshkonong Creek, which are east of the Project Area. Slopes within the Project Area are generally within the 0 to 6% range with minor areas of 6 to 12% slopes. The Project is designed to use the existing topography to the maximum extent practicable to minimize grading.

5.2.2 *Describe expected changes to site topography due to grading activities.*

Grading changes to the existing topography that would affect land use, water inflow/outflow directions from the Project, and flow rates impacting erosion on or off the Project will be minimized in the engineering process. Cut/fill and associated blending of the Project will be required in areas, pending final engineering design, but will not change the overall nature of the topography on the site. Note that all cut/fill or earth movement quantities provided in this application are subject to final design

engineering. WDNR regulates erosion control on the site via WPDES permitting. Topsoil preservation, as required by WDNR, is not included in any estimated or approximated quantities provided in this application.

5.3 Land Cover

5.3.1 *Vegetative communities in the project area - List and identify the dominant plants in the following community categories. Analysis should use recent data, not greater than two years old. Land cover can be based on recent aerial photography or on-site evaluation.*

5.3.1.1 *Agricultural*

- *Row/Traditional crops*
- *Specialty crops/Other*

The Project Area is heavily dominated by row crop agriculture, primarily composed of corn (*Zea mays*) and soybeans (*Glycine max*). See **Table 5.3.2** for acreages of the agricultural land cover categories. No organic farms were identified within the Project Area.

5.3.1.2 *Non-Agricultural upland*

- *Prairie/Grasslands/Pasture/Fallow field*
- *Upland forests*

Minor areas of grassland, prairie, and pasture were observed within the Project Area during the site reconnaissance from September 24-25, 2019 and field wetland delineation conducted between November 9, 2020 and November 12, 2020. The prairie/grassland/pasture/fallow field areas are also depicted on **Figure 4.1.6.4** (**Appendix B**). Grassland and prairie areas generally consist of small plots utilized for hay production, lawns associated with homes or businesses, and areas along roadways. Only one area, the Smith-Reiner Drumlin Prairie State Natural Area (**Figure 4.1.6.4**), located nearby but outside the Project Area, was considered high-quality grassland, prairie or pasture during the 2020 site reconnaissance and field wetland delineation efforts. Fallow fields that were observed were likely a result of a wetter than normal growing season and are normally in crop production. Grassy swales within and separating fields were dominated by smooth brome (*Bromus inermis*), orchard grass (*Dactylis glomerata*), and reed canary grass (*Phalaris arundinacea*) (**Table 5.3.2**).

Upland woodlands are typically composed of a combination of red oak (*Quercus rubra*), white oak (*Quercus alba*), bur oak (*Quercus macrocarpa*), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), and elms (*Ulmus* spp.). The

woodland communities are defined by the Natural Communities of Wisconsin[22] as Southern Mesic Forests, Southern Dry-Mesic Forests, or Southern Dry Forests (**Table 5.3.2**).

5.3.1.3 *Wetlands (by Eggers and Reed classification type)*

Based on a desktop review that consisted of a review of historic aerial imagery, water resource shapefiles, LiDAR data, soils data and other publicly available resources, wetlands within the Project Area were desktop delineated and included seasonally flooded basins, fresh (wet) meadow, shallow marsh, shrub-carr, shallow open water, and floodplain forest wetlands[23].

Seasonally flooded basins are wetlands that have alternating periods of saturation and inundation. In an agricultural setting, depressional areas with stunted crops, a lack of vegetation, or a predominance of wet, weedy vegetation are indications of a seasonally flooded basin. Fresh (wet) meadow wetlands typically remain wetter for longer periods of time than seasonally flooded basins and are dominated by sedges or other graminoids such as reed canary grass. Shallow marsh wetlands possess standing water throughout the majority of the growing season, but rarely exceeds a depth of 1 meter. It is common for wetlands within this classification to be dominated by cattail (*Typha spp*.), river bulrush (*Schoenoplectus fluviatilis*), and dark-green bulrush (*Scirpus atrovirens*). Shrub-carr wetlands are regularly inundated and dominated by a shrub layer. Common plants found within this wetland type include red osier dogwood (*Cornus alba*), speckled alder (*Alnus incana*), and sandbar willow (*Salix interior*). Shallow open water wetlands include shallow and deep ponds that are usually 3 to 6 feet deep. Plant species include duckweed (*Lemnoideae* spp.), pondweed (*Potamogeton* spp.), coontail (*Ceratophyllum demersum*), and watermilfoil (*Myriophyllum* spp.). Floodplain forest wetlands are typically located in riparian areas and dominated by cottonwood (*Populus deltoides*), black willow (*Salix nigra*), box elder (*Acer negundo*), silver maple (*Acer saccharinum*), and green ash (*Fraxinus pennsylvanica*). The wooded wetland communities are typical of the Floodplain Forest as defined by the Natural Communities of Wisconsin[6].

A field wetland delineation was conducted between November 9 and 12, 2020. The field investigation only covered areas within the Project Area that, at the time, had potential to be impacted due to development ("Delineation Area") and therefore did not cover the entirety of the Project Area. The field wetland delineation documented 62 wetlands in the 4,327-acre Delineation Area, which primarily consisted of seasonally flooded basins and wet meadow wetlands. Within the Delineation Area,

[22] Epstein, E.E. Natural communities, aquatic features, and selected habitats of Wisconsin. Chapter 7 in The ecological landscapes of Wisconsin: An assessment of ecological resources and a guide to planning sustainable management. Wisconsin Department of Natural Resources, PUB-SS-1131H 2017, Madison.
[23] Eggers, S. D. and D. M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota and Wisconsin, second edition. U. S. Army Corps of Engineers, St. Paul, MN, USA.

herbaceous wetlands were typically disturbed and contained non-native plant species. Additionally, no bog or fen features were observed. Full results of the field wetland delineation can be found in the Wetland Delineation Report in **Appendix U.** Full details of the desktop and field delineation efforts are described in Section 8.2.

5.3.2 *Acres of land cover categories in project area - Estimate the number of acres within each land cover category listed below. Provide this information in table format and explain what method was used to calculate the areas reported.*

5.3.2.1 *Agricultural*

- *Row/Traditional crops*
- *Specialty crops/Other*

5.3.2.2 *Non-Agricultural upland*

- *Prairie/Grasslands/Pasture/Fallow field*
- *Upland forests*

5.3.2.3 *Wetlands by Eggers and Reed classification type.*

5.3.2.4 *Developed land*

- *Residential*
- *Commercial/Industrial*

Land cover within the Project Area was originally mapped and described using data and descriptions from the Wiscland 2.0 Land Cover Data (WLCD)[24], which combines ground-level mapping, satellite imagery, and USDA data in a product produced jointly by the WDNR, UW-Madison and the State Cartographer's Office. The updated view of Wisconsin's land cover was accomplished by using data from the U.S. Government's Landsat series of satellites followed up with a coordinated field collection effort combining WDNR staff assistance and a WDNR summer field collection crew that visited field locations in 2015 to collect and verify land cover type information.

Within the Project Area, WLCD data was reviewed during a site visit by a biologist in September 2019 and November 2020 in order to conduct a high-level evaluation of the accuracy of the WLCD land cover types. The WLCD was also compared to 2019 NAIP photography to further evaluate current land cover conditions within the Project Area. Based on these reviews it was found the WLCD differed slightly from existing conditions on the ground. Using the WLCD shapefile, Westwood digitized land cover using GIS software to make a more accurate representation of current land cover within the Project Area and have used those numbers in **Table 5.3.2** below and

[24] Wisconsin Department of Natural Resource, Univ. of Wisconsin-Madison. 2016. Land Cover Data (Wiscland 2.0).

subsequent land cover impact tables. It is worth noting that wetland land cover and wetland impact quantities identified in this section are based on the above land cover digitization effort. Detailed wetland types and quantities and impact amounts based on field and desktop wetland delineation efforts are provided in Section 8.3, **Appendix U** and depicted in **Figures 4.1.6.1, 8.3.1** and **8.3.2** (**Appendix B**).

Thirteen land cover types were recognized and mapped within the Project Area based on the land cover digitizing effort described above; eight land cover types are aquatic features. Row/traditional crops comprise 85% of land cover with upland forest, the next largest cover type, with nearly 4%. Other cover types under 4% are summarized in **Table 5.3.2**.

Table 5.3.2 – Estimated Land Cover Types Within Project Area*

Land Cover Type **	**Area (Acres)**	**Percent of Total**
Row/traditional crops	5,423	84.95
Upland forest	250	3.91
Prairie/grasslands/pasture/fallow field	179	2.81
Seasonally flooded basin	186	2.91
Floodplain forest	34	0.53
Wet meadow	46	0.72
Shallow open water	7	0.10
Shallow marsh	5	0.07
Shrub-carr	<1	<0.01
Waterway	25	0.39
Set of Stock Ponds	36	0.56
Commercial/industrial	148	2.32
Residential	46	0.73
Total	**6,384**	**100**

***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.

****Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.

5.3.3 *Land Cover Impacts – In table format, estimate the number of acres, in each land cover type identified in Section 5.3.2, that would be affected by project construction and or facilities. Provide the amounts of both temporary and permanent impacts for the following categories*

5.3.3.1 *Solar panel rows and pads*

Table 5.3.3.1 – Array Area Land Cover Impacts*						
Land Cover Type **	**Fence I.D.**	**Power Block I.D.**	**Primary Array Areas**		**Alternate Array Areas**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Row/traditional crops	All Fence I.D.'s	All Power Block I.D.'s	2,292	35.91	970	15.19
Prairie/grasslands/ pasture/fallow field	A, B, C, D, F, G, I, J, M, N , O, P, Q, R, S, U, X, Y, Z, CC, EE, FF, GG	B1, C3, C4, G7-Alt, I4, U1, U2, X2, FF1, FF3, GG1	7	0.1	3	0.05
Upland forest	A, B, C, D, E, F, G, H, I, K, M, N, O, P, Q, S, T, X, Y, Z, AA, CC, DD, EE, FF, GG	A1, A2, A3, C3, C4, E4-Alt, G6-Alt, H1, I4, I8-Alt, M1, M5, N2, N8, N9, Q2, Q5-Alt, S1, S10-Alt, S4, S6, X2, AA1, DD2, DD3, EE2, EE3, FF1, FF3, GG1	20	0.31	18	0.28
Seasonally flooded basin	A, C, E, F, G, H, I, J, K, L, M, N, O, P, Q, S, BB, EE, GG	A2, A3, C3, C5, E4-Alt, F8-Alt, G4, I5-Alt, J1, J2, K1, K2, K3, L2, L3, N9, O1, P1, P10-Alt, Q1, Q2, Q3, Q5-Alt, S4, S7, S8, BB1, EE2, GG2	29	0.46	16	0.25
Floodplain forest	C, N	N/A	<1	<0.01	0	0
Wet meadow	F, N, P, U, V	N/A	<1	<0.01	<1	<0.01
Shallow open water	N/A	N/A	0	0	0	0
Shallow marsh	N/A	N/A	0	0	0	0
Shrub-carr	N	N/A	0	0	<1	<0.01
Waterway	G, H, R	G7-Alt, R1	<1	<0.01	<1	<0.01
Set of Stock Ponds	B	N/A	<1	<0.01	0	0
Commercial/industrial	H, N, S, Z	N/A	<1	<0.01	<1	<0.01
Residential	F, I, J, M, N, O, Q, S, U, X, AA	N/A	<1	<0.01	<1	<0.01

Table 5.3.3.1 – Array Area Land Cover Impacts*						
Land Cover Type **	**Fence I.D.**	**Power Block I.D.**	**Primary Array Areas**		**Alternate Array Areas**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Total			**2,348**	**36.78**	**1,007**	**15.77**
*****See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.						
**Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.						

Most of the land cover within the fence boundaries is assumed to change based on the VMS for the Project. (See **Appendix W**). Though the land cover can be converted back to its original purpose following the decommissioning of the Project, the impact will be considered permanent for the duration of the Project.

5.3.3.2 *Collector circuits. For collector circuits in wooded areas, disclose whether or not a ROW around the cables would be maintained in an open (no tree) condition.*

Land cover impact for collector circuits were calculated only for those located outside of the array fence boundaries to avoid counting impact twice between this section and section 5.3.3.1. The estimates in Table 5.3.3.2 include an impact buffer of 15 feet to each side of the collector center line to account for the potential impact of the equipment used to place the collection lines. All impacts from the collection system are considered temporary, because after the circuits are placed, the land cover will be allowed to return to its existing condition (**Table 5.3.3.2**).

Table 5.3.3.2 – Collection System Land Cover Impacts*						
Land Cover Type**	**Fence I.D.**	**Power Block I.D.**	**Primary Collection Line**		**Alternative Collection Line**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Row/traditional crops	All Fence I.D.'s	A1, A2, A3, B1, BB1, C1, C2, C3, C4, C5, D1, D3-Alt, E1, E2, E3-Alt, E4-Alt, F1, F2, F3, F4, F5, F6, F7-Alt, F9-Alt, G1, G2, G3, G4, G5, G6-Alt, G9-Alt, H1, I1, I2, I3, I4, I5-Alt, I6-Alt, I7-Alt, I9-Alt, J1, J2, J3, J4, J5, J6-Alt, J7-Alt, K1, K2, K3, K4, K5, L1, L2, L3, L4, M1, M2, M3, M4, M5, M6-Alt, M7-Alt, N1, N2, N3, N4, N5, N6, N7, N8, N9, O1, O2-Alt, P1, P10-Alt, P11-Alt, P2, P3, P4, P5, P6, P7, P8, P9-Alt, Q1, Q2, Q3, Q4, Q5-Alt, R1, S1, S10-Alt, S2, S3, S4, S5, S6, S7, S8, T1, U1, U2, U3-Alt, V1, W1, W2, X1, X2, X3, Y1, Z1, Z2-Alt, AA1, CC1, CC2, DD1, DD2, DD3, DD4, EE1, EE2, EE3, EE4, FF1, FF2, FF3, GG1, GG2, GG3, GG4	43	0.67	10	0.15
Prairie/grasslands/ pasture/fallow field	D, I, FF	N/A	1	0.01	1	0.01
Upland forest	B, G, I, M, N, O, S, X, AA, DD, EE, GG	G6-Alt, M1, N9, S10-Alt, X2, DD2, DD3, EE3	1	0.01	1	0.02
Seasonally flooded basin	C, I, O, EE	C5, O1, I5-Alt	<1	<0.01	<1	<0.01
Floodplain forest	N/A	N/A	1	0.01	0	0
Wet meadow	N/A	N/A	1	0.01	0	0
Shallow open water	N/A	N/A	0	0	0	0
Shallow marsh	N/A	N/A	0	0	0	0
Shrub-carr	N/A	N/A	0	0	0	0
Waterway	N/A	N/A	<1	0.01	<1	<0.01
Set of Stock Ponds	N/A	N/A	0	0	0	0
Commercial/industrial	N/A	N/A	1	0.02	<1	<0.01

Table 5.3.3.2 – Collection System Land Cover Impacts*						
Land Cover Type**	**Fence I.D.**	**Power Block I.D.**	**Primary Collection Line**		**Alternative Collection Line**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Residential	N/A	N/A	<1	<0.01	0	0
Total			**48**	**0.74**	**12**	**0.18**
***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.						
**Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.						

5.3.3.3 *Access roads*

Land cover impact for access roads were calculated only for those located outside of the array fence boundaries to avoid counting impact twice between this section and section 5.3.3.1. The permanent impacts to land cover due to the access roads is calculated based on the maximum proposed road width of 12 feet with 4 foot shoulders. The temporary impacts to land cover due to the access roads is calculated based on a 15' buffer on each side of the access road, for a total construction corridor of 50 feet (15 feet on each side of the 20-foot-wide road/shoulders).

Table 5.3.3.3 – Access Road Land Cover Temporary Impacts*						
Land Cover Type**	**Fence I.D.**	**Power Block I.D.**	**Primary Access Road**		**Alternative Access Road**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Row/ traditional crops	All Fence I.D.'s	A1, A2, A3, B1, C1, C2, C3, C4, C5, D1, D2-Alt, E1, E2, E3-Alt, E4-Alt, F1, F2, F3, F4, F5, F6, G1, G2, G3, G4, G5, G9-Alt, H1, I1, I2, I3, I4, I5-Alt, I6-Alt, I7-Alt, I9-Alt, J1, J2, J3, J4, J5, K1, K2, K3, K4, L1, L2, L3, L4, M1, M2, M3, M4, M5, M6-Alt, N1, N10-Alt, N3, N4, N5, N6, N7, N8, N9, O1, P10-Alt, P11-Alt, P2, P3, P4, P6, P7, P8, Q1, Q2, Q3, Q4, Q5-Alt, R1, S1, S2, S3, S4, S5, S6, S7, S8, T1, U1, U2, V1, W1, W2, X1, X2, X3, Y1, Z1, AA1, BB1, CC1, CC2, DD1, DD2, DD3, DD4, EE1, EE2,	2	0.02	<1	<0.01

Table 5.3.3.3 – Access Road Land Cover Temporary Impacts*						
Land Cover Type**	**Fence I.D.**	**Power Block I.D.**	**Primary Access Road**		**Alternative Access Road**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
		EE3, EE4, FF1, FF2, FF3, GG1, GG2, GG3, GG4				
Prairie/ Grasslands/ pasture/fallow field	FF	N/A	<1	<0.01	<1	<0.01
Upland forest	G, H, M, N, S, X, DD, EE, GG	H1, M1, N9, X2, DD2, DD3, EE3	<1	<0.01	<1	<0.01
Seasonally flooded basin	C, I, O	C5, I5-Alt	<1	<0.01	0	0
Floodplain forest	N/A	N/A	0	0	0	0
Wet meadow	N/A	N/A	0	0	0	0
Shallow open water	N/A	N/A	0	0	0	0
Shallow marsh	N/A	N/A	0	0	0	0
Shrub-carr	N/A	N/A	0	0	0	0
Waterway	N/A	N/A	0	0	0	0
Set of Stock Ponds	N/A	N/A	0	0	0	0
Commercial/ industrial	N/A	N/A	1	0.01	<1	<0.01
Residential	N/A	N/A	0	0	0	0
Total			**3**	**0.03**	**0**	**0**
***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.						
****Land cover categories based on Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.						

Table 5.3.3.3 – Access Road Land Cover Permanent Impacts*						
Land Cover Type**	**Fence I.D.**	**Power Block I.D.**	**Primary Access Road**		**Alternative Access Road**	
			Area (Acres)	**Percent of Total Project Area**	**Area (Acres)**	**Percent of Total Project Area**
Row/ traditional crops	All Fence I.D.'s	A1, A2, A3, B1, C1, C2, C3, C4, C5, D1, D2-Alt, E1, E2, E3-Alt, E4-Alt, F1, F2, F3, F4, F5, F6, G1, G2, G3, G4, G5, G9-Alt, H1, I1, I2, I3, I4, I5-Alt, I6-Alt, I7-Alt, I9-Alt, J1, J2, J3, J4, J5, K1, K2, K3, K4, L1, L2, L3, L4, M1, M2, M3, M4, M5, M6-Alt, N1, N10-Alt, N3, N4, N5, N6, N7, N8, N9, O1, P10-Alt, P11-Alt, P2, P3, P4, P6, P7, P8, Q1, Q2, Q3, Q4, Q5-Alt, R1, S1, S2, S3, S4, S5, S6, S7, S8, T1, U1, U2, V1, W1, W2, X1, X2, X3, Y1, Z1, AA1, BB1, CC1, CC2, DD1, DD2, DD3, DD4, EE1, EE2, EE3, EE4, FF1, FF2, FF3, GG1, GG2, GG3, GG4	1	0.01	<1	<0.01
Prairie/ Grasslands/ Pasture/ fallow field	FF	N/A	<1	<0.01	<1	<0.01
Upland forest	G, H, M, N, S, X, DD, EE, GG	H1, M1, N9, X2, DD2, DD3, EE3	0	0	0	0
Seasonally flooded basin	C, I, O	C5, I5-Alt	<1	<0.01	0	0
Floodplain forest	N/A	N/A	0	0	0	0
Wet meadow	N/A	N/A	0	0	0	0
Shallow open water	N/A	N/A	0	0	0	0
Shallow marsh	N/A	N/A	0	0	0	0
Shrub-carr	N/A	N/A	0	0	0	0
Waterway	N/A	N/A	0	0	0	0

Set of Stock Ponds	N/A	N/A	0	0	0	0
Commercial/ industrial	N/A	N/A	<1	<0.01	<1	<0.01
Residential	N/A	N/A	0	0	0	0
Total			**1**	**0.01**	**0**	**0**
***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.						
**Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.						

5.3.3.4 *Substation and BESS*

The Project Substation and BESS will collectively impact approximately 19 acres of row crop agricultural land. The preliminary Project Substation design assumes the footprint will be approximately 4 acres and the BESS footprint is estimated at 15 acres. Land cover impacts are summarized in **Tables 5.3.3.4**. Both Project Substation and BESS land cover impacts are considered permanent. The proposed layout of the parcels are depicted in **Figure 4.1.4/4.1.5** in **Appendix B**.

Table 5.3.3.4 – Substation and BESS Landcover Impacts*

Land Cover Type **	**Substation**		**BESS**	
	Area (Acres)	**Percent of Total**	**Area (Acres)**	**Percent of Total**
Row/traditional crops	4	0.06	15	0.23
Prairie/grasslands/pasture/fallow field	0	0	0	0
Upland forest	0	0	0	0
Seasonally flooded basin	0	0	0	0
Floodplain forest	0	0	0	0
Wet meadow	0	0	0	0
Shallow open water	0	0	0	0
Shallow marsh	0	0	0	0
Shrub-carr	0	0	0	0
Waterway	0	0	0	0
Set of Stock Ponds	0	0	0	0
Commercial/industrial	0	0	0	0
Residential	0	0	0	0
Total	**4**	**0.06**	**15**	**0.23**
***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.				
****Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.				

5.3.3.5 *O&M Building*

The preliminary O&M Building design is expected to require approximately 5,000 square feet (0.11 acres). The land cover impacts in **Table 5.3.3.5** include the O&M building, associated parking (0.23 acres) and a gravel storage area (2.0 acres) and are considered permanent. The proposed layout of the parcel with the O&M Building is depicted in **Figure 4.1.4/4.1.5** in **Appendix B**. Note that because the O&M area is within the fence of Array X, land cover impacts have already been accounted for in the primary array impact numbers in Section 5.3.3.1.

Table 5.3.3.5 – O&M Building Landcover Impacts* (Includes gravel storage area and parking)

Land Cover Type **	**Area (Acres)**	**Percent of Total**
Row/traditional crops	2	0.04
Prairie/grasslands/pasture/ fallow field	0	0
Upland forest	0	0
Seasonally flooded basin	0	0
Floodplain forest	0	0
Wet meadow	0	0
Shallow open water	0	0
Shallow marsh	0	0
Shrub-carr	0	0
Waterway	0	0
Set of Stock Ponds	0	0
Commercial/industrial	0	0
Residential	0	0
Total	**2**	**0.04**

***See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.

****Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.

5.3.3.6 *Generator tie line*

A 345kV Gen-Tie line will be located between the Koshkonong Solar Project Substation and the existing Interconnection Substation to span approximately 0.84 miles. The Gen-Tie line will consist of eight monopole steel structures on a concrete pier foundation or directly embedded. Final engineering for the Project Substation and Gen-Tie have not been completed; however, the structure height is anticipated to be approximately 95 to 130 feet above ground. A typical pole structure is included in **Appendix D** and shown in **Figure 4.1.4/4.1.5 Appendix B**. Gen-tie facilities will be designed and built in compliance with the NESC[2].

Land cover impacts resulting from the 100-foot wide ROW corridor for the 0.84-mile Gen-Tie line are summarized in **Table 5.3.3.6**. Land cover impacts associated with power poles are incorporated into the Gen-Tie calculation.

