

**COMMONWEALTH OF KENTUCKY
BEFORE THE KENTUCKY STATE BOARD ON
ELECTRIC GENERATION AND TRANSMISSION SITING**


In the Matter of:

ELECTRONIC APPLICATION OF NORTHERN)
BOBWHITE SOLAR LLC FOR A CERTIFICATE)
OF CONSTRUCTION FOR AN APPROXIMATELY)
96 MEGAWATT MERCHANT SOLAR ELECTRIC) Case No. 2020-00208
GENERATING FACILITY AND NON-REGULATED)
TRANSMISSION LINE IN MARION COUNTY)
KENTUCKY)

CERTIFICATION

This is to certify that I have prepared or supervised the preparation of the responses to the Siting Board Staff's and Harvey Economics' First Requests for Information for which I am identified as the witness on behalf of Northern Bobwhite Solar, LLC and that the responses are true and accurate to the best of my knowledge, information and believe after reasonable inquiry.

DATE: February 15, 2021



Scott Wentzell

**COMMONWEALTH OF KENTUCKY
BEFORE THE KENTUCKY STATE BOARD ON
ELECTRIC GENERATION AND TRANSMISSION SITING**


In the Matter of:

ELECTRONIC APPLICATION OF NORTHERN)
BOBWHITE SOLAR LLC FOR A CERTIFICATE)
OF CONSTRUCTION FOR AN APPROXIMATELY)
96 MEGAWATT MERCHANT SOLAR ELECTRIC) Case No. 2020-00208
GENERATING FACILITY AND NON-REGULATED)
TRANSMISSION LINE IN MARION COUNTY)
KENTUCKY)

CERTIFICATION

This is to certify that I have prepared or supervised the preparation of the responses to the Siting Board Staff's and Harvey Economics' First Requests for Information for which I am identified as the witness on behalf of Northern Bobwhite Solar, LLC and that the responses are true and accurate to the best of my knowledge, information and believe after reasonable inquiry.

DATE: February 15, 2021



Kara Price

**COMMONWEALTH OF KENTUCKY
BEFORE THE KENTUCKY STATE BOARD ON
ELECTRIC GENERATION AND TRANSMISSION SITING**

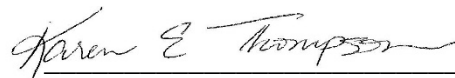
In the Matter of:

ELECTRONIC APPLICATION OF NORTHERN)
BOBWHITE SOLAR LLC FOR A CERTIFICATE)
OF CONSTRUCTION FOR AN APPROXIMATELY)
96 MEGAWATT MERCHANT SOLAR ELECTRIC) Case No. 2020-00208
GENERATING FACILITY AND NON-REGULATED)
TRANSMISSION LINE IN MARION COUNTY)
KENTUCKY)

CERTIFICATION

This is to certify that I have prepared or supervised the preparation of the responses to the Siting Board Staff's and Harvey Economics' First Requests for Information for which I am identified as the witness on behalf of Northern Bobwhite Solar, LLC and that the responses are true and accurate to the best of my knowledge, information and believe after reasonable inquiry.

DATE: February 15, 2021



Karen Thompson

**COMMONWEALTH OF KENTUCKY
BEFORE THE KENTUCKY STATE BOARD ON
ELECTRIC GENERATION AND TRANSMISSION SITING**

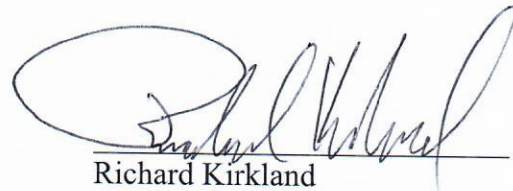
In the Matter of:

ELECTRONIC APPLICATION OF NORTHERN)
BOBWHITE SOLAR LLC FOR A CERTIFICATE)
OF CONSTRUCTION FOR AN APPROXIMATELY)
96 MEGAWATT MERCHANT SOLAR ELECTRIC) Case No. 2020-00208
GENERATING FACILITY AND NON-REGULATED)
TRANSMISSION LINE IN MARION COUNTY)
KENTUCKY)

CERTIFICATION

This is to certify that I have prepared or supervised the preparation of the responses to the Siting Board Staff's and Harvey Economics' First Requests for Information for which I am identified as the witness on behalf of Northern Bobwhite Solar, LLC and that the responses are true and accurate to the best of my knowledge, information and believe after reasonable inquiry.

