May 27, 2022

Solar Generation Siting Final Report – Blue Moon Solar

KY State Board on Electric Generation and Transmission Siting
Case #2021-00414

Customer:
Kentucky Public Service Commission

Prepared for:
KY State Board on Electric Generation and Transmission Siting

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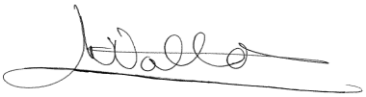
May 27, 2022

Prepared by:



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Solar Generation siting Final Report – Blue Moon Solar

Synopsis

This document is the Final Report prepared by Wells Engineering for Blue Moon Solar siting in Harrison County, KY.

WEPSC Order: WE22022138

Public Service Commission PO: PON2 123 2100001913

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REVISIONS

Revision	Date Issued	Issue Type	By	Description
0	05-27-22	Final Report	LW	Issue for Review & Record

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1 General Statement

The present document is the Final report prepared for the Solar Generation siting project of Blue Moon Solar LLC who is applying for a certificate of construction for an approximately 70 MW Merchant Electric Solar Generation Facility in Harrison County, KY.

1.1 Scope

As part of the personal service contract for the 'Generation Siting Board Fall 2021', between The Commonwealth of Kentucky Energy Environment Cabinet/Public Service commission and Wells Engineering, in the matter of the order issued for case number 2020-00414, Wells Engineering was appointed to review the Application documents and the Site assessment report submitted by the applicant as per the Kentucky Revised Statutes 278.706 & .708 and submit a Final report on the Solar Generation Siting for the application for a construction certificate by Blue Moon Solar LLC in Harrison County KY.

Wells Engineering performed the review of the Application documents and the Site Assessment report submitted by the applicant by assigning it to the Senior Engineers and Designers at Wells Engineering and by hiring experts as per different requirements of the siting project as seen by Wells Engineering.

Wells Engineering contracted the following expertise based on the requirements of the project,

i) Clover lake Consulting Services for Noise & Environmental assessment.
ii) Watters Unclaimed Property Consulting LLC for Economic impact.
iii) Clark Toleman, MAI-SRA for the review on impact on property values.

1.2 Reference Document

The following documents are referenced for the creation of this document.

i) Application Exhibit F (SAR and Exhibits)
ii) Application with Exhibits A-E and G,
iii) Kirkland Property Valve Impact Analysis
iv) Kentucky Revised Statutes[1], KRS 278-706, 708, 710
v) Public Resources within 2 Mile of PV Panels Exhibit A
vi) Responses provided by Bluebird Solar, LLC for First RFI
vii) Responses provided by Bluebird Solar, LLC for Second RFI

2 Solar Electric Power – 'Know-how'

Earth receives energy from the sun in the form of heat and light. It is possible for the light energy received to be converted into electricity using a device called a solar cell or photovoltaic cell (PV Cell for short). A solar cell receives 'Photons' from sunlight which then produces Electric 'Volts' thus giving these devices the name 'Photovoltaic'.

A simple solar cell is relatively small and can only produce a couple watts of electricity, which is not sufficient for large-scale utilization. To increase the power production, several cells are combined to form a 'Solar Module', which can produce a usable amount of electricity. A 'Solar System' is when several solar modules are arranged systematically for large-scale power production.

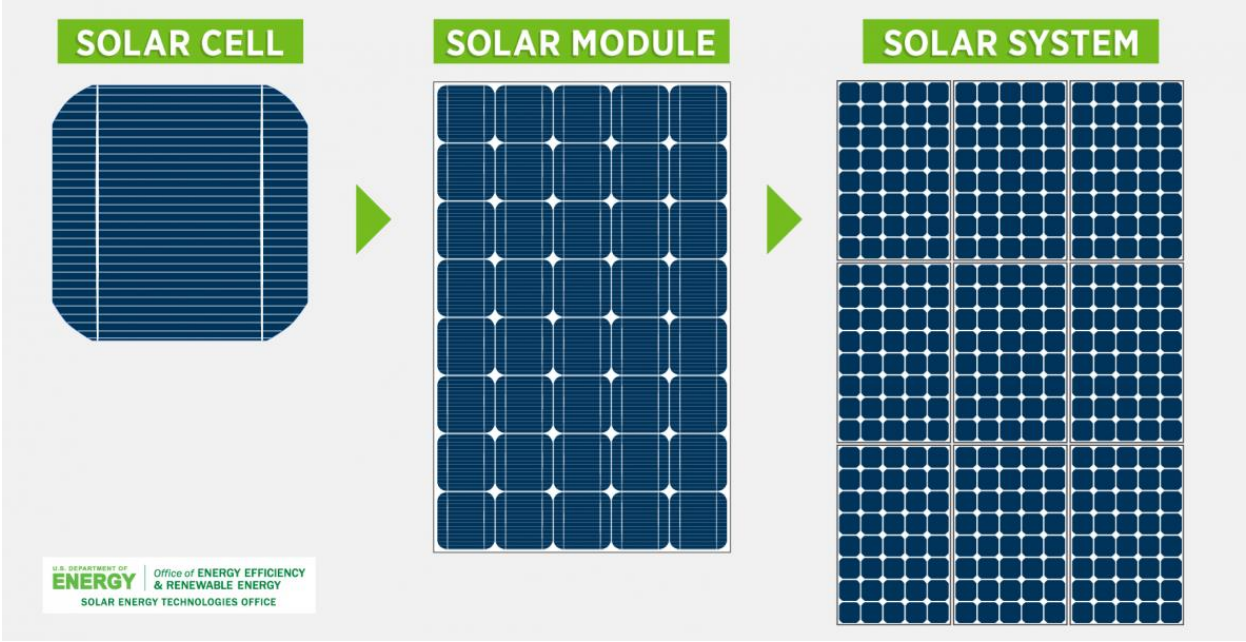


Fig. (1)
Solar System[2]

For electricity generated by Solar systems to be utilized, it first must be connected to the regional electric grid. Once the solar system is connected to the electric grid it can then be distributed to consumers. This is achieved by constructing a solar power plant with the use of a solar panels, in which the quantity and arrangement of solar modules is determined from the electrical system

[2] Picture from the official website of 'Office of Energy Efficiency & Renewable Energy'

design of the plant and is then connected to the regional electric grid for distribution to the consumer.

2.1 Solar Power Plant

A Solar Power plant is an electric power plant constructed for generating electric power using solar modules. A Solar Power Plant consists of a solar system and the other associated electrical and plant equipment for transmitting the energy generated.

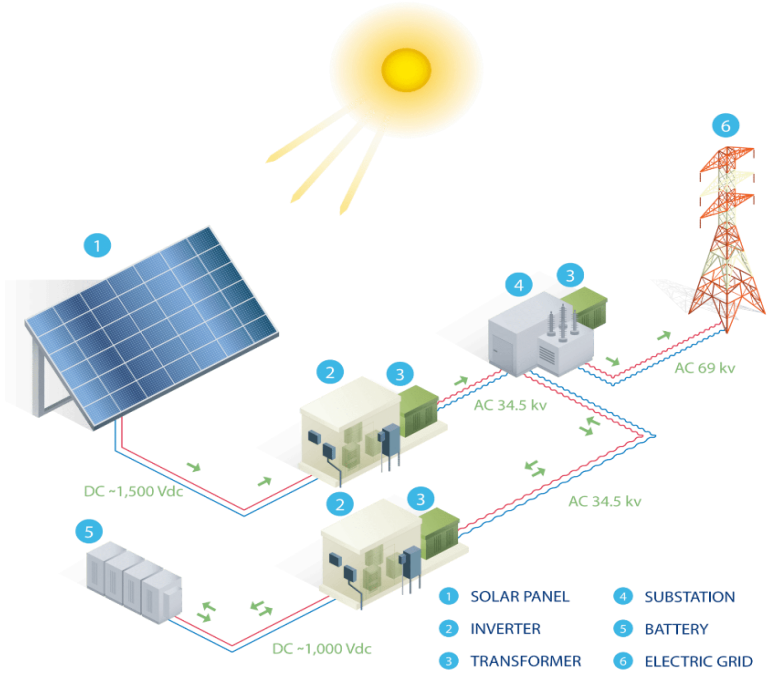


Fig. (2)
A Solar Power Plant[3]

Some of the commonly seen equipment in a solar power plant are,

i) Solar Modules
ii) Inverters,
iii) Batteries
iv) Power transformer,
v) High voltage Circuit breakers, Fuses and Other protection equipment
vi) Utility Metering equipment
vii) Electrical Conductors &
viii) Steel & Concrete structures,

[2] Image found from industrial-on-grid-scheme.png (1600×1546) (avenston.com)

A Solar Power plant, constructed by a private entity, after making Power Purchase Agreements (PPA) with the local Electric Power grid to supply electric power, is known as a 'Merchant Electric Solar Power Plant'.

2.2 Role of Solar Modules

As stated earlier a Solar Module which is 'Photovoltaic', uses 'Photons' that are absorbed from sunlight to then produce electric power. This electric power is unidirectional in nature and requires additional equipment such as Inverters and Transformers for Electric Power Utilization.

Besides the additional equipment, the Solar modules are manufactured with the ability to track the sun to increase their efficiency.

Fig. (3)
Solar Modules Installed on Farmland[4]

2.3 Role of Inverters

The power produced by a solar system, because of its basic principle of operation, is

[3] Refer to PV magazine Molong Solar Farm nolonger in development, successfully energised – pv magazine Australia (pv-magazine-australia.com)

unidirectional and is in the form of Direct Current or in short, DC. This form of DC Power is not suitable for utilization. The DC power should be converted to Alternating current, AC for utilization.

A 'Solar inverter' or a 'PV inverter' is a power electronic device which converts the DC Power generated by the Solar system, into AC Power. This AC Power is then transmitted to the electrical grid for power distribution.

Figure (4)
Industrial Solar Inverter[4]

[4] Refer to PV magazine SMA reaches 10 GW of installed Sunny Central inverters in North America – pv magazine USA (pv-magazine-usa.com)

2.4 Role of Batteries

As a Solar system can produce electric power only when the sunlight is available. It is because of this drawback a Solar power plant cannot produce electricity during night. In order to overcome this drawback Solar power plants are installed with batteries so that some portion of electricity produced by the solar modules during the day is stored in the batteries and retrieved during night.

The Solar Modules and the Batteries function on DC. A proper combination of Solar Modules and Batteries can produce electricity all day long.

Figure (5)
GE Industrial Battery[5]

2.5 Role of Transformers and Other associated switchyard equipment

A Transformer is an electrical power equipment which is used either to step-up or to step-down the voltage of an electrical power source without changing the frequency of the voltage. A Transformer is an AC power equipment.

In a Solar Power plant, the power produced by the solar modules is converted into the useful form of AC by Inverters. The AC Power produced by inverters are at a relatively lower voltage comparted to the voltage available at the electric power grid. A Transformer, which can step-up the voltage to match it with the grid, is used to overcome the difference in voltages and to establish an interconnection for the supply of power.

In a large Solar Power plant, every Inverter is installed with a Transformer locally to the inverter,

[5] Refer to PV magazine GE to supply 100 MW/300 MWh battery for South Australia solar farm – pv magazine International (pv-magazine.com)

to step-up the voltage to a medium level, other than the voltage available at the grid. This is done to form a network of Transformers to collect the power coming from each Inverter.

This Electric network of transformers will have one high-capacity Main Transformer, which does the final step-up for the connection with the grid.

Besides the Transformers, Solar Power plants are installed with some other electrical equipment like,

i) Electric Switchgear
ii) Electric Bus system
iii) Electric Protection system &
iv) Electric Energy measurement system

Figure (6) Substation Transformer[6]

[6] Image found from the following website Transformer substation THE TRENT - The Trent (thetrentonline.com)

2.6 Role of Steel & Concrete Structures, Roadways & Fencing

Steel & Concrete structures are necessary structures for the installation of solar modules and all other necessary electrical equipment. Roadways provide access to the modules for site personnel for work to be completed for maintenance and general site operation. Fencing is installed at solar facilities to determine the boundary of the facility, safety, as well as controlling who has access to the facility.

Figure (7)
Steel Structures within a Substation[7]

[7] Image found from the following website Gary-Chicago Airport Substation-Power Line Upgrades | Newkirk Electric (newkirk-electric.com)

2.7 General Effects of Solar Power Plants

2.7.1 Noise from the Equipment

In a Solar power plant the Solar Inverters and the Power Transformers are the main sources of noise, the cooling fans mounted on the Power Transformers are responsible for majority of the noise. However, the noise produced by this equipment are effective only in the vicinity of the equipment and decay with the distance. When this equipment is located appropriately in the plant the effect of noise can be minimized.