Table 5.3.3.6 – Generator Tie Line Land Cover Impacts		
Land Cover Type *	**Temporary Impacts**	
	Area (Acres)	**Percent of Total Project Area**
Row/traditional crops	8	0.13
Prairie/grasslands/pasture/fallow field	1	0.02
Upland forest	<1	0.01
Seasonally flooded basin	0	0
Floodplain forest	0	0
Wet meadow	0	0
Shallow open water	0	0
Shallow marsh	0	0
Shrub-carr	0	0
Waterway	0	0
Set of Stock Ponds	0	0
Commercial/industrial	<1	<0.01
Residential	0	0
Total	**9**	**0.16**
*****Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.		

Table 5.3.3.6a represents temporary land cover impacts associated with the general construction laydown yard located within the fence of Array O. These land cover impacts have already been accounted for within the alternate solar array land cover impacts in **Table 5.3.3.1**.

Table 5.3.3.6a – Laydown Yard Temporary Land Cover Impacts*		
Land Cover Type **	**Area (Acres)**	**Percent of Total**
Row/traditional crops	18	0.28
Prairie/grasslands/pasture/fallow field	<1	0.01
Upland forest	0	0
Seasonally flooded basin	1	0.01
Floodplain forest	0	0

Table 5.3.3.6a – Laydown Yard Temporary Land Cover Impacts*		
Land Cover Type **	**Area (Acres)**	**Percent of Total**
Wet meadow	0	0
Shallow open water	0	0
Shallow marsh	0	0
Shrub-carr	0	0
Waterway	0	0
Set of Stock Ponds	0	0
Commercial/industrial	0	0
Residential	0	0
Total	**19**	**0.29**
*****See **Section 8.3, Appendix U** and **Figures 8.3.1** and **8.3.2** for actual wetland quantities and impact amounts.		
******Land cover based on modified Wiscland 2.0 Land Cover Data; See Section 5.3.2.1 for methods of calculation.		

5.4 Invasive Species

5.4.1 *Describe locations where invasive species, forest pests, or diseases have been observed in the project area (e.g., invasive plants, oak wilt, etc.).*

During the 2020 field reconnaissance and field wetland delineation conducted by Westwood, non-native or invasive species were observed. (*See* **Appendix F** and **W**). Invasive and non-native species were mainly concentrated around field edges and roadside ditches in small localized populations, and in wetlands. Commonly encountered non-native and invasive species included smooth brome (*Bromus inermis*), dandelion (*Taraxacum officinale*), garlic mustard (*Alliaria petiolata*) Kentucky bluegrass (*Poa pratensis*), white campion (*Silene latifolia*), Canada thistle (*Cirsium arvense*), common burdock (*Arctium minus*), common buckthorn (*Rhamnus cathartica*), Tatarian honeysuckle (*Lonicera tatarica*), Siberian elm (*Ulmus pumila*), reed canary grass (*Phalaris arundinacea*), common reed grass (*Phragmites australis*), and narrow-leaved cattail (*Typha angustifolia*). Emerald ash borer (*Agrilus planipennis*), gypsy moth (*Lymantria dispar dispar*), and oak wilt (*Ceratocystis fagacearum*), although not encountered in the Project Area during field reconnaissance, have the potential to occur in Dane County.

5.4.2 *Describe mitigation actions during construction that would be used to prevent the introduction or spread of invasive species, forest pests, or diseases.*

In order to prevent the introduction or spread of invasive species, forest pests, or disease, topsoil and fill material from within the Project Area or from a local source will be used. If excavation and other construction equipment is used in an area containing documented invasive species, then the equipment will be inspected and cleaned of debris and soil prior to removal of equipment from the area. ROWs and treelines will be a top priority for monitoring the potential of invading species.

5.4.3 *Describe planned ongoing invasive species management for the project during operations.*

The invasive species monitoring protocol would be implemented by a qualified contractor. Periodic visual inspections of the establishing and established vegetation will be made to detect new invasive plant species occurrences and expansion of pre-existing ones. The timing and frequency of these inspections will be adapted in response to needs identified during and immediately following construction. The outcome of these inspections will be contractor-developed control recommendations based on the species and circumstances observed. These control recommendations will be reviewed and implemented as appropriate by Koshkonong Solar. Refer to the VMS in **Appendix W** for additional information in response to Sections 5.4.2 and 5.4.3. Additional information regarding Koshkonong Solar's invasive species management for the Project during operations is provided below at Section 5.5.1.3.

5.5 Vegetation Management

5.5.1 *Provide a detailed revegetation and site restoration plan that discusses the following items:*

5.5.1.1 *Types of revegetation proposed for impacted areas. Include seed mixes if known.*

The Koshkonong VMS's phased approach begins with site soil preparation and cover crop seeding (Phase 1), followed by zone establishment of native grass and sedge ground cover and pollinator mixes (Phase 2). This strategy will reduce the risk that plantings will be overtaken by weedy plants, leading to lower maintenance efforts in the long term. Phase 1 and Phase 2 can occur before or after solar facility construction but will ideally occur prior to panel installation. Phase 3, site management, will occur after solar facilities are constructed. This phased approach results in plantings that contain a greater diversity of species while minimizing disturbance and maximizing weed control. The ecological communities proposed in the zone establishment section of the VMS will be capable of adapting over time to environmental change with minimal impact to solar arrays. The proposed vegetation zones include the Grass Sedge Cover for Upland (GSU), Moist Soil (GSM), Pollinator Habitat for Upland (PHU), Moist Soil (PHM), View Screening Perennial (VSP), and View Screening Trees and Shrubs (VSTS) zones. Where these zones will be applied and the typical seed mixes proposed for these zones are further detailed in the VMS in **Appendix W**. Information in response to Sections 5.5.1.1 through 5.5.1.3 is also provided in **Appendix W**.

5.5.1.2 *Vegetation monitoring and management protocols for subsequent years after construction.*

The conceptual approach of the VMS will be applied across the entire Project by an ecological consulting firm/landscape professionals, Koshkonong Solar staff, and construction contractors. The implementation of the VMS will result in a Vegetation

Management Plan (VMP) executed by a similar group of experienced professionals. The VMP will be materially similar to the VMS but will take into account the conditions within the final limits of Project disturbance, seed mix availability, and timing of the construction sequence. The same vegetation management practices will be implemented during the construction, operation, and reclamation of the Gen-Tie line. Vegetation impacts in the Gen-Tie line's easement area are expected to be minimal given the short distance of the proposed line and existing land use and landscape features. Koshkonong Solar is also considering the use of grazing sheep at the proposed project as identified in **Appendix W**. Refer to the VMS in **Appendix W** for information in response to Sections 5.5.1.1 through 5.5.1.3. The final VMP will be available and provided to the Commission prior to commencement of construction activities.

5.5.1.3 *Invasive species monitoring and management.*

One of the primary goals of the VMS, which will inform the VMP, is to maintain a high degree of weed control and invasive species management across the site. As further detailed in **Appendix W**, mowing and spot-herbicide application will be primary methods of invasive species management. The VMP will take a granular approach to monitoring invasive species in the area, specifically detailing road rights-of-way and tree lines crossing through the site. The findings will be used to inform site-specific seed mix and invasive species management strategies across the site. To assess the success of native and non-native species, a monitoring program will be established to address a set of performance standards to be developed in concert with the final VMP and construction sequence. Periodic visual inspections of the establishing and established vegetation will be made to detect native and non-native invasive species and their expansion across the Project. The results of the inspections will provide information on the achievement of performance standards and will provide recommendations on management methods and additional seeding. The invasive species monitoring protocol will be implemented by a qualified contractor. The timing and frequency of these inspections will be adapted in response to needs identified during and immediately following construction. The outcome of these inspections will be contractor-developed control recommendations based on the species and circumstances observed. These control recommendations will be reviewed and implemented as appropriate by Koshkonong Solar staff.

5.6 Wildlife

5.6.1 *Describe existing wildlife resources and estimate expected impacts to plant and animal habitats and populations.*

Below is a summary of the Koshkonong Solar Site Characterization Study (SCS) (**Appendix F**), a detailed report that describes the existing animal and plant resources and the potential for special status (e.g., threatened, endangered, special concern) species or their habitats to occur within the Project Area.

As detailed in Section 5.3.2 (*see also* **Table 5.3.2** and **Figure 4.1.6.4**, **Appendix B**), the land cover within the Project Area is dominated by cultivated crops, including corn and soybean fields (85 percent). Corn and soybeans are annual cover types that are typically used by a few common wildlife species on a limited seasonal basis. Species that may use agricultural land include white-tailed deer (*Odocoileus virginianus*), small mammals such as mouse [Family Muridae] and vole [Family Cricetidae] species, raccoon (*Procyon lotor*), striped skunk (Mephitis mephitis) and woodchuck (*Marmota monax*). Bird species that may use the agricultural land include ring-necked pheasant (*Phasianus colchicus*), blackbird [Family Icteridae] species, other small perching birds, and common raptors such as the red-tailed hawk (*Buteo jamaicensis*). After crops are harvested, the fields may offer short term foraging areas for common waterfowl including the Canada goose (*Branta canadensis*) and mallard (*Anas platyrhynchos*). Reptile and amphibian species known to use agriculture habitat include the common garter snake (*Thamnophis sirtalis*), eastern hognose snake (*Heterodon platirhinos*), western fox snake *(Pantherophis vulpinus*), northern leopard frog (*Lithobates pipiens*), and American toad (*Anaxyrus americanus*). However, due to the relative lack of plant diversity and habitat structure, and the temporary seasonal nature of the crop cover, the use of cropped field habitat by the aforementioned species is likely limited. The conversion of agricultural to native or naturalized herbaceous cover (*see* **Appendix W**) should improve habitat quality and benefit the populations for many of the species that use the areas currently consisting of agricultural row crop production. Some larger mammalian species may not be able to access the areas following construction due to fencing, but it is unlikely that it will negatively impact their populations.

The wetland habitat within the Project Area (4 percent combined across types, e.g., seasonally flooded basins, wet meadows) may be used by species such as the red-winged blackbird (*Agelaius phoeniceus*), mallard, blue-winged teal (*Anas discors*), and great blue heron (*Ardea herodias*). Also, mammal species such as mink (*Neovison vison*) and muskrat (*Ondatra zibethicus*) may occur in wetland areas. Many reptile and amphibian species may occur in the wetland areas, including the aforementioned species and others, such as the boreal chorus frog (*Pseudacris maculate*), green frog (*Lithobates clamitans*), painted turtle (*Chrysemys picta*), and common snapping turtle (*Chelydra serpentina*). Project-related impacts to wetland/waterway habitats will be avoided and are not anticipated to negatively impact the populations of species that use these habitats. Also, erosion control BMPs will be employed to avoid indirect impacts to wetlands.

Forested habitat, which comprises 4 percent of the Project Area, is predominately located along waterways and wetland complexes, and is also associated with farmsteads. Species that may use these forested areas include white-tailed deer, gray squirrel (*Sciurus carolinensis*), woodchuck, and mouse and vole species. Birds that may use these woodlots include American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), downy woodpecker (*Picoides pubescens*) and other common bird species. Reptile and amphibian species that use woodlot habitats include

common garter snake, wood frog (*Lithobates sylvaticus*), spring peeper (*Pseudacris crucifer*), gray treefrog (*Hyla versicolor*), American toad, and tiger salamander (*Ambystoma tigrinum*). Project-related impacts to forested areas are minimal relative to the total of forest available within the Project Area, thus disturbance should not negatively impact the populations of these forest-dwelling species.

Prairie, grassland, fallow fields, and pastureland comprise 2.8 percent of the Project Area, combined. It is worth noting that prairie and natural grassland habitat types only comprise a small percentage of this combined land cover grouping; most of these areas are managed farmland which is periodically disturbed, similar to the cultivated agricultural areas discussed above. Species that may use hay and pastureland include white-tailed deer, cottontail rabbit (*Sylvilagus floridanus*), mouse and vole species, raccoon, and striped skunk. Bird, amphibian, and reptile species that may use hay and pastureland will be similar to those listed in the agricultural section. However, due to the relative lack of diverse vegetative cover and habitat structure, and regular grazing and hay cutting, this habitat offers mostly temporary habitat for foraging, rather than stable long-term habitat. The conversion to stable year-round herbaceous habitat following Project construction should improve habitat quality for many of these species and benefit their populations. As with the large mammalian species that use agricultural lands, the large mammalian species that use hay and pastureland may not be able to access the areas due to fencing, but it likely will not negatively impact their populations.

Developed areas (i.e., commercial/industrial/residential), which comprise 3 percent of the Project Area, are typically used by species accustomed to human disturbance, including mammal species such as the gray squirrel and thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*) and bird species, such as the house sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*). Species that use developed areas are typically common and tolerant of human activity[25, 26, 27]. Because these species have robust and secure populations, are adaptable/tolerant to anthropogenic disturbance of land covers, and developed areas are already altered by human activity, impacts to developed areas will not negatively impact populations of these species.

Direct and Indirect Effects of Utility-Scale Solar Facilities on Birds

Based on the current relevant literature and available information, the direct impacts to birds, including waterbirds, are limited in absolute numbers and in relative number

[25] Scalice, S., M. Benson, and A. Howard. 2018. Increased tolerance of human presence observed in urban compared to rural eastern gray squirrels. Journal of Ecology (2):2-9.
[26] Lowther, P.E. and C.L. Link. 2006. House sparrow (*Passer domesticus*), version 2.0. In the Birds of North America (A.F. Poole, Ed.). Cornell Lab of Ornithology. Ithaca, NY.
[27] Cabe. P.R. 1993. European starling (*Sturnus vulgaris*), version 2.0. In the Birds of North America (P.G. Rodewald, Ed.). Cornell Lab of Ornithology, Ithaca, NY.

as compared to other anthropogenic sources. The operational wildlife response and reporting system to be implemented at Koshkonong Solar will gather data helpful in determining if bird mortality is occurring (see Section 5.6.2.3). The potential for indirect effects to birds will be minimized at the Project by prioritizing the use of land in agricultural areas for the Project footprint, implementing a ground cover strategy with a diverse plant community, and employing BMPs for lighting and noise reduction.

Direct effects to birds at PV solar facilities have been described as apparent collisions with the fixed structures of the facilities[28]. However, there is evidence that many of the recorded bird fatalities were indicative of predation or even preening (i.e., feather-spots), and were not collision related[29]. The published literature on avian collisions with fixed PV solar infrastructure is limited to a few studies in regions of the world substantially more arid than Wisconsin[30, 31, 32, 33]. These studies suggest direct impacts to birds were limited and mostly (about 85 percent) comprised of passerine (perching bird) species[34]. Although passerines appear to account for most solar-related bird fatalities, waterbirds often receive a disproportionate amount of attention due to the idea that posits waterbirds are at a greater risk of collision due to their misinterpretation of PV-panel arrays as a waterbody, and that panels create a visual "lake effect" from a distance. However, to date there does not appear to be a consistent pattern of waterbird fatalities to support this notion[33, 34].

Even with conservative inclusion of the bird fatalities attributed to background influences such as predation events, adjusted bird fatality estimates from the studies were low compared to other anthropogenic sources of avian mortality (i.e., vehicle- and building-collisions) with reported annual average bird fatality rates ranging from 1 to 3 birds/MW/year for solar facilities. The total statistical variability around these

[28] Walston Jr., L.J., K.E. Rollins, K.E. LaGory, K.P. Smith, and S.A. Meyers. 2016. A preliminary assessment of avian mortality at utility-scale solar energy facilities in the United States. Renewable Energy, 92:405-414.
[29] Kosciuch, K., D. Riser-Espinoza, W. Erickson. 2017. Understanding potential risk, and patterns of avian fatalities from utility-scale photovoltaic solar facilities. Technical memorandum to EDF Renewable Energy in support of the Palen Solar Bird and Bat Conservation Strategy. 10pp.
[30] Visser, E., V. Perold, S. Ralston-Paton, A. C. Cardenal, and P. G. Ryan. 2019. Assessing the impacts of a utility-scale photovoltaic solar energy facility on birds in the Northern Cape, South Africa. Renewable Energy, 133: 1285-1294.
[31] H.T. Harvey & Associates. 2015. California Valley Solar Ranch Project Avian and Bat Protection Plan, Final Postconstruction Fatality Report. Project #3326-03. Prepared for HPR II, LLC.
[32] Western Ecosystems Technology, Inc. 2014. Sources of avian mortality and risk factors based on empirical data from three photovoltaic solar facilities. Pp. 1-77.
[33] American Bird Conservancy. 2020. Habitat Loss. www.abcbirds.org. Accessed April 9, 2020.
[34] Wilcoxen, C.A., J.W. Walk, and M.P. Ward. 2018. Use of cover crop fields by migratory and resident birds. Agriculture, Ecosystems, and Environment. 252: 42-50.

reported bird fatality estimates ranged from 0.5 to 10.0 birds/MW/year[35], [36], [37]. A study by Walston et al.[28] estimated total annual bird mortality for solar energy facilities (included PV and concentrated solar power tower facilities) in the United States to be 37,800 – 138,600 per year for projects operating or under construction through 2015. None of the studies suggest that PV solar facilities present a population-level risk to any species. For context, various studies summarized by Walston et al.[28] estimated that, annually, between 97 and 988 million birds die from building and window strikes, and 80 to 340 million die from vehicle collisions.

The primary indirect effect by PV solar facilities to birds, as with other development, is loss or fragmentation of suitable habitat[28]. It is generally considered a BMP to site development in a way that minimizes loss of undisturbed or high-quality habitats, as has been done for this Project. Agricultural row crop areas are generally considered of lower ecological value compared to undisturbed, native habitats, semi-natural habitats (e.g., cover crops[29]), or Conservation Reserve Program [CRP] lands[35]. Best et al.[36] assessed habitat use by breeding birds in Iowa agricultural landscapes and found the lowest bird species abundances in agricultural habitats, and greater bird species abundances in natural and strip-cover habitats.

The replacement of monocultural row crops with a higher diversity plant community under and around PV-array fields as proposed by Koshkonong Solar will, for some bird species, increase the attractiveness of the land to individual birds. For example, though different habitat types were evaluated in studies by Visser et al.[30] and Devault et al.[37] found that some bird species used PV-facilities to the same degree or more than the surrounding, undeveloped lands. By prioritizing Project disturbance to lands in active agriculture and minimizing disturbance in existing non-agricultural or natural habitats, and by implementing the proposed VMS, Koshkonong Solar will mitigate indirect impacts to birds due to loss of the pre-construction land cover.

Other indirect effects to birds would be related to periodic human disturbance through artificial light and noise associated with equipment and human presence during construction and operations. BMPs used to minimize impacts to birds by artificial light sources include: 1) limiting the use of artificial lights to that which is necessary for human safety and security, 2) using hooded lights that are directed downward, and

---

[35] Johnson, D.H. 2000. Grassland bird use of Conservation Reserve Program fields in the Great Plains. Pages 19–34 in W. L. Hohman and D. J. Halloum, editors. A comprehensive review of Farm Bill contributions to wildlife conservation, 1985–2000. U.S. Department of Agriculture, Natural Resources Conservation Service, Wildlife Habitat Management Institute, Technical Report USDA/NRCS/WHMI-2000.

[36] Best, L. B., K. E. Freemark, J. J. Dinsmore, and M. Camp. 1995. A review and synthesis of habitat use by breeding birds in agricultural landscapes of Iowa. The American Midland Naturalist, 134:1-29.

[37] DeVault, T.L., T. W. Seamans, J. A. Schmidt, J. L. Belant, B. F. Blackwell, N. Mooers, L.A. Tyson, and L. VanPelt. 2014. Bird use of solar photovoltaic installations at U.S. airports: Implications for aviation safety. Landscape and Urban Planning, 122:122-128.

3) ensuring lights are illuminated only when needed through use of switches or motion-sensors[38]. These BMPs have been incorporated into the design and plans for the Koshkonong Solar Energy Center. In terms of noise disturbance, noise during the operations phase will be comparable to that of the surrounding agricultural, commercial, and residential communities. Noise during construction is anticipated to occur within an 18-24-month period and will be spatially and temporally variable in response to the construction sequence.

Koshkonong Solar will limit impacts to non-agricultural lands and use BMPs to avoid, minimize and mitigate impacts to suitable wildlife habitat and populations. BMPs to be used to avoid or minimize impacts to plant and animal populations and their habitats include avoiding unnecessary disturbance to habitats by driving on existing roads and already disturbed areas (i.e., agricultural land), and installing silt fencing around construction areas, and avoiding wetlands and waterways.

Federally Protected Species

A USFWS[39] Information for Planning and Consultation (IPaC) request (**Appendix A**) identified four federally threatened species, one federally endangered species, and one non-essential experimental population as potentially occurring within the Project Area or associated two-mile buffer (*see* **Appendix F**). Non-essential experimental population designations are assigned to populations deemed unnecessary for the continued existence of the species[40]. Regulatory restrictions are reduced for non-essential experimental populations. The federally threatened species identified include a mammal species and three vascular plant species. The federally endangered species is an insect.

Although not included in the IPaC, an additional federally protected species may occur within the Project Area or two-mile buffer. The federally protected species is known to breed in Dane County and has been observed on a nearby BBS route (Beloit Route) and four nearby Christmas Bird Counts (**Appendix F**).

Suitable summer habitat for the [redacted] includes [redacted] habitats where they roost and forage, and occasionally includes adjacent [redacted] habitats, such as [redacted] or the edges of [redacted]

[38] National Park Service. 2019. Night Skies: Best Practices. Accessed April 9, 2020.
[39] United States Fish and Wildlife Service (USFWS). 2021. Information for Planning and Consultation – Koshkonong Solar.
[40] USFWS. 2016. Endangered Species Act: Experimental Populations Pacific Region Fact Sheet. Pp. 1-2.

[redacted], and [redacted][42]. As Project-related impacts to [redacted] areas (roosting habitat) are minimized, any [redacted] clearing will be conducted outside the period of [redacted], and impacts to foraging areas (i.e., [redacted] [redacted] or [redacted] will not reduce their quality, [redacted] habitat and populations are not expected to be negatively affected.

[redacted] typically use large [redacted] complexes to forage, nest, and roost. The species occasionally use [redacted] areas during migration, as stop-over sites. The nearest [redacted] records are within two miles to the northeast of the Project Area near the Lake Mills Wildlife Area[43]. However, no impacts to large [redacted] complexes are expected from Project construction or operation and [redacted] areas are considered marginally suitable for stop-over. Therefore, [redacted] populations are not expected to be negatively affected.

The [redacted] occurs in a variety of habitats including [redacted], and [redacted] and [redacted] The [redacted] requires areas that support sufficient food ([redacted] and [redacted] from diverse and abundant [redacted] undisturbed nesting sites in proximity to [redacted] resources, and overwintering sites for hibernating [redacted] There are 2,111 acres of [redacted] within the Project Area; the remaining area is encompassed within the [redacted] [redacted]. Although [redacted] will use [redacted] areas, Project-related impacts to [redacted] areas are not anticipated to negatively affect [redacted] populations as implementation of the VMS (see **Appendix W**) will likely create more suitable habitat for the species.

[redacted] select sites near [redacted] and [redacted] in [redacted] areas where tall, large diameter [redacted] are available for nesting and roosting[47]. Wintering grounds typically contain [redacted], food resources, and roosting sites; and stopover habitat is similar to wintering habitat. According to the ERR (see **Appendix K**), there is one known [redacted] within one mile of the Project Area, however WDNR indicates the

[redacted]

Project proximity to its location does not pose a risk of impact to the occurrence. Impacts to [redacted] populations are not expected to occur as a result of Project construction or operation.

The [redacted] typically occur in moist, undisturbed [redacted] or [redacted]. Other habitat requirements for this species include [redacted] and [redacted] areas with minimal [redacted] encroachment[48]. As the Project will be sited in areas outside of potentially suitable habitat for this species, no impacts to [redacted] populations or habitats are expected.