DATE: February 15, 2021


Richard Kirkland

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

- 1. Refer to the Application, Exhibit D.4 – Open House for Public Information Meeting. On the second slide under the heading “Available for Review at Meeting” column, provide a copy of the referenced NCSU Clean Energy Technology Center Research on Health & Safety of Solar Photovoltaics and NCSU Clean Energy Technology Center Research on Balancing Agriculture with Solar Development.**

Response:

See attached Exhibit A – “Health and Safety Impacts of Solar Photovoltaics”

See attached Exhibit B – “Balancing Agriculture with Solar Development”

Witness: Kara Price

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

2. Refer to the Application, Exhibit D.5 – Presentation for Public Information Meeting.

- a. **On the slide entitled “Solar: A Proven & Environmentally Safe Technology,” provide support for the statements made on this slide and state whether such statements are applicable to the proposed Northern Bobwhite solar facility.**

Response:

Solar photovoltaic technology has been in use for more than 50 years. “A Brief History of Solar Panels” can be found in an article from the Smithsonian Magazine.

“In 1954, the first silicon solar photovoltaic cell was invented at Bell Labs and only four years later in 1958, NASA began using solar PV cells to power satellites in space. This timing is generally where we begin to see the growth of industrial and commercial uses of solar photovoltaics and is where we draw the statement that solar photovoltaic technology has been in use for more than 50 years.”

A copy of this article is included as Exhibit C.

No emissions or contamination (air, water or soil)

Please refer to research conducted by the N.C. State University Clean Energy Technology Center in their white paper entitled “Health & Safety Impacts of Solar Photovoltaics” included as Exhibit A. This research explains the components of a solar facility and any potential areas of concern. The conclusion of their research is that the panels and facility components do not pose a hazard to the general community due to their lack of emissions or use of contaminating materials.

The solar technology reviewed in this research paper is the same technology to be utilized on the Northern Bobwhite Solar facility.

No noise outside of fence line.

Please refer to “Study of Acoustic and EMF Levels from Solar Photovoltaic Projects” published in 2012 for measurements of noise levels at solar projects ranging from 1,000 to 3,500 kW in size. A copy of this study is included as Exhibit D. Sound levels generally followed the hemispherical wave spreading law (i.e noise levels decrease 6 dB at every doubling of distance). Average sound levels 10 feet from the invertors varied over a range of 48 to 72 dBA across all sites

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

surveyed. Sound levels were less in the perpendicular direction with an average of 4 to 14 dBA at 10 to 30 feet. The study found that when sounds were recorded at the fence line the sound was a low “hum”. Measurements were also taken at 50 and 150 feet from the fence line. At 150 feet sound levels that could be recorded were approaching background.

Very little reflectivity or glare from panels that are designed to absorb as much sunlight as possible.

A summary of the research substantiating the lack of glare concerns with solar photovoltaic panels is found below:

- ***Summary:*** *“A Study of the Hazardous Glare Potential to Aviators from Utility-Scale Flat- Plate Photovoltaic Systems”. This study examined the flash glare a pilot could experience from a 25-degree fixed-tilt flat-plate polycrystalline PV system located near Las Vegas, Nevada. The study modeled the amount of visible radiation that would be reflected from a PV module for every hour between 1998 and 2004 and calculated the hourly retinal irradiance. The retinal irradiance was compared to known ocular safety metrics. A copy of this study is included as Exhibit E.*
- ***Key Takeaways:*** *Modern PV panels reflect as little as two percent of incoming sunlight, about the same as water and less than soil or even wood shingles. Much of the misperception surrounding solar and glare is likely due to confusion between solar PV and concentrated solar power (CSP), which use a system of large mirrors to direct sunlight in accordance with the “General Design Procedures for Airport-Based Solar Photovoltaic Systems.” A copy of these procedures is included as Exhibit F.*
- ***Summary:*** *“[R]eflection from a PV front glass surface without any antireflecting (AR) coating is less intense than that of water.”¹ PV modules are increasingly coated with anti-reflection materials, so it is expected that modules will be less reflective in the future. The most straightforward method to eliminate all glare problems is to use Sandia National Laboratories’ Solar Glare Hazard Analysis Tool,”² which determines when and where solar glare can occur throughout the year from a user-specified PV array view from user-prescribed observation*

¹ ANURAG ANURAG ET AL., GENERAL DESIGN PROCEDURES FOR AIRPORT-BASED SOLAR PHOTOVOLTAIC SYSTEMS 10 (2017).

² *Solar Glare Hazard Analysis Tool*, SANDIA NAT’L LABS., <https://share-ng.sandia.gov/glare-tools/> (last visited Feb. 13, 2021).

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

points. This is a web-based tool, and as such, has not been included as an exhibit.

- **Key Takeaways:** *“The reflection off a solar PV panel from most near normal angles is less than 3% and represents no risk to air traffic.”³ (p. 10). A copy of the Massachusetts Department of Energy Resources “Clean Energy Results: Questions & Answers Ground-Mounted Solar Photovoltaic Systems” is included in Exhibit G.*
- **Key Takeaways:** *Most solar panels are designed with anti-reflective glass front surfaces and only reflect about 2 percent of incoming light. United Kingdom and U.S. aircraft databases contain no cases of accidents in which glare caused by a solar energy facility was cited as a factor.*

Resources specific to siting PV at airports include:

- *Technical Guidance for Evaluating Selected Solar Technologies on Airports*
- *Implementing Solar Technologies at Airports*
- *Federal Aviation Administration; Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports*

Copies of each of these documents are included as Exhibits H, I, and J, respectively. As detailed in these reports, with proper planning and modeling, solar PV is compatible with aviation and has reflectivity similar to water. Additional misperceptions about large-scale PV are discussed in a 2016 STAT Blog: Top Five Large-Scale Solar Myths.⁴ Local and state governments can access technical assistance regarding potential impacts and benefits of PV through the NREL’s “State, Local, and Tribal Governments, Decision Support for States”⁵ program and the U.S. Department of Energy Solar Energy Technologies Office’s “SolSmart Program”⁶. These three resources are web-based tools, and as such, has not been included as an exhibit.

More than 90% of materials can be sold for scrap or recycled at end of project’s useful life.

Please refer to research conducted by N.C. State University’s Clean Energy Technology Center in their research paper entitled “Health & Safety Impacts of

³ CLEAN ENERGY RESULTS: QUESTIONS & ANSWERS GROUND-MOUNTED SOLAR PHOTOVOLTAIC SYSTEMS, MASS. DEP’T OF ENERGY RES. 10 (June 2015).

⁴ <https://www.nrel.gov/state-local-tribal/blog/posts/top-five-large-scale-solar-myths.html>

⁵ <https://www.nrel.gov/state-local-tribal/states.html>

⁶ <https://solsmart.org/>

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

Solar Photovoltaics” included as Exhibit A; Page 11, Section 1.2.3 “End of Life Management” addresses the recyclable nature of solar panel components. “...PV-specific panel recycling technologies have been researched and implemented to some extent for the past decade, and have been shown to be able to recover over 95% of PY material (semiconductor) and over 90% of the glass in a PY panel.”

The solar technology reviewed in this research paper is the same technology to be utilized on the Bobwhite’s Solar facility.