2.7.2 Increased Road Traffic, Noise and Fugitive dust

The Solar Powerplant is a power plant with stationary equipment producing energy based on the photovoltaic effect. There will not be any transportation of raw material or the plant wastage for the Solar power plant. Hence, Solar power plants do not increase the Traffic, Noise and Fugitive dust. However, during construction there will be considerable traffic of construction vehicles transporting the equipment of the plant. Necessary mitigation measures must be taken to avoid traffic congestion, Noise and Fugitive dust during the construction of the Solar Power plant

2.7.3 Environmental and Wildlife

Solar energy systems/power plants do not produce air pollution or greenhouse gases. Using solar energy can have a positive indirect effect on the environment, reduces the use of other energy sources that have larger effects on the environment. However, some toxic materials and chemicals are used to make the photovoltaic (PV) cells that convert light energy into electricity.

There has been a relatively low number of studies that have been done on how solar facilities affect wildlife. However, the following methods can be adopted to minimize the impact of Solar power plants on wildlife[8],

i) Avoid areas of high native biodiversity and high-quality natural communities
ii) Allow for wildlife connectivity, now and in the face of climate change
iii) Preferentially use disturbed or degraded lands
iv) Protect water quality and avoid erosion
v) Restore native vegetation and grasslands
vi) Provide wildlife habitat

[8] Making Solar Wildlife-Friendly
Creating solutions to maximize conservation benefit from solar production
https://www.nature.org/en-us/about-us/where-we-work/united-states/north-carolina/stories-in-north-carolina/making-solar-wildlife-friendly/

2.7.4 Farming land

One of the biggest concerns with solar farms built on farmland is the effects they will have on the land once all the panels and associated equipment are removed from the site, as well the effect on local wildlife species and the ability for the land to be used with domesticated animals.

The land occupying a solar farm can be reverted to agricultural uses once the project has reached the end of its operational life. The life of a solar installation is roughly 20-25 years and can provide a recovery period, increasing the value of that land for agriculture in the future. Giving soil rest can also maintain soil quality and contribute to the biodiversity of agricultural land. [9]

Silicon-based photovoltaic cells (PV) are the type of PV cells commonly used. Most solar panels are manufactured with a glass front that protects the PV cell as well as either a aluminum or steel frame. Research shows that traces metals leaching from solar modules is unlikely to present a significant risk due to the sealed nature of the PV cells. Some manufacturers use cadmium telluride (CdTe). Cadmium compounds are toxic, but studies show that these compounds cannot be emitted from CdTe modules during normal operation or even during fires. Industrial incineration temperatures, which are higher than grassfires, are required to release the compounds from the modules. [10]

During the Plant operation, Solar farms can be used to graze domestic animals such as sheep, which are commonly used to control vegetation at the facility as they do not climb on or damage the PV modules. It is not necessary to raise the PV modules in height to accommodate grazing as vegetation is accessible beneath the modules at the standard mounting heights. When sheep are used for grazing to control vegetation growth it can benefit local shepherds, the solar operators, and the land due to a reduction in mowing, herbicide, and other management needs. Cattle grazing is generally not compatible with PV facilities due to the risk of damage to the modules. Wild animals can graze under PV modules; however, security fences can be installed to increase the security of the facility as well as keeping out larger animals if they are deemed to be a damage risk to the modules. Fencing can be built to accommodate smaller animals such as foxes. The areas below the PV modules can be built to provide a habitat and forage to pollinators, birds, and other small species.[11]

[9] Farmer's Guide to Going Solar https://www.energy.gov/eere/solar/farmers-guide-going-solar
[10] Farmer's Guide to Going Solar https://www.energy.gov/eere/solar/farmers-guide-going-solar
[11] Farmer's Guide to Going Solar https://www.energy.gov/eere/solar/farmers-guide-going-solar

3 Blue Moon Solar – Application Review & Findings

The present document, as mentioned in the previous sections, is the final report created after reviewing the application documents submitted by the applicant, Blue Moon Solar, LLC.

In this section, a detailed discussion is made on the Initial review, Site visit and the Final review from Wells Engineering.

3.1 Initial Review

Wells Engineering and its Consultants working on the Siting Project review the applicant document for their adequacy, as part of the requirements of the state order for the applicant's Blue Moon Case No. 2021-00414. After the initial review of the application documents, a list of statements was submitted from First and Second Requests for Information

3.2 Site Visit

As part of the requirements of the state order, for the applicant's Case No. 2021-00414, Wells Engineering, made a visit to site as organized by the Siting board, on April 19th, 2022.

The locations visited are indicated on the site visit location below. Reference Fig (8).

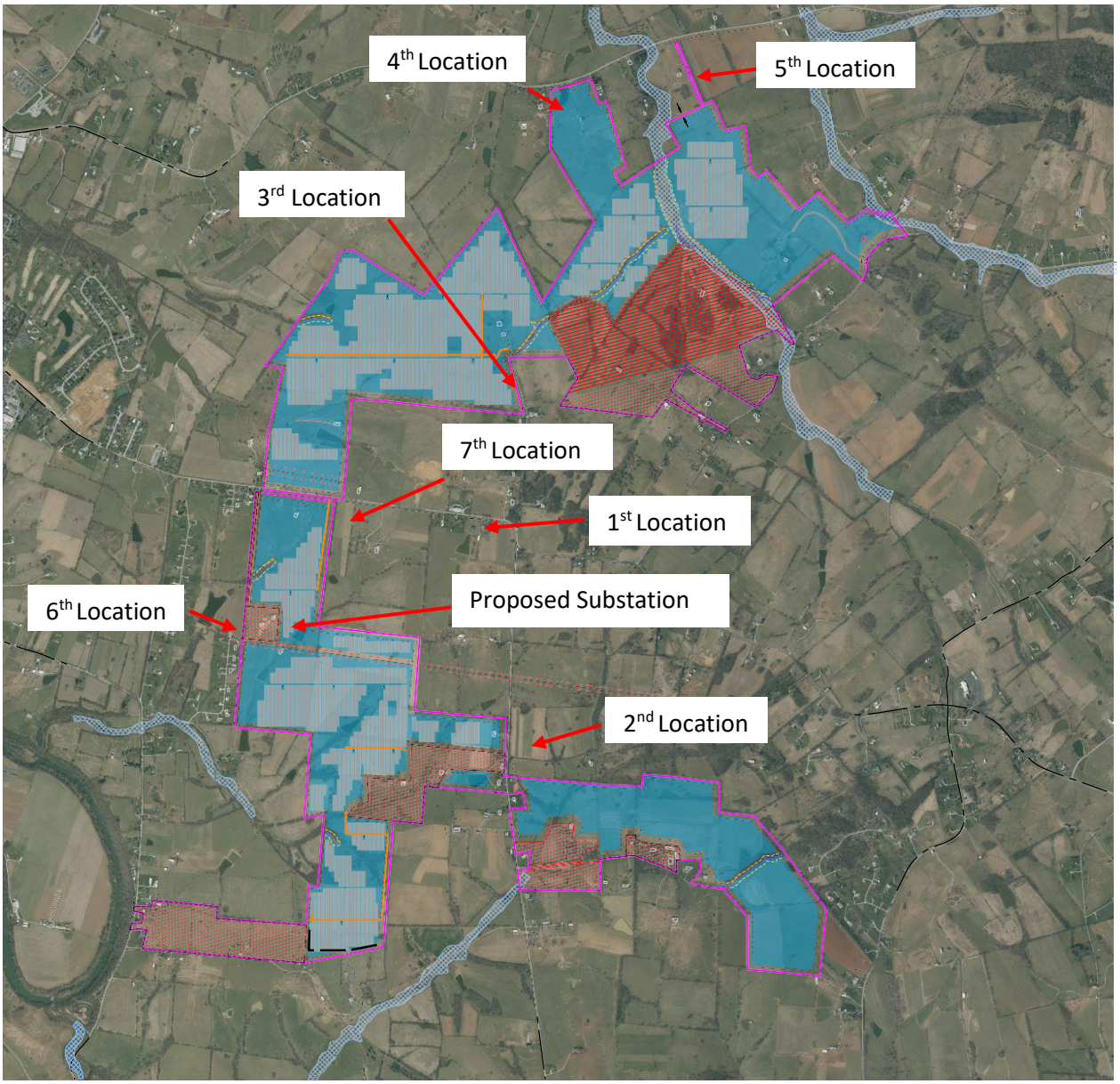


Fig. (8)
Site Visit Location

Pictures from the site visit are shown in the following pages.

Picture (1)
Location #1 Millersburg Pike

Picture (2)
Location #2 Ruddles Rd/Old East Broadwell Cemetery

Picture (3)
Location #3 Existing Pond - Hedges Lane

Picture (4)

Location #3 House in Hedges Lane not shown on Plot 2 Map

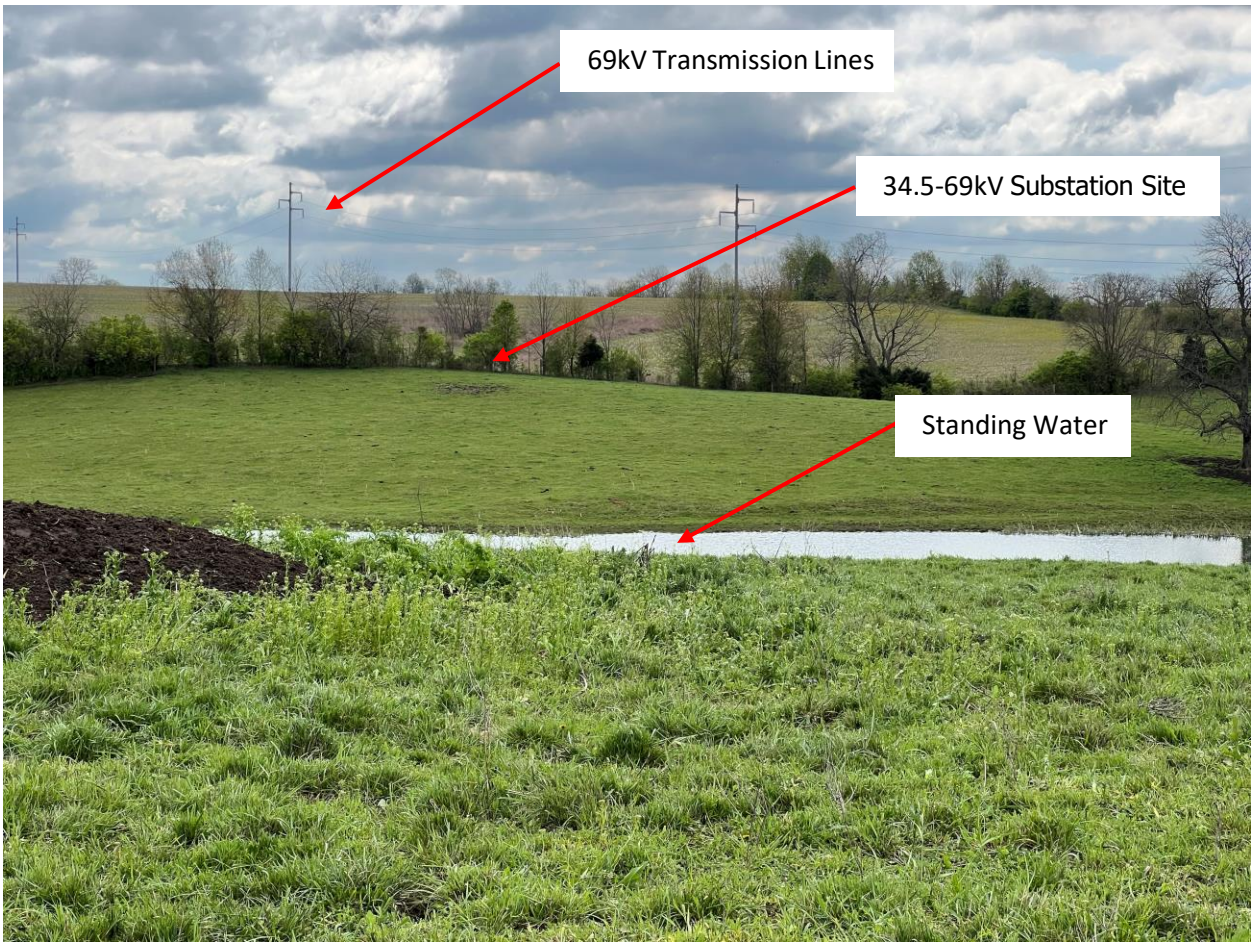
Picture (5)

Location #4 Existing Pond Republican Pike/SR 393

Picture (6)

Location #5 Existing gravel road (Republican Pike/SR 393)

Picture (7)
Location #6 Substation Site



Picture (8)

Location #6 Substation Site, Existing Transmission Line

Picture (9)

Location #7 Millersburg Pike Rd

Picture (10)

Old East Broadwell Cemetery

Picture (11)

Hedges Lane

Picture (12)
Millersburg Pike R

3.3 Final Review

In this section a detailed discussion is made on the major aspects of the application documents submitted for their compliance as per the statutes KRS 278.706 & 708.714.

3.3.1 Review of Application documents

Accordant with KRS 278.706 the applicant, Blue Moon Solar LLC, submitted the application documents and a site assessment report addressing the compliances on different requirements of KRS 278.708. Blue Moon Solar, LLC also submitted document explaining the size of the transmission voltage, length, and location.