[redacted] typically occurs in dry, dry-mesic, or mesic [redacted] More specifically, the species occurs on [redacted] or [redacted] hillside [redacted] As the Project will primarily be sited in row crop areas, no impacts to [redacted] populations or habitats are expected.

[redacted] typically occur in wet (mesic) to moderately dry (dry mesic) [redacted] with [redacted]structure, but is occasionally found in [redacted], or [redacted] As [redacted] is believed to be extirpated in Wisconsin, no impacts to [redacted] populations are expected.

State-listed threatened or endangered species and species of concern

Five of the federally listed species discussed above have also been awarded state-level conservation statuses. The [redacted] is state-threatened, the [redacted] and [redacted] are considered species of concern, and the [redacted] and [redacted] are state-endangered. Nine other species with state-level statuses were analyzed within the SCS (**Appendix F**) as having potential to occur within the Project Area. These include the [redacted]), and [redacted]). The six additional [redacted] species were identified based on results from nearby USGS [redacted] routes or [redacted]. The three [redacted] species, all state threatened, were identified as potentially occurring within the Project Area based on range maps and habitat availability. Of the species described in this section, the ERR (**Appendix K**) only indicated the [redacted] and [redacted] as having occurrences in the vicinity of the Project Area. Section 5.1.2 contains a discussion of the ERR results and Project plans in response to ERR Required or Recommended actions.

[redacted]

During the summer months, the state threatened [redacted] uses farmland, urban areas, and edge habitats near water where they roost in trees, [redacted] attics, [redacted] houses, and the eaves of buildings. [redacted] prefer to forage in urban landscapes along habitat edges, over open water, and along shorelines. During the winter months, [redacted] hibernate in [redacted], and [redacted] As Project-related impacts to natural roosting habitat (i.e., [redacted] is limited and non-[redacted] foraging habitat (i.e., [redacted] habitats and [redacted] will be temporary (i.e., during construction) (**Appendix W**), no impacts to [redacted] populations are expected.

The state threatened [redacted] roosts in [redacted]-made structures during the summer months but will occasionally use trees or rock crevices. [redacted] select roost sites based on proximity to water, as they prefer to forage over open water, shorelines, or along edge habitat[51]. During the winter months, [redacted] hibernate in [redacted] or [redacted] As Project-related impacts to natural roosting (i.e., woodlands) and foraging habitat (i.e., forest edge habitats and aquatic features) will be limited, impacts to [redacted] populations are not expected.

The state threatened [redacted] roosts in the foliage of [redacted] and will often switch roost sites during the summer. Occasionally, female [redacted] will use [redacted] for maternity roosts but prefer to use [redacted] spp.) or [redacted] spp.) [redacted] forage along [redacted] edges, and in [redacted] canopies. During the winter months, they hibernate in [redacted] or [redacted][52]. As Project-related impacts to natural roosting and foraging habitat (i.e., [redacted] will be limited, impacts to [redacted] populations are not expected.

The state threatened [redacted] prefers [redacted] that are interspersed with [redacted] and small [redacted] although it will occasionally use [redacted] and [redacted]. [redacted] avoid [redacted] areas, and open [redacted] As the Project will primarily be sited in [redacted] areas, a habitat avoided by the species, negative impacts to [redacted] populations are not anticipated.

[redacted] are a state threatened species that forage in [redacted] and [redacted] nest in [redacted] Post-breeding dispersal is common for this species and dispersing [redacted] will forage in [redacted] or [redacted] areas and roost in [redacted] until they migrate. As Project-related impacts to suitable [redacted] and [redacted] habitats are limited or

[redacted]

completely avoided, it is unlikely that [redacted] populations will be negatively affected.

[redacted] are a state threatened species that typically occur near [redacted] The preferred roosting and foraging habitat of [redacted] is large expanses of [redacted] interspersed with open [redacted] However, [redacted] are known to nest in [redacted] with native [redacted] Habitat use of overwintering adults includes similar habitats to those used during the breeding season and includes [redacted] habitat, [redacted] and [redacted] areas[55]. As Project-related impacts to [redacted] and [redacted] habitats are limited or completely avoided, it is unlikely that the Project will negatively affect [redacted] populations.

The [redacted] is a state-threatened species that is considered area-sensitive during the breeding and over-wintering seasons, requiring 250 to 1500 acres (0.4 to 2.3 square miles) of mostly [redacted] interspersed with dense [redacted] or [redacted] prefer mesic [redacted] and dry-mesic [redacted] and will also use small [redacted] openings created by logging, fires, or roads. As the Project will not impact suitable [redacted] habitat, it is unlikely that their populations will be negatively affected.

The [redacted] is a state-endangered species that prefers [redacted] or [redacted] or [redacted] with extensive beds of [redacted] and [redacted] vegetation, such as [redacted] As there does not appear to be suitable [redacted] habitat available within the Project Area, [redacted] populations are unlikely to be affected.

The [redacted] is a state endangered species that typically nests on [redacted] or [redacted] near open [redacted] and migrate along the [redacted] and [redacted] of the [redacted]. Most individuals in Wisconsin are migrants, although some individuals occur as year-round residents along the [redacted] and the [redacted] of [redacted]. Project-related impacts to [redacted] populations

[redacted]

are not expected, as the Project will be sited in agricultural areas which is not suitable habitat for the species.

In summary, as the Project will primarily be constructed on agricultural land, it is not expected that Project construction or operation will adversely impact special status species populations or any of their habitats that may occur within or near the Project Area. Although it is possible that some special status species such as the [redacted] and [redacted] may use the agricultural land that will be developed into the solar facility (for foraging purposes), it is unlikely that Project construction or operation will negatively affect these species as there is abundant similar habitat in the surrounding region. Disturbance to these species, if any, will likely be limited to the duration of Project construction and is not anticipated to continue into the operational stage. During Project construction, wildlife within the construction areas may be temporarily displaced due to construction noise and human activity. The temporary displacement will primarily occur in areas that are currently used for row-crop production. Human activity during Project construction is not likely to differ from human activity that takes place during agricultural row-crop production. Also, the surrounding region provides similar habitat to that available within the Project Area and is likely to accommodate the temporary displacement of individuals during Project construction. Species using the woodland and wetland areas are unlikely to be negatively affected by Project construction, as the planned siting of facility infrastructure is mostly outside of these habitat types. The operational stage of the Project is expected to have a predominately positive impact on area wildlife. For example, once construction is complete, the majority of the Project Area will be disturbed less frequently than it was during row-crop farming practices. Also, the herbaceous habitat available throughout the arrays and in the general Project Area will improve habitat stability and diversity compared to row-crop habitat. It should be noted that the perimeter fence may exclude some large mammals from entering the Project Area; most small mammals, birds, reptiles and amphibians will still be able to access this area, whether through, under, or over the fence.

5.6.2 *Wildlife pre-construction surveys. (See Habitat Surveys and Biological Assessments in the Introduction.)*

A Westwood biologist conducted a field reconnaissance for Koshkonong Solar from September 24-25, 2019 and from November 9-16, 2020, in order to conduct a coarse-scale ground-truthing of the WDNR WLCD[24] Level 2 land cover types from public roads to verify that the land cover types identified were generally accurate and to identify any discrepancies between WLCD[26] classifications and field observations; document areas where land cover types may provide habitat for special status species; coarse-scale ground-truth NWI[60] and WWI[61] mapped wetlands; document ecological features that may attract wildlife; take photographs of representative habitats in the

[60] USFWS. 2018, National Wetland Inventory dataset.
[61] WDNR. 2015. Wisconsin Wetland Inventory dataset.

Project Area and; record incidental wildlife observations while on-site. The field reconnaissance followed a desktop assessment of the biological resources within the Project Area, and results of both of these assessments are presented as a Site Characterization Study (**Appendix F**).

5.6.2.1 *Provide a summary of pre-application consultation meetings held with DNR or USFWS for the purposes of determining whether or not any pre-construction wildlife studies would be required for the project.*

On November 11, 2020, a pre-application consultation meeting for the Project was held with PSC, WDNR, Westwood, and Koshkonong Solar staff to introduce the Project. A subsequent consultation with WDNR, USFWS, Westwood, and Koshkonong Solar staff was held on January 14th, 2021. During these meetings, Project plans, surveys, vegetation management planning, siting, overall best management practices, and special status species were discussed. Through the consultation during the January 14, 2021 meeting and subsequent email correspondence, the Project, USFWS, and WDNR completed development of a suite of BMPs to be implemented to avoid impacts to [redacted]

5.6.2.2 *If, after consultation with DNR or USFWS, wildlife pre-construction studies are required, provide the following:*

- *A copy of the approved survey methodologies for any studies including the species of interest, dates of surveys, and a schedule for releasing data and reports to the PSC and DNR.*
- *Copies of all data collected for all pre-construction studies (data should be provided using a format acceptable to DNR and PSC staff).*

No additional pre-construction wildlife surveys were required following consultation with WDNR and USFWS staff.

- *Final report/s or analyses prepared using the data collected.*

The Site Characterization Study (**Appendix F**) includes an analysis of potential special-status species and general wildlife habitats in and around the Project Area.

5.6.2.3 *Provide any monitoring and response protocol for wildlife accessing the solar arrays.*

Koshkonong Solar will implement a wildlife response and reporting system during operation, which will allow the Project to assess wildlife impacts. The wildlife response and reporting system incorporates an electronic and communications pathway that uses a software program to expedite the transfer of wildlife data from the field staff to environmental managers. This system includes operations staff training, monitoring for wildlife incidents (e.g., injured or deceased animal) by operations staff, and active reporting of and potentially response to wildlife incidents.

The operations staff training will occur during staff onboarding and on an annual basis. The training will provide instruction to operations staff on reportable wildlife incidents, data documentation when an incident is identified, and the incident report process. The training also includes BMPs (e.g., only drive on designated access roads). The operations staff are expected to view their surroundings while performing regular maintenance visits and incorporate scans for wildlife into their work habits. Should an incident be observed, the technicians are required to collect data (e.g., date, time, location, etc.) and photographs of the wildlife and surroundings. This data is reported to the site manager, who submits it to an electronic database and notifies the designated environmental manager for the Project.

The site and environmental manager will then coordinate to take the appropriate actions. The actions include working with a qualified biologist (e.g., consultant) to confirm species identification. For injured animals, the site manager will contact a wildlife rehabilitator or local wildlife agent to capture, treat, and if able, release the animal. If the species is identified as a state- or federally listed species, the appropriate agency will also be notified. The site environmental manager also reviews the circumstances around each incident and the combined incidents on an annual basis, to determine if any trends such as a common location or circumstance are evident. Identification of such a trend would trigger an analysis to identify appropriate mitigation actions.

If a member of the public observes a potential wildlife incident within the Project's operational footprint, they should bring that observation to the Project's site manager. From this point, the reporting process and coordination around the incident will be similar to those found and documented by the Operations Staff during routine Project visits, as described above.

5.7 Public Lands

List all public properties within the project area and in a separate list all public properties within two miles of the project area boundary.

5.7.1 *State properties, including:*

5.7.1.1 *Wildlife Areas*

A desktop evaluation was conducted using the U.S. Geological Survey[62] Protected Areas Database of U.S. (PADUS), to document special biological resource management areas, such as conservation easements and state or federal land managed for biodiversity within the Project Area or a 2-mile buffer. Results of this effort indicated that there are no conservation easements, state- or federally managed properties within the Project Area. There are 987 acres of public lands (i.e.,

[62] USGS. 2019. Protected Areas Database of the U.S. (PADUS).

conservation easements, county, state, federal, or tribal lands) within the 2-mile buffer; of which one is a county-owned property and one is a state-natural area (owned by the Prairie Enthusiasts) (*see* **Figure 4.1.6.3 Appendix B**).

5.7.1.2 *Fisheries Areas*

There are no DNR fisheries identified in the Project Area or within two miles of the Project Area.

5.7.1.3 *State Parks and Forests*

There are no state parks or forests within the Project Area or within two miles of the Project Area.

5.7.2 *Federal properties, including:*

5.7.2.1 *Wildlife Refuges*

There are no federally managed properties located within the Project Area. One federally managed property, the Jefferson County Waterfowl Production Area, is located within two miles of the Project Area[62] (**Figure 4.1.6.3 Appendix B**).

5.7.2.2 *Parks*

5.7.2.3 *Scenic Riverways*

5.7.3 *County Parks*

There are no county parks located within the Project Area, however the 422-acre CamRock County Park is located within two miles of the Project Area, adjacent to Array X separated by Highland Dr.[62] (*See* **Figures 4.1.1 and 4.1.6.3 Appendix B**). The Project is engaged with and supports the efforts of the CamRock Bike Trail Connector Committee and Dane County to create a bike trail connecting the CamRock County Park to the Glacial Drumlin State Trail, which would traverse through a portion of the Project Area nearby Array C (*see* **Figure 4.1.1 Appendix B**).

5.7.4 *Recreation Trails*

There are no recreational trails on public land located within the Project Area but the Glacial Drumlin State Trail is approximately 0.3 miles north of the Project Area[63] (*see* **Figure 4.1.6.3 Appendix B**). The Project is engaged with and supports the efforts of the CamRock Bike Trail Connector Committee and Dane County to create a bike trail connecting the CamRock County Park to the Glacial Drumlin State Trail, which would traverse through a portion of the Project Area nearby Array C (*see* **Figure 4.1.1 Appendix B**). The Project has donated to the effort, shared field wetland delineation data for the section that traverses through the Project Area, offered to setback solar facilities from the proposed route, and will continue working with the applicable parties to help implement the project.

Seasonal snowmobile trails on private lands exist within the Project Area. The Project has been in contact with the Utica Nora Rockdale Trailblazers and will work with this organization to propose alternate routes as applicable for the continued use and enjoyment of this trail system.

5.8 Contaminated Sites

List all contaminated sites and solid waste sites within the project area, and in a separate list, all contaminated sites and solid waste sites within two miles of the project area boundary.

5.8.1 *Using the Wisconsin Remediation and Redevelopment Database (WRRD),* http://dnr.wi.gov/topic/Brownfields/WRRD.html, *identify any contaminated sites (open and closed) within the project area and within 2 miles of the project area.*

Tables 5.8.1a and **5.8.1b** list the open and closed contaminated sites in and within 2 miles of the Project Area as identified from http://dnr.wi.gov/topic/Brownfields/WRRD.html.

Table 5.8.1a BRRTS Listings Within the Project Area

Site Name	BRRTS #	Facility ID	Site Status
Vasby Farms	0365197526		Closed
Smith Property	0365002083		Closed

Table 5.8.1b BRRTS Listings Within 2-miles of the Project Area

Site Name	BRRTS #	Facility ID	Site Status
ROWE PROPERTY	313002673		Open
STA-RITE PLT	213001621		Open
UNITED COOPERATIVE LONDON FACILITY	213552966		Open
ROWE PROPERTY	313558384		Open
GREKA HOLDINGS LLC	213585790		Open
KURTS PLACE WI DOT ROW	313528227		Closed
DIAMOND INN	313001742	113055690	Closed
ROGERS SERVICE DEERFIELD	313000319	113076370	Closed
DEERFIELD COOP FERTILIZER PLANT-LONDON	213547064		Closed
UNITED COOPERATIVE - DEERFIELD	213547248		Closed

Table 5.8.1b BRRTS Listings Within 2-miles of the Project Area			
Site Name	**BRRTS #**	**Facility ID**	**Site Status**
CAMBRIDGE PARK ANTIQUES PARK ST ROW	313526036		Closed
ROCKDALE MILL	313172916		Closed
CAMBRIDGE SHELL	313001381	113233890	Closed
LAKE RIPLEY SALES & SERVICE	313001857		Closed
A T & T RADIO TOWER	313001710	113120040	Closed
FAIRWAY CROSSING	313282725		Closed
STENKLYFT PROPERTY	328001567		Closed
WAGON FACTORY WI DOT ROW	313529083		Closed
HOESLY FARM PROPERTY	313195904		Closed
CAMBRIDGE GATEWAY SHELL	313561634		Closed
CALABRESE CHEVROLET PONTIAC	313001749	113242360	Closed
UNITED COOP	313199624		Closed
EDWARDS PROPERTY	313198814		Closed
US POST OFFICE	313001671		Closed
CAMBRIDGE FIRE COMMISSION	313002796		Closed
LEIN LARS - EDGERTON	213547081		Closed
DEERFIELD VIL	313002668		Closed
COACHMAN INN	313002581		Closed
D & J SERVICE CENTER	313002278	113356320	Closed
REINER FARM PROPERTY	313225553		Closed
LOEDER OIL OUTBACK LOT	213001579		Closed
ADAMS & HAACK	213231502		Closed
ADAMS PROPERTY	328198853		Closed
DEERFIELD FARMERS COOP	213001574		Closed
MILLER TRANSPORT	213001007		Closed
THOMPSON CORRECTIONAL CENTER	213522674	113022250	Closed
CAMBRIDGE SHELL #2	213560471	113233890	Closed
TOM GULLICKSON INC	313001804	113246210	Closed

Table 5.8.1b BRRTS Listings Within 2-miles of the Project Area			
Site Name	**BRRTS #**	**Facility ID**	**Site Status**
FOSDAL PROPERTY	313116757		Closed
ELMORE PROPERTY	313546658		Closed
BAMLETTS GAS N STUFF	313001809		Closed
SCHROEDER PROPERTY	313150605		Closed
CENEX LAND-O-LAKES AGRONOMY CENTER	313000617		Closed
COUNTRY STORE	313002593		Closed

5.8.2 *Using the Historic Registry of Waste Disposal Sites,* http://dnr.wi.gov/topic/Landfills/registry.html, *identify any Environmental Repair and Solid Waste disposal sites within the project area and within 2 miles of the project area.*

Table 5.8.2 lists the Environmental Repair and Solid Waste disposal sites within 2 miles of the Project Area as identified from http://dnr.wi.gov/topic/Landfills/registry.html. According to the WDNR Historic Registry of Waste Disposal Sites; there are no sites located within the Project Area.

Table 5.8.2 Environmental Repair and Solid Waste Listings Within 2-miles of the Project Area			
Site Name	**Object ID**	**Site ID**	**Site Status**
CHRISTIANA TN	113113330	1640800	Closed
CHRISTIANA TN	113113330	1640800	Closed
CAMBRIDGE VIL	128123270	25457900	Closed
CAMBRIDGE VIL	128123270	25457900	Closed
DEERFIELD TN	113119710	1656000	Closed
DEERFIELD TN	113119710	1656000	Closed
DEERFIELD VIL LF	113117290	1573700	Closed
WI DOC THOMPSON CORRECTIONAL CTR	113117290	1573700	Closed

5.9 Local Zoning and Safety

Utilities (CA)

5.9.1 *Provide copies of any zoning ordinances affecting the project area and within two miles of the Project Area. Provide only the page(s) directly citing ordinance language.*

5.9.2 *Describe any zoning changes needed for the project.*

5.9.3 *Describe zoning changes that the applicant has requested of local government for the proposed project. Include:*

5.9.3.1 *The name of the entity responsible for zoning changes.*

5.9.3.2 *Description of the process required to make the zoning change.*

5.9.3.3 *The outcome or expected outcome for requested zoning changes.*

5.9.4 *Township road safety and use plans.*

5.9.4.1 *Provide details on any plan or permit requirement pertaining to local road safety, use, or repair.*

5.9.5 *Other conditional use permits*

5.9.5.1 *Provide details on any other conditional use permit required by local government.*

[SECTIONS OMITTED, ONLY APPLY TO UTILITIES]

Utilities and IPPs (CPCN)

5.9.6 *Provide a list of potential local issues normally associated with zoning, road use and safety, or other condition uses.*

5.9.6.1 *Provide copies of all correspondence to and from local government pertaining to issues of zoning, safety, or local road use safety plans.*

Copies of local government correspondence are included in **Appendix A**.

Koshkonong Solar has discussed zoning and other local issues with Town of Christiana, Town of Deerfield, and Village of Cambridge Officials, Dane County Planning and Development Staff, Dane County Land and Water Resources Staff, Dane County Office of Energy and Climate Change, and Dane County Administration staff. In Dane County, zoning authority is exercised at the county level, unless the local municipality has adopted general zoning regulations under Section 62.23 of Wisconsin State Statutes[63]. Shoreland and floodplain zoning regulation enforcement is retained by the County. The Project Area is sited entirely outside of any local city or village. Land in the Project Area is primarily zoned "Farmland Preservation" (FP-35) pursuant to the conditions of Section 10.222 of the Dane County Zoning Ordinance[6]. Solar infrastructure in Dane County is proposed within the FP-35 Farmland Preservation District, FP-1 Farmland Preservation District, and a minor strip of UTR Utility, Transportation, and Right-of-way District[5]. The proposed transmission line in Dane County will extend from the Project

[63] Wisconsin State Statutes Section 62.23 – City planning.

Substation (zoned FP-35) to the Interconnection Substation, which is located in the FP-35 Farmland Preservation District[5]. The transmission line will cross a minor amount of lands zoned as RM-16, Rural Mixed-Use[5]. The Project Area is within a Farmland Preservation Zone in compliance with the requirements of Wisconsin State Statutes Chapter 91[64] and Wisconsin Administrative Code Chapter ATCP 49[65].

Under Wis. Stat. 91.42(2) and 91.46(1)(f)[64] allowable uses in a farmland preservation zoning district include "[t]ransportation, communications, pipeline, electric transmission, utility, or drainage uses that qualify under sub. (4)." Under Wis. Admin. Code ATCP 49.01(19)[65], "'[u]tility use' as used in s. 91.46(1)(f), Stats., includes facilities for the generation of electricity from sunlight, wind, coal, or natural gas." In addition, the approved Dane County Farmland Preservation Plan[68] and the associated ordinances[6] permit a project with an approved CPCN application on land zoned for farmland preservation (see Dane County Ordinance 10.221(2)(e)2.; 10.222(2)(e)2. - permitting utility use authorized to be located in a specific place under a state law that specifically preempts the requirements of a conditional use permit.) Therefore, if Koshkonong Solar's CPCN Application is approved, the Project will qualify as a permitted use under Dane County's Certified Farmland Preservation Plan.

Koshkonong Solar has stated a desire to work cooperatively with County, Town, and Village authorities to identify and address issues and concerns. Communication is ongoing with Town, Village, and County Officials/Staff.

In addition to zoning/land use issues, local officials and members of the public have inquired about the following issues:

- Responsibility for maintenance and repair of roads used during construction.
- Type and size of vehicles used in construction.
- Construction materials and employee traffic routes.
- Location of new driveways.
- Site vegetation management strategies.
- Stormwater management impacts during and after construction.
- Emergency response needs of the proposed facility.
- Source of Project construction and operations staff.
- Facility lighting.
- Local government and school tax impacts.
- Wildlife impacts and recreational paths.
- Decommissioning.

[64] Wisconsin State Statutes Chapter 91 – Farmland Preservation.
[65] Wisconsin Administrative Code Chapter ATCP 49 – Farmland Preservation.
[68] Dane County. July 23, 2012. Farmland Preservation Plan.

5.9.6.2 *Provide a discussion of how local concerns would be accommodated.*

Koshkonong Solar has proposed that a local agreement such as a Joint Development Agreement (JDA), Memorandum of Understanding (MOU) or Local Operating Contract (LOC) be used to memorialize agreements regarding management and responsibility for local concerns on both the County, Town, and Village level. These communications are in process and will continue throughout the CPCN approval process. The template draft agreement for negotiation with the local governments is included in **Appendix AD**.

Koshkonong Solar has established a thorough and multi-faceted outreach plan to receive and address local concerns as further discussed in section 6.1.

Upon receipt of a local concern, Koshkonong Solar will work in good faith to reach a mutually agreeable resolution.