Land can be returned to its original agricultural use after its life as a solar farm; solar is a place-holder for the future.

Please refer to research conducted by N.C. State University’s Clean Energy Technology Center in their research paper entitled “Balancing Agricultural Productivity with Ground-Based Solar Photovoltaic (PV) Development” included as Exhibit B. With the use of standard industry practices such as ground-cover maintenance and decommissioning plans as described therein, leased land that has been temporarily used as a solar generation facility can return to its former agricultural use.

Witness: Kara Price

- b. On the slide entitled “Decommissioning Plan,” identify the number of landowner agreements entered into by Northern Bobwhite for the proposed solar facility and provide a copy of each of those agreements. Also, explain whether those agreements contain any provision(s) setting forth Northern Bobwhite’s obligations with respect to the decommissioning of the proposed solar facility.**

Response:

There are ten (10) Lease Agreements and three (3) Access and Utility Easement Agreements. All of these agreements address Bobwhite’s obligations for decommissioning. Additionally, there is one Option to Purchase Agreement for a narrow strip of land (approximately three (3) acres), which is currently used as an access lane. This agreement does not include a Decommissioning Plan. Bobwhite anticipates reclaiming that land to the same standards as adjacent parcels at the end of the Project’s life.

See attached Exhibit K for a copy of each of these agreements. Bobwhite is seeking confidential treatment for these documents in their entirety.

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

3. Refer to the Application, Exhibit O – Site Assessment Report, page 3, and Appendix C – Site Plans, regarding the pipeline right-of-way.

a. State the width of the legal right-of-way.

Response:

Bobwhite obtained information regarding the location of the pipeline from title searches. The width of the pipeline right-of-way as recorded on title varies by parcel from 10 feet to 30 feet wide and up to 45 feet wide during construction.

Witness: Scott Wentzell

b. State the owner of the right-of-way.

Response:

Bobwhite purchased pipeline locational data from S&P Platts in November of 2019. This dataset indicated a pipeline owned by Atmos Energy Corporation, formerly Western Kentucky Gas Company, crossed the Project boundary (as shown on Bobwhite's Site Plan). The KY PSC also provided a 1984 map that indicates a pipeline in the vicinity was owned by Western Gas Transmission Company. After a subsequent request by Applicant, S&P Platts admitted that they could not verify the existence of a pipeline and removed the pipeline from the . Bobwhite subsequently received updated information from Atmos Energy Corporation indicating a pipeline exists at a different location.

Witness: Scott Wentzell

c. State if the pipeline is operational and what liquid or gas it carries.

Response:

Bobwhite has inquired about the existence and specific nature of this pipeline. Bobwhite submitted an inquiry to Atmos Energy Corporation on 02/03/2021. On 02/09/2021 Atmos Energy Corporation referred the inquiry to a local office and opened the following reference cases: BP Ref No 2003235497 - Local Ref 47437749. Atmos Energy Corporation responded on 02/12/2021 with the following map and email response:

“Here is the Google shot showing approximate locations of our facilities in the area. The green line designates the old high pressure distribution main that has been abandoned in place, any easements related to this line and