As per KRS 278.708(3) the site assessment report shall include the following

(a) A description of the proposed facility that shall include a proposed site development plan that describes:
   1) Surrounding land uses for residential, commercial, agricultural, and recreational purposes.
   2) The legal boundaries of the proposed site.
   3) Proposed access control to the site.
   4) The location of facility buildings, transmission lines, and other structures.
   5) Location and use of access ways, internal roads, and railways.
   6) Existing or proposed utilities to service the facility.
   7) Compliance with applicable setback requirements as provided under KRS 278.704(2), (3), (4), or (5).
   8) Evaluation of the noise levels expected to be produced by the facility.

(b) An evaluation of the compatibility of the facility with scenic surroundings.

(c) The potential changes in property values and land use resulting from the siting, construction, and operation of the proposed facility for property owners adjacent to the facility.

(d) Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary.

(e) The impact of the facility's operation on road and rail traffic to and within the facility, including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility.

For the 69kV Transmission line, the KRS 278.714 requires the following as part of the application. (2)(b) A full description of the route of the electric transmission line or the carbon dioxide transmission pipeline and its appurtenances. The description shall include a map or maps

showing:

1) The location of the proposed line or pipeline and all proposed structures that will support it.
2) The proposed right-of-way limits.
3) Existing property lines and the names of persons who own the property over which the line or pipeline will cross.
4) a. The distance of the proposed electric transmission line from residential neighborhoods, schools, and public and private parks within one (1) mile of the proposed facilities; or
   b. The distance of the proposed carbon dioxide transmission pipeline from residential neighborhoods, schools, and parks, either private or public, within one thousand (1,000) feet of the proposed facilities.

As per KRS 278.714 (2)(c) With respect to electric transmission lines, a full description of the proposed line and appurtenances, including the following:

1) Initial and design voltages and capacities.
2) Length of line
3) Terminal points; and
4) Substation connections.

As per KRS 278.714 (2)(d) A statement that the proposed electric transmission line and appurtenances will be constructed and maintained in accordance with accepted engineering practices and the National Electric Safety Code.

3.3.2 278.708(3)(a)(1) Surrounding Land Uses

Wells Engineering reviewed the Site Layout and the 2-mile vicinity maps submitted by the applicant and performed Site Visit on April 19th, 2022. The findings after the site visit are discussed below.

Findings on the Site Layouts & 2-Mile vicinity maps

1) On the site layout diagrams all the water bodies like ponds, lakes, creeks should be identified. Reference the picture (3), and (5) of Location #3, and 4 respectively.
2) Old East Broadwell Cemetery located on Ruddles Mills Road should be easily accessible

3.3.3 278.708(3)(a)(2) Legal Boundaries

After reviewing the legal descriptions of the land submitted as part of the application documents with the Kentucky State Board in Harrison County. The documentation found to be adequate as part of the application. However, any discrepancy identified at any stage of the project shall be brought to the attention of the Public Service commission and resolved for legal compliance.

3.3.4 278.708(3)(a)(3) Proposed Access Control

As per the KRS requirements KRS 278.708 (3)(a)(3), the applicant has proposed the access control methods that are adopted for the site.

Finding on Proposed Access Control:

1) At the time of construction and operation of the plant, besides providing fencing (as proposed by the applicant), all necessary signage, caution boards and safety requirements as per OSHA shall be installed.

3.3.5 278.708(3)(a)(4) Location of Facility Buildings & Transmission Lines

After reviewing the Site Layout and other plans submitted by the applicant and after visiting the site, the following findings were made.

Findings on Location of Facility Buildings and Transmission lines.

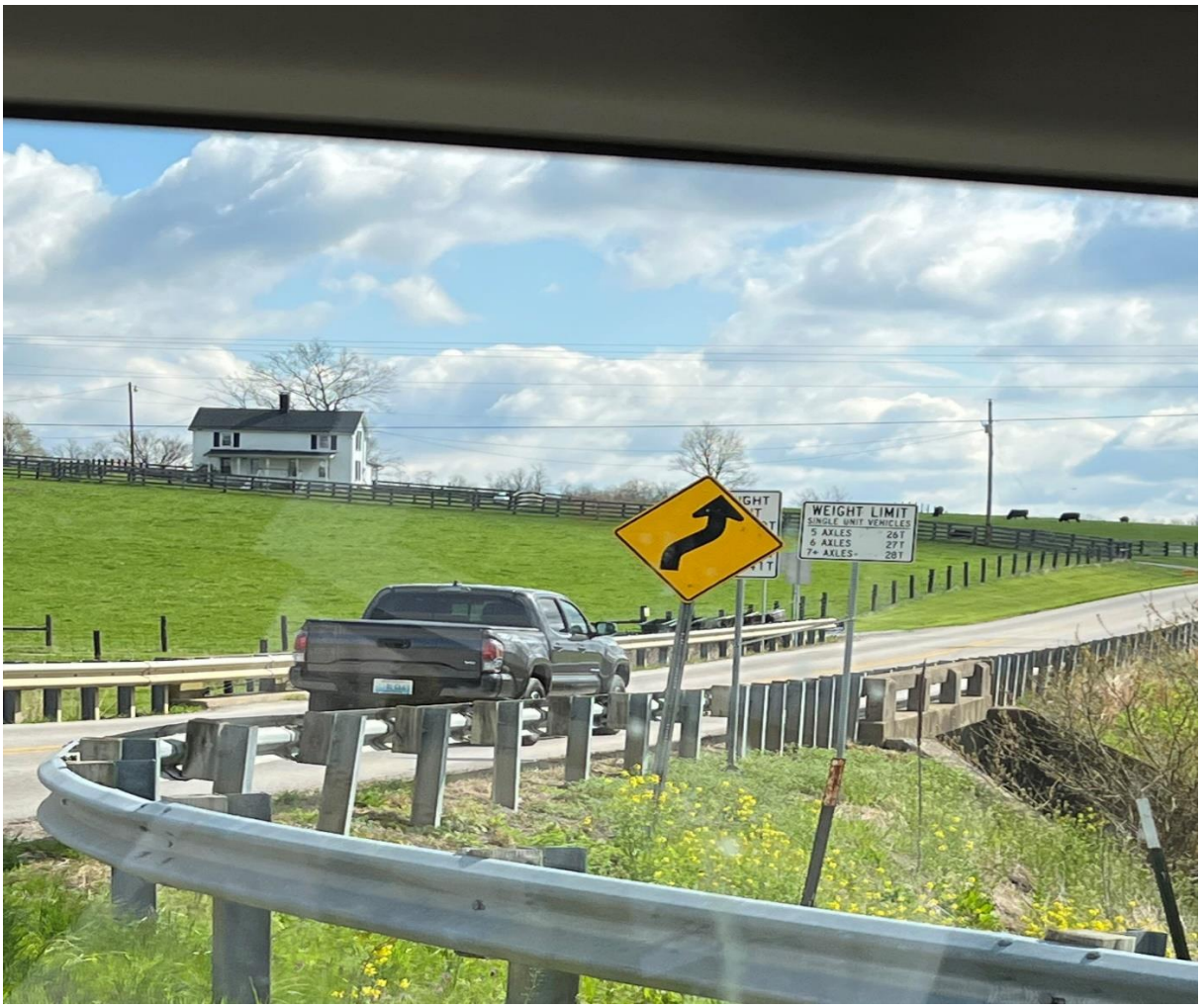
1) Existing Electric service:
   Any new power line should be clear of the existing electric service line, power pole and guy wire. Reference Picture (7).
2) The Substation will need oil containment for the Transformer to prevent any leakage of oil into nearby body of water.
3) The location has on existing 69kV line near the vicinity of the proposed substation area, which will make the interconnection into the 69kV power grid much easier. Reference Picture (8).
4) The location will have a control building to host the control equipment for the substation. This control building is the central unit of the transmission system and should be protected against any unauthorized personnel.

3.3.6 278.708(3)(a)(5) Location and Use of Accessways, Internal Road & Railways

As part of the site visit, major access points are visited, and the following findings were made.

Findings on Location and Use of Accessways, Internal Road & Road

1) The internal roads are proposed to be all-weather gravel. Reference Picture (15).
2) Rail roads are not applicable to site.
3) Avoid using Oversize trailers for material transport and limit the overall weight as per the bridges and culverts of the Road. Reference Picture (13) & (14).



Picture (13)

Bridge/Culvert on State Highway 393

Picture (14)
Bridge/Culvert on State Highway 393

Picture (15)
Gravel Road and drainage- (Republican Pike Rd /SR 393)

3.3.7 278.708(3)(a)(6) Existing or Proposed Utilities to Service the Facility

After reviewing the plot plans submitted by the applicant, it was found that the drawings do not indicate the utilities to the facility buildings of the plant, as the drawings are prepared as preliminary. The applicant has not indicated if water, internet, or phone connection will be provided to the site. If applicable, there should be necessary drawings created to indicated all underground, overhead utilities required to site at the time of construction.

3.3.8 278.708(3)(a)(7) Compliance with Applicable setback requirements

The KRS required setback is 2000 feet. This setback is practical for turbine-based plants and the noise and view generated but not practical for a solar power plant. After reviewing the applications documents, statutes, and applicable zoning ordinances, it was found that the property line setback from the nonparticipating properties and roadways is 50 feet from the side and rear and 100 feet from the front. There should also be no more than 200 feet from any residential structure or dwelling unit.

3.3.9 278.708(3)(a)(8); (b); (d) & (e) Evaluation of Noise levels, Scenic surroundings, Environmental impact & Fugitive Dust

Wells Engineering has appointed Thomas Chaney for the Environmental Assessment of site for Noise, Scenic surroundings, historic and archeological, Environmental & Fugitive dust.

Summary: "Based on a review of The Blue Moon Solar Project Site Assessment Report, by W. Thomas Chaney of Cloverlake Consulting, all of the report is in compliance with the intent of KRS 278.708." However, it was noted that these four areas listed may need to be re-examine during the design process.

- Fugitive Dust and PM10
- Protection of Water Resources in the Project Area
- Endangered Species and Wetlands
- Historic and Archeologic Resources

Reference Attachment-B for complete report.

3.3.10 278.708(3)(c) & (e) Visual Impacts, Traffic and Property Values

Wells Engineering has appointed Clark Toleman for the assessment of the Application document for Visual impacts, Traffic and Property Values.

Summary: "Considering my analysis of the Kirkland Impact Study my conclusion is that the report is credible and representative of the market conditions that would exist should the Blue Moon

Solar Project be constructed."
Reference the Attachment-C for complete report.

3.3.11 278.708(3)(c) Economic Impact Analysis

Economic Impact Analysis was performed by Mark Watters, as contracted by Wells Engineering, for the Site Assessment.

Summary: "Based upon the representations of the Applicant through its Economic Impact Analysis and Responses to the Siting Board's Requests for Information, there is a significant, short-term initial economic to both the region and the Commonwealth of Kentucky. During the longer operational (generation) phase, there are lesser-but-positive economic regional impacts. The Applicant's Blue Moon Solar Economic & Fiscal Contribution to Harrison County & the State of Kentucky prepared by Mangum Economics, is a thorough report exhaustively detailing and supporting the positive economic impacts the proposed project and facility."

Reference the Attachment-D for complete report.

3.3.12 278.714(2)(b) Transmission Line Description and Maps

Wells Engineering reviewed the Transmission line application documents submitted by the applicant and performed Site Visit on April 19th, 2022. The findings after the site visit are discussed below.

Findings on the Transmission line

1) The Transmission line shall have sufficient clearance from the existing Electrical Power lines of the project area. Reference Pictures (7) Location (6)
2) The Public and Private structures and buildings shall have clearances as per OSHA and NESC governing standards
3)

3.3.13 278.714(2)(c) Transmission Line Design Parameters

Wells Engineering reviewed the Transmission line application documents submitted by the applicant and performed Site Visit on April 19th, 2022. The findings after the site visit are discussed below.

Findings on the Transmission line design

1) The structural details drawings shall include the Transmission line Dead-end structures and Line turning vertical formations.
2) Transmission line structure design shall be according to the number of circuits of the transmission.

3) Transmission line shall be adequately clear off the following as per National Electric Safety Code (NESC), Occupational Health, and Safety Administration (OSHA) and other applicable statutory requirements.
    - Railroads
    - Roadways
    - Farmlands
    - Oversized vehicles like Harvesting equipment
    - Grain Bins loaded by portable Auger
    - Signboards
    - Other Public & Private structures

4 Recommendations & Mitigations Measures

After reviewing the application documents and performing the site visit, Wells Engineering provides the following Recommendations & Mitigation measures.