Appendix G includes a study of Health and Safety Impacts of Solar Photovoltaics performed by North Carolina State University[66], which also addresses concerns that the public may have regarding the Project. The study addresses concerns of public health and safety in the following categories: (1) Toxicity, (2) Electromagnetic Fields, (3) Electric Shock and Arc Flash, and (4) Fire. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts. In particular, the study identifies that due to the reduction in the pollution from fossil-fuel-fired electric generators, the overall impact of solar development on human health is overwhelmingly positive. This pollution reduction results from a partial replacement of fossil-fuel fired generation by emission-free PV-generated electricity, which reduces harmful sulfur dioxide (SO2), nitrogen oxides (NOx), and fine particulate matter (PM 2.5). A detailed emissions analysis for the project is included in **Appendix AB.**

5.9.7 *Describe any impacts the proposed project would have on existing infrastructure including electric distribution lines and gas pipelines.*

Prior to initiating construction, all crossings of Project infrastructure with existing infrastructure will be field-located by a licensed land surveyor. The Koshkonong Solar development team will seek to negotiate crossing agreements with the owners of the infrastructure.

Major existing infrastructure within the Project Area includes two substations and nine (9) transmission lines ranging from 138-345 kV. An additional step-up

[66] North Carolina State University. May 2017. Health and Safety Impacts of Solar Photovoltaics.

transmission line is located between the Rockgen Energy Center and the Christiana Substation. Solar infrastructure has been sited to avoid impacts to the identified substations and electric transmission lines to the greatest extent possible; however, collection lines, access roads, the overhead Gen-Tie line, and fences will require crossing existing infrastructure in several locations. Lower voltage electrical distribution lines are in multiple locations around the Project and are primarily along road right of way lines. Project infrastructure will need to cross these in multiple locations based on final engineering, particularly for surface-level access roads and underground collection lines. One natural gas pipeline traveling west to east through the central portion of the Project Area was identified[67]. No other natural gas, crude oil, hazardous liquids, or other pipelines were identified in the Project Area. Solar infrastructure has been sited to avoid impacts to the identified natural gas pipeline with the exception of one crossing for the electrical collection system.

Crossing agreements will determine, among other things, the appropriate cover required to provide adequate protection to existing infrastructure. Underground collection cables will cross the natural gas pipeline underground, as close to perpendicular as possible. Solar array tracker and foundation infrastructure will be set back outside of the right of way of existing pipelines and the transmission line to minimize impacts.

5.10 Land Use Plans

Provide a copy of all land-use plans adopted by local governments that pertain to the project area, extending out two miles from the Project Area. (See Application Size in the Introduction.) Include not only general land-use plans, but also other relevant planning documents such as:

5.10.1 *County Recreation Plans*
5.10.2 *Farmland Preservation Plans*
5.10.3 *Highway Development Plans*
5.10.4 *Sewer Service Area Plans*

Copies of the requested land-use plans within the Project Area and a two-mile buffer are included in **Appendix I**. A table of the additional plans and links to where they can be found on the internet is also included in **Appendix I**.

5.11 Archaeological and Historic Resources

Confidential information includes the location and other sensitive details of archaeological and historic resources (e.g., maps, traditional tribal knowledge, etc.). Confidential information should be submitted in redacted documents on ERF or under separate cover to the Commission's Historic Preservation Officer. The Wisconsin Historical Society (WHS) can provide a list of qualified archaeologists, architectural

[67] Pipeline and Hazardous Material Safety Administration. National Pipeline Mapping System – Public Viewer. Accessed March 2021.

historians, human burial specialists, or tribal preservation officers who may be required to perform steps of this review. Access to the Wisconsin Historic Preservation Database (WHPD) is required to complete this review. Access to WHPD is free at the WHS headquarters or can be used online for a fee. Depending on the outcome of this review, the Commission may be required to consult with the State Historic Preservation Office (SHPO). SHPO consultation may take up to an additional 30 days. The 2012 Guide for Public Archeology in Wisconsin, provides information about best management practices.

5.11.1 *Provide maps and a description of all archaeological sites, historic buildings and districts, and human burial sites within or near the proposed project area.*

5.11.2 *Determine the boundaries, historic significance, and integrity of each resource. Additional field surveys may be required to make these determinations.*

5.11.3 *Identify the potential project effects on each resource.*

5.11.4 *Describe modifications to the project that would reduce, eliminate, avoid, or otherwise mitigate effects on the resources. Examples of modifications include changes to construction locations, modified construction practices (e.g. use of low-pressure tires, matting, etc.), placement of protective barriers and warning signage, and construction monitoring.*

5.11.5 *Obtain a Burial Site Disturbance Authorization/Permit from WHS for all human burial sites that would be affected by the project.*

Per Wisconsin Historical Society protocol, a Burial Site Disturbance Authorization/Permit is being requested for potential impacts to burial site BDA-0204, which is an uncatalogued burial site consisting of a private Euro-American cemetery with three graves. The specific location of the graves is unknown and BDA-0204 is a large area of approximately 90 acres, contrasted with other burial sites identified by Koshkonong Solar's cultural resource research that indicated specific locations for the other burial sites that Koshkonong Solar was able to avoid in preliminary design and will do so with final engineering as well. The project facility that has potential to impact BDA-0204 is an alternative collection circuit within the northwest corner of the large area. The circuit is associated with alternative arrays to the southwest. Koshkonong Solar will work with the Wisconsin Historical Society to further assess this burial site and is committed to ensuring there is no impact to the graves. All requirements of the burial disturbance authorization will be followed to prevent impacts to burials. If the graves are found to be in that northwest corner of the area where the collection circuit is presently proposed, Koshkonong Solar will re-route the collection circuit to prevent impacts if the alternative arrays served by this circuit are chosen for construction.

5.11.6 *Provide an unanticipated archaeological discoveries plan. The plan should outline procedures to be followed in the event of an*

unanticipated discovery of archaeological resources or human remains during construction activities for the project.

Sections 5.11.1 through 5.11.6 are addressed in the Cultural Resources Report [CONFIDENTIAL] and Unanticipated Archaeological Discoveries Plan provided in **Appendix J**.

All previously recorded archaeological sites within the Project Area will be avoided by Project design. No National Register of Historic Places (NRHP)[68] eligible or listed archaeological sites will be impacted by the Project. The Project Area is generally of low potential for unrecorded, significant archaeological resources. A request to impact burial site BDA-0204 is being made. No impact to burials is anticipated.

Background research revealed that houses and agricultural buildings on several farmsteads and other historic resources in the vicinity of the Project Area have been previously inventoried. Thirteen properties were identified in the Wisconsin Architectural History Inventory (AHI) database[69]. An architectural history evaluation of the properties is planned with preliminary impact assessments if necessary. Should any NRHP eligible structures be identified that may be impacted by the Project, the applicant will discuss mitigative measures with the PSC Historic Preservation Officer.

If unrecorded archaeological sites or human remains are discovered during construction, the Unanticipated Discovery Plan will be followed.

5.12 ER Review – Endangered, Threatened, and Special Concern Species and Communities

5.12.1 *Provide a copy of the DNR approved ER Review and all supporting materials (see DNR Application Needs in the Introduction).*

Westwood Professional Services requested an updated ERR from the WDNR for the Project on behalf of Koshkonong Solar and received a response on March 10, 2021 (ERR Log# 19-695) (**Appendix K**).

5.12.2 *Discuss how any DNR-required actions to comply with endangered species law would be incorporated into the project construction or operation.*

The WDNR identified required actions for two species, the [redacted] and the [redacted]. The actions summarized here and detailed in the ERR (**Appendix K**)

[68] National Park Service. National Register of Historic Places – Data Download. Accessed 2021.
[69] Wisconsin Historical Society. Wisconsin Historic Preservation Database (WHPD). Accessed 2021.

were developed by the Project, WDNR, and USFWS staff, and have been implemented through siting or will be implemented as appropriate through design iterations, construction, and operations. These required measures include: Planting native or naturalized plant species, implementation of vegetation management BMPs, and avoidance of Smith Drumlin Prairie State Natural Area and suitable species habitats.

5.12.3 *Discuss how any DNR-recommended actions to comply with endangered species law would be incorporated into the project construction or operation.*

The WDNR also made recommendations to avoid impacts to six sensitive biological resources in addition to those mentioned in the previous section. The six biological resources included one insect species, one animal species, three plant species, and one natural plant community. The plant community and suitable habitat for the five species will be avoided during Project construction and operation. BMPs outlined in Section 5.12.2, above, also ensure indirect impacts to these species or communities are avoided. Core suitable habitat will be avoided for the remaining species; however, potentially suitable nesting habitat may be impacted during Project construction for one species, the [redacted]). To avoid impacts to the species, Koshkonong Solar will employ species-specific BMPs as outlined in the ERR (**Appendix K**) (e.g., installing exclusionary fencing during the species inactive season).

5.13 Agricultural Impacts

5.13.1 *Identify current agricultural practices in the project area.*

The proposed areas of the site where construction activities will occur are typically planted in a rotation of corn and soybeans. Some limited areas of alfalfa and hay fields used for grazing or for harvesting are also within the Project Area.

5.13.2 *Identify the location of drainage tiles or irrigation systems in the project area that could be impacted by construction activities.*

It is expected that drain tile will be impacted in portions of the Project Area that are tiled and undergo construction. Koshkonong Solar has reached out to all participating landowners to ask for their assistance in locating tile; requesting drain tile maps, personal knowledge of their property, and knowledge of existing tile that was placed without written record. Koshkonong Solar will continue communication with landowners on a parcel-by-parcel basis as construction approaches; possibly utilizing field location services and historical satellite imagery when necessary to identify drain tiles systems that may be impacted by construction activities. Drain tile mains within the construction areas that service upstream farms will be maintained or relocated as needed to maintain drainage in the Project Area.

5.13.3 *Describe how damage to drainage tiles would be prevented during construction, or if it occurs, how it would be detected and repaired.*

In accordance with the approach outlined in Section 5.13.2, Koshkonong Solar will take a proactive approach to identify the location of drain tiles, in an effort to mitigate damage to existing tile. Koshkonong Solar will make commercially reasonable efforts to prevent damage to drain tile mains through locating the mains and incorporating the identified locations into engineering designs. In the event damage to a drain tile main is unavoidable and such damage would create adverse drainage effects to participating or neighboring property, Koshkonong Solar will re-route or repair the existing drain tile main during the construction process.

5.13.4 *Provide information on any farmland preservation agreements for the proposed sites.*

To the best of Koshkonong Solar's knowledge none of the Project's participating landowners have property enrolled in farmland preservation agreements.

5.13.5 *Indicate whether any lands within the Project Area are enrolled in the Conservation Reserve Program.*

To the best of Koshkonong Solar's knowledge, four participating landowners have portions of property leased to the Project enrolled in CRP. The locations of CRP property will be included as GIS Shapefiles upon receipt from the local FSA office.

5.13.6 *Describe the process for returning land to agricultural use after decommissioning, including any subsequent years of monitoring.*

Detailed decommissioning steps are provided in Section 1.7.3 and provide a viable process for returning the Project Area to productive agricultural use. Decommissioning steps include the removal of impervious surfaces and below- and above-ground infrastructure and decompacting in all areas. Primary Array areas planted in native perennial cover during the life of the Project should result in soil improvements (*see* **Appendix W**). Thus the return to agricultural use following decommissioning should only require tilling to break the new vegetative growth. The selection of native/naturalized prairie and savanna species as the primary vegetation cover for the Project is ideal for improving and maintaining soil health. The topsoil present on the Project site, which has benefitted agriculture for several decades, was created over time by deep-rooted perennial native species prior to its conversion for agricultural use. Even minimally diverse prairies provide superior rainwater infiltration and control, filtering and improving the quality of groundwater, and increasing soil health. It has been well documented that the integration of native prairie and savanna species on the land will result in tangible soil improvements including significantly reduced topsoil loss through erosion, an increase in soil organic carbon levels, improved soil fertility through increased organic matter, and improved soil moisture and drought resilience. In addition, a shift in soil microorganisms to a higher fungal/microbial ratio overall is expected to improve the

soil structure and stability against erosion. Accordingly, because of the improvement to soils, it is very likely the cropland will be returned to pre-construction yields or better after years of use as a solar generating facility.

In addition, the Project will provide benefits to the agricultural land and landowners, which relate to the agricultural land use concerns raised by the Commission in recent approvals of other solar projects.

Koshkonong Solar has voluntary easements with the owners of the agricultural land that would host the Project. These landowners are sophisticated, experienced agricultural producers. They have an educated view of the agricultural market and have knowingly and voluntarily decided to participate in the Project. Their property rights deserve to be respected and their economic opportunities not unfairly restricted. Koshkonong Solar is seeking a merchant CPCN and not a Utility CPCN and has affirmatively stated within this application that the Project will not be seeking condemnation powers. Thus, any landowners who own land that is presently agricultural and would host solar generating facilities are choosing to do so purely voluntarily.

Koshkonong Solar will employ commercially reasonable efforts to implement more agricultural co-use at the site, including possible activities such as grazing with sheep and honey production. In addition, **Appendix W** explains how the anticipated increase in pollinator activity can boost agricultural production on adjacent, non-participating agricultural land.

Koshkonong Solar has prepared new information in **Appendix X** Preliminary Drainage Study that describes some of the significant, but previously unheralded environmental benefits that come from the proposed VMS. Anticipated water quality improvements include phosphorous reductions of 768 lbs/year (53%) and nitrogen reductions of 3,444 lbs/yr (48%) for an approximately 2,400-acre site. This will improve water quality downstream of the Project. The 2,400 acres represents the Primary Array area and the estimated 75 acres of impervious surface from access roads, inverter pads and other Project facilities.

Water run-off rate reductions of more than 50% occurred in nearly all of the eight subwatersheds evaluated for 1- and 2-year precipitation events. Runoff rates for 10-year and 100-year events were reduced 41% and 30%, respectively. This Project Area-wide reduction in runoff rates will reduce flooding downstream of the Project.

Beyond these water benefits, there are significant additional environmental benefits that will come from the Project. Perennial native vegetation naturally captures and converts atmospheric carbon into soil organic carbon, which can build soils over the

life of the project[70]. Soil building through carbon sequestration not only improves local land fertility, but also assists to offset human-caused atmospheric carbon emissions. Perennial native vegetation also offers superior erosion control. The dense network of roots serve as anchors and are exceptionally efficient at holding soil in place. Studies have shown that similar soil conservation practices reduced soil wind erosion by 58% and soil water erosion by 72%[71].

Perennial native vegetation provides habitat for birds, butterflies, insects, reptiles and other small wildlife. When converted from cropland, studies have shown an increase in species abundance and biodiversity[72]. Perennial native vegetation also creates complex soil food webs which can accommodate a larger population of beneficial microorganisms. Restored prairies have been found to significantly increase an ecosystem's total biomass, arbuscular mycorrhizal fungi biomass, and gram-negative bacteria biomass approaching levels found in long-established prairies[73].

The physics of solar energy generation are fundamentally about harnessing the energy from the sun as it shines on a given area of the earth's surface, and because that energy is produced without air emissions as described in **Appendix AB**, a bigger project generates more air pollution offsets.

A solar farm is a long term but ultimately temporary use. The Project will have a robust decommissioning plan (described in Section 1.7.3) based upon recent Commission precedent and the Project's leases are finite and have decommissioning requirements. Thus, it can be helpful to think of a solar energy project as an "agricultural reserve," that will ultimately return the land to production of cereal grain crops, as the site is presently used for the most part. When the land is returned to agricultural use, the soil should be healthier and more productive than it is now.

A more thorough analysis of the benefits that solar can provide to not only the participating property, but also to the local communities can be found in the detailed Economic Impact Analysis attached as **Appendix M**.

---

[70] Ecological Society of America. 2006. Mclauchlan, K. K., Hobbie, S. E., & Post, W. M. Accessed August 20, 2019.
[71] United States Department of Agriculture. 2012. Conservation Effects Assessment Project. Accessed August 20, 2019.
[72] Proceedings of the National Academy of Sciences of the United States of America. 2017. Schulte, L. A., Niemi, J., Helmers, M. J., Liebman, M., Arbuckle, J. G., James, D. E., Kolka, R. K., O'Neal, M. E., Tomer, M. D., Tyndall, J. C., Asbjornsen, H., Drobney, P., Neal, J., Van Ryswyk, G., & Witte, C. https://www.pnas.org/content/114/42/11247.full. Accessed August 20, 2019.
[73] Plos One. 2014. Herzberger, A. J., Duncan, D. S., & Jackson, R. D. Accessed August 22, 2019.

5.13.7 *Discuss induced voltage issues as they relate to the project arrays, collector circuits, and generator tie line. Provide the following information:*

5.13.7.1 *The number of confined animal dairy operations within 300 feet of any proposed electric transmission or distribution centerline on or off the project site alternatives.*

No DNR-permitted concentrated animal feeding operations (CAFO; greater than 1,000 animal units) are located within the Project Area or one mile buffer[74]. The closest CAFO is Daybreak Foods Inc 7.6 miles from the Project in Jefferson County. Koshkonong Solar has attempted to identify the locations of smaller confined animal operations (CAO) based on publicly available data and aerial imagery (Section 4.2.15.5). Specific types and numbers of animals are not known; however, cattle, sheep, and horses are common in the region. Based on this effort, three (3) potential confined animal operations were identified within 300 feet of arrays and named as CAO 1, CAO 4 and CAO5. CAO 1 is 181' from Power Block K1, CAO 4 is 279' from Power Block N10(Alt) and CAO 5 is 241' from Power Block FF2 (**Figures 4.1.1** and **4.1.2**). None of the identified confined animal operations are located within 300 feet of any proposed collection circuits or transmission lines. Locations of identified confined animal operations will be verified during a field reconnaissance investigation.

5.13.7.2 *The number of agricultural buildings located within 300 feet of the proposed centerline.*

No other agricultural buildings are located within 300 feet of any proposed collection circuit or transmission line centerlines (*see* **Figure 4.1.2, Appendix B**).

5.13.7.3 *A discussion of induced voltage issues as they relate to the project and its related power line routes.*

The Koshkonong Solar Project will be constructed to meet the standards of Chapter SPS 316 (Electrical)[75] and Chapter SPS 371 (Solar Energy Systems)[76] of the Administrative Code of the State of Wisconsin, PSC 114 – Wisconsin State Electrical Code[77], and the National Fire Protection Association's NFPA70 National Electric Code[1]. Following the adopted electric codes and guidelines will ensure the system is designed correctly and potential issues of induced voltage are mitigated in accordance with applicable law.

[74] Wisconsin Department of Natural Resources. CAFO Permittees search. Accessed April 22, 2020.
[75] Wisconsin Administrative Code Chapter SPS 316.
[76] Wisconsin Administrative Code Chapter SPS 371.
[77] Wisconsin Administrative Code Chapter PSC 114.

5.13.7.4 *Any plans to conduct stray voltage testing pre and post construction.*

Koshkonong Solar will conduct both pre and post construction stray voltage testing for any confined animal operation is located within 300 feet of the final Project layout, consistent with recent Commission Orders (*see Final Order,* Docket No. 9801-CE-100; PSC REF# 402226).

5.14 Airports and Landing Strips

5.14.1 *Airport, Landing Strips, and Helipads*

5.14.1.1 *Identify all public and private airports, landing strips, and helipads within 10 miles of the project facilities (both for solar arrays and the nearest generator tie line structure).*

5.14.1.2 *Describe each of the airports, landing strips, and helipads with a description of the runways/landing zone and type of use.*

5.14.1.3 *Describe any potential for impacts to aircraft safety and potential facility intrusion into navigable airspace.*

5.14.1.4 *Describe any mitigation measures pertaining to public airport impacts.*

This section addresses the requirements of Section 5.14.1, including all subsections, i.e., 5.14.1.1 through 5.14.1.4.

Table 5.14.1 – Airports and Landing Strips

Facility Name	Airport ID:	Distance from Project	Ownership	Runway Information
Blackburn Airport	WI98	8.4 miles southwest	Private	Two turf runways, private uses
Blackhawk Airfield	87Y	8.1 miles northwest	Private	Two asphalt runways, public uses
Blackhawk Island	1WI9	9.4 miles east	Private	One turf runway, private uses
Christie Aerodrome	WS49	9.0 miles east	Private	One turf runway, private uses
Egre Landing Strip	N/A	In Project Area	Private	One turf runway, private uses
Ha-rail Airport	17WI	6.8 miles east	Private	One turf runway, private uses
Jana Airport	58C	4.1 miles south	Private	One turf runway, public uses
Little Wheel Field Airport	59WI	5.4 miles west	Private	One turf runway, private uses

Table 5.14.1 – Airports and Landing Strips				
Facility Name	**Airport ID:**	**Distance from Project**	**Ownership**	**Runway Information**
Matson Airport	2WI6	5.8 miles southwest	Private	One turf runway, private uses
Meier Airport	WI99	8.8 miles south	Private	One turf runway, private uses
Memorial Community Hospital Heliport	WS37	6.6 miles south	Private	One asphalt helipad, private uses
Quale Airport	87WI	4.6 miles west	Private	One turf runway, private uses
Quams Marina Seaplane Base	99C	8.3 miles west	Private	One runway, public uses
Rockdale Airport	OWS7	0.8 miles east	Private	One turf runway, private use
Tesmer Airport	3WI2	8.1 miles north	Private	One turf runway, private uses
Uff-da Airport	2WI1	9.2 miles west	Private	One turf runway, private uses
Wisersky Airport	95WI	2.5 miles southwest	Private	One turf runway, private uses

One turf airstrip is located in the central region of the Project Area, the Egre Landing Strip. The Egre Landing Strip does not have an airport identification number per the Wisconsin Department of Transportation's 2019 Airport Directory[78]. All Project arrays and other facilities have been sited outside of the parcel hosting the Egre Landing Strip and no impacts to airstrip operations are anticipated. Outside of the Project Area, the closest airstrips to the Project are one private turf airstrip, the Rockdale Airport, located 0.80 miles east of arrays in the east part of the Project, a second private turf airstrip, Wisersky Airport, is 2.5 miles southwest of the Project and a third airstrip, Jana airport, a public turf runway, is 4.1 miles south of the Project. The approximate maximum height of solar panels is 15 feet aboveground and, thus, will not interfere with airspace uses by any aforementioned airports or airstrips. Given the low height of the solar panels and distance from existing airports, no impacts to private or public airports, airstrips, heliports, or other facilities are anticipated as a result of Project development. Therefore, no mitigation measures have been proposed.

[78] WisDOT. 2019. Wisconsin Airport Directory.

5.14.2 *Commercial Aviation*

5.14.2.1 *Identify all commercial air services operating within the project boundaries (i.e. aerial applications for agricultural purposes, state programs for control of forest diseases and pests (i.e. Gypsy moth control).*

5.14.2.2 *Describe any potential impact to commercial aviation operations.*

5.14.2.3 *Describe any mitigation measures pertaining to commercial aviation.*

According to the DATCP's Interactive Map of the Gypsy Moth Aerial Spray Program[79], no areas in Dane County have been treated with aerial applications in 2020. Dane County is not expected to have aerial application conducted in 2021.

Inquiries with local landowners determined that the use of aerial application services infrequently occur within the Project Area. United Cooperative located in Deerfield, Wisconsin was identified as the group performing or contracting aerial applications.

Based on the maximum height of the facility equipment and the absence of airports as described above, no commercial aviation or private aviation impacts are anticipated for the Project.

5.14.3 *Agency Consultation*

5.14.3.1 *Identify any potential construction limitations and permit issues.*

5.14.3.2 *Provide a summary of the status of any FAA determinations with details on mitigation actions or how any unresolved problems with aircraft safety are being addressed (including generator tie line structures)*

5.14.3.3 *Provide a list of any structures requiring WisDOT high structure permits, and the status of any such permits.*

This section addresses the requirements of Section 5.14.3, including all subsections, i.e., 5.14.3.1 through 5.14.3.3.

Evaluation of proposed infrastructure in conjunction with nearby airports was conducted using the FAA's Notice Criteria Tool[80]. Results of the investigation revealed that solar infrastructure and proposed transmission route construction will not exceed notice criteria in accordance with CFR Title 14, Part 77.9[9].