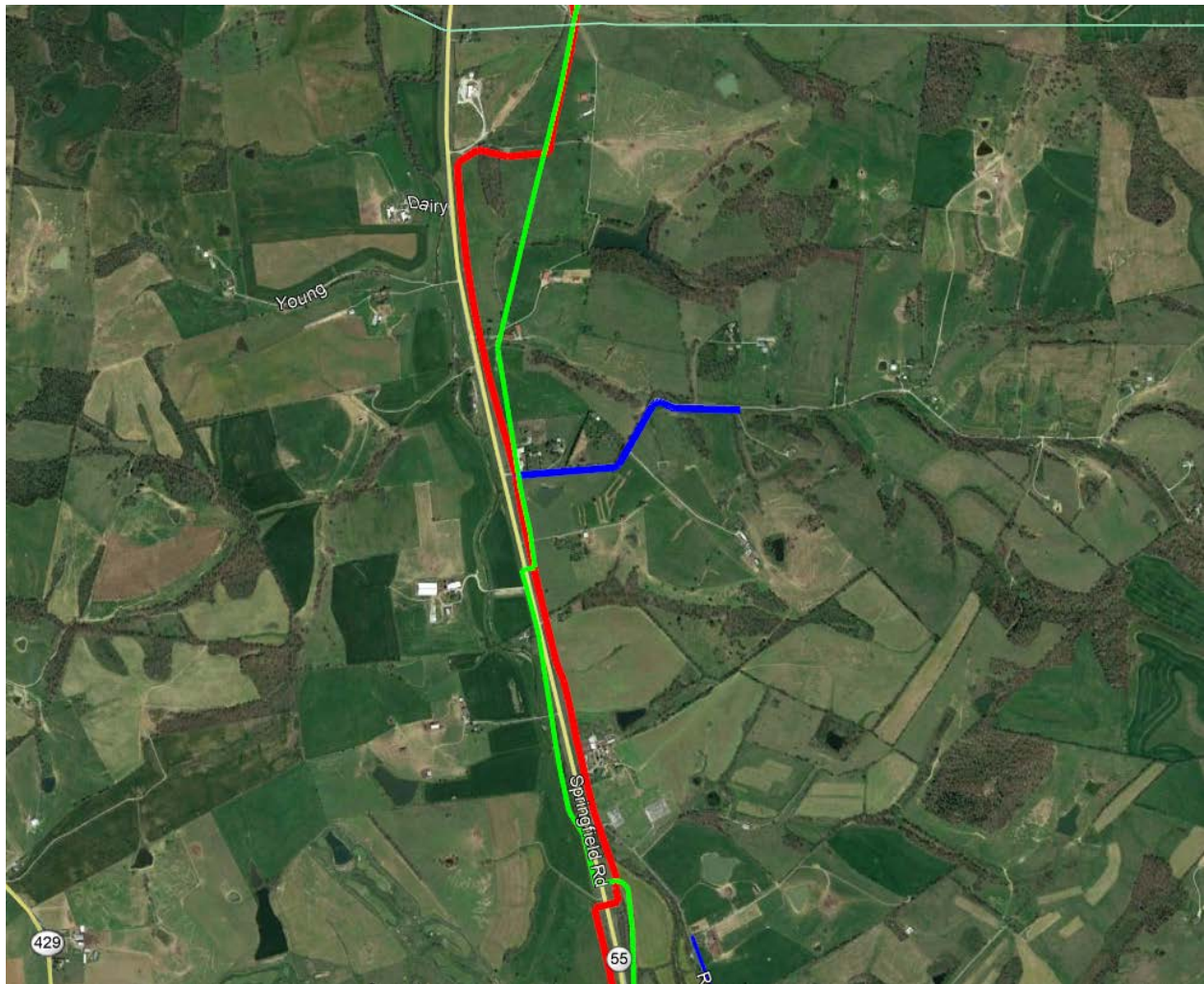
Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

conflicting with the project boundaries could be released as needed. The red line designates the new high pressure distribution main that is in service, which is the line that the 2 recent easements are referring to. The blue lines designate intermediate pressure mains feeding residential customers.

As we discussed on the phone, all locations are approximate and must be verified with field locates. Please let me know how else I can help as you all move forward on this project. Thanks!"

Bobwhite will continue to seek additional details on the pipeline and associated right of way, including whether or not they are accurate and still exist, as provided by S&P Platts data and which appeared in a similar location as a Western Gas Transmission Company pipeline on the 1984 map provided by the KY PSC.