1. Create a Site Survey Map indicating the property boundaries. This will be a good reference for current and future needs of the project.
2. Create an over-all plot plan indicating all water bodies, bridges, culverts, access roads, power lines, residential and public structures, etc.
3. For locating the Solar Modules and Other associated equipment of the plant maintain sufficient clearance from the existing power lines
4. Construct new bridge or culvert wherever necessary for equipment loading.
5. Adhere to the setback distance at all locations as per guidelines from the local planning zone authority.
6. Setbacks for solar equipment from roads and property lines, with increased setbacks for certain equipment. Security fencing, and vegetative buffer shall not be subject to setback restrictions.
7. Leaving existing vegetation between solar equipment and neighboring residences in place, to the extent practicable, to help screen the Project and reduce the visual impact
8. Notices to neighbors regarding potential construction and operation noises, as well as limits on working hours during the construction period, as described in the Application.
9. Fugitive Dust and PM10(Coarse particles)
   Coarse (bigger) particles, called PM10, can irritate your eyes, nose, and throat. Dust from roads, farms, dry riverbeds, construction sites, and mines are types of PM10. The applicant will submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction.
10. Protection of Water Resources in the Project Area
    Ten days prior to the commencement of construction, the Applicant will provide a detailed plan on how they will protect water resources in the project area. The site assessment documents in several locations say that certain mitigation measures regarding erosion and protection of water resources “may” be carried out. This needs to be clearly specified. The primary focus should be on preventing turbidity from being added to local streams because of erosion during construction.

4.1 Cumulative effect of the Total Solar generation on the Grid

Solar developments are rapidly increasing and while the impact to the surrounding environment might be minimal, the combined or cumulative effects of multiple developments may have a greater impact. Environmental concerns due to cumulative impacts, such as Glint, Glare and emission are expected to grow.

The proposed project would create air emissions due to vehicle and dust emissions associated with development activities. Similar effects would be experience during decommissioning, which would be carried out according to the project's restoration plan.

Generating electricity using solar rather than fossil fuels reduce greenhouse gas emissions and helps address climate change. While solar energy is preferable to fossil fuel generators from an emissions perspective, power output from solar energy sources depends on variable natural resources, which makes these plants more difficult to control and presents challenges for grid operators.

As the electricity from solar energy can be produced only during daytime, the Solar Power projects have the inherent risk of unavailability during nighttime. The utilities and the transmission planning authorities shall identify the risks associated with this and plan the intake of the energy from Solar plants effectively.

To accurately balance electricity supply and demand on the power grid, grid operators must understand how much solar energy is being generated at any given time, how much solar energy generation is expected, and how to respond to changing generation. This can be challenging for grid operators due to the intermittent nature of solar energy and the wide variety in the size and locations of solar energy across the power grid. As the proportion of solar energy capacity on the grid increases, these issues are becoming increasingly important to understand renewables connect to the grid, how these connections impact grid operations, and implications of a high penetration of renewables for the grid in the future.

ATTACHMENT A

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Executive Summary

Project Description

Pursuant to KRS 278.708(3)(a), the proposed Blue Moon Solar Project ("the Project") is situated on 1,581 acres located near Cynthiana, Kentucky, in Harrison County (See Exhibit 1). The site consists mainly of 17 parcels secured from 13 landowners pursuant to real estate agreements with each landowner. The parcels and those surrounding parcels have generally experienced row crop agriculture, pastureland, and residential use. The proposed project is a 70 MW solar facility capable of providing clean, renewable electricity. Photovoltaic (PV) solar modules are used to convert sunlight into direct current (DC) electricity which is then converted to alternating current (AC) electricity through inverters. Transformers step up the AC electricity to a higher voltage so that it can connect to the regional transmission grid.

The Applicant Blue Moon Solar submitted adequate documentation as required for a certificate to operate a generating facility as well as the required documentation which assessed the impact of the proposed project on the natural and human environment.

Adequacy of the Applicants Assessment

Applicant's Mitigation Measures

REQUIREMENT: per KRS 278.708(4); The site assessment report shall also suggest any mitigating measures to be implemented by the applicant to minimize or avoid adverse effects identified in the site assessment report; and per KRS 278.708(6); The applicant shall be given the opportunity to present evidence to the board regarding any mitigation measures. As a condition of approval for an application to obtain a construction certificate, the board may require the implementation of any mitigation measures that the board deems appropriate. The Application lists specific mitigation measures as detailed in the sixth section of the beginning of this report on page .

These mitigation measures are listed above in section 6 of this report.

Below are the additional mitigating measures recommended by the Consultant (Cloverlake Consultants)

Fugitive Dust and PM10

The applicant will submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction.

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Executive Summary

Protection of Water Resources in the Project Area

Ten days prior to the commencement of construction, the Applicant should provide a detailed plan on how they will protect water resources in the project area. The site assessment documents in several locations say that certain mitigation measures regarding erosion and protection of water resources "may" be caried out. This needs to be clearly specified.

Endangered Species and Wetlands

Wetlands Delineation Report

Wetlands research for the project area has been performed by the applicant and the project has been designed to avoid wetlands or endangered species.

Historic and Archeologic Resources

A search for sensitive archeologic and cultural resources was performed by the applicant. The project has been designed to avoid these resources.

Summary of the Adequacy of the Applicants Site Assessment Report

Based on a review of The Blue Moon Solar Project Site Assessment Report, by W. Thomas Chaney of Cloverlake Consulting, all of the sections of the report are in compliance with the intent of KRS 278.708.

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Executive Summary

ATTACHMENT B

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Developed for Wells Engineering and the Kentucky Public Service Commission- State Board on Electric Generation and Transmission Siting

By Cloverlake Consulting, W. Thomas Chaney, President

May 13, 2022

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Cloverlake Consulting Services May 13, 2022

On Behalf of Wells Engineering, Florence, Kentucky For the Blue Moon Solar Project-Kentucky State Siting Board on Electric Generation and Transmission Case No: 2021-00414

Introduction

The Kentucky Public Service Commission, State Siting Board requires that applicants for a certificate for Solar Facilities file an application which details the current state of the affected properties to be used for the facilities. It also requires an assessment of the impact on the properties regarding the natural and human environment. This report assesses the adequacy of the assessment on the natural environment including noise, traffic, dust, historic, archeologic

resources, and natural resources including endangered plant and animal species groundwater and surface water.

At its conclusion this adequacy report shows that the application submitted by the applicant, Blue Moon Solar, is fully in compliance with the intent of the Kentucky Revised Statutes.

1 Siting Project Description (See Exhibit 1)

Pursuant to KRS 278.708(3)(a), the proposed Blue Moon Solar Project ("the Project") is situated on 1,581 acres located near Cynthiana, Kentucky, in Harrison County (See Exhibit 1). The site consists mainly of 17 parcels secured from 13 landowners pursuant to real estate agreements with each landowner. The parcels and those surrounding parcels have generally experienced row crop agriculture, pastureland, and residential use. The proposed project is a 70 MW solar facility capable of providing clean, renewable electricity. Photovoltaic (PV) solar modules are used to convert sunlight into direct current (DC) electricity which is then converted to alternating current (AC) electricity through inverters. Transformers step up the AC electricity to a higher voltage so that it can connect to the regional transmission grid.

2. Project components will include a PV solar field, which consists of modules mounted on metal structures anchored to the ground with pilings; panels will move to track the sun over the course of the day. Other Project components include: an onsite substation, a DC collection system of underground cabling and combiner boxes, and power conversion stations (PCS) with inverters, transformers, and emergency backup power to convert DC to AC. An underground and/or overhead collection system will be used to convey electricity from the solar array field to the substation. An operation and maintenance (O&M) area for the Project will also be installed and could include, as necessary, an O&M building, parking area, and other associated facilities such as above-ground water storage tanks, security gate, signage, and flagpoles. In addition, the Project will also include an onsite transmission line, fiber optic cable for communications underground or on overhead lines, a meteorological station mounted on a concrete foundation, interior access ways, and a Facility perimeter road. During construction, the Project will include a temporary construction mobilization and laydown area for construction trailers, construction workforce down area for construction trailers, construction workforce parking, above ground water and fuel tanks, materials receiving, and materials storage.

3. Approximately 46,250 linear feet of private access roads will be utilized within the facility and will be constructed of all-weather gravel. Roads will not exceed 16 feet (4.9 meters) in width, except for turning radii, which will not exceed 50 feet (15.2 meters) in radius. All entrances and driveways will comply with

applicable design requirements for safe access and egress. The Project solar arrays will be secured with approximately 65,785 linear feet of perimeter fence and will consist of six (6)-foot chain link fence with three strand barbed wire and colored green or black per requirements of Article 23 Section 4(B)(i)(3) of the Ordinance. Fixed lighting at the perimeter will be limited to gates and the substation area and will be motion-activated to minimize light spillage. The Project will utilize construction methods that minimize large-scale grading and removal of native soil. Clearing and grubbing will occur where necessary. Minimal grading may be required to level rough or undulating areas of the site and to prepare soils for concrete foundations for substation equipment and inverters. Access roads will also be grubbed, graded, and compacted. The site cut and fill will be appropriately balanced, with no anticipation of import/export necessary.

4. The PV solar arrays, consisting of modules in individual rows placed on a racking structure, will be supported by steel piles driven into the soil. Piles typically are spaced approximately 20 feet apart, and the maximum height of the PV arrays will not exceed 15 feet. The spacing between array rows is estimated to be approximately 8 to 15 feet. Modules will be oriented in rows running from north to south utilizing a single axis tracking system. The racking system will be supported by approximately 34,722 steel posts installed with a combination of pile-driving machines and augers. The center height of the racking structures will be approximately 4 feet (1.2 meters) to 6.8 feet (2.1 meters) above the ground. The modules will be connected using DC cables that can either be buried in a trench or attached to the racking system. The DC cables gather at the end of racking systems to combiner boxes which are connected to cables routing to an inverter. 5. Approximately 19 inverters will be installed throughout the Project to convert the DC power from the 1,500-volt DC collection system to AC power, which will then be transmitted to a Project substation via the 34.5-kilovolt (kV) AC collection system. The AC collection system will include underground and/or overhead segments. Underground segments of the AC collection system will be buried a minimum of 3 feet (0.9 meters) below grade; and overhead portions will not exceed a maximum height of 45 feet (13.7 meters) above grade. The AC collection system will be comprised of medium voltage (MV) cable that will transfer electricity to the Project substation. Approximately 221,000 linear feet of DC collection system cables and 52,000 linear feet of AC collection cables would be installed throughout the Project. Collection cables are congregated into common trenches and run adjacent to one another. All electrical inverters and the transformer will be placed on concrete foundations or steel skids.

5. Approximately 19 inverters will be installed throughout the Project to convert the DC power from the 1,500-volt DC collection system to AC power, which will then be transmitted to a Project substation via the 34.5-kilovolt (kV) AC collection system. The AC collection system will include underground and/or overhead segments. Underground segments of the AC collection system will be buried a minimum of 3 feet (0.9 meters) below grade; and overhead portions will not exceed a maximum height of 45 feet (13.7

meters) above grade. The AC collection system will be comprised of medium voltage (MV) cable that will transfer electricity to the Project substation. Approximately 221,000 linear feet of DC collection system cables and 52,000 linear feet of AC collection cables would be installed throughout the Project. Collection cables are congregated into common trenches and run adjacent to one another. All electrical inverters and the transformer will be placed on concrete foundations or steel skids. 6. The Project will require one substation that will include one 81-mega volt ampere (MVA) transformer equipment, control building foundation, and oil containment area. Concrete pads will be constructed as foundations for substation equipment, and the remaining area will be graveled. Concrete for foundations will be brought on-site from an external batching plant. The substation area will serve as the general parking area for permanent employees and contain all necessary equipment to step up incoming MV electricity to the high voltage electricity necessary to interconnect into the existing 69kV Cynthiana Tie-Headquarters transmission line onsite owned and operated by East Kentucky Power Cooperative. The gen-tie line will be no more than 100 feet (30.48 meters) in length, will be located entirely within the project footprint, and will be constructed by the Applicant. East Kentucky Power Cooperative will be responsible for any additional transmission equipment located within the switchyard for the Project. It is anticipated that the gen-tie poles and substation components will not exceed 85 feet (25.9 meters) above grade.

6.The Project will require one substation that will include one 81-mega volt ampere (MVA) transformer equipment, control building foundation, and oil containment area. Concrete pads will be constructed as foundations for substation equipment, and the remaining area will be graveled. Concrete for foundations will be brought on-site from an external batching plant. The substation area will serve as the general parking area for permanent employees and contain all necessary equipment to step up incoming MV electricity to the high voltage electricity necessary to interconnect into the existing 69kV Cynthiana Tie-Headquarters transmission line onsite owned and operated by East Kentucky Power Cooperative. The gen-tie line will be no more than 100 feet (30.48 meters) in length, will be located entirely within the project footprint, and will be constructed by the Applicant. East Kentucky Power Cooperative will be responsible for and be buried in a trench or attached to the racking system. The DC cables gather at the end of racking systems to combiner boxes which are connected to cables routing to an inverter.

7. Pursuant to KRS 278.708(3)(a)(1), a detailed description of the surrounding land uses is identified in the Property Value Impact Study conducted by Kirkland Appraisals, LLC, and attached to the application as SAR Exhibit B. A summary of the surrounding land use is contained in the chart below:

	Acreage	Parcels
Residential	5.86%	53.25%
Agricultural	54.99%	23.38%
Agri/Res	39.15%	23.38%

8. Pursuant to KRS 278.708(3)(a)(2), SAR Exhibit C of the Application contains the legal description of the proposed site.