---

[79] Wisconsin Department of Agriculture, Trade and Consumer Protection. Gypsy Moth Aerial Spray Program. Accessed March 2021.

[80] Federal Aviation Administration. Notice Criteria Tool. Accessed March 2021.

CFR Title 14, Part 77.9[9] states that notice is required for any construction or alteration exceeding 200 feet above ground level, any construction or alteration within 20,000 feet of a public use airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet, any construction or alteration within 10,000 feet of a public use airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet, or within 5,000 feet of a public use heliport which exceeds a 25:1 surface.

The Wisersky (95WI) and Rockdale (OWS7) private airports were identified within 20,000 feet of the Project Area. No other airports were identified within 20,000 feet of the Project Area. Neither the Wisersky nor Rockdale private airports meet the criteria listed in §77.9 paragraph (d); therefore, Notice of Construction is not required under Title 14 Part 77.9[9].

Based on Wisconsin Statutes Section 114.135(7)[81], the necessity of a permit for the erection of high structures is limited to objects that extend to a height greater than 500 feet aboveground within one mile of the location of the object, or above a height determined by the ratio of one vertical foot to 40 horizontal feet measured from the boundary of the nearest public airport or spaceport within the state. As there will be no structures constructed above 500 feet in height or within two miles of a public airport or spaceport for the Project, there is no need for a permit for the erection of high structures.

Overall heights of solar infrastructure will be between 858 feet and 1,058 ft amsl when including the maximum height of 15 feet for solar panels. Poles for the transmission line are estimated to be between 90 and 130 feet in height. Project development will not trigger the need for any FAA Notice or WisDOT high structure permits. Therefore, no mitigation measures or other airport safety assurance measures have been considered for the Project.

5.15 Communications Towers

For the following sections, include in the assessment all facilities that make up the solar arrays as well as any structures that are part of a necessary generator tie line for the project.

5.15.1 *Cell phone communications*

5.15.2 *Radio broadcasts*

5.15.3 *Internet (WiFi)*

5.15.4 *Television*

[81] Wisconsin State Statute Chapter 114 – Aeronautics and Astronautics.

5.15.5 *Doppler radar network*

5.15.5.1 *Cell phone communications*

Comsearch has developed and maintains comprehensive technical databases containing information on licensed mobile phone carriers across the US. Mobile phone carriers operate in multiple frequency bands and are often referred to as Advanced Wireless Service, Personal Communication Service, 700 MHz Band, Wireless Communications Service, and Cellular. They hold licenses on an area-wide basis which are typically comprised of several counties. For the cellular towers located within the Project Area, no setback distance is required from an interference standpoint due to the higher frequencies in which they operate within the UHF band. Electromagnetic interference (EMI) from a solar generation facility could be caused by an induction field, which is created by the AC electrical power and harmonics at the inverter of the Power Conversion Stations located throughout the facility. The propagation of the interference occurs over very short distances which are generally around 500 feet or less, and due to the low frequency (60 Hz) operation of the PV inverter, EMI from solar generation facilities does not normally extend above 1 MHz. Full details are in **Appendix O**.

5.15.5.2 *Radio broadcasts*

Comsearch analyzed AM and FM radio broadcast stations whose service could potentially be affected by the Project. No recommendation for mitigation is necessary for Koshkonong, as the location of the solar arrays meets or exceeds the required distance separation from all licensed AM and FM broadcast stations near the Project Area. Full details are in **Appendix O**.

5.15.5.3 *Internet (WiFi)*

Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. This report focuses on the potential impact of a proposed solar generation facility on licensed, proposed, and applied non-federal government microwave systems.

This study identified five microwave paths intersecting the Project Area. The Fresnel Zones and Consultation Zones for these microwave paths were calculated and mapped. The lower edge of the zones for all paths were found to be at least 111 feet above ground throughout the Project Area. The solar panels have a maximum height of 15 feet. Therefore, all proposed solar array structures within the defined Project Area have sufficient vertical clearance and avoid the risk of obstructing or causing harmful interference to the microwave paths in and around the Project Area. Full details are in **Appendix O.**

5.15.5.4 *Television*

Comsearch performed an Over-the-Air (OTA) TV Analysis and concluded that television reception interference was unlikely. Specifically, the inverters of a power conversion station will be installed away from residential areas to reduce the likelihood of EMI to households that may rely on OTA television service. At minimum, a setback distance of 500 feet from any household is recommended. In the unlikely event that EMI is observed at a certain household following the construction of the solar generation facility, a high-gain directional antenna may be employed, preferably outdoors, and oriented towards the signal origin to mitigate the potential impact on OTA TV signal reception.

Both cable service and direct broadcast satellite service will be unaffected by the presence of the solar generation facility and may be offered to those residents who can show that their OTA TV reception has been disrupted by the presence of the solar generation facility after it is installed. Full details are in **Appendix O**.

5.15.5.5 *Doppler radar network*

Doppler radar works through the interpretation of data received from radar signals that have returned to the sending station after being reflected by an object in the path of the beam. Some of the things that can interfere with this beam to create a false positive interpretation include dense bird populations, adverse atmospheric conditions, and smoke plumes. Tall structures such as trees or buildings within the sight line of the sending position are also described as a growing problem by the National Oceanic and Atmospheric Administration. The development of a solar generation facility would have a maximum topographic impact of fifteen feet. Because the radar towers are elevated to avoid interference from topography (minimum height of the NEXRAD towers is 10 meters in height), Koshkonong Solar believes there will be no impact from the development of a solar facility. Full details are in **Appendix O.**

5.15.6 *Describe mitigation measures should interference occur during project operation for any of the communications infrastructure listed above.*

In addition to the items analyzed in Sections 5.15.1.1 through 5.15.1.5, Koshkonong Solar commissioned an assessment of the emergency services in the Project Area by Comsearch to identify potential impact from the Project. Comsearch evaluated the registered frequencies for the following types of first responder entities: police, fire, emergency medical services, emergency management, hospitals, public works, transportation and other state, county, and municipal agencies. Comsearch also identified all industrial and business land mobile radio systems and commercial E911 operators in proximity of the Project.

No mitigation to coverage impact was recommended for any of the items referenced in Sections 5.15.1.1 through 5.15.1.5, or herein, as the proposed Project is not expected to cause any significant degradation in signal strength after construction. Further, appropriate military personnel identified in **Appendix O** have been contacted to verify the project has no impacts to military airspace. Full details are in **Appendix O**.

5.16 Electric and Magnetic Fields (EMF)

5.16.1 *Provide an estimate of the magnetic profile created by collector circuits. Estimates should be made using the following criteria:*

- *Show a separate profile for the typical buried collector circuits. If some trenches would support more than one buried circuit, provide a separate estimate for each bundled configuration.*
- *Show a separate profile for any overhead collector circuits.*
- *Assume all panels are working and project is producing at maximum capacity.*
- *Show EMF profile at 0 ft., 25 ft., 50 ft., and 100 ft. from the centerline of each circuit type modeled.*

5.16.2 *Provide an estimate of the magnetic profile created by any necessary electric transmission facilities (generator tie line). Estimates should be made using the following criteria:*

- *Show a separate profile for the typical buried collector circuits. If some trenches would support more than one buried circuit, provide a separate estimate for each bundled configuration.*
- *Show a separate profile for any overhead collector circuits.*
- *Assume all panels are working and project is producing at maximum capacity.*
- *Show EMF profile at 0 ft., 25 ft., 50 ft., and 100 ft. from the centerline of each circuit type modeled.*

Magnetic fields, measured in milliGauss (mG), are generated when electricity flows on a conductor such as an underground collector circuit in this case. The intensity of the magnetic field is dependent on the voltage and load on the line and rapidly decreases with the distance from the conductors. The magnetic field generated from the conductors of an electrical circuit extends from the energized conductors to other nearby objects. The load on a circuit varies throughout the day and therefore the magnetic field level will also vary from hour to hour. For the purposes of this study, maximum loading was assumed for the unique line segments associated with this Project. Considerable research has been conducted to determine whether exposure to 60 Hz (the electrical grid frequency in the United States) magnetic fields cause negative health effects. These studies have shown no statistically significant association. The PSC has also concluded that there is no correlation between magnetic fields and negative health effects.

Appendix N details the magnetic field profiles for each unique underground circuit configuration at the Project's full capacity. A separate profile was added for the proposed transmission line. Predicted electric fields are de minimus due to the advanced engineering and design of the underground collection system and proposed transmission line. Predicted magnetic fields are below levels associated with typical household electric appliances and tools.

5.17 Noise

Pre- and post-construction noise studies are required for all electric generation projects. Noise measurement studies must be approved by PSC staff.

5.17.1 *Provide existing (ambient) noise measurements and projected noise impacts from the project using the PSC's Noise Measurement Protocol. The PSC Noise Measurement Protocol can be found on the PSC website at:* https://psc.wi.gov/SiteAssets/ConventionalNoiseProtocol.pdf.

A pre-construction noise analysis was conducted for the Project by Hankard Environmental. The analysis consisted of determining the location of all noise-sensitive receptors located near the Project (primarily houses), measuring existing noise levels within and near the Project Area, and predicting both construction and operational noise levels. The analysis was carried out in accordance with the PSC's Measurement Protocol for Sound and Vibration Assessment of Proposed and Existing Electrical Power Plants. For more detailed information, refer to the Pre-Construction Noise Analysis for the Proposed Koshkonong Solar Energy Center, **Appendix P.** The Noise Analysis factors in recent operational noise measurements performed by Hankard Environmental at other Invenergy-operated solar projects, which have served to calibrate and validate the model used by Hankard here.

Noise-producing elements of the operation of the Project include inverters, transformers and the BESS. The three main power transformers are located at the Project Substation near the middle of the Project Area. Operational monitoring has shown that tracking motors contribute negligible quantities of noise. Wisconsin siting rules require the inclusion of Alternate sites, so the Project layout version studied for this analysis includes all 429 MW.

Noise-producing equipment to be employed during construction includes typical bulldozers, graders, excavators, trucks, vibratory post setters, and cranes.

In summary, the Pre-Construction Noise Analysis shows that all residences and other noise-sensitive receptors within the Project Area are predicted to experience less than 41 dBA at night and less than 42 dBA during the day from the Project.

5.17.2 *Provide copies of any local noise ordinance.*

Dane County Code of Ordinances Chapter 10 Section 10.102 (6)[6]. *Noise Reduction* can be found attached in **Appendix I**. Dane County Code of Ordinances contains a *Noise criteria* subsection specific to wind energy facilities; however, no noise criteria was identified specific to solar energy facilities, or for other general construction operations.

5.17.3 *Provide equipment manufacturer's description of noise attenuating methods and materials used in the construction of proposed facilities.*

See Section 5.17.1 and **Appendix P** for detailed information responsive to this section.

5.17.4 *Describe how noise complaints would be handled.*

Koshkonong Solar will meet with any local resident submitting a noise complaint to fully understand the complaint. Observations of excess noise can sometimes indicate the need to repair or maintain equipment, and Koshkonong Solar will determine if the noise is the result of a mechanical issue that can be repaired. If not, Koshkonong Solar will attempt to negotiate a mutually agreeable solution.

5.17.5 *Discuss any mitigation measures that would be used to address noise complaints during the operation of the project.*

With a predicted maximum noise level of less than 42 dBA during daytime, Koshkonong believes it unlikely that the Project will elicit noise complaints that require mitigation.

5.18 Solar Panel Glint or Glare

5.18.1 *Provide an analysis showing the potential for glint or glare from a typical project solar panel, as well as from the project as a whole. Include the following:*

- *The analysis should list the basic assumptions used and the methodology/software used for creating the glint or glare analysis.*
- *The analysis should evaluate impacts to aircraft and air traffic controllers from any impacted airports.*
- *The analysis should also examine the risk of glint or glare to local residents and road users in the project area.*
- *The analysis software may indicate that proposed array areas are large enough to impact the accuracy of glare results. If this warning is encountered in the modeling, the applicant should break the affected array areas into smaller sub-arrays and perform the glare analysis using these smaller sub-arrays.*

- *The analysis software may model different amounts of glare at observation points with different elevations. For any stationary observation points that could have human occupancy at higher elevations (e.g. a second story of a residence), the applicant should model multiple elevations for those stationary observation points.*
- *The analysis software may model different amounts of glare depending on the assumed heights of the solar panels. The applicant should model panel elevations for at least two different solar panel heights to establish a range of potential glare results.*
- *The analysis software may model different amounts of glare depending on the assume rest angle of the solar panels. The applicant should model at least two resting angle configurations, including one configuration with a resting angle set at between zero and five degrees.*

A glare analysis for the Project is included in **Appendix Q**. The ForgeSolar PV planning and glare analysis software, GlareGauge[82], was used to characterize the potential of glare from PV panels as viewed by a receptor (i.e., observer). For glare to reach a receptor, the observer must be able to see the top of a PV module, the panels must be angled such that they reflect the sunlight towards the observer, and the view of the panels must be clear of obstruction. Solar PV modules are designed to absorb light to produce energy, not reflect light. They are also manufactured with a non-reflective film.

Initial modelling in GlareGauge used the following assumptions: glare analyses did not account for physical obstructions between reflectors and receptors (e.g., buildings, topography or vegetation) and the glare hazard determination relied on approximations of observer eye characteristics, view angle, and blink time. A model of the topography and solar array was developed in ArcGIS to determine line of sight between the Observation Points (OPs) and the PV panels to eliminate areas that would be blocked from view by the terrain.

One hundred and seventy-four (174) Observation Points (OPs) consisting of 86 residences and one (1) hospital were established within the Project Area for glint and glare modelling (See Figure 13 and Table 1 in **Appendix Q**). The OPs were selected to be spatially representative of the Project Area and consisted of non-participating occupied residences within 500 feet of an array. Each modeled residence was assigned two numbers, one ID number to represent the first floor (5-foot height above ground) of the residence and that ID number with a zero (0) added to represent the second floor (15-foot height above ground). Additionally, a total of 38 route segments among 22 different roads in proximity to the Project were modeled. Each OP and route segment was assessed for glare with the array resting angle at 5 degrees and

[82] ForgeSolar. GlareGauge Comprehensive Solar Glare Analysis Software. Accessed 2020.

using a 6-foot array height. An alternative, limited sampling using a 0 degree resting angle and 9-foot array height was also completed.

The model classifies the impact of glare for an observer into three color-coded levels: low potential for producing an after-image (green), potential for producing an after-image (yellow), and potential for permanent eye damage (red). The model did not identify any potential for permanent eye damage instances (red) for any resident OP or route segments under any scenario, i.e. 0 or 5 degree rest angle and 6 or 9-foot array height.

At a 0 degree rest angle the model did identify instances of low potential for producing an after-image (green) at 146 resident OPs and 29 route segments and potential for producing an after image (yellow) glare to 159 resident OPs and 35 route segments. With a 5 degree rest angle the model reported (green) glare to 40 resident OPs and 5 route segments and (yellow) glare to 22 resident OPs and 4 route segments (Appendix A in **Appendix Q**). The remaining OPs and road segments are not expected to experience glint or glare effects. The sampling of arrays modeled at 9 feet essentially produced the same or less glare as arrays modeled at 6 feet.

5.18.2 *In the event of an inquiry or complaint by a resident in or near the project area, describe what modeling or other analysis would be used to evaluate the possibility of unreasonable panel glint or glare at the residence.*

In the event of a complaint about glare by a resident within or outside of the Project Area, GlareGauge modelling will likely be used to assess the extent and time of day of glare at the point of concern and to determine potential mitigation options.

5.18.3 *Describe mitigation options available to reduce unreasonable panel glint or glare.*

As the PV panels will be mounted to single-axis tracking systems, the surface of the PVs will be in-line with the position of the sun; thereby, reducing the potential for steep, glancing angles (i.e., chance for glare) compared to fixed-tilt systems. If glint or glare prove to be problematic for an observer, Koshkonong Solar may use fencing, vegetation, or other objects of obstructive nature to mitigate glint or glare effects, or possibly slightly adjust the resting angle.

Koshkonong Solar expects nighttime resting angles to be consistent across the Project Area and will seek to minimize any potential impacts from glint or glare during final engineering of the site. The planned overnight resting angle for the proposed solar arrays varies across tracker manufacturers and the planned resting angle will be determined during final design engineering. The resting angle is likely to be approximately 0 degrees to 30 degrees.

6. Local Government Impacts

6.1 Joint Development and Other Agreements

6.1.1 *Provide a summary of major agreement items agreed upon in any Joint Development Agreements (JDA) or other type of agreement including:*

6.1.1.1 *All services to be provided by the city, town, and/or county during construction and when the plant is in operation (e.g. water, fire, EMS, police, security measures, and traffic control).*

6.1.1.2 *Specifically, address community and facility readiness for incidents such as fires.*

Koshkonong Solar is engaged with Dane County, the Towns of Christiana and Deerfield, and the Village of Cambridge and will negotiate possible Joint Development Agreement(s) (JDA), and anticipates these discussions to yield an agreement for subjects such as:

- Materials delivery haul routes
- Driveway permits
- Road maintenance and repair
- Stormwater management
- Reimbursement of town or county costs
- Replacement of lost tax receipts for taxing bodies which do not receive Utility Aid Shared Revenue funds
- State Utility Aid Shared Revenue payments to hold harmless for county and municipal governments
- Decommissioning
- Construction period public safety and EMS service
- Site lighting
- Insurance issues
- Dispute resolution process
- Snowmobile paths

Koshkonong Solar expects that the Joint Cambridge Fire/EMS Department, Deerfield Fire Department, and Deer Grove EMS Department will provide fire and emergency services to the Project during construction. If needed, the Dane County Sheriff's Office is expected to provide traffic control and security services.

Koshkonong Solar will propose in draft agreements to meet with local government officials and emergency responders at least 60 days prior to construction to present final plans for use of public roads, location of equipment laydown yards, finalize construction scheduling, discuss safety practices, and coordinate local emergency response capabilities.

Construction of a solar photovoltaic electrical generating facility does not create any unique or especially dangerous environments or situations for local emergency responders. Koshkonong Solar will require that all contractors on the site during construction meet all state, federal and industry best practice standards for employee and public safety. Koshkonong Solar intends to communicate regularly with site area Emergency Response agencies to provide project and facility familiarization and establish communication channels. Should any aspect of the Project construction or operations present unfamiliar equipment or situations for responders, Koshkonong Solar will arrange for adequate professional training to deal with those concerns.

Regarding the BESS, safe operation of advanced energy storage systems begins with safe equipment and compliance with safety codes and regulations. Any potential equipment suppliers to Koshkonong Solar manufacture to stringent quality standards, and equipment used for the Project must be tested and certified by third party professionals. As a member of the U.S. Energy Storage Association's Corporate Responsibility Initiative, Invenergy is an industry leader in advancing responsible supply chain practices and emergency response planning that would be utilized at Koshkonong Solar.

Koshkonong Solar will closely coordinate with local responders to ensure they are prepared in the unlikely event that an incident occurs. Koshkonong Solar will develop a BESS Emergency Response Plan (ERP) with local authorities. A BESS ERP would typically require quarterly safety drills and annual safety training with local first responders. The ERP will include emergency procedures for fire, medical emergencies, and other potential situations. In general, the ERP will state that emergency responders should not enter a project enclosure or area.

The BESS would be equipped with a battery management system (BMS) that provides constant monitoring of key safety parameters and can automatically stop operations if necessary, as described in Section 2.7. Any alarm also notifies the Invenergy Control Center, which has redundant remote shut-down capability and will alert local Project technicians to investigate further or notify local emergency services if conditions require.

As described in Section 2.7, an automatic fire suppression system would be installed as part of a BESS at Koshkonong Solar. This system would use U.S. Environmental Protection Agency-approved suppression agents certified for battery storage systems and meet all relevant codes and regulations, including those set by the National Fire Protection Association.

The final ERP may include information not outlined in the preceding list as a custom approach is taken to address local concerns.

6.1.2 *Provide a copy of all agreements with local communities (e.g. JDA).*

Koshkonong Solar is engaged with Dane County, the Towns of Christiana and Deerfield, and the Village of Cambridge and have discussed negotiating possible JDA(s) but negotiations are not complete. Koshkonong Solar will propose using the Badger Hollow Local Operating Contract as a starting point for negotiations. This agreement is included in **Appendix AD**.

6.2 Infrastructure and Service Improvements

6.2.1 *Identify any local government infrastructure and facility improvements required (e.g. sewer, water lines, railroad, police, and fire).*

No additional infrastructure or facility improvements are expected to be required for the construction and operation of the Project.

6.2.2 *Describe the effects of the proposed project on city, village, town and/or county budgets for these items.*

The impact to budgets of local governments will be positive due to increased revenue from the Shared Revenue payment and ancillary impacts such as increase in local jobs, landowner payments, and increased spending locally during the construction period. (*See* **Appendix M**). Koshkonong Solar will fund training Fire/EMS exercises associated with the project.

6.2.3 *For each site provide an estimate of any revenue to the local community (i.e. city, village, town, county) resulting from the project in terms of taxes, shared revenue, or payments in lieu of taxes.*

Under Wisconsin's current Utility State Aid Shared Revenue formula, local governments would receive a total of $4,000 per MW per year, or $1,200,000 for the Project, with Dane County receiving 58% of the total and the Towns of Christiana and Deerfield receiving 42%.

Koshkonong Solar has proposed a "hold harmless" provision in the draft JDA, such that the Project would make up for all local taxing bodies that will not receive Shared Revenue funds, including annual increases during the life of the project, subject to Commission approval if the Project is acquired by a regulated utility in Wisconsin.

6.2.4 *Describe any other benefits to the community (e.g. employment, reduced production costs, goodwill gestures).*

Utility-scale solar energy projects have numerous benefits for local communities including direct payments to participating landowners, increased local government revenue from shared revenue utility aid payments, and job opportunities during both the short-term construction phase and the long-term operational phase of the Project. In addition to the workers directly involved in the construction and maintenance of the Project, numerous other jobs are created through indirect supply chain purchases,

services required, and the higher spending that is induced by employees and landowners. Koshkonong Solar is estimated to create 106 new local jobs during construction and 25.9 new local long-term jobs for Dane County. These new jobs will equate to over $9.6 million in new local earnings during construction and $1.4 million in new local long-term earnings for Dane County annually. Local revenue and other benefits to the community from the Project are presented at length in the Economic Impact Report (*See* **Appendix M**).

7. Landowners Affected and Public Outreach

7.1 Contact lists

Provide a separate alphabetized list (names and addresses) in Microsoft Excel for each of the groups described below:

- 7.1.1 *Property owners and residents within the Project Area and a separate list of property owners and residents from the Project Area out to a distance of one mile. It is strongly recommended that applicants consult with PSC staff in order to ensure that the format and coverage are appropriate considering the project type, surrounding land use, etc.*
- 7.1.2 *Public property, such as schools or other government land.*
- 7.1.3 *Clerks of cities, villages, townships, county, and Regional Planning Commissions directly affected. Also include on this list the main public library in each county the proposed facilities would occupy.*
- 7.1.4 *Local media for the project area, at least one print and one broadcast.*

Appendix R addresses the requirements of Section 7.1 of the Application Filing Requirements, including all subsections, i.e. 7.1.1 through 7.1.4.

7.2 Public Outreach and Communication

- 7.2.1 *List and describe all attempts made to communicate with and provide information to the public. Describe efforts to date and any planned public information activities.*
- 7.2.2 *Provide copies of public outreach mailings or website addresses for project pages.*
- 7.2.3 *Describe plans and schedules for maintaining communication with the public (e.g. public advisory board, open houses, suggestion boxes, and newsletters).*

As evidenced by the pre-application communication efforts put forth, Koshkonong Solar recognizes the importance of community outreach and information sharing.