Witness: Scott Wentzell



Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

- d. Describe how the constraint “50 feet from Pipeline” conforms to the legal right of way.**

Response:

Given the uncertainty in the exact pipeline location, Bobwhite has first mapped a 100' right of way (ROW) around the presumed location of the pipeline (as provided by S&P Platts); the ROW is in fact 10-30' wide as recorded on title. Bobwhite buffered an additional 50' in all directions from this assumed 100' ROW. Bobwhite believes this conservative approach is warranted at this time to ensure proposed Project infrastructure does not encroach on the pipeline ROW, except where road or electrical cable crossings are necessary.

After an American Land and Title Association (ALTA) survey is completed and the pipeline and ROW are precisely located, Bobwhite intends to adjust our setback assumptions so that the fence line of the Project is a minimum of 10' outside of the legal right-of-way for the pipeline.

Witness: Scott Wentzell

- e. Refer to Appendix C – Site Plans, Map page 1 of 4, confirm that the internal road and access road point cross the pipeline.**

Response:

The pipeline ROW in question transects the Bobwhite Project footprint. Several internal access roads are planned to provide contiguous site access, which will allow for greater efficiency and limited use of public roads during both the construction and operations phase of the Project. Bobwhite currently plans to cross the pipeline ROW on parcels 063-017 and 064-001A. A crossing may also be required on parcel 063-007, which would provide access to Project facilities on that parcel as well as 063-008-02 and 063-021.

Bobwhite will commission an American Land and Title Association (ALTA) survey to confirm the pipeline's existence and precisely locate the pipeline's position throughout the Project footprint. The exact crossing locations will be determined in coordination with the pipeline owner and will be based on the final Project layout and design. Crossing agreements will be entered into with the pipeline owner for each crossing required.

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

- f. Refer to Appendix C – Site Plans, Map page 3 of 4, confirm that the internal access roads cross the pipeline in three places.**

Response:

Bobwhite currently contemplates four crossings for internal and access roads in our design. These crossings are based on publicly available data regarding the pipeline provided by S&P Platts. Bobwhite will verify the exact location of the pipeline and corresponding Right of Way through an American Land and Title Association (ALTA) survey, which is anticipated for Q3 of 2021.

Bobwhite currently plans to cross the pipeline on parcels 063-007, 063-017, and 064-001A.

Witness: Scott Wentzell

- g. Describe any discussion with the owner of the pipeline or any relevant regulatory agencies regarding the internal road crossings.**

Response:

Bobwhite has not discussed the proposed crossings with the pipeline owner at this time. These discussions commonly take place closer to the start of construction and will be based on final engineering and design documents for the Project. Final engineering and design will commence following issuance of a construction certificate. Design of the crossings will be consistent with the pipeline owner's requirements and any applicable regulatory requirements, if any.

Witness: Scott Wentzell

- h. Describe how the tamping process during construction might affect the pipeline.**

Response:

Bobwhite does not anticipate it will be necessary to adjust construction techniques when crossing the pipeline, but will adhere to all specifications required by the pipeline owner. The depth and material of the pipeline will influence engineering requirements. The final engineering and design of the crossing will be developed in consultation with the pipeline owner.

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

4. Refer to the Application, Exhibit O – Site Assessment Report, page 4, regarding the southwest part of the project area that is in the electric service territory of Kentucky Utilities Company. Discuss the sentence “When electricity is needed at night for the Project, it will be provided via the transmission level connection with potential billing through Inter County Energy Cooperative.”

- a. State whether this is regarding construction or operation or both.

Response:

A distribution level connection will be needed for electricity needs during construction day or night. After construction is complete and the Project synchronizes with the transmission system (coincident with the start of delivery of test energy), some electric needs such as no-load/standby losses will be provided via the transmission level connection during non-production hours. Some load may continue to be served by the distribution service. The final electrical design of the facility will determine whether and to what extent distribution service is required.

Witness: Scott Wentzell

- b. State whether there has been any agreement or discussion with Kentucky Utilities Company regarding potential billing through Inter County Energy Cooperative.