9. Pursuant to KRS 278.708(3)(a)(3), the proposed facility layout is included in SAR Exhibit A and B as well as Exhibit A of the overall Siting Board Application. The layout shows the proposed access to the site. A security fence meeting National Electric Safety Code (NESC) requirements will consist of a six (6) foot chain link fence with three strings of barbed wire at the top, to secure the facility.

10. Pursuant to KRS 278.708(3)(a)(4), the proposed locations of all project infrastructure (buildings, transmission lines, and other structures) are included in the Preliminary Site Layout in SAR Exhibit A and B.

11. Pursuant to KRS 278.708(3)(a)(5), proposed access points are shown in SAR Exhibit A. There are no adjacent railways that could be used for construction or operational activities

12. Pursuant to KRS 278.708(3)(a)(6), there is one 69-kV transmission line, Cynthiana TieHeadquarters bisecting the central portion of the project, connecting to the proposed switchyard to Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 be constructed and located in the central portion of the project. The proposed switchyard and transmission lines are owned by East Kentucky Power Cooperative. The location of the switchyard and transmission lines are shown in SAR Exhibit A and Exhibit A of the Siting Board Application. At this time, it is not anticipated that the Project will need to receive external utility services during typical plant operation.

13. Pursuant to KRS 278.708(3)(a)(7), Harrison County has enacted Article 23 of the CynthianaHarrison County-Berry Joint Planning Commission Ordinance, the Applicant has designed the project to be consistent with Harrison County's Zoning Ordinance. Buffers and setbacks will be included along the boundaries of the Project and from sensitive resources such as homes, businesses, and wetlands or streams. Pursuant to the Conditional Use Permit granted to the project (SAR Exhibit G), condition number 3, setbacks will be as follows: Except for fencing and any pole mounted electric lines, consistent with the County ordinance, all above-ground equipment will have a minimum front setback of at least

one hundred (100) feet to frontage boundary lines and fifty (50) feet to side and rear boundary lines of any non-participating properties and roadways. No setbacks are required between the boundary lines of parcels that are part of a single project. Aboveground equipment shall be located no closer than 150' from any participating residential structures and no closer than 200' feet from any non-participating landowner. Setbacks are included on the project layout in SAR Exhibit A. The Zoning Ordinance is enclosed as SAR Exhibit F.

14. Pursuant to KRS 278.708(3)(a)(8), two noise assessments were completed for the Project in October 2021: Cardno conducted a construction noise assessment while Hessler Associates assessed operational noise (SAR Exhibit D). The noise assessment indicates that during site operation, minimal intermittent noise related to the panel tracking system and the noise of the inverters is expected. The noise is negligible due to both the vertical and horizontal distances between the panels/inverters and the nearest noise sensitive receptors. The nearest sensitive receptor is more than 300 feet from any solar panels and approximately 850 feet from an inverter. While the exact model for inverter and transformer has not yet been selected, operational sound was modeled using Cadna/A software. According to manufacturer specifications, the maximum operational sound of the transformer during daytime is 97 dBA while the proposed inverter has a maximum noise production of 99 dBA. Sound quickly dissipates away from transformer, inverters, and substation locations. At the nearest receptors no prolonged noise levels above background levels are expected during operation of the Project. As demonstrated on the Hessler Associates Plots 1 and 2, all residences, whether participating or not, are well outside of the 45 dBA sound contour and all non-participating residences are outside of the 40 dBA contour. This contour generally represents a sound level that is so low in absolute terms that complaints are highly unlikely. The nearest concentration of sensitive receptors is along Jill Lane on the western side of the Project. The nearest non-participating residence will be located more than 500 feet from proposed inverters and substation. The nearest public sensitive receptor will be the Ashford Acres Inn, over 2,000 feet west of the nearest proposed solar panels. Due to distance of receptors to operational components, noise emitted from the Project during operation would be less than typical background noise. Site visits and maintenance activities including single vehicular traffic and mowing will be negligible as they are similar to the background agricultural noise characteristics. As discussed further below, the Cardno study demonstrates that construction will not contribute to a significant sound increase when compared to sound currently occurring onsite and baseline ambient sound levels.

15. All site visits, outside of emergency maintenance, will occur during daylight hours. Operationally, the Project will not produce any potentially disturbing prominent discrete tones due to distances from the substation to any receptors. Motors operate intermittently through the day to tilt each solar panel array

a few degrees to optimize its angle toward the sun. While the exact model for the inverter and transformer has not yet been selected, operational sound was modeled using Cadna/A software. According to manufacturer specifications, the maximum operational sound of the transformer during daytime is 97 dBA while the proposed inverter has a maximum noise production of 99 dBA. Sound quickly dissipates away from transformer, inverters, and substation locations. At the nearest receptors no prolonged noise levels above background levels are expected during operation of the Project. As demonstrated on the Hessler Associates Plots 1 and 2, all residences, whether participating or not, are well outside of the 45 dBA sound contour and all non-participating residences are outside of the 40 dBA contour. This contour generally represents a sound level that is so low in absolute terms that complaints are highly unlikely. The nearest concentration of sensitive receptors is along Jill Lane on the western side of the Project. The nearest non-participating residence will be located more than 500 feet from proposed inverters and substation. The nearest public sensitive receptor will be the Ashford Acres Inn, over 2,000 feet west of the nearest proposed solar panels. Due to distance of receptors to operational components, noise emitted from the Project during operation would be less than typical background noise. Site visits and maintenance activities including single vehicular traffic and mowing will be negligible as they are similar to the background agricultural noise characteristics. As discussed further below, the Cardno study demonstrates that construction will not contribute to a significant sound increase when compared to sound currently occurring onsite and baseline ambient sound levels.

15. All site visits, outside of emergency maintenance, will occur during daylight hours. Operationally, the Project will not produce any potentially disturbing prominent discrete tones due to distances from the substation to any receptors. Motors operate intermittently through the day to tilt each solar panel array a few degrees to optimize its angle toward the sun, however, this sound source is not significant with respect to for-site receptor locations. At night all inverters are inactive, and noise is restricted to the substation.

2. Compatibility with Scenic Surroundings

16. Pursuant to KRS 278.708(3)(b), a Property Value Impact Study was completed for the Project by Kirkland Appraisals, LLC in July 2021 (SAR Exhibit B). Please refer to Sections VII-XI from SAR Exhibit B which address appropriate setbacks, topography, impacts during construction, scope of research, and compatibility in detail.

17. An excerpt from Section XI, page 115, reads as follows: “[L]arger solar farms using fixed or tracking panels are a passive use of the land that is in keeping with a rural/residential area. The solar panels are all less than 15 feet high, which means that the visual impact of the solar panels will be similar in height to a typical greenhouse and lower than a single-story residential dwelling. Were the subject property developed with single family housing, that development would have a much greater visual impact on

the surrounding area given that a two- story home with attic could be three to four times as high as these proposed panels."

18. General rolling terrain with some distant solar panel views show no impact on adjoining property value. Solar facilities using panels of 15 feet in height have a similar visual impact as large greenhouse. Further, ample vegetative screening will be implemented to mitigate any visual impacts of the Facility.

3. Property Value Impacts

19. Pursuant to KRS 278.708(3)(c), see SAR Exhibit B for a report studying potential property value impacts to owners adjacent to the proposed facility by a certified real estate appraiser. The conclusion of the report, Section XII on page 117, reads as follows: "The matched pair analysis shows no negative impact in home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all support a finding of no impact on property value. Very similar solar farms in very similar areas have been found by hundreds of towns and counties not to have a substantial injury to abutting or adjoining properties, and many of those findings of no impact have been upheld by appellate courts. Similar solar farms have been approved adjoining agricultural uses, schools, churches, and residential developments. Based on the data and analysis in this report, it is my professional opinion that the solar farm proposed at the subject property will have no negative impact on the value of adjoining or abutting property. I note that some of the positive implications of a solar farm that have been expressed by people living next to solar farms include protection from future development of residential developments or other more intrusive uses, reduced dust, odor and chemicals from former farming operations, protection from light pollution at night, it's quiet, and there is no traffic."

4. Anticipated Noise Levels at Property Boundary

20. Pursuant to KRS 278.708(3)(d), noise will occur temporarily and intermittently during the construction phase of the project due to increases in vehicular traffic, construction equipment and assembly of the solar facility components. This construction noise is expected to be of short duration at any given location within the Project. As a majority of the Project area is currently used for crop production, the need for extensive tree removal and earthmoving to prepare the site is anticipated to be relatively minor. Construction of the solar facility will use equipment typical for site development, such as dozers, graders, loaders, pile drivers, and trucks. The U.S. Department of Transportation, Federal Highway Administration (FHWA), publishes sound levels for typical construction equipment, which are shown in Table 2 in the application. No sound generated by typical construction equipment will violate Harrison County Ordinance 254. Construction for the Project will consist of roads, fencing, solar arrays, a substation and associated electrical infrastructure(buried lines, etc.).

21. The levels of sound generated during construction will vary depending on the type of activities occurring on a given day. Grading equipment, bobcats, pile drivers, and other construction equipment typically emit sounds between 76 to 90 dBA at 50 feet (FHWA 1999, 2006). Sounds associated with these types of equipment will primarily occur during the initial site set up – grading and access road construction, which is expected to last approximately 9 to 12 months. It is anticipated that pile driving for rack support foundations will create the loudest sound (98 and 101 dBA at 50 feet, FHWA 1999, 2009). Installation of each rack support foundation takes between 30 seconds to 2 minutes, depending on soil conditions; it is anticipated this activity will take up to 6 to 8 months across the entire Project. Finally, installation of the solar panels on the tracking racks will emit sound levels similar to general construction (75 to 85 dBA at 50 feet). Typically, a forklift is used to place individual panels on the tracking rack system. The sounds from all construction activities will dissipate with distance and will be audible at varying levels, depending on the locations of the equipment and receptors. Note that the Project is approximately 3 miles from North to South; hence construction noise will not be isolated to a particular area for long periods of time (i.e. 30-days), for the exception of prime access ways and laydown areas. These areas would experience noise from worker vehicles and delivery trucks. The noisiest portion of the construction includes the use of pile drivers to install the solar panel supports. Typical noise level within 50- feet of pile driving equipment is 84-101 dBA.

22. Construction traffic will use the existing county roadway system to access the Project facilities and deliver construction materials and personnel. Based upon the sound levels published by FHWA, the sounds contributed by construction vehicles such as semi-trucks, light passenger cars, and trucks fall within acceptable ranges if the sounds do not occur between 11:00 p.m. and 6:00 a.m. Construction traffic sounds will be similar to common farm equipment and typical vehicles on local roadways. Sound generated during construction is expected to only occur during daylight hours and will be generated by heavy equipment, passenger cars and trucks, and tool use during assembly of the Project. Sound will be present in the Project during construction; however, because of the size of the Project and the distance to the nearest receptors, construction will not contribute to a significant sound increase when compared to sound currently occurring onsite (i.e., the operation of farming equipment and crop harvesting) and baseline ambient sound levels. See SAR Exhibit D for the full report studying anticipated peak and average noise levels associated with the facility's construction at the Project boundary.

23. The nearest concentration of sensitive receptors is near the town of Cynthiana along Jill and Midden Lane on the western side of the Project area and Hedges Lane near the central eastern portion of the Project. The nearest non-participating residence will be more than 300 feet from Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 proposed Project Components. The nearest public sensitive receptor will be the Ashford Acres Inn, which is located over 2,000 feet west of the nearest proposed solar panels. Since the nearest

nonparticipating residential receptor is more than 1,200ft from the substation, transformers are not expected to add additional noise above background noise. These homes are well outside of the 40dBh noise threshold as seen in SAR Exhibit D.

24. There are two principal sound sources associated with normal daytime operation of the Project: the substation step-up transformer and the electric current inverters, which are distributed through the panel arrays. The only other sound that emanates from the Project is from the small tracking system motors that intermittently tilt each panel array a few degrees to optimize its angle towards the sun. These motors are only active for a few seconds at a time and are normally only faintly audible when standing within the panel array itself consequently, this sound source is not significant with respect to off-site receptor locations.

25. The precise main transformer model, rating, and manufacturer for this Project has not yet been completely finalized, but the best estimate at this time is for a unit with a rating of 81 Megavolt Ampere (MVA). SAR Exhibit D fully models operational sound using these two-unit ratings, however, all models illustrate that sound power level of the transformer during daytime is less than 100 dBA (94-99 dBA) at the source. 26. It is important to note that the algorithm used to model noise of the transformer tends to overpredict the sound power levels of modern transformers. At night, the Project shuts down Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 completely; however, the substation transformer remains energized and back feeds a small amount of house load power to the Project (rather than delivering power to the grid) and could also interact with the grid by supplying some reactive compensation. The sound level associated with this mode of operation is probably very minimal, but to be conservative, the minimum 48 MVA rating for this transformer was assumed for noise studies, yielding a sound power level of 94 dBA at the source during nighttime operations.