Landowners – Project representatives have been meeting with area landowners to discuss the Project and land leasing since Fall 2018. Participating landowners have received welcome packets, update mailings, and notification letters since joining the Project. Beginning in late 2020, Koshkonong Solar employed a local representative who has introduced herself to all participating landowners and held multiple one-on-one meetings with participating and non-participating landowners. The Koshkonong Solar local representative is a participating landowner in Badger Hollow Solar and serves as the local representative for that project as well. Koshkonong Solar felt that including her in this project with her real world experience with utility scale solar project development, permitting and construction would optimize communication with the local community. In February 2021, she also begun hosting office hours at 114 S Pleasant St, Cambridge, WI, on the second and fourth Tuesdays of the month from 10:00 AM to 3:00 PM. Special appointments are also available as requested.

Regulatory Agencies – Beginning in late 2019, meetings and discussions concerning the Project and possible permitting issues were held with staff from the Public Service Commission of Wisconsin, Department of Agriculture, Trade and Consumer Protection (DATCP), USFWS and WDNR.

Local Governmental Units – Beginning in early-2019, meetings to describe the Project were held with local representatives for the Project Area. As the plans for the Project have matured, the aggregate list and engagement with local government stakeholders has grown correspondingly. The list of local government units engaged with the Project to date include Dane County (County Administration, Land and Water Resources, Planning and Zoning, Supervisors, Office of Energy and Climate Change), Town of Christiana (Chair, Supervisors), Town of Deerfield (Chair, Supervisors), Village of Cambridge (President, Board of Trustees, Energy Planning Subcommittee), and the Village of Rockdale (President, Trustees).

General Public – Project representatives have shared information with the general public via an open house, a presentation to the Town of Christiana, a presentation to the Village of Cambridge, and a significant amount of one-on-one meetings. In September of 2019, Project representatives sent out an open house invitation mailer to 184 members of the public including both participating and non-participating landowners. After the open house, Project representatives continued to engage with all members of the public who reached out to continue discussions. In winter of 2020, Project representatives sent out a mailer to 100 nearby non-participating residents encouraging them to engage with the Project and reach out to Project representatives if they had any questions. On January 19, 2021, Project representatives gave a presentation on the Project to the Town of Christiana which was followed by an approximately 2-hour public comment and question and answer period. On March 4th 2021, Project representatives gave a presentation on the Project to the Village of Cambridge Energy Planning Subcommittee, which was followed by an approximately 1.5-hour public comment and question and answer period. Project representatives have been in attendance at local Town and Village Board Meetings, and have

followed up with individuals who have stated they would like to learn more about the Project. Project representatives plan to continue working with members of the public and local governments after the CPCN application is filed.

Dates for Appendix S

Mailings – Below is a list of mailings sent to project participants and neighbors within the Project Area:

Date	Mailing Title
9/17/2019	Open House Invitation to Participating and Non-participating Landowners
10/9/2019	Thank you letter to Open House Attendees
3/11/2020	Letter + FAQ + Project Fact Sheet to Participating Landowners
10/20/2020	Letter to Participating Landowners
12/8/2020	Letter to Non-participating Landowners
12/15/2020	Holiday Postcard to Participating Landowners

Meetings/Events – Below is a list of meetings and events held throughout the local community:

Date	Organization/ Meeting Participant
1/9/2019	Town of Christiana – Maureen Lien
1/21/2019	Town of Christiana – Jeff Notstad
2/9/2019	Town of Christiana – Jim Lowrey
2/13/2019	Town of Christiana – Maureen Lien
3/5/2019	Dane County Office of Energy and Climate Change – Keith Reopelle
4/11/2019	Town of Christiana – Maureen Lien
6/3/2019	Town of Christiana – Jim Lowrey
6/19/2019	Dane County Administration - Dave Merritt
7/11/2019	Dane County Office of Energy and Climate Change – Keith Reopelle Dane County Land and Water Resources – Laura Hicklin, Kyle Minks, John Reimer Dane County Administration – Dave Merritt Dane County Executive Office – Josh Wescott
7/19/2019	Dane County Administration – Dave Merritt Dane County Land and Water Resources – Kyle Minks, John Reimer
8/1/2019	Town of Christiana – Maureen Lien
8/8/2019	Dane County Planning and Development – Roger Lane, Todd Violante

Date	Organization/ Meeting Participant
8/15/2019	Town of Christiana – Maureen Lien
8/19/2019	Dane County Planning and Development – Roger Lane, Todd Violante
8/29/2019	WI Assembly – Barbara Dittrich District 38 (Staff)
9/5/2019	Town of Christiana – Jim Lowrey
9/5/2019	Town of Christiana – Maureen Lien
9/12/2019	Town of Christiana – Jeff Notstad, Mark Cook
9/26/2019	Koshkonong Solar Open House
10/2/2019	Madison Metropolitan Sewerage District – Martin Griffin, Kathy Lake
10/3/2019	Dane County Administration – Dave Merritt Dane County Land and Water Resources – Kyle Minks, John Reimer
10/7/2019	PSC – Carrie Templeton DATCP – Angela James
10/25/2019	Dane County Supervisors – Bob Salov District 37
11/22/2019	Dane County Supervisors – Bob Salov District 37
12/09/2019	Cambridge School District – Building and Grounds Committee
12/12/2019	Cambridge-Oakland Wastewater Commission – Gregory Droessler
1/28/2020	Village of Cambridge – Connector Bike Trail Donation
2/11/2020	Town of Christiana – Board Meeting
2/12/2020	Town of Christiana – Maureen Lien
4/6/2020	Cambridge Farm to School and Eco Jays – Jacy Eckerman
4/29/2020	Dane County Office of Energy and Climate Change – Keith Reopelle
4/30/2020	City of Madison – Stacie Reece
6/8/2020	Cambridge School District – Mark Worthing
7/30/2020	USFWS Consultation
8/20/2020	Dane County Board of Supervisors – Kate McGinnity District 37
8/24/2020	Dane County Administration – Dave Merritt
10/30/2020	Dane County Office of Energy and Climate Change – Kathy Kuntz
11/10/2020	Town of Christiana – Board Meeting
11/18/2020	PSC/DNR Pre-Application Meeting
1/5/2021	Town of Deerfield – Mike Schlobohm
1/11/2021	Town of Deerfield – Board Meeting
1/14/2021	DNR/USFWS Consultation
1/19/2021	Town of Christiana – Board Meeting
1/26/2021	Village of Cambridge – Board Meeting
2/2/2021	Village of Cambridge – Mark McNally
2/8/2021	Town of Deerfield – Board Meeting

Date	Organization/ Meeting Participant
2/9/2021	Town of Christiana – Board Meeting
2/9/2021	Village of Cambridge – Board Meeting
2/11/2021	Dane County Office of Energy and Climate Change – Kathy Kuntz Dane County Land and Water Resources – Laura Hicklin, Curt Kodl Dane County Administration – Dave Merritt Dane County Executive Office – Josh Wescott Dane County Planning and Development – Roger Lane, Todd Violante
2/18/2021	Village of Rockdale – Planning Committee & Board Meeting
2/18/2021	Village of Cambridge – Energy Planning Subcommittee Public Hearing
2/23/2021	Village of Cambridge – Board Meeting
3/4/2021	Village of Cambridge – Energy Planning Subcommittee Meeting
3/8/2021	Town of Deerfield – Board Meeting
3/9/2021	Town of Christiana – Board Meeting
3/9/2021	Village of Cambridge – Board Meeting
3/23/2021	Village of Cambridge – Board Meeting
3/24/2021	Dane County Land and Water Resources – Laura Hicklin, Curt Kodl
3/25/2021	PSC – Andrew Craft
3/25/2021	Town of Christiana – Maureen Lien
3/31/2021	Village of Cambridge – Energy Planning Subcommittee Meeting
4/12/2021	Town of Deerfield – Board Meeting
4/13/2021	Village of Cambridge – Board Meeting
4/13/2021	Town of Christiana – Board Meeting

Online - The Koshkonong Solar Facebook presence is nested within a single, statewide page called "WisconSUN." This is updated regularly to share solar information, receive questions and comments from the public, and further communicate on Project status. The Facebook pages can be found at https://www.facebook.com/WisconSUN. Additionally, Koshkonong Solar will create a Project-specific website for the general public to access information about the Project. The Project website will be published as soon as it is available.

Examples of Project mailings and other community informational material is attached in **Appendix S**.

7.2.4 *Identify all local media that have been informed about the project.*

Local media informed about the Project include the Cambridge News & Deerfield Independent, Edgerton Reporter, and the WORT 89.9 radio station.

7.2.5 *Describe the ongoing ways that the public would be able to communicate with plant operators or the company. Describe any internal process for addressing queries or complaints.*

Throughout the remainder of the Project's development, the Project team will continue communication via advertisements, social media, mailings, local governmental board meeting attendance, and local office and local Project representative presence.

When construction commences, Koshkonong Solar will select a Construction Site Manager as the primary local point of contact. This person will be available for local inquiries via phone and email.

During the operation of the Project, members of the community will be able to communicate with Project personnel through the operations and maintenance facility, which will be centrally located near the Project Substation and house full time maintenance personnel. Any maintenance or operations related questions can be directed to the maintenance staff at this location.

8. Waterway/Wetland Permitting Activities

Section 8.0 covers information required by DNR for waterway, wetland, and erosion control permits. The following subsections apply to both proposed and alternate solar array sites. Questions about this section should be directed to DNR Office of Energy staff.

8.1 Waterway Permitting Activities

This section should be consistent with the waterways included in DNR Tables 1 and 2 and associated maps. See page iii in this document on what to include in DNR Tables 1 and 2 regarding waterway resources.

8.1.1 *Identify the number of waterways present, including all DNR mapped waterways and field identified waterways, assuming all waterways are navigable until a navigability determination is conducted (if requested). Provide an overall project total, as well as broken down by the primary/preferred site and the alternate site and their associated facilities.*

A desktop delineation of wetlands and waterways for the overall Project Area was completed for preliminary planning and familiarity of what resources may be around the land proposed for development. The desktop delineation was completed using available public resources such as USGS topography, National Wetlands Inventory Mapping (NWI), National Hydrography Dataset flowlines and waterbodies (NHD), Wisconsin Wetland Inventory Mapping (WWI), WDNR 24K Hydrography Dataset, FEMA floodplain mapping, Digital Elevation Model mapping, Natural Resource Conservation Service (NRCS) Soil Survey Geographic database (SSURGO2) for Dane County, and several years of aerial photography from FSA, Google Earth, and Dane County imagery. Wetlands and waterways were desktop-delineated using the

level one routine determination method set forth in the USACE 1987 Manual[83] and the Northcentral & Northeast Regional Supplement[84].

For purposes of fine-scale site design and assessment of any Project impacts, a field delineation of wetlands and waterways was completed for a "Delineation Area" which was created around an early proposed Project construction footprint. The field delineation occurred between November 9 and November 12, 2020. The desktop-delineated wetlands and waterways are referenced for the portion of the Project Area outside of the field "Delineation Area" on maps (**Figures 4.1.6.1**, **8.3.1** and **8.3.2**-**Appendix B**) and **DNR Tables 1** and **2** (**Appendix U**). **Figures 4.1.6.1** and **8.3.3** (**Appendix B**) show which delineation methods were used within the Project Area. There are approximately 100 acres of Primary Array area and approximately 300 acres of Alternate Array area that have not been field delineated. Wetlands and waterways were identified in these locations from the desktop delineation and Project infrastructure have been sited around the wetlands and waterways. A field wetland delineation will be conducted in these areas during the 2021 growing season (**Figures 4.1.6.1** and **8.3.3**).

A summary of the waterways within the Project Area is included in DNR Table 2 (**Appendix U**) and shown on **Figures 4.1.6.1**, **8.3.1** and **8.3.2** (**Appendix B**). DNR Table 2 indicates whether a waterway is associated with the Primary or Alternate Array areas or is within the greater Project Area boundary. A total of twenty-two waterways were identified within the Project Area from field and desktop delineations. Fifteen waterways, totaling 6.39 miles, were delineated within the Delineation Area during field delineation efforts. Nine of the waterways correspond to DNR-mapped WBIC flowlines. Portions of six WBIC flowlines that occur within the Project Area were not field delineated due to these waterways being located outside of the field Delineation Area or due to these features lacking waterway characteristics. All WBIC-flowlines were assumed navigable until determined otherwise by WDNR. Additionally, one desktop delineated waterway was located within the Project Area but not within the field Delineation Area and is included in DNR Table 2 (**Appendix U**). Parts of the Project Area not field-delineated in 2020 will be field-delineated during the 2021 growing season.

Of the twenty-two waterways that are within the Project Area, nine are associated with the Primary Array areas, which includes one fence crossing of a desktop delineated waterway and thirty-five total collection line borings of four field delineated waterway features. Additionally, four WBIC flowlines are crossed by

[83] Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
[84] U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Project infrastructure which were not delineated in the field due to a lack of waterway characteristics (**Figures 8.3.1** and **8.3.2**). Navigability Determination Requests have been made for these four flowline segments which are included in **Appendix U**. These features are crossed by perimeter fencing, permanent access roads, solar arrays, and collection lines. If the WDNR finds any WBIC flowlines navigable that are currently crossed by Project infrastructure, the Project plan will be revised to avoid impacts to jurisdictional waterways.

The proposed Alternate Array areas contain two underground collection line bores of a field delineated waterway and a solar array crossing of a WBIC flowline that was not delineated in the field due to its lack of waterway characteristics. This WBIC flowline segment is also included in the Navigability Determination Request. The other thirteen waterways are located within the greater Project Area, outside of the Project footprint/Delineation Area. As noted, Navigability Determination Requests have been drafted for WBIC flowlines which were not delineated in the field due to a lack of waterway characteristics and are included in **Appendix U**.

8.1.2 *Identify any waterways in the project area that are classified as Outstanding or Exceptional Resource Waters, Trout Streams, and Wild or Scenic Rivers.*

As indicated in **Figure 4.1.6.1** (**Appendix B**), no features identified as Exceptional Resource Waters, Outstanding Resource Waters, Trout Streams, or Wild or Scenic Rivers were identified within the Project Area.

8.1.3 *State if you are requesting DNR staff perform a navigability determination on any of the DNR mapped waterways and/or field identified waterways that would be impacted and/or crossed by project activities. If a navigability determination is requested, provide the following information in a separate appendix with the application:*

- *A table with columns for:*
  - *The crossing unique ID,*
  - *Waterbody Identification Code (WBIC) for each waterway (found in the Surface Water Data Viewer or in the GIS data for the DNR mapped waterways),*
  - *Latitude and longitude for each crossing,*
  - *Waterway name,*
  - *Waterway characteristics from field investigation, and;*
  - *Any other pertinent information or comments.*
- *Site photographs, clearly labeled with the photo number, direction, date photo was taken, and crossing unique ID. A short description of what the photo is showing, and any field observation must also be included in the caption.*

- *Project map showing the following:*
  - *Aerial imagery (leaf-off, color imagery is preferred),*
  - *DNR mapped waterways (labeled with their unique ID),*
  - *Field identified waterways (labeled with their unique ID),*
  - *the location of each site photograph taken (labeled with the photo number),*
  - *the project area, and;*
  - *Call out box/symbol for each DNR mapped waterway crossing where the navigability determination is requested (labeled with their unique ID).*

Navigability Determinations are being requested for portions of 6 WBIC flowlines. These features are included in DNR Tables 1 and 2. The required photos, maps, tables, and forms for the Navigability Determination Requests are included in **Appendix U**.

8.1.4 *For both the primary/preferred and alternate sites and their associated facilities, provide the following:*

8.1.4.1 *The number of waterways that would be crossed by collection lines and specify the installation method (e.g. X waterways would be bored, Y waterways would be trenched, etc.).*

As summarized in the Table 1 (**Appendix U**), Supplement to DNR Form 3500-53, and as shown on **Figures 8.3.1** and **8.3.2** (**Appendix B**), thirty-five collection line directional bores are proposed under four field waterways associated with the Primary Array areas. Also associated with the Primary Array areas are nine collection line bores which are proposed under three WBIC flowlines. Two additional collection line directional bores under one field delineated waterway is proposed for the Alternate Array areas.

8.1.4.2 *The number of waterways that would be traversed with equipment for temporary access roads, and how that crossing would be accomplished (e.g. temporary clear span bridges (TCSB), use of existing bridge or culvert, etc.).*

No impacts to waterways are proposed for temporary access roads.

8.1.4.3 *The number of waterways that would be impacted for permanent access roads, and how that crossing would be accomplished (e.g. placement of culvert, ford, permanent bridge, etc.).*

8.1.4.4 *Two waterway WBIC flowlines would be crossed by permanent access road crossings that are associated with the Primary Array areas. Navigability Determinations have been submitted for the portions of the flowlines associated with these crossings (**Appendix U**). Pending the*

results of the navigability determination, if found to be a navigable waterway, the features will likely be avoided by final Project design, if that's not feasible or possible, the waterways would be crossed via a low water ford crossing or culvert as appropriate. It is anticipated that ultimately the WDNR will find these two waterway segments non-navigable. The number of waterways that would be impacted and/or crossed by fence installation and footings.

Perimeter fencing is currently proposed to cross over one desktop delineated waterway and four WBIC flowline features which were not field delineated due to a lack of waterway characteristics. All perimeter fence crossings of waterways are associated with the Primary Array areas. A field delineation will be conducted in the location of the desktop delineated waterway to assess the presence and extent of this feature in the field. If results of a field delineation indicate this waterway is present, the fence will be adjusted to avoid impacts entirely. The results of the Navigability Determination on the 4 WBIC flowline features will be incorporated into the final Project design to avoid impacts to navigable waterways.

8.1.4.5 *The number of waterways that would be impacted and/or crossed by other construction activities or facilities (e.g. placement of a stormwater pond within 500 feet of a waterway, stream relocation, etc.).*

There are portions of four WBIC flowlines that would be crossed by solar arrays. Navigability Determination requests have been submitted for the portions of the WBIC flowlines associated with these crossings because they were found to lack waterway characteristics during the field delineation. The final Project design will be adjusted to avoid any of these features if deemed navigable in the Navigability Determination.

A proposed stormwater pond (located east of power block V1) is located within 500 feet of WBIC flowline 5036882, which is located outside of the Project Area. This feature will most likely be relocated in the final Project design to avoid any indirect waterway impacts, but if the stormwater pond is still proposed within 500 feet of a waterway on final design, the Applicant will apply for a WNDR General Permit.

8.1.5 *Provide the methods to be used for avoiding, minimizing, and mitigation construction impacts in and near waterways. This discussion should include, but not be limited to, avoiding waterways, installation methods (i.e. directional bore versus open-cut trenching or plowing), equipment crossing methods (i.e. for temporary access, the use of TCSB versus temporary culvert; for permanent access, the use of permanent bridge versus permanent culvert), sediment and erosion controls, invasive species protocols for equipment, etc.*

Impacts to waterways will be avoided through siting and construction planning. All collection line crossings of waterways will be directionally bored to avoid impacts. Appropriate sediment and erosion control measures as detailed in the ECSWMP will be put in place to avoid sedimentation into waterways (**Appendix L**). When feasible, HDD equipment, trenching equipment and backhoes will be power washed before mobilization to the site to prevent introduction of invasive species from off-site sources and equipment will be manually cleaned of plant materials between work zones where invasive species have been identified within the Project Area per the VMS (**Appendix W**).

8.1.6 *Describe fence crossings of waterways, including the location of support pilings (i.e. in waterway channel, at the top of the waterway banks) and the amount of clearance between the bottom of the fence and the ordinary high-water mark. Also describe any existing public use of the waterway and how this public use may be impacted by the fence crossing.*

Perimeter fencing is currently proposed to cross over one desktop delineated waterway and four WBIC flowline features that were not field delineated due to a lack of waterway characteristics. A Navigability Determination request has been submitted for the portions of the WBIC flowlines that are associated with these fence crossing locations. The flowlines are anticipated to be determined non-navigable. The location of the desktop-delineated waterway crossing will be delineated in the field in Spring 2021 to confirm the presence of a waterway feature. Ultimately, the final design of the Project will avoid any impacts to jurisdictional/navigable waterways.

8.1.7 *For waterways that would be open-cut trenched, provide the following:*

8.1.7.1 *The machinery to be used, and where it would operate from (i.e. from the banks, in the waterway channel) and if a TCSB is needed to access both banks.*

8.1.7.2 *The size of the trench (length, width, and depth) for each waterway crossing.*

8.1.7.3 *The details on the proposed in-water work zone isolation/stream flow bypass system (i.e. dam and pump, dam and flume, etc.).*

8.1.7.4 *The details on the proposed dewatering associated with the in-water work zone isolation/stream flow bypass system, including where the dewatering structure would be located.*

8.1.7.5 *The duration and timing of the in-stream work, including the installation and removal of the isolation/bypass system and the trenching activity.*

8.1.7.6 *How impacts to the waterway would be minimized during in-water work (e.g. energy dissipation, sediment controls, gradually releasing dams, screened and floating pumps, etc.).*

8.1.7.7 *How the waterway bed and banks would be restored to pre-existing conditions.*

The following addresses Sections 8.1.7.1 through 8.1.7.7. All utility line crossings of waterways will be directionally bored. No open-cut trenching across waterways is proposed, and no other crossings of waterways for access roads or fences is proposed to be included in final design. As noted previously, if the remaining field delineations and Navigability Determination results find waterways currently crossed by Project infrastructure to be present, jurisdictional, and/or navigable, then the final Project design will be adjusted to avoid impacts.

8.1.8 *For waterways that would be directionally bored, provide the following:*

8.1.8.1 *Where the equipment would operate from (e.g. from upland banks, from wetland banks, etc.) and if a TCSB is needed to access both banks.*

Entry points and exit points will be positioned at least ten feet outside of the established waterway boundaries and will be moved further away when appropriate to achieve the proper depth required for each bore and to avoid tree lines or other obstacles.

8.1.8.2 *The location and size of any temporary staging and equipment storage.*

Temporary staging and equipment storage will be located in upland areas in an area of up to five hundred feet by thirty feet, which includes area to stage the bore pipe.

8.1.8.3 *The location and size of bore pits.*

Bore pits will generally be twenty feet in length, twenty feet wide, and four feet deep. Installation depths will be at least five feet below the bottom of the waterway crossing.

8.1.8.4 *Provide a contingency plan for bore refusal and a plan for the containment and clean-up of any inadvertent releases of drilling fluid (e.g. a frac-out).*

Typical crossing details and a standard frac-out plan is included in **Appendix D**. In the event of a refused boring, the boring will be re-attempted from the same boring pit on a slightly different path than the refused bore. In the case it is determined that the area of the refused bore is not adequate for a bore, the bore location will be moved to a new location and the bore re-attempted, which may require an additional bore pit at that location.

Appendix D describes in detail the response actions for clean-up of inadvertent releases of drilling fluid, but in general the actions to be taken include ceasing work to assess the nature of the release, containment of the released fluids, and notification of the appropriate agency(ies), if required.

8.1.9 *For waterways that would have a TCSB installed across them, provide the following:*

8.1.9.1 *A description of the TCSB proposed, including dimensions, materials, and approaches.*

8.1.9.2 *State if any waterways are wider than 35 feet, and/or if any in-stream supports would be used.*

8.1.9.3 *State how the TCSB placement and removal would occur (e.g. carried in and placed with equipment, assembled on site, etc.) and if any disturbance would occur to the bed or banks for the installation and removal.*

8.1.9.4 *The duration of the TCSB and when installation and removal would occur.*

8.1.9.5 *Describe sediment controls that would be installed during the installation, use, and removal of the TCSBs.*

8.1.9.6 *Describe how the TCSBs would be inspected during use, and how they would be anchored to prevent them from being transported downstream.*

8.1.9.7 *State if the required five foot clearance would be maintained, or if the standards in Wis. Admin. Code NR 320.04(3) would be complied with.*

8.1.9.8 *How the waterway banks would be restored when the TCSB is removed.*

No temporary clear span bridge crossings of waterways are proposed.