Response:

Bobwhite has begun discussions with East Kentucky Power Cooperative as the interconnection provider on the treatment of electricity usage during non-production hours; however, no formal agreement among the parties has been reached. Bobwhite has not yet begun discussions directly with Kentucky Utilities Company or Inter County Energy Cooperative.

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

- 5. Refer to the Application, Exhibit O – Site Assessment Report, Appendix C – Site Plans. Regarding the Site Plan Overview map, which depicts the project site divided into four map pages, there is an area on this map that is yellow in color and has line indicating “Collection Easement Parcels.” Explain what is meant by the term “Collection Easement Parcels” and how this area functions in relation to the proposed footprint.**

Response:

The Collection Easement Parcels contain easements that provide a contiguous link between the solar panel infrastructure on the eastern portion of the Project the Project’s substation and, ultimately, the transmission grid. Landowners have signed easement agreements granting these easements to Bobwhite for the purpose of constructing collection facilities, which will be built within a defined right-of-way.

These easement areas will be used to construct above and/or below ground 34.5kV electrical collection lines, including supporting infrastructure such as poles, to connect the eastern portion of the Project with the Project substation. Direct current (DC) electricity generated by the solar panels will flow at low voltage to inverters, where the direct current will be converted to alternating current (AC). The electricity from the inverters will flow to transformers where it will then be stepped up to 34.5kV and flow along the collection lines to the Project substation. Electricity flowing into the Project’s main power transformer in the Project substation will be stepped-up in voltage once again from 34.5kV to 161kV before interconnecting onto the transmission system at the Marion County 161kV substation (the Point of Interconnection).

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

6. Refer to Application, Exhibit O – Site Assessment Report, Appendix E – The Traffic Assessment, which notes that construction will take approximately 12-18 months and will produce an increase in traffic from construction workers and delivery of equipment and material. The Traffic Assessment provides a chart of the number of vehicle trips during construction but does not provide all necessary information regarding the anticipated workers. Please provide the following answers regarding the workers to the request for information below.

- a. The number of anticipated workers is provided, but please indicate the average and peak numbers of anticipated workers.**

Response:

Bobwhite is not able to provide a more detailed estimate of average and peak workers at this time. The number of workers on site at any point in time will be influenced by a variety of factors including, for example, the season, total duration of construction, the specific panel and tracker equipment selected, and weather, among other factors. Ultimately, Bobwhite will contract with an engineering, procurement and construction contractor, and the contractor will manage staffing and the construction schedule.

Witness: Scott Wentzell

- b. Identify where the construction crew, supervisors, and others will park on-site.**

Response:

The laydown yard will contain a parking area for construction crew, supervisors and others. Vehicles may also be parked inside the fence, adjacent to access roads, in portions of the Project that are actively under construction. Temporary areas may also be graded to allow for parking of vehicles and any such temporary parking areas will ultimately be constructed over.

Witness: Scott Wentzell

- c. Regarding impact on road infrastructure, state whether there are any plans for paving (or putting down gravel) for roads associated with the project.**

Response:

Bobwhite will put down gravel for all internal access roads within the Project. No additional paving or road improvement for other public or private roads is

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

anticipated. However, Bobwhite will repair any damage to public roads caused by Project construction.

Witness: Scott Wentzell

- d. In addition to construction access drives and internal roads to accommodate appropriate vehicles and equipment, state whether there will be any improvement plans for the existing roads used to access the site.**

Response:

No additional improvements for existing roads are expected at this time. If future detailed engineering and equipment delivery planning indicate that upgrades for existing roads will be required, Bobwhite will work with the relevant local or state agencies to plan, coordinate and execute such existing road upgrades.

Witness: Scott Wentzell

Case No. 2020-00208
Northern Bobwhite Solar LLC
Responses to Siting Board Staffs' First Request for Information

- 7. Refer to the questions propounded by Harvey Economics Consulting, which are attached as an Appendix to this information request, and provide responses to those questions.**

Response:

Please see Bobwhite's Response to Harvey Economics' First Request for Information.

Witness: Scott Wentzell