27. Solar facilities generate minimal sound while in operation during daylight hours. Inverters are the main source of sound within a solar facility with typical noise levels averaging 75 dBA at the point source, comparable to a vacuum cleaner, and sound dissipates quickly from the point source. Due to landscaping, setbacks, fence lines, and perimeter roads, noise-generating equipment will not be located in proximity to sensitive receptors or near the Project boundary. At the present time, the specific inverter model for the Project has not yet been confirmed, but the TMEIC Ninja-5 4200kW is currently anticipated (see below). Sound information for this model obtained from a field sound test from the manufacturer indicates that a five-module grouping produces an average near field sound pressure level of 80.5 dBA. After accounting for the physical size of a 5-unit group and a 1 m measurement distance the nominal sound power level comes out to 99 dBA.

28. A sound level of 45 dBA is a common design goal and regulatory limit for nighttime sound emissions. This value originates from guidelines published years ago by the U.S. environmental Protection Agency,

where a maximum day-night average (Ldn) sound of 55 dBA is recommended for "outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in high quiet is a basis for use." All residences, whether participating or not, in the Project are well outside of the 45 dBA sound contour. Moreover, all non-participating residences are outside of the 40 dBA contour, which generally represents a project sound level that is so low in absolute terms that complaints are highly unlikely even in quiet rural environments with very low background levels. Consequently, little to no adverse community reaction is anticipated during normal daytime operations.

29. At night all inverters are inactive and any possible noise from the Project would be confined to the immediate vicinity of the substation. Further, the potentially tonal character of the sound from transformer must also be considered. In this case, the sound emissions from the substation transformer are not expected to contain any prominent discrete tones at the nearest nonparticipating residences, which are roughly 1,400 feet from the substation. The nearest participant is about 1,200 feet away. Transformers are normally tonal in the near field, but the prominence of any tones drops away quickly with distance and becomes insignificant, usually within 150-500 feet. The 81 MVA solar project transformer discussed above had no prominent tones remaining at only 45 meters. The transformer itself produces a 60 Hz tone which is not significant or even audible. Consequently, it can be reasonably concluded that due to the distances from the substation to any homes that the Project will not produce any potentially disturbing prominent discrete tones.

30. Offsite noise is not anticipated to be a material issue within the Project for both construction and Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 operation. Per County Ordinance No. 254 and 283, Series 2014, noise levels at the Project boundary will comply with the Harrison County Noise Ordinance and will not cause disturbance or destroy the enjoyment of dwelling houses in the vicinity of the Project. Project operational noise levels will not exceed 57 dBA from 7:00 AM to 10:00 PM and 52 dBA from 10:00 PM to 7:00 AM. Operational noise assessment was modeled by Hessler Associates, Inc. and is included in SAR Exhibit D.

5. Effect on Road, Railways and Fugitive Dust

31. Pursuant to KRS 278.708(3)(e), a traffic impact study was completed for the Project by Fisher Associates in September 2021 (SAR Exhibit E). It evaluates the Project's impact on road and rail traffic and transportation, and anticipated levels of fugitive dust created by vehicles and degradation of roads.

32. Any transportation impacts will be temporary in nature as they will occur only during the construction phase of the Project. There are no railroads near the Project site and therefore no impact. The Peak of Project construction activities is expected to generate up to 32 daily trips, including 369

worker vehicle trips and 24 truck haul trips. This includes up to 196 AM and 196 PM peak hour trips, with 184 peak hour worker vehicle trips and 12 truck haul trips each peak hour. All study segments are projected to operate acceptably at LOS D or better with only slight degradations in operations, therefore, the Project is not expected to cause a significant impact with respect to traffic. Any other roadway segments that Project travel may travel on will have acceptable operations. The total design hour VMT on the study segments is projected to increase by approximately 551 miles which is an approximately 36.5% increase, primarily due to low volume of existing traffic on the study segments and will be temporary during construction. The Project would not substantially increase hazards nor alter any roadways or create any traffic conditions, thus, the Project would result in less-than-significant impacts to transportation and emergency access.

33. Construction and associated land disturbance associated with the proposed Project may temporarily contribute airborne materials. The Project will utilize Best Management Practices (BMPs) such as: dewatering procedures, stormwater runoff quality control measures, concrete waste management, watering for dust control, and construction of perimeter silt fences, as needed. Water for dust control and operations will be obtained from several potential sources, including an on or off-site groundwater well, or trucked from an offsite water purveyor. During the construction phase, water will be used for dust suppression and other purposes. Additionally, open-bodied trucks transporting dirt will be covered while moving. During construction activities, water may be applied to reduce dust generation. Water used for dust control is authorized under the Kentucky Pollutant Discharge Elimination System (KPDES) as a non-stormwater discharge activity, which will be required for the proposed Project. The Project will comply with dust control regulations and all other applicable requirements to manage erosion, sedimentation, and stormwater runoff that will include submitting a stormwater pollution prevention plan and notice of intent for use of the Kentucky stormwater construction permit KYR10 to the Kentucky Department for Environmental Protection, Division of Water for review and approval.

34. The Project will likely not be using railways for any construction or operational activities.

6. Mitigation Measures

35. The Facility will be compatible with the existing land uses in the area. Construction methods will be implemented to minimize potential impacts on noise, dust, and traffic. The Project design also incorporates avoidance and mitigation measures for sensitive resources such as wetlands, listed plant and animal species, and sensitive cultural resources. Vegetative screening will be Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 implemented to mitigate any visual impacts of the Facility. Once the Facility enters the operational phase, there will be no hazardous materials, pollutant emissions, or discernible sound outside of the Facility. Pursuant to KRS 278.708(4), the Applicant has implemented or intends to implement the following mitigation measures for the Project:

36. Viewscape: Adjoining property values are not affected by the general rolling terrain with some distant solar panel views. The Project will utilize construction methods that minimize large-scale grading and removal of native soil. Clearing and grubbing will occur where necessary. The Project is not expected to negatively impact public road glint and glare such that any mitigation measures are necessary. Blue Moon Energy LLC provide landscape buffers of double row evergreen trees spaced on 15-feet centers, per the county zoning ordinance, along the public roadways where the arrays could be visible.

37. The Cynthiana-Harrison County Airport has one runway (11-29) with the end of the runway being within 2 miles of a portion of the facility. Glint and glare analysis were performed for the approach of Runway 29 to determine any potential impacts to approaching pilots. Modeling indicates that the southern array is directly in the flight path and has the potential to produce yellow glare and all but one of the arrays could produce green glare. Project layout data including panels and proposed substation were submitted to the Federal Aviation Administration (FAA) for potential Project impacts upon the existing runway. The FAA conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, Part 77 and found that the project would have no effect on navigable airspace or air navigation. Final approval will be secured from the Kentucky Airport Zoning Commission prior to commencing construction.

38. Vegetation: The Project has been designed to minimize the amount of tree clearing required. The landscaping plan focuses on preservation of existing vegetation, augmented by supplemental Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 vegetation to provide an effective screen and enhance the biological habitat of the area. Preexisting vegetation will remain preserved to the extent practical to retain visual consistency for adjacent properties and to achieve screening for adjacent properties and ROW. Where pre-existing vegetation was removed or considered insufficient, supplemental landscaping will be installed as depicted in the landscape plan (Exhibit A) and on the site plan to meet Ordnance requirements. Supplemental screening will consist of two rows of a combination of locally adapted evergreen species on 15-foot centers to mitigate visual impact. Supplemental plantings, where necessary, will be a minimum of six (6) feet at the time of planting, no more than 15 feet apart, and consisting of single or double rows. Proposed vegetation will size at minimum of 8 feet at maturity.

39. The interior of the Project will be reseeded with a native seed mixture of grasses and interior vegetation will be maintained at 12 inches in height to prevent shading effects and protect from safety hazards.

40. Impacts to cultural resources. A search for sensitive site receptors (adjacent historic residences, churches, schools, cemeteries, hospitals, etc.) within 1,000 feet of the Project boundary was performed.

One cemetery and two historic homes were identified within this search area. Three additional historic homes were identified outside of the Project boundary and would not be affected due to vegetation screening as implemented in the landscape plan. The Project has been designed to avoid impacts to historic homes and preserve access to one cemetery located within 500 feet of the Project.

41. Setbacks. Buffers and setbacks will be included along the boundaries of the Project and from sensitive resources such as homes, businesses, and wetlands or streams. In compliance with Article 23, Section 4 of the Ordinance, and the Conditional Use Approvals and Conditions SAR Exhibit G, Setbacks are included on the Project layout (Exhibit A and Exhibit F, SAR Exhibit F).

42. Stormwater: The Project will comply with all applicable requirements to manage erosion, sedimentation, and stormwater runoff. This will include submitting a stormwater pollution prevention plan (SWPPP) and a notice of intent (NOI) for use of the Kentucky stormwater construction permit KYR10 to the KY department for Environmental Projection, Division of Water for review and approval. The SWPPP prepared by a qualified engineer or erosion control specialist and will be implemented before and during construction. The SWPPP will be designed to reduce potential impacts related to erosion and surface water quality during construction activities and will include Project information and best management practices (BMPs). BMPs will include dewatering procedures, stormwater runoff quality control measures, concrete waste management, stormwater detention, watering for dust control, and construction of perimeter silt fences, as needed.

43. WOTUS: The Project has been designed to avoid impacts to Waters of the U.S. (WOTUS) delineated on site. If impact to such features becomes necessary, then the impact will be minimized to the extent practicable, and the appropriate Clean Water Act (CWA) Section 404/401 permit will be obtained from the U.S. Army Corps of Engineers (USACE) and the Kentucky Energy & Environment Cabinet – Department for Environmental Protection – Division of Water ("Kentucky DOW").

44. The regulation and permitting of utility scale solar impacts to stormwater and WOTUS will be addressed separately to this Siting Board application. Stormwater discharge is addressed in paragraph 42 and WOTUS are addressed in paragraph 43.

45. Regulatory Agency: Kentucky DOW: The Project will obtain a Kentucky Department of Environmental Protection Stormwater Construction General Permit from the Kentucky DOW in compliance with the CWA.

46. Regulatory Agency: USACE – Louisville District: The Project has been designed to avoid impacts to WOTUS. However, if impact becomes necessary then Blue Moon Solar will coordinate with Blue Moon Energy LLC Exhibit F Kentucky State Board on Electric Generation and Transmission Application February 2022 the USACE – Louisville District and the appropriate CWA Section 404 permit will be obtained. If

necessary, a CWA Section 401 Water Quality Certification will be obtained from the Kentucky DOW. As required, the applicant will obtain permit coverage for crossings from the USACE-Louisville District.

6.3 Applicant's Mitigation Measures

REQUIREMENT: per KRS 278.708(4); The site assessment report shall also suggest any mitigating measures to be implemented by the applicant to minimize or avoid adverse effects identified in the site assessment report; and per KRS 278.708(6); The applicant shall be given the opportunity to present evidence to the board regarding any mitigation measures. As a condition of approval for an application to obtain a construction certificate, the board may require the implementation of any mitigation measures that the board deems appropriate. The Application lists specific mitigation measures as detailed in the sixth section of the beginning of this report on page .

These mitigation measures are listed above in section 6 of this report.

6.4 Below are the additional mitigating measures recommended by the Consultant (Cloverlake Consultants)

Fugitive Dust and PM10

The applicant will submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction.

Protection of Water Resources in the Project Area

Ten days prior to the commencement of construction, the Applicant should provide a detailed plan on how they will protect water resources in the project area. The site assessment documents in several locations say that certain mitigation measures regarding erosion and protection of water resources "may" be caried out. This needs to be clearly specified.

Endangered Species and Wetlands

Wetlands Delineation Report

Wetlands research for the project area has been performed by the applicant and the project has been designed to avoid wetlands or endangered species.