8.1.10 *Describe the proposed area of land disturbance and vegetation removal at waterway crossings. Include a description of the type of vegetation to be removed, and if this vegetation removal would be temporary (allowed to regrow) or permanent (maintained as cleared).*

An approximately twenty by twenty-foot area will be temporarily cleared of vegetation for bore pits for waterway crossings. Bore pits will be located in uplands at least ten feet from waterways and will be moved further away when appropriate to achieve the proper depth required for each bore. Bore pits will be located to avoid the need to clear woody vegetation. Koshkonong Solar expects that herbaceous vegetation will be removed temporarily and will be replanted and/or allowed to regrow after construction in accordance with the VMS (**Appendix W**). Potential waterway crossings from fences will be avoided with final design so no vegetation removal is planned associated with Project fence crossings of waterways.

8.1.11 *If any of the following activities are proposed, provide the information as detailed on the applicable permit checklist:*

- *Culvert placement: https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-CulvertWPEDesign.pdf (General Permit) or https://dnr.wi.gov/topic/Waterways/documents/PermitDocs/IPs/IP-culvert.pdf (Individual Permit).*

- *Permanent bridge: https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-ClearSpanBridge.pdf (General Permit, no in-stream supports) or https://dnr.wi.gov/topic/Waterways/documents/PermitDocs/IPs/IP-bridgeTempCross.pdf (Individual Permit, in-stream supports).*
- *Stormwater pond within 500 feet of a waterway: https://dnr.wi.gov/topic/waterways/documents/PermitDocs/GPs/GP-StormwaterPond.pdf.*

Koshkonong Solar will conform to WPDES requirements for temporary stormwater ponds that may be located within 500 feet of a jurisdictional waterway pending final engineering. It is anticipated that no other permits will be necessary for crossings of jurisdictional waterways. If any in-stream work needs to be conducted during fish timing restrictions, a waiver will be requested through the WDNR.

8.2 Wetland Permitting Activities

This section should be consistent with the wetlands included in DNR Tables 1 and 2 and associated figures. See page iii in this document on what to include in DNR Tables 1 and 2 regarding wetland resources.

8.2.1 *Describe the method used to identify wetland presence and boundaries within the project area (i.e. wetland delineation, wetland determination, review of desktop resources only, etc.). If a combination of methods were used, describe which project areas utilized which method. The associated delineation report and/or desktop review documentation should be uploaded to the PSC's website as part of the application filing.*

As stated in Section 8.1.1, a desktop delineation of wetlands and waterways within the overall Project Area was completed using available public resources prior to the field delineation. Desktop-delineated wetlands were classified by their probable Wetlands and Deepwater Habitats of the United States[85], Wetland Plants and Communities of Minnesota and Wisconsin[86], and Wetlands of the United States[87] wetland types for the wetland or wetland complex. The desktop-delineated wetlands and waterways are referenced for the portion of the Project Area outside of the field "Delineation Area" as depicted on **Figures 4.1.6.1**, **8.3.1, 8.3.2 a**nd **8.3.3, Appendix B** and in **DNR Tables 1** and **2** in **Appendix U**. **Figures 4.1.6.1** and **8.3.3** show which delineation methods were used within the Project Area.

[85] Cowardin, L.M., V.M. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Biological Services Program, Washington, DC, USA. FWS/OBS-79/31. 103 pp.

[86] Eggers, Steve D., and Donald M. Reed. 1997. Wetland plants and communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District. 263pp.

[87] Shaw, S.P. and C.G. Fredine. 1971. Wetlands of the United States. U.S. Fish and Wildlife Circular 39. U.S. Department of the Interior, Washington, D.C. 67 pp.

For purposes of fine-scale site design and assessment of any Project impacts, a field delineation of wetlands and waterways was completed for a "Delineation Area" which was created around an early proposed Project construction footprint. A field delineation of wetlands and waterways was completed between November 9 and 12, 2020 for the "Delineation Area" (**Appendix B Figures 4.1.6.1**, **8.3.1, 8.3.2, a**nd **8.3.3; Appendix U DNR Tables 1** and **2, Wetland Delineation Report**). Wetlands were delineated in accordance with the level two routine determination method set forth in the USACE 1987 Wetlands Delineation Manual[83] and the supplemental methods set forth in the regional supplement to the USACE Wetland Delineation Manual: Northcentral & Northeast Region[84]. A total of 62 wetlands or wetland complexes (76 distinct Eggers and Reed polygons) totaling 182.6 acres were field delineated within the Delineation Area inside the Project Area. Desktop wetlands within the Delineation Area were confirmed in the field and, if meeting the criteria for wetland conditions, delineated as wetlands with associated upland/wetland transects using USACE Northcentral & Northeast region datasheets. If the field conditions (hydrology, soils, and vegetation) indicated that a desktop wetland was actually an upland, a data point, USACE datasheet, and photos were taken. There are minor portions of the Project footprint that were not field delineated as Project infrastructure was only recently proposed in these locations. Wetlands and waterways were identified in these locations from the desktop delineation. A field wetland delineation will be conducted in these areas in Spring 2021 should Project infrastructure be planned in these areas as part of final design.

A summary of field and desktop-delineated wetlands in the Project Area can be found in **DNR Table 2** and the Wetland Delineation Report in **Appendix U**. A mapbook of all desktop- and field-delineated features is shown on **Figure 4.1.6.1** (**Appendix B**)**.** Wetland delineation methods within the Project Area are indicated in **Figure 8.3.3** (**Appendix B**)**.**

8.2.2 *Identify the number of wetlands present and by wetland type, using the Eggers and Reed classification. Provide as an overall project total, as well as broken down by the primary/preferred site and the alternate site and their associated facilities.*

A total of 101 wetlands or wetland complexes (field and desktop delineated, combined) are present within the Project Area. All of the desktop and field-delineated wetlands are classified according to the Eggers & Reed method and are included in **Appendix U** and **Figure 4.1.6.1** (**Appendix B**). Of the 101 wetlands delineated in the overall Project Area, 62 are field delineated and 39 are desktop delineated wetlands. Desktop-delineated wetlands have not been confirmed by a field delineation because they were located outside the Project footprint at the time of survey. The 76 distinct Eggers and Reed community types of the 62 field-delineated wetlands include seasonally flooded basins (48) and wet meadows (18), shallow marsh (1), shrub-carr (2), floodplain forest (6), and hardwood swamp (1). Desktop delineated wetlands

within the Project Area are mostly comprised of seasonally flooded basins located in farmed fields, wet meadows, and floodplain forest systems.

The Primary Array areas includes a total of eighteen field-delineated wetlands and one desktop-delineated wetland (**Appendix U, Table 2**). A total of thirteen wetlands would be located inside of the perimeter fences and six would be crossed by underground collection line bores. Fifteen of the wetlands associated with the Primary Array areas are classified as seasonally flooded basins. The remaining four wetlands associated with the Primary Array areas consist of two wetlands classified as wet meadows and one floodplain forest and wet meadow wetland complex.

The Alternate Array areas include a total of one field-delineated wetland and two desktop-delineated wetlands (**Appendix U, Table 2**). One wetland would be located inside of perimeter fences, one would be crossed by underground collection line bores, and one would be impacted by perimeter fencing (**Appendix U, Table 1**). Two of the wetlands associated with the Alternate Array areas are classified as seasonally flooded basins and the other one is classified as a wet meadow. If desktop-delineated wetlands are confirmed in the field, Project infrastructure would likely be revised to avoid impacts from fences.

8.2.3 *Identify the any wetlands in the project area that are considered sensitive and/or high-quality wetlands, including, but not limited to:*

8.2.3.1 *Any wetlands in or adjacent to an area of special natural resource interest (Wis. Admin. Code NR 103.04).*

No wetlands are in or adjacent to an area of special natural resource interest as no special natural resource areas occur within the Project Area.

8.2.3.2 *Any of the following types: deep marsh, northern or southern sedge meadow not dominated by reed canary grass, wet or wet-mesic prairie not dominated by reed canary grass, fresh wet meadows not dominated by reed canary grass, coastal marsh, interdunal or ridge and swale complex, wild rice-dominated emergent aquatic, open bog, bog relict, muskeg, floodplain forest, and ephemeral ponds in wooded settings.*

Within the Project Area, six wetlands or portions of wetland complexes were desktop-delineated that contain floodplain forest. These features totaled 2.8 acres. Seven wetlands or wetland complexes were desktop-delineated that contained fresh wet meadow that may not be dominated by reed canary grass. These wet meadow wetlands totaled 14.2 acres. All of these desktop-delineated wetlands are avoided by Project infrastructure. No open bog, bog relict, muskegs, ephemeral ponds in wooded settings, interdunal or ridge swale complex, wild rice-dominated emergent aquatic wet or wet-mesic prairies, deep marsh, or sedge meadow communities were identified in the desktop delineation.

Within the Delineation Area, six wetlands classified as floodplain forest were field-delineated and totaled 11.30 acres. Of the six field-delineated floodplain forests, one will be crossed by underground collection line bores to avoid impacts. The other five wetlands will be avoided by all Project infrastructure. A total of 18 wetlands or portions of wetland complexes within the Delineation Area were field-delineated as fresh wet meadow. These wetlands totaled 72.7 acres. Fresh wet meadow communities within the delineation area were generally dominated by reed canary grass. Four of these features are crossed by underground collection line bores. No open bog, bog relict, muskegs, ephemeral ponds in wooded settings, interdunal or ridge swale complex, wild rice-dominated emergent aquatic wet or wet-mesic prairies, or sedge meadow communities were identified in the field delineation.

8.2.3.3 *Any wetlands with high functional values based on factors such as abundance of native species and/or rare species, wildlife habitat, hydrology functions, etc.*

Functional values for wetlands within the Delineation Area were generally low due to their presence within or near cultivated fields. Vegetative diversity within wetlands was generally low and most wetlands were dominated by non-native or invasive species.

8.2.4 *For both the primary/preferred and alternate sites and their associated facilities, provide the following:*

8.2.4.1 *How many wetlands would be crossed by collection lines and specify the installation method (i.e. X wetlands would be bored, Y wetlands would be trenched).*

A total of five wetlands (six Eggers and Reed community polygons) associated with the Primary Array areas, would be crossed by a total of forty-three underground collection lines. Additionally, one wetland associated with the Alternate Array areas, would be crossed by a total of two underground collection lines. All underground collections lines are proposed to be directionally bored to avoid impacts to wetland features.

8.2.4.2 *How many wetlands would have construction matting placed within them to facilitate vehicle access and operation and material storage. Also provide the total amount of wetland matting, in square feet.*

Construction matting is proposed in one desktop wetland for the purposes of fence installation. While this impact will be avoided by final project design, a calculation was conducted to determine potential matting impacts so the CPCN application was consistent with the design as illustrated. A total of 3,832 square feet of matting would be required to cross the desktop delineated feature. Construction matting would be in place for the duration of time needed to construct the fence crossing of the feature.

8.2.4.3 *How many wetlands would be impacted for permanent access roads and indicate if culverts would be installed under the roads to maintain wetland hydrology.*

No permanent or temporary access roads will be constructed in wetlands.

8.2.4.4 *How many wetlands would be impacted and/or crossed by fence installation and footings.*

One perimeter fence crossing of a desktop-delineated seasonally flooded basin is proposed for the Alternate Array areas. A total of 50 footings would be installed in the wetland which would result in a total of 75 sq.ft. of wetland fill. However, if field delineations determine this feature is present, the final Project design will be adjusted to avoid impacts.

8.2.5 *Describe if wetlands would be disturbed for site preparation activities (e.g. grading, leveling, etc.) in the array areas, and for the installation of the arrays and associated supports.*

No grading or leveling of wetlands is anticipated as solar arrays have been sited outside of field-delineated and desktop-delineated wetlands.

8.2.6 *Describe the sequencing of matting placement in wetlands and the anticipated duration of matting placement in wetlands. For matting placed in any wetland for longer than 60 consecutive days during the growing season, prepare and submit a wetland matting restoration plan with the application filing.*

Construction matting within wetlands is expected to be limited to one desktop-delineated wetland to facilitate fence post installation. If the field delineation confirms a wetland in this location, final design will likely be adjusted to avoid this fence crossing.

8.2.7 *For wetlands that would be open-cut trenched, provide the following:*

8.2.7.1 *Provide details on the total disturbance area in wetland, including how total wetland disturbance was calculated. Include the size of the trench (length, width, and depth), where stockpiled soils would be placed (i.e. in upland, in wetlands on construction mats, etc.), and where equipment would operate.*

8.2.7.2 *Details on the proposed trench dewatering, including how discharge would be treated and where the dewatering structure would be located.*

8.2.7.3 *Duration and timing of the work in wetland.*

8.2.7.4 *How the wetland would be restored to pre-existing conditions.*

No open-cut trenching of wetlands is proposed.

8.2.8 *For wetlands that would be directionally bored, provide the following:*

8.2.8.1 *How bored wetlands and associated bore pits would be accessed.*

Bored wetlands and associated bore pits would be accessed from adjacent upland areas.

8.2.8.2 *The location and size of any temporary staging and equipment storage.*

Temporary staging and equipment storage will be located in upland areas in an area of up to five hundred feet by thirty feet, which includes area to stage the bore pipe.

8.2.8.3 *The location and size of bore pits.*

Entry points and exit points will be positioned at least ten feet outside of the established wetland boundaries and will be moved further away when appropriate to achieve the proper depth required for each bore and to avoid tree lines and other obstacles. Bore pits will generally be twenty feet long, twenty feet wide, and approximately four feet deep.

8.2.8.4 *Provide a contingency plan for bore refusal and a plan for the containment and clean-up of any inadvertent releases of drilling fluid (e.g. a frac-out).*

Typical bore crossing details and a standard frac-out plan is included in **Appendix D**. In the event of a refused boring, the boring will be re-attempted from the same boring pit on a slightly different path than the refused bore. In the case it is determined that the area of the refused bore is not adequate for a bore, the bore location will be moved to a new location and the bore re-attempted, which may require an additional bore pit at that location. **Appendix D** describes in detail the response actions for clean-up of inadvertent releases of drilling fluid, but in general the actions to be taken include ceasing work to assess the nature of the release, containment of the released fluids, and as required, notification of the appropriate agency(ies).

8.2.9 *Describe how fence installation would occur in wetlands, including the footing types (e.g. direct imbed, concrete, etc.), any associated wetland impact such as vegetation clearing, operation of equipment, etc.*

Fence installation is proposed for one desktop-delineated seasonally flooded basin in the Alternate Array areas. A field delineation will be conducted in Spring 2021 to determine the presence of wetland in this area. If present, the final Project design will be adjusted to avoid this impact. Nonetheless, to align with the CPCN application design, it was assumed that the 75 sq.ft of impacts for the placement of footings will occur for the purposes of this application. Concrete footings were assumed, but exact installation methods will likely be determined by the site conditions. Vegetation clearing would likely be limited to hand-cut clearing of vegetation to allow for fence

post installation. Construction matting would be used to limit impacts to the wetland during fence post installation.

8.2.10 *For wetland vegetation that would be cleared or cut, provide the following:*

8.2.10.1 *The justification for why wetland trees and shrubs are proposed to be cleared, and what construction activity the clearing is associated with.*

8.2.10.2 *The timing and duration of vegetation removal*

8.2.10.3 *Describe the type of equipment that would be used, and if the vegetation removal would result in soil disturbance, including rutting and soil mixing.*

8.2.10.4 *The type of wetland and type of vegetation to be cleared.*

8.2.10.5 *If tree and shrubs removed would be allowed to regrow or be replanted, or if cleared areas would be kept free of trees and shrubs long-term.*

8.2.10.6 *Indicate the plan for removal and disposal of brush and wood chips.*

Tree and shrub clearing is not anticipated for wetland crossings as cover in the area is entirely herbaceous. Koshkonong Solar expects that any herbaceous vegetation will be removed temporarily and will be replanted and/or allowed to regrow after construction in accordance with the VMS.

8.2.11 *Indicate if any permanent wetland fill is proposed, such as for substation placement, permanent roads, fence or array footings, pole locations, etc. and provide the amount of permanent wetland fill.*

No permanent wetland fill is proposed for the construction of the Project. The current Project design depicts 75 sq.ft of permanent fill for the placement of fence footings within one desktop-delineated seasonally flooded basin in the Primary Array areas. The final Project design will be adjusted to avoid this area if determined to be a wetland during field delineations in 2021.

8.2.12 *Provide the methods to be used for avoiding, minimizing, and mitigation construction impacts in and near wetlands. This discussion should include, but not limited to, avoiding wetlands, installation methods (i.e. directional bore versus open-cut trenching, soil segregation during trenching, etc.), equipment crossing methods (i.e. use of construction matting, frozen ground conditions, etc.), sediment and erosion controls, invasive species protocols for equipment, etc. Additional guidance to prepare this discussion can be found here: https://dnr.wi.gov/topic/Sectors/documents/PAAsupp3Utility.pdf.*

All collection line crossings of wetlands will be directionally bored to avoid impact. The remaining direct Project impacts will be avoided through final design. During

construction, appropriate sediment and erosion control measures will be put in place to avoid sedimentation into any wetlands during construction and be clearly marked to avoid disturbance (**Appendix L**). Additional information regarding invasive species management is provided in Sections 5.4.2 and 5.4.3 as well as the VMS (**Appendix W**).

8.2.13 *Indicate if an environmental monitor would be employed during project construction and restoration activities. If so, describe the monitors roles and responsibilities, frequency of visits, etc.*

A third-party stormwater/environmental monitor will be on site periodically throughout construction to ensure compliance with the construction stormwater permit, that wetland/waterway impacts are being avoided, and that environmental best management practices are being properly utilized to avoid encounters with wildlife species.

8.2.14 *Describe how all wetlands within the project area would be restored. This includes wetlands that would be encompassed within the arrays even if not directly impacted by project construction. This discussion should include details on the seeding plan, maintenance and monitoring, restoring elevations and soil profiles, restoring wetland hydrology, etc.*

Temporarily impacted wetlands will be restored to existing contours and re-seeded. Seeding of wetland areas will be comprised of native sedge, grass, rush, and forb species classified as FAC, FACW, or OBL. Spot herbicide treatments will be used to prevent invasive species propagation as needed before, during, and after construction. Periodic inspections of establishing and established vegetation will be made to detect native and non-native invasive species issues. As most of the wetlands within the solar array and fencing are currently surrounded by row crop production, vegetative diversity and improved wildlife habitat are expected. Deep-rooted native and naturalized plant species planted in adjacent uplands will also provide erosion control through increased soil stabilization. Decreased nutrient runoff, fertilizer application, and herbicide and pesticide use should also improve water quality. Details on restoration of wetlands can be found in the VMS (**Appendix W**) and the Erosion Control and Storm Water Management Plan (ECSWMP) (**Appendix L**).

8.3 Mapping Wetland and Waterway Crossings

For each facility (primary/preferred arrays and alternate arrays, plus associated components such as temporary access roads, permanent access roads, collector circuits, fences, arrays, associated transmission lines, any permanent buildings such as substation and O&M buildings, etc.) in or adjacent to wetlands or waterways, provide three map sets. Each map set should include an index page, as well as small scale map pages showing the project area and features in detail. The same scale and page extent should be used for each map set.

8.3.1 *Topographic map set showing the following:*

- *Delineated wetlands, labeled with the feature unique ID (if a delineation was conducted), or Wisconsin Wetland Inventory and Hydric soils if a delineation was not conducted.*
- *DNR mapped waterways, labeled with the feature unique ID.*
- *Field identified waterways, labeled with the feature unique ID.*
- *Solar arrays and all connecting facilities (permanent and temporary access roads, fences, and collector circuits) with the installation method identified (i.e. directional bore, plow, open-cut trench, etc.).*
- *O&M Building.*
- *Substation.*
- *Generator tie line, including pole locations and all access roads, including off-ROW access.*
- *Locations of proposed stormwater features (i.e. ponds, swales, etc.).*
- *Vehicle crossing method of waterways for both permanent and temporary access (i.e. TCSB, installation of culvert, installation of bridge, installation of ford, use of existing culvert, use of existing bridge, use of existing ford, driving on the bed).*
- *Placement of construction matting in wetlands.*
- *Excavation areas in wetlands (i.e. bore pits, open-cut trench, etc.).*

8.3.2 *Aerial photo map set showing the following:*

- *Delineated wetlands, labeled with the feature unique ID (if a delineation was conducted), or Wisconsin Wetland Inventory and Hydric soils if a delineation was not conducted.*
- *DNR mapped waterways, labeled with the feature unique ID.*
- *Field identified waterways, labeled with the feature unique ID.*
- *Solar arrays and all connecting facilities (permanent and temporary access roads, fences, and collector circuits) with the installation method identified (i.e. directional bore, plow, open-cut trench, etc.).*
- *O&M Building.*
- *Substation.*
- *Generator tie line, including pole locations and all access roads, including off-ROW access.*
- *Locations of proposed stormwater features (e.g. ponds, swales, etc.).*
- *Vehicle crossing method of waterways for both permanent and temporary access (i.e. TCSB, installation of culvert, installation of bridge, installation of ford, use of existing culvert, use of existing bridge, use of existing ford, driving on the bed).*
- *Placement of construction matting in wetlands.*
- *Excavation areas in wetlands (i.e. bore pits, open-cut trench, etc.).*

8.3.3 *A map showing which method(s) were used to identify wetland presence and boundaries within the project area (i.e. wetland delineation, wetland determination, review of desktop resources only).*

Appendix B includes **Figures 8.3.1**, **8.3.2** and **8.3.3** which address the requirements of Sections 8.3.1, 8.3.2 and 8.3.3.

8.4 Erosion Control and Storm Water Management Plans

DNR may require a detailed description of temporary and permanent erosion and sediment control measures to be utilized during and after construction of the project.

If the project would involve one or more acres of land disturbance, the applicant's request for permits under Wis. Stat. § 30.025 must identify the need for coverage under the Construction Site Storm Water Runoff General Permit [PDF] from DNR. The permit application itself must be submitted through the DNR's electronic Water Permits system after the PSC order. This permit may also authorize construction site dewatering discharges.

The Storm Water Permit and ch. NR 216 Wis. Adm. Code require a site-specific Erosion Control Plan, Site Map, and Storm Water Management Plan. The permittee would be required to implement and maintain, as appropriate, all erosion and sediment control practices identified in the plans from the start of land disturbance until final stabilization of the site. Final stabilization means that all land-disturbing construction activities at the construction site have been completed and that a uniform perennial vegetative cover has been established with a density of at least 70 percent of the cover for the unpaved areas and areas not covered by permanent structures or equivalent stabilization measures.

The draft Erosion Control Plan, Site Map, Storm Water Management Plan, and any supporting documentation (such as modeling input/output, design specifications, geotech/soil report, site photos, etc.) must be submitted with the Storm Water Permit application through the DNR's ePermitting system.