Historic and Archeologic Resources

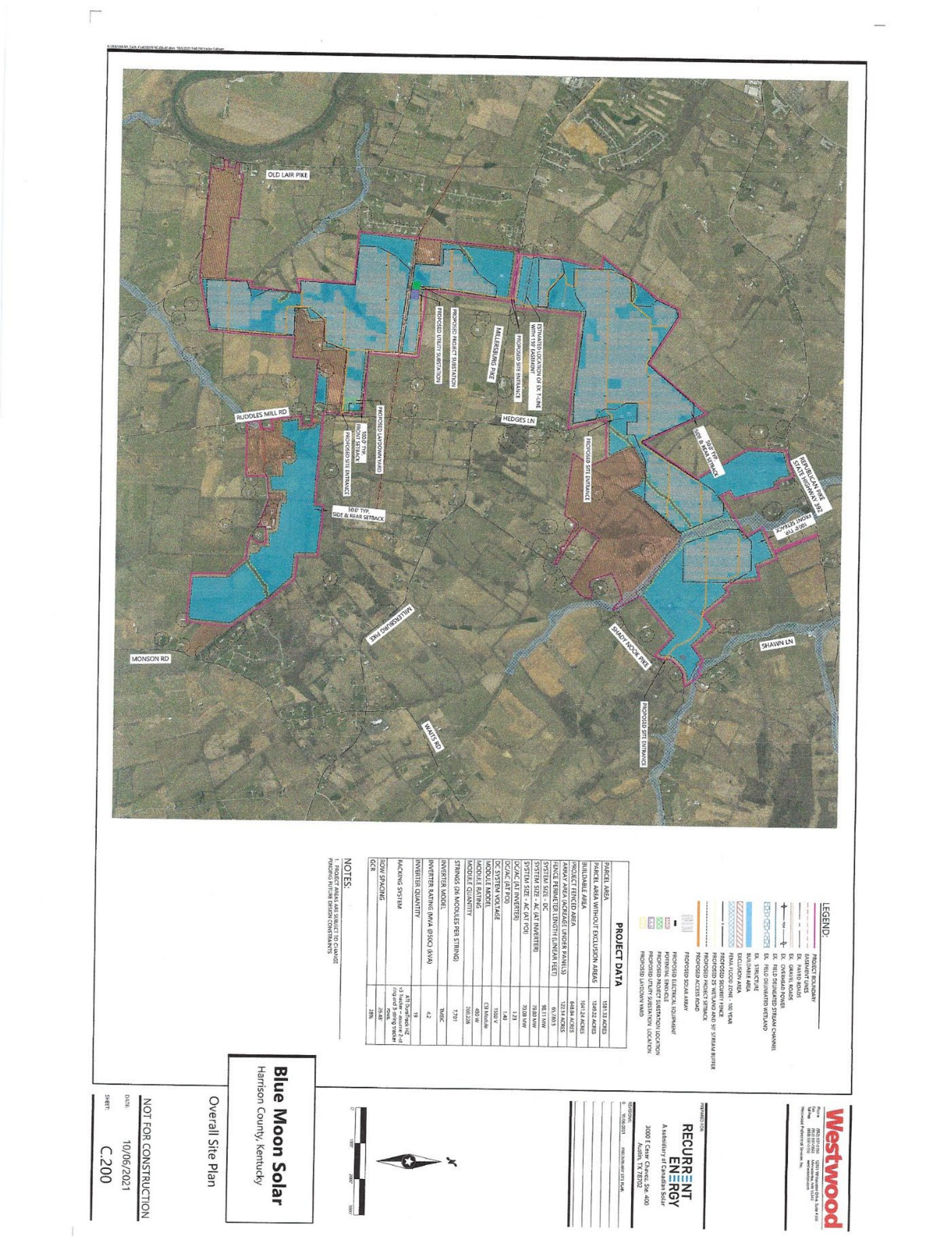
A search for sensitive archeologic and cultural resources was performed by the applicant. The project has been designed to avoid these resources.

Summary of the Adequacy of the Applicants Site Assessment Report

Based on a review of The Blue Moon Solar Project Site Assessment Report, by W. Thomas Chaney of Cloverlake Consulting, all of the sections of the report are in compliance with the intent of KRS 278.708.

Kentucky State Board on Electric Generation and Transmission Siting

Blue Moon Energy – Case No. 2021-00414



PROJECT DATA	
PARCEL AREA	1581.33 ACRES
PARCEL AREA WITHOUT EXCLUSION AREAS	1249.22 ACRES
BUILDABLE AREA	1041.24 ACRES
PROJECT FENCED AREA	648.84 ACRES
ARRAY AREA (ACREAGE UNDER PANELS)	122.14 ACRES
FENCE PERIMETER LENGTH (LINEAR FEET)	65,780.5
SYSTEM SIZE - DC	98.11 MW
SYSTEM SIZE - AC (AT INVERTER)	79.80 MW
SYSTEM SIZE - AC (AT POI)	70.08 MW
DC/AC (AT INVERTER)	1.23
DC/AC (AT POI)	1.40
DC SYSTEM VOLTAGE	1500 V
MODULE MODEL	CSI Module
MODULE RATING	490 W
MODULE QUANTITY	200,226
STRINGS (26 MODULES PER STRING)	7,701
INVERTER MODEL	TMEIC
INVERTER RATING (MVA @50C) (kVA)	4.2
INVERTER QUANTITY	19
RACKING SYSTEM	ATI DuraTrack HZ v3 Tracker – assume 2-string and 3-string tracker rows.
ROW SPACING	26.48'
GCR	28%

REFERENCES

All the information was extracted from the Applicant's Site Assessment Report Blue Moon Solar Project and a field analysis performed on April 1, 2022.

Gallery of Photographs Taken During The Site Visit on April 1, 2022

Kentucky State Board on Electric Generation and Transmission Siting
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Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

Resume W. Thomas Chaney

W. THOMAS CHANEY

PRESIDENT CLOVERLAKE CONSULTING

YEARS OF EXPERIENCE
48

EDUCATION
- MBA, Point Park University, 2011
- M.A., Environmental Planning, Eastern Kentucky University, 1973
- B.A., Physical Geography and Geology, Eastern Kentucky University, 1972

AREAS OF EXPERTISE
Strategic training and mentoring of employees
Management and direction of multidiscipline natural resource management consulting teams
Environmental Assessment of Energy Facilities
Harvard Leadership Development Training
Advanced Project Management Training

CERTIFICATION
Certified Mediator, 2004
Certified Kepner-Tregoe Rational Process Program Leader, 2003
Harvard Leadership Development
Advanced Project Management

HONORS
Cinergy "Above and Beyond Award" for Diversity, CG&E/Cinergy, Duke Energy
Diversity Champion and "Wolf" Award recipient for top individual performance, CG&E/Cinergy, Duke Energy

EXPERIENCE SUMMARY

Mr. Chaney is the President of Cloverlake Consulting Services and directs the work of expert natural resource management teams of engineers and scientists. He has a distinguished background in utility management, organizational development and consultant service to utility companies for environmental and planning work. He has done career management service for large utilities including Cinergy, Cincinnati Gas & Electric and Duke, and has consulting experience with Power Engineers, BHE Environmental, GAI Consultants, Booz-Allen Hamilton, Woolpert Consultants, and Dames and Moore.

Mr. Chaney's current practice involves Siting and Environmental Planning for major utility facilities. In several states in the Midwest. He has developed testimony and testified in front of state siting agencies.

He also specializes in strategically training and mentoring employees, and has grown a prominent Cincinnati multi-discipline environmental engineering and consulting practice. He also provided strategic training and mentoring services for CG&E, Cinergy, and Duke Energy for 25 years and currently provides these services to Master Provisions, a Northern Kentucky food charity.. Mr. Chaney developed and presented the Business Case for Diversity to Cinergy executives in 1995, and was responsible for environmental training and education, and high-performance team training and coaching.

He is a certified mediator and holds a license as a Program Leader for Kepner-Tregoe rational process.

Kentucky Public Service Commission-Siting Board Ohio Power Siting Board SITING AND CERTIFICATION

Another specialty is the management of the Ohio Power Siting Board siting/certification process. He is also proficient at managing the Kentucky PSC Siting Board Process. He was involved in the original development of the rules for these processes with the PUCO and the OPSB and served as the implementing Principal contact for CG&E, Cinergy and Duke from 1984 to 2006. He has been involved in consulting practices since then that specialize in these siting processes including GAI Consultants, BHE consultants, Power Engineers and ERM.

The following projects are a few examples of this work:

Kentucky Public Service Commission Siting Board

In his position as President of Cloverlake Consulting Services, he has completed the analysis of the adequacy of two solar projects in Kentucky; Madison Solar and Horseshoe Bend Solar. He is currently actively involved in two additional solar projects; McCracken County Solar and Meade County Solar.

AEP Siting and Permitting Projects, Ohio, Kentucky, Indiana, Virginia and West Virginia

In his position with Power Engineers, he supervised over twenty siting and permitting projects in the above states.

NIPSCO Permitting In Indiana

Mr. Chaney, likewise was involved in several Transmission Line permitting projects in Indiana for NIPSCO.

GAI Consultants, Constance-Zimmer Natural Gas Transmission Line, Ohio

Project Manager responsible for the siting, routing and certification of this transmission line. The project required numerous environmental permits and a Certificate of Environmental Compatibility and Public need from the Ohio Power Siting Board (OPSB).

Dominion East Ohio Gas, Akron-Canton Gas Transmission Line, Ohio

Project manager responsible for siting, certification (OPSB) and permitting.

Management Consulting, Large Aviation and Environmental Projects

As a management consultant for a private management consulting firm, Mr. Chaney was responsible for numerous large aviation and environmental projects, including the Chicago, O'Hare International Airport Delta Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS) Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS)project, and the Greater Pittsburgh International Airport Midfield Terminal Studies project that required noise and land use compatibility studies.

Regional Planning Manager

As a planning manager for the Northern Kentucky Area Development District, Mr. Chaney covered all aspects of regional planning for eight counties in northern Kentucky. He supervised professional and clerical staff dealing with issues on the environment, housing, land use and recreation in compliance with the Older Americans Act (Title III) and the Social Security Act (Titles XIX and XX).

Senior Environmental Planning Consultant

Mr. Chaney's experience as a Senior Environmental Planner with a private consulting firm required management of numerous land use planning and environmental assessment projects. His duties included marketing, proposal preparation, budget preparation, staffing, and project management that included accountability to the client.

Duke Energy, Edwardsport IGCC Start-Up Natural Gas Line, Indiana

Project Manager for the routing and permitting of a gas transmission line used to start-up the Edwardsport Indiana IGCC. This project is a clean coal endeavor that utilizes Illinois Basin high sulfur coal.

Dominion East Ohio Gas Company, Solid Waste Natural Gas Siting Study and Application, Ohio

Project Manager for the OPSB application for this complex project, which was rerouted due to the construction of a large municipal landfill.

GAI Consultants, Rockies Express Line, Ohio

Project Manager for cultural resources projects associated with this gas transmission line.

CG&E, Gas Storage Site, Kentucky

Project Manager responsible for the environmental permitting of this large gas storage site, formerly a depleted gas and oil production field.

CG&E/Cinergy/Duke Energy, Natural Gas Licensing Projects, Multiple States

Reviewed and led the licensing and environmental permitting for all natural gas transmission line projects.

CG&E/Cinergy, Numerous Power Plant, Transmission Line and Gas Line Siting and Permitting Projects

In his capacity as Licensing Division Director, Mr. Chaney was involved in more than 100 Transmission Line, Gas Line and Power Plant projects during his tenure with CG&E/Cinergy/Duke.

Kentucky State Board on Electric Generation and Transmission Siting
Blue Moon Energy – Case No. 2021-00414

ATTACHMENT C

Review Appraisal

Of:

Kirkland Appraisals, LLC

Impact Study

Blue Moon Solar Project

Harrison County, Kentucky

1113.07 Total 949.87 with panels Acres

Date of Review

May 05, 2022

Prepared for:

Mr. Scott Campbell, Senior Project Manager

Wells Engineering

6900 Houston Road, Suite 38

Florence, Kentucky 41042

Prepared by:

E. Clark Toleman, MAI, SRA

333 West Vine Street, Suite 300

Lexington, Kentucky 40507

E. Clark Toleman, MAI, SRPA

Real Estate Appraisal Services

VINE CENTER 333 W. VINE ST., SUITE 300 · LEXINGTON, KENTUCKY 40507
TEL. (859) 253-0314 · FAX (859) 253-0653

May 15,2022

Mr. Scott H. Campbell
Senior Project Manager
Wells Engineering
6900 Houston Road, Suite 38
Florence, Kentucky 41042

Re: ***Review Appraisal Report***
Kirkland Appraisal, LLC-Impact Study
Blue Moon Solar Project, Harrison County Kentucky

Dear Mr. Campbell

Following your request, I have carried out an investigation and review of the Kirkland Appraisal LLC Impact Study that estimates the impact in terms of property value to the surrounding properties to the proposed Blue Moon Solar Project. The Kirkland report is part of the application for the 1,113.07 acre solar project with 949.87 with panels amened to 1,581.33 acres total parcel area with 1,249.22 acres unrestricted for panels to The Kentucky State Board on Electric Generation and Transmission Siting. I have reviewed the Kirkland report as well as the data within in application, and made a physical inspection of the subject parcels that make up the project and surrounding area. There are 77 properties that have been identified as adjoining the project tracts.

Considering my analysis of the Kirkland Impact Study my conclusion is that the report is credible and representative of the market conditions that would exist should the Blue Moon Solar Project be constructed.

The following is a summary of my technical review of the Kirkland report and comments on the specific data and analysis contained in the report prepared in compliance with Standard 3 of the Uniform Standards of Professional Practice.

Respectfully submitted,

E. Clark Toleman, MAI, SRA

Project Name:	*Blue Moon Solar Project*
Property Address:	Agracultural/Rural
Metropolitan Area:	Cynthiana, KY Harrison County Seat
Property Type:	Agracultural with homesites
Report Option:	Narrative Impact Study
Review Client:	Mr .Scott Campbell Wells Engineering 6900 Houston Rd., Suite 38 Florence, Ky.41042
Intended Use of Review:	Internal Use

Purpose of this Review

The purpose of this review is to determine if the appraisal report is essentially in compliance with:

(1) The uniform Standards of Professional Appraisal Practice (USPAP) as promulgated by the Appraisal Standards Board of The Appraisal Foundation;

Scope of the Review

This review was limited to an analysis of the appraisal report in order to form an opinion as to:

- The completeness of the report;
- The adequacy and relevance of the data presented;
- The reasonableness of any adjustments made by the appraiser to the data;
- The appropriateness of appraisal methods and techniques used; and
- The adequacy and reasonableness of the analysis, opinions and conclusions contained in the appraisal report.