8.4.1 *Erosion Control Plan - See Wis. Admin. Code § NR 216.46 for details regarding information required in the Erosion Control Plan as part of a complete permit application. Topics include:*

- *Site-specific plans.*
- *Compliance with construction performance standards in Wis. Admin. Code § NR 151.11.*
- *Details about the site and the project.*
- *List and schedule of construction activities.*
- *Site map(s) with site, project, and erosion and sediment control details.*
- *Description of temporary and permanent erosion and sediment controls.*
- *Compliance with material management, velocity dissipation, and inspection schedule requirements.*

Considerations:

- *All areas of land disturbance associated with the solar project should be identified and included in the permit application, including staging/laydown areas, stockpile areas, temporary access roads, etc.*
- *Minimize or avoid land disturbance, and vegetate the project area as soon as possible to preclude the need for temporary sediment basins.*
- *Design, implement, and maintain erosion and sediment controls in accordance with Wisconsin Technical Standards (https://dnr.wi.gov/topic/stormwater/standards/const_standards.html).*
- *Some storm water discharges from temporary support activities such as portable concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, and borrow areas are authorized under this permit provided that the support activity is directly related to and part of the construction site covered under the permit. The Erosion Control Plan should include provisions to prevent and control discharge of pollutants to waters of the state from any temporary support activity. (See DNR permit section 1.1.2 for more information.)*
- *The permit covers some dewatering activities, such as dewatering of construction pits, pipe trenches, and other similar operations. Dewatering activities that would be covered under the Construction Site Storm Water Runoff General Permit should be discussed in the Erosion Control Plan or provided as a separate Dewatering Plan attachment in the permit application. See Dewatering Plan guidance below and DNR permit sections 1.1.1.1 and 3.1.10 for more information.*

Koshkonong Solar has prepared a draft ECSWMP describing the best management practices that will be used on-site for erosion control and post-construction storm water management, included in **Appendix L**. Once a contractor is selected and prior to construction, the ECSWMP will be finalized, and coverage will be obtained under the Construction Site Storm Water Runoff Permit from the DNR under Wis. Admin. Code § NR 216.[88] The applicant will be required to submit a Construction Project Consolidated Permit Application which will meet the Technical Standards used by the DNR.

8.4.2 *Storm Water Management Plan – See Wis. Admin. Code § NR 216.47 for details regarding information required in the Storm Water Management Plan as part of a complete permit application. Topics include:*

- *Compliance with applicable post-construction performance standards in Wis. Admin. Code § NR 151.121 through § NR 151.128.*

[88] Wisconsin State Legislature. Wisconsin Administrative Code Chapter NR 216 – Stormwater Discharge Permits. Register November 2018 No. 755.

- *Description of permanent storm water management practices at the site and technical rationale.*
- *Groundwater and bedrock information if using permanent infiltration devices.*
- *Separation distances of permanent storm water management practices from wells.*
- *Long-term maintenance agreement for site vegetation and any other permanent storm water management features.*

Considerations:

- *Configure arrays to allow for sheet flow through vegetation beneath, between, and around solar arrays for runoff management during the life of the facility. Vegetation can prevent erosion, filter runoff, and improve infiltration capacity of soils. Depending on site characteristics (such as if the site has steep slopes, erosive soils, concentrated flow, conditions for poor vegetation establishment, etc.), additional permanent/long-term storm water management measures may be necessary. Sun-tracking panels are less likely to contribute to erosion compared to fixed panels and may necessitate less-frequent long-term vegetation maintenance and erosion control.*
- *Runoff from other permanent impervious surfaces associated with the project (i.e., access roads, parking areas, structures) may require permanent storm water management practices (i.e., ponds, swales, etc.) to meet post-construction performance standards. Gravel, aggregate, dirt, pavement, and asphalt are examples of impervious surfaces.*
- *Avoid or minimize permanent impervious areas by specifying grassed/vegetated permanent accessways instead of impervious access roads. If loaded vehicles require additional support during construction, use temporary impervious access (i.e., gravel or timber/composite matting) that would be replaced with vegetation or a vegetated accessway.*
- *Design, implement, and maintain permanent post-construction storm water management features in accordance with Wisconsin Technical Standards (https://dnr.wi.gov/topic/stormwater/standards/postconst_standards.html).*
- *Develop a long-term maintenance agreement. Some municipalities may have specific formats and/or filing requirements for such agreements. At a minimum identify the responsible party, all permanent storm water management features, and associated inspections and maintenance. Note that vegetation under, between, and around arrays is considered a permanent storm water management feature and should be included in the agreement.*

To meet the Wisconsin Administrative Code NR 151.121-151.128,[89] post-construction performance standards for new development and redevelopment projects, a low impact development (LID) approach is proposed. The management plan proposes using a vegetated filter under the proposed panel arrays and throughout the Project Area. All-season equipment access will also necessitate aggregate roads leading to inverter skids. Calculations applicable to these requirements can be found in the Preliminary Drainage Study in **Appendix X.**

The Project layout minimizes impervious surface coverage and will consist of solar panels, gravel roads, and other electrical equipment. Solar panels have a unique, fully-disconnected impervious surface runoff characteristic that is unlike buildings or roads. The runoff generated from the solar panels will flow to the edge of the panels and be allowed to drip onto the pervious surface below.

To reduce the potential for erosion and scour at the dripline of the panels, the vertical clearance between the panels and the ground will be minimized and shall be less than 8 feet maximum elevation. Also, erosion and sediment prevention and control measures have been specified and will be used during Project construction. Final stabilization will occur at the end of the Project prior to termination of permit coverage and will be achieved when permanent erosion control BMPs are applied and functioning on-site. Permanent erosion control BMPs may be a combination of vegetative and non-vegetative cover types.

Groundcover, including native grasses and pollinator-friendly species, will be used throughout the site. In areas under the panels, this will function as a filter and act as a permanent BMP that will capture runoff, sediment, and other pollutants. In addition to stormwater benefits, the native groundcover will reduce vegetation management costs during Project operations, reduce snow drifts, improve drought resistance and create and conserve pollinator and wildlife habitat. Additional details of the VMS can be found in Section 5.5 and **Appendix W**.

The Project Area is predominately comprised of agricultural row crops on B and C soils[91]. The existing and proposed infiltration rates were calculated for the entire Project Area using the P8 Urban Catchment Model program. For the existing conditions, various curve numbers were used to represent the runoff conditions for each subwatershed within the Project Area. For the proposed conditions, a weighted curve number was used to represent meadow vegetation for each corresponding watershed and HSG. This curve number was weighted to include the proposed disconnected impervious surfaces consisting of arrays, aggregate access roads,

[89] Wisconsin State Legislature. Wisconsin Administrative Code Chapter NR 151 - Runoff Management. Register November 2018 No. 755.

transformers, a substation, a BESS, and an O&M facility. Due to the HSG Type B and C soils present on-site, infiltration rate of 0.13 inches/hour was input into the P8 model for both the existing and proposed conditions.

Changing the landcover to the meadow condition will greatly reduce the amount of runoff from the Project Area (**Appendix X**).

Infiltration

The proposed site has less than 10% impervious surface as a whole. Wisconsin Administrative Code NR 151.124[91] requires that for a site with less than 10% impervious, provided infiltration volume must equal at least 90% of the existing site infiltration.

The existing and proposed infiltration rates were calculated for the Project Area using the P8 Urban Catchment Model program. **Table 8.4.2a** compares the existing and proposed infiltration rates for the site. The proposed site infiltrates more than 90% of the existing infiltration and meets the requirements of the state.

Table 8.4.2a. Existing and Proposed Infiltration Rates for the Project Area

Pre-Construction Infiltration Volume (ac-ft)	Post-Construction Infiltration Volume (ac-ft)	Percent of Pre-Construction Infiltration (Δ %)
26,485	27,076	2.2%

Runoff Rates

Wisconsin Administrative Code NR 151.123[91] requires that pre-construction runoff rates are maintained or reduced in post-construction conditions for both the 1- and 2-year 24-hour storm event. The Dane County Erosion Control and Stormwater Management Chapter 14.51 requires that the peak discharge rates not exceed the pre-developed rates for the 1-year, 2-year, 10-year, and 100-year 24-hour storm events. **Table 8.4.2b** summarizes the results pre-and post-development for the 1- and 2-year 24-hour rainfall events and **Table 8.4.2c** compares discharge rates for the 10- and 100-year events.

Table 8.4.2b 1-year & 2-year Runoff Rate Summary

Subwatershed #	1-year Runoff (cfs)		2-year Runoff (cfs)	
	Existing	Proposed	Existing	Proposed
1	127.67	45.03	200.30	83.79
2	28.38	12.03	42.93	21.09
3	133.30	63.51	202.93	108.62
4	39.69	13.55	62.62	26.14

Table 8.4.2b 1-year & 2-year Runoff Rate Summary				
Subwatershed #	**1-year Runoff (cfs)**		**2-year Runoff (cfs)**	
	Existing	**Proposed**	**Existing**	**Proposed**
5	3.21	1.19	5.31	2.34
6	58.76	23.25	87.93	40.05
7	5.70	2.13	8.80	3.92
8	18.34	6.10	29.29	11.97

Table 8.4.2c 10-year & 100-year Runoff Rate Summary				
Subwatershed #	**10-year Runoff (cfs)**		**100-year Runoff (cfs)**	
	Existing	**Proposed**	**Existing**	**Proposed**
1	504.09	276.97	1203.30	807.08
2	100.86	62.26	226.20	164.09
3	483.54	313.25	1103.49	825.03
4	157.11	88.12	369.86	252.83
5	14.13	8.49	33.92	24.73
6	203.66	117.18	455.26	311.32
7	21.25	12.37	48.62	33.90
8	75.17	41.36	180.41	121.87

Total Suspended Solids

The Wisconsin Administrative Code NR 151.122[91] requires that new development reduce the total suspended solids (TSS) load by 80%. Per State requirements, the TSS removal from the site overland flow was calculated for the developed site area using the P8 Urban Catchment Model program. For the existing conditions, a weighted curve number was used to represent the existing agricultural vegetation for each corresponding watershed and HSG. For the proposed condition, a weighted curve number was used to represent the proposed meadow vegetation for each corresponding watershed and HSG. This curve number was weighted to include the proposed disconnected impervious surfaces consisting of aggregate access roads, transformers, a substation, a BESS, and an O&M facility. The runoff generated from the solar panels will flow to the edge of the panels and be allowed to drip onto the pervious meadow vegetation below. Based on this calculation, the TSS load reduction will be 87%.

Table 8.4.2d. TSS Removal		
Load In (lbs.)	**Load Out (lbs.)**	**Load Reduction (%)**
333,399	42,511	87

8.5 Materials Management Plan

Applicants may opt to refer to the company's standard Materials Management Plan to meet most of these requirements, though some form of supplemental information on project-specific elements may be required. The following checklist serves as guidance in the completion of a Materials Management Plan. The Materials Management Plan should contain information on all of the following components, where applicable.

- *Access Point Locations*
  - *List the locations that would be used to gain access to the work site.*
  - *Include a plan view of all access points.*

- *Haul Routes*
  - *Indicate how and where hauled materials would be routed, including inbound and outbound materials, clean fill materials, contaminated materials, and any other materials.*
  - *Alternate locations, if necessary.*
  - *Include a haul route diagram indicating haul route locations.*

This section addresses the requirements of Section 8.5 of the Application Filing Requirements.

The primary haul routes for construction materials to the Project will be on US Interstate 90/39, US Highway 12/18 and State Highway 73. Local roads planned for use in and adjacent to the Project include London Road, Prairie Drive, State Farm Road, County Road 134, Evergreen Drive, Hillcrest Road, Clear View Road, Prairie Queen Road/County Hwy Pq/W Water Street, Highland Drive, Count Road/Hwy B/Water Street, Hillside Road, Koshkonong Road, E Church Road and County Road/Hwy A. **Figure 8.5.1** in **Appendix B** shows the proposed haul routes. Access points from public roads into the various array and facility areas can be seen by the access road layout also shown on **Figure 8.5.1**.

Inbound and outbound materials, clean fill materials (if required), contaminated materials (if or as required), and any other materials will be transported on the Project haul routes.

- *Stockpile Areas*
  - *List and describe material to be stockpiled, the location where material would be stockpiled on-site, and the measures to be taken to protect stockpiled areas.*

Construction material stockpiles will be located at the general construction laydown area as identified in Section 2.3.1.2 and materials will be staged for use throughout the Project, consistent with normal construction practices.

Soils stripped or removed during access road construction, grading, and excavation, will be stockpiled near the removal location and used as fill on site, or thin spread on the site. Topsoil stripped from the general construction laydown area will be stockpiled adjacent to the laydown area and replaced upon reclamation. Sediment control measures will be installed prior to any topsoil removal or grading and will be inspected and maintained in accordance with the ECSWMP (**Appendix L**).

- *Equipment Staging Areas*
    - *Identify where equipment would be stored on-site.*

Equipment will be staged in the construction laydown area and in solar array areas where construction activities are imminent or ongoing, or as allowed by agreements with landowners.

    - *Include a plan view of equipment storage areas on-site.*

Appendix D includes an image of a typical laydown area configuration, including equipment and material storage areas, along with parking and office space.

    - *Identify where spill control and kits would be stored on-site.*

Spill control kits will be stored at the Project laydown area and within construction vehicles.

- *Field Screening Protocol for Contaminant Testing*
  If contaminated materials (i.e., soil) are encountered on-site, specify:
    - *The procedure for screening materials.*
    - *The location where materials be tested.*
    - *The protocols that would be followed.*
    - *Whether construction work would be impacted.*

This section addresses the requirements of Section *Field Screening Protocol for Contaminant Testing* of the AFR, including all subsections.

It is not expected that any contaminated materials will be encountered on-site. If suspected contaminated soils or other materials are identified, a qualified firm will be contacted to test suspected materials. If contamination is confirmed, the contaminated materials will be treated and/or disposed of according to the appropriate protocol for the situation encountered and the relevant regulations. The DNR will be contacted as required under state law. If contamination is encountered, work would be suspended

as appropriate in the immediate area of contamination until the appropriate remediation measures have been completed.

- *Contaminated Materials*
  If contaminated materials are known to exist on-site, list and describe:
  - *The type of contaminant(s) known to exist on-site.*
  - *The location of the contaminant(s).*
  - *The media in which the contaminant is located within (i.e., soil, water, etc.).*
  - *The estimated concentration of the contaminant(s).*
  - *The estimated volumes of the contaminant(s).*

No contaminated materials are known to exist on-site.

- *Excavation Methods*
  List and describe:
  - *The materials that would be excavated.*
  - *The location of the excavated materials.*
  - *The way in which the materials would be excavated and removed.*
  - *How the excavated materials would be exported from site.*
  - *The location where excavated materials would be exported to.*

No excavation materials are expected to be removed from site, as discussed in detail below. In the case that it is deemed necessary to remove excavated materials from the site, the materials will be transported via ground transportation on the haul routes to an appropriate location for disposal in accordance with all codes, standards, rules, and regulations that apply.

- *Dewatering of Excavated Materials*
  If free water is found present in excavated materials, list and describe:
  - *The methods that would be used to correct the situation (i.e., how would water be removed).*
  - *Identify where these methods would take place on-site.*

Due to the shallow excavation depths on site, significant dewatering is not expected during construction. If dewatering is required due to intrusion of rainwater, surface runoff, or groundwater into trenches or other excavations, dewatering will use small pumps and discharge locally applying sediment control as described in Section 9.7 of the draft ECSWMP. It is expected that these dewatering activities would be covered under the Project's General Construction Stormwater Permit.

- *In-channel and Upland Excavated Materials*
  - *Estimate the total volume of dredged materials (cubic yards) that would be excavated from beds and banks of waterways and wetlands.*

- *Estimate the volume of upland materials (cubic yards) to be excavated from areas outside of waterway(s) and wetland(s).*

Preliminary engineering analysis indicates that approximately 900 acres of the proposed Primary Array areas will require some degree of grading to accommodate the single axis trackers. For the Alternate Array areas, 750 acres of grading is estimated. The grading consists of localized cut and fill to provide a consistent slope under each tracker. A consistent slope is required to maintain adequate ground clearance at all points without requiring excessive post heights in other locations along the tracker. Approximately 700,000 cubic yards of material are expected to be excavated and balanced across the Project as a result of grading activities to install the Primary Arrays and an estimated 670,000 cubic yards for Alternate Arrays. The excavation numbers above are preliminary pending final engineering. The final grading plan will be designed to both minimize and balance the required cut and fill quantities to the extent practical, and excess soils will be even spread over participating parcels in accordance with the procedures outlined in previous sections.

Topsoil will be stripped prior to construction of the estimated 21 miles of permanent access roads associated with the Primary Array areas, pending final engineering. Road cross sections typically range from 12 to 24 inches thick with and average depth of 16 inches. This will result in approximately 109,000 cubic yards of excavation for Project access road construction, dependent on final engineering.

Installation of the Project's estimated 75 miles of underground AC collection system at 3.5 feet deep and 1.5 foot wide will involve approximately 77,000 cubic yards of excavation, all pending final engineering. The 3.5' depth and 1.5' width was used for the purpose of calculating volumes but final depths will range from 36" to 60" depth and 12" to 18" width depending on conditions. The collection system installation method will likely involve trenching, cable installation and backfill all in one pass.

DC cables will connect the strings of panels. These cables may be affixed or hung in line with the racking system to the end of each row, then sent to combiner boxes where larger gauge cables will exit and run to an inverter. To create a conservative, worst-case estimate, this analysis assumes all DC cables will be trenched at a depth of 2.5 feet in a trench 10 feet wide. For the 300 MW Project, this DC cabling excavation sums to just over 124,000 cubic yards, pending final engineering.

No materials are expected to be dredged from beds and banks of waterways and wetlands throughout the Project Area. Details of waterway crossing impacts are provided in Sections 8.1.4 and 8.3.

- *Re-used In-Channel and Upland Excavated Materials*
  - *Estimate the total volume.*

- *Identify the location where dredged materials would be used on either project plans or provide off-site address, property owner, and site map (drawn to scale).*
- *Describe the purpose of dredged materials (e.g. grading, trench backfill, etc.).*

No channel dredging is proposed for the Project, so the Re-used In-Channel and Upland Excavated Materials section and accompanying subsections are not applicable.

- *Reuse of Upland Materials*
  - *Estimate the total volume.*
  - *Identify the location where dredged materials would be used on either project plans or provide off-site address, property owner, and site map (drawn to scale).*
  - *Describe the purpose of dredged materials (i.e., grading, trench backfill, etc.).*

All material excavated as discussed in Section *Excavation Methods*, is expected to be reused on site, either as fill within the array or trench backfill. Topsoil stripped within the Project Area will be reused as topsoil within the Project Area. The Project plan set will include topsoil stripping specifications to ensure proper topsoil management.

- *Off-site Disposal Plans for Contaminated Materials and Non-contaminated Materials*
  - *Estimate the cubic yards of dredged materials and the cubic yards of upland material that would be disposed.*
  - *Detail disposal site information for both dredged materials and upland materials including material to be disposed, type of disposal site (such as disposal facility, landfill, etc.), disposal site name, disposal site location.*

No off-site disposal of material is expected for the Project. All non-contaminated materials are expected to be re-used within the Project Area. If suspected contaminated soils or other materials are identified, they will be tested and disposed of as described in the above portion of Section 8.5 titled *Field Screening Protocol for Contaminant Testing*.

8.6 Dewatering Plans

Provide details for dewatering work areas, including excavation for structure foundations or poles. Applicants may opt to refer to the company's standard Dewatering Plan to meet most of these requirements, though some form of supplemental information on project-specific elements may be required. Consider the following items in the Dewatering Plan.

- *Dewatering*

For pit/trench dewatering discharges covered under the Wisconsin DNR Construction Site Stormwater Runoff General Permit, additional requirements include:

- *Follow the Wisconsin DNR technical standard 1061 for dewatering (https://dnr.wi.gov/topic/stormwater/standards/const_standards.html) or equivalent methodology.*
- *Design and construct dewatering settling basins, if used, in accordance with good engineering practices and design standards and:*
  - *Design basins to discharge to a vegetated or otherwise stabilized area protected from erosion.*
  - *Remove accumulated sediment when it reaches one-half the height of the sediment control structure or one-half the depth of the permanent pool.*
  - *Dispose of materials removed from basins in a manner that would not pollute waters of the state.*
  - *Consider installing fences around settling basins for human safety.*

Dewatering of turbid water (water that is visibly cloudy or brown in color) will be discharged via pump and hose or overland flow (via temporary ditch or grade cuts) to a temporary sediment basin for pretreatment. Riprap aprons (energy dissipation) will be used for discharge locations. If riprap is not used, an alternative form of energy dissipation will be used to prevent scour and re-suspension of soil at the discharge point of the hose. If discharge to a temporary sediment basin is not feasible, the use of dewatering dumpsters, dewatering bags, or other prefabricated product will be used. The use of rock checks, erosion control blanket, and sumps or traps will be considered for overland flow dewatering. After the use of BMPs, the water could be discharged through a vegetated buffer and energy dissipation. The discharge of water from the site will be visibly clear in appearance. The discharge of accumulated water will not: contain oil, grease, a sheen, odor, or concrete washout; adversely impact adjacent properties with water or sediment; adversely impact waters of the state; cause erosion of slopes and channels; cause nuisance conditions; or contribute to inundation of wetlands.

- *Dewatering/Diversion of Flow*

Provide detailed plans for the dewatering/diversion of flow/standing water removal. Include typical dewatering/diversion measure plans.

- *Provide specifications for the dewatering/diversion of flow/ standing water removal.*
- *Specify the methods to be employed to dewater/divert flow/treat water, if applicable.*
- *Detail the methods that would be employed.*
- *Specify where the methods would be employed.*
- *Detail the proposed methods, capacities, and capabilities.*

- *Downstream Impact Minimization*

List and describe methods of minimizing downstream impacts during high flow conditions.

- *Analysis of Possible System Overload Scenarios*

Provide the following information if the stream is overloaded.

- *Estimate the volume of system overload (i.e., what rainfall overloads the system).*
- *Estimate frequency of system overload (i.e., how often would the system be overloaded).*
- *Specify actions that would be taken if stream is overloaded.*

- *Impacts of System Overload on Construction Activities and Water Quality*

If the system overloads, list and describe:

- *The anticipated number of lost work days.*
- *The possible water quality impacts.*
- *The methods that would be used to deter adverse changes in water quality.*

- *Water Discharge Locations*

Provide the following:

- *Where water would be discharged.*
- *How water would be discharged.*
- *A site map indicating discharge locations.*

The Project Area drains into four primary watersheds: Lake Ripley-Koshkonong Creek, Koshkonong Creek, Saunders Creek, and Mud Creek. The Project Area drainage maps are available in the ECSWMP (**Appendix L**).

Due to the proposed low impact design (LID), no major changes to the existing grades or flow direction will occur during construction. The water will leave the Project Area in the same manner as existing conditions, although flows will be reduced within the proposed meadow areas.

- *Details of a Back-up System*

If a back-up system becomes necessary, indicate:

- *The type of back-up system that would be used (include backup and standby equipment/power supply).*
- *The conditions when the system would be needed.*
- *How the back-up system would operate.*
- *Where the back-up system would be located.*

- *High Flow Plan*

When flooding is likely to occur, list and describe the following:

- *How the water would be removed from the site.*
- *Methods of water removal (e.g. pumping).*
- *Methods of minimizing water contamination (e.g. treatment methods).*
- *Protocols for evacuating materials from the flood conveyance channel including:*
  - *A list of materials that would require evacuation during high flow periods.*
  - *How the materials would be evacuated from the flood conveyance channel.*

- *The location where the materials would be temporarily placed on-site.*
- *How materials would be transported.*
- *The methods for protecting the materials.*
- *A site map indicating the location of temporary placement.*

- *Protocols for evacuating machinery from the flood conveyance channel including:*
  - *The type of machinery that would require evacuation during high flow periods.*
  - *How the machinery would be evacuated from the flood conveyance channel.*
  - *Where the machinery would be temporarily placed on-site.*
  - *A site map indicating possible locations of temporary machinery placement.*

- *Contaminated Water*

List and describe what measures would be taken if contaminated water is found on site including:

- *Methods of isolating the contaminated water.*
- *Methods of analyzing the contaminated water.*
- *Where the water would be tested.*
- *Methods of removing contaminated water from site.*
- *How the water would be treated and disposed.*

Due to the shallow depth and short-term nature of the proposed excavations on site, no site-specific dewatering plan is proposed. Collector system trenches will be backfilled within approximately a day of when they are opened, so any dewatering would require a temporary setup. If dewatering is required due to intrusion of rainwater, surface runoff, or groundwater into trenches or other excavations, dewatering will use small pumps and discharge locally applying sediment control as described in the draft ECSWMP. It is expected that these dewatering activities would be covered under the Project's General Construction Stormwater Permit.