Reviewer: E. Clark Toleman MAI, SRA Date of Review: May 05, 2022

Purpose of the Impact Study

The purpose of this impact study under review is to estimate any related change in terms of market value to the adjoining properties due to the proposed solar project known as Blue Moon in Harrison County as of July 31, 2021.

Market Value is defined as:

> The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller, each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus, Implicit in this definition is the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby: (1) buyer and seller are typically motivated; (2) both parties are will informed or well advised, and each acting in what he considers his own best interest; (3) a reasonable time is allowed for exposure to open markets; (4) payment is made in terms of cash in U,S, dollars or in terms of financial arrangements comparable thereto; and (5) the price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale.

Market Value is therefore the actual real dollar value of the subject property would bring at an appraisal date under "normal" conditions with the seller and buyer acting reasonably. The contemporary concept emphasizes cash value. This is necessary in the investigation of "market" sales to equate any non-typical financing terms to conditions that are typical at an appraisal date.

Intended Use of the Appraisal

This review appraisal is prepared for Wells Engineering on behalf of the Kentucky State Board on Electric Generation and Transmission Siting Board.

Date of Appraisal Review

This Review Appraisal is made as of May 05, 2022 with all economic, statistical and market data correlated to this date. The last inspection of the property was made on this date and all physical characteristics are described relative to this date unless otherwise sated within this report.

Proposed Project Area

The subject properties are situated on the east side of the Cynthiana city limits with a total parcel area of 1581.33 acre with an area of 1,249.22 without exclusions filed in a subsequent filing. The Kirkland report shows the same parcel area but states the total parcel area is 1,113.07 acres with panels restricted to 949.87 acres. The parent parcels are on HW 392,HW 36 E, and HW 1940. All the adjoining seventy-seven properties are listed including thirty-five residential tracts under ten acres with the balance being general farms. The Kirkland Impact Study states the closest adjoining house will be 250 feet from a solar panel with an average distance to the adjoining residence being 1,545 feet.

List of Adjoining Properties

Surrounding Uses

#	MAP ID	Owner	GIS Data Acres	Present Use	Distance (ft) Home/Panel	L.F Adjacent	Fair Cash Value
1	115-0000-038-00-000	MSJ	196.09	Agricultural	N/A	3,580	$618,944
2	128-0000-003-00-000	Bradford	66.59	Agri/Res	3,185	1,410	$377,471
3	128-0000-007-00-000	Florence	99.09	Agricultural	N/A	6,350	$429,200
4	128-0000-004-00-000	Nichols	82.00	Agri/Res	3,055	755	$283,930
5	128-0000-009-00-000	Fowler	1.72	Residential	2,505	631	$138,935
6	128-0000-010-00-000	Thomas	40.00	Agri/Res	1,650	3,495	$235,030
7	128-0000-013-01-000	Whalen	25.49	Agricultural	N/A	1,982	$256,178
8	128-0000-012-00-000	Nichols	30.00	Agricultural	N/A	34	$104,210
9	128-0000-016-00-000	Bradford	92.00	Agricultural	N/A	2,413	$350,390
10	128-0000-025-00-000	Obryan	70.65	Agri/Res	870	4,065	$269,200
11	128-0000-026-00-000	Wiglesworth	0.58	Residential	N/A	255	$10,000
12	140-0000-009-03-000	Corbin	5.53	Residential	2,450	235	$40,500
13	141-0000-005-01-000	Hostetler	80.00	Agri/Res	2,370	440	$316,900
14	141-0000-004-00-000	Berry	110.00	Agri/Res	3,641	774	$241,886
15	141-0000-003-00-000	Arnold	2.16	Residential	2,105	227	$76,800
16	141-0000-002-00-000	Brewer	2.03	Residential	1,940	305	$172,000
17	129-0000-023-00-000	Whitaker	65.00	Agricultural	N/A	1	$227,260
18	129-0000-023-02-000	Moore	29.32	Agri/Res	1,060	2,975	$295,000
19	129-0000-023-01-000	May	6.86	Residential	1,450	35	$215,000
20	129-0000-022-00-000	Reno	13.75	Residential	1,385	2,350	$166,483
21	129-0000-023-03-000	Whitaker	19.08	Residential	N/A	305	$56,455
22	129-0000-023-04-000	Sparks	4.88	Residential	N/A	420	$25,000
23	129-0000-021-00-000	Dampier	0.95	Residential	2,375	1	$95,165
24	129-0000-019-02-000	Midden	19.35	Residential	2,315	3,325	$410,077
25	129-0000-020-00-000	Moore	50.00	Agri/Res	2,840	65	$232,870
26	129-0000-019-01-000	Carrel	9.40	Residential	2,910	1,160	$228,054
27	129-0000-016-00-000	Batte	14.71	Residential	2,845	580	$280,000
28	129-0000-007-01-000	Cook	131.60	Agricultural	N/A	4,685	$284,200
29	129-0000-008-00-000	Cook	3.51	Residential	705	130	$169,300
30	129-0000-002-06-000	Zimmerman	2.02	Residential	665	400	$178,900
31	129-0000-002-00-000	Craycraft	40.81	Agri/Res	2,075	680	$342,975
32	116-0000-011-03-000	Craycraft	51.23	Agricultural	N/A	2,400	$133,960
33	116-0000-011-04-000	Bennett	39.14	Agricultural	N/A	1,605	$178,096
34	116-0000-012-00-000	McGee	100.00	Agri/Res	670	4,215	$459,610
35	130-0000-001-00-000	McGee	311.11	Agricultural	N/A	7,400	$1,298,545
36	130-0000-017-00-000	McCloskey	36.81	Agri/Res	2,180	880	$280,000
37	130-0000-020-05-000	Hemlock	70.25	Agri/Res	1,080	1,950	$332,585
38	130-0000-026-00-000	Ingram	5.05	Residential	435	855	$204,910
39	130-0000-032-02-000	Sing	2.02	Residential	250	285	$41,500
40	130-0000-032-01-000	Sanders	2.00	Residential	350	255	$189,375
41	130-0000-022-00-000	Perraut	90.97	Agri/Res	1,190	2,600	$489,487
42	130-0000-013-00-000	Clyde	166.20	Agricultural	N/A	3,070	$628,500
43	130-0000-012-02-000	Asher	3.39	Residential	460	1,155	$340,000
44	130-0000-007-01-000	Mcilvain	5.11	Residential	680	310	$195,622
45	130-0000-007-02-000	Grayson	5.11	Residential	590	290	$48,000
46	130-0000-007-00-000	Rose	25.50	Agri/Res	1,605	1,160	$240,000
47	130-0000-007-05-000	Rose	2.13	Residential	1,605	340	$140,758
48	130-0000-010-02-000	Owsley	1.46	Residential	1,455	545	$111,580
49	130-0000-010-01-000	Carter	2.00	Residential	1,670	830	$158,320

#	MAP ID	Owner	GIS Data Acres	Present Use	Distance (ft) Home/Panel	L.F Adjacent	Fair Cash Value
50	130-0000-005-00-000	Whitaker	40.00	Agri/Res	1,335	3,460	$295,895
51	130-0000-006-00-000	Whitaker	89.00	Agricultural	N/A	1,210	$346,050
52	130-0000-008-00-000	Curtis	100.27	Agri/Res	960	390	$337,500
53	117-0000-025-00-000	Mckee	84.11	Agri/Res	825	1,400	$316,870
54	117-0000-024-04-000	Mckee	2.00	Residential	320	150	$110,000
55	117-0000-024-01-000	Stinson	40.64	Agricultural	N/A	550	$174,983
56	117-0000-024-03-000	Saurer	28.78	Agricultural	N/A	1,915	$106,303
57	117-0000-024-02-000	Grinstead	12.52	Residential	2,775	475	$145,438
58	117-0000-022-02-000	Moore	2.46	Residential	3,205	660	$225,370
59	117-0000-020-00-000	Lucky	11.00	Residential	3,320	215	$106,000
60	117-0000-023-00-000	Mckee	0.95	Residential	3,145	550	$170,720
61	117-0000-022-01-000	Neace	0.77	Residential	3,085	430	$89,400
62	117-0000-021-00-000	Lemons	2.07	Residential	3,140	40	$156,000
63	117-0000-008-02-000	Boone	104.78	Agricultural	N/A	3,765	$412,012
64	117-0000-008-00-000	Lusby	91.92	Agri/Res	785	4,910	$395,096
65	117-0000-045-00-000	Ishmael	1.20	Residential	450	1	$148,846
66	117-0000-044-00-000	Royalty	1.80	Residential	360	375	$195,500
67	117-0000-043-00-000	Simpson	1.26	Residential	375	185	$140,000
68	117-0000-042-00-000	Stubbs	1.26	Residential	350	245	$143,000
69	117-0000-041-00-000	Gasser	1.26	Residential	N/A	170	$26,000
70	117-0000-040-00-000	Vallandingham	1.26	Residential	340	185	$284,015
71	117-0000-039-00-000	Landrum	1.26	Residential	300	175	$178,600
72	117-0000-038-00-000	Kinsey	1.46	Residential	300	185	$208,125
73	116-0000-009-09-000	Martin	29.26	Agricultural	N/A	1,100	$283,000
74	116-0000-010-00-000	Wade	23.48	Agricultural	N/A	1,480	$138,760
75	116-0000-010-01-000	Anderson	1.74	Residential	550	280	$152,080
76	116-0000-011-00-000	Levi	1.98	Residential	435	3,235	$102,500
77	116-0000-001-00-000	Colson	175.59	Agricultural	N/A	925	$656,952
		Total	**3088.730**		1,545	1,336	$242,132

N/A indicates that there is no adjoining home to which to measure.

Linear feet of adjacency listed in red means that the property is across a right of way from the subject property.

Linear feet of adjacency of 1 foot was assigned where properties meet at a corner.

The Fair Cash Value was derived from the Harrison County PVA website and the map and parcel information was derived from the Harrison County GIS/PVA website.

Methodology to Indicate Effect on Adjoining Properties

The Kirkland Impact Study utilizes the Paired Sales Analysis as the basis for an indication of change in value experienced to adjoining properties from solar farm projects in several states. This is a quantitative analysis to identify the effect of any one characteristic in a given market on market price. This analysis is used to estimate what adjustment is indicated for an individual characteristic such as a garage, swimming pool or any number of characteristics that need adjustment for the subject property. This is a standard analysis technique in appraisal practice and is most indicative when there is a large sample size.

The Kirkland Impact Study applied the paired sales analysis to adjoining properties around solar farms in 10 states including Kentucky. The result is has been broken down into sub-groups with the Kentucky analysis indicating a range of change in value from -1% to +3%.It should be mentioned that three of these solar farms are on the utility companies land and one is in an industrial park.

The next survey is done in the surrounding states including 19 solar farms with a paired sale analysis indicating a range of effect on value from -5% to +7% with an average overall change of +1%. This result would indicate a neutral effect overall. Solar farms over 5 MW where than analyzed including 23 projects and 56 paired sales studied with gross range in change from -10% to +10, with only one sale showing -10%, 41 sales indicating 0% to +7% and the average being +1%, which overall is an indication of a neutral effect.

Conclusion of Solar Farm Impact

These paired sales are a strong indicator that proximity to a solar farm has a neutral impact on the adjoining property value when a buffer screening is in place, and this is because a solar farm is a passive entity without the recognized nuisance characteristics of noise, traffic, odor, or other typical stigma considered to create a detrimental effect. There is a review of published research material on this subject included in this Impact Study which also indicates the neutral effect on the adjoining property to solar and wind farms.

Review Appraiser's Limiting Conditions and Certification

- This review memorandum is based on data and information contained in the appraisal report under review as well as additional information from other sources that may be applicable and have been identified.
- It is assumed that the data and information contained in the appraisal under review are factual and accurate.
- The reviewer reserves the right to consider any additional information that may subsequently become available and may revise any opinions and conclusions if such data and information dictate the need for change.
- Unless otherwise stated, all of the assumptions and limiting conditions contained in the appraisal report under review are also conditions of this report.
- This appraisal review is specifically not an appraisal. Any opinions expressed by the reviewer are limited by the scope of the analysis identified in this review report.
- If the yield capitalization methodology (discounted cash flow analysis) was completed by the appraiser using a market-accepted, preformatted lease-by-lease software program: To the extent possible, the inputs have been scanned for reasonableness, however, neither the reliability or accuracy of the inputs nor the expertise or competency of the person working with the software can be verified by the reviewer. Further, no property specific, corroborating diskette has been submitted with this assignment.
- The review appraiser is not required to give testimony or appear in court, or at public hearings or at any special meeting or hearing with reference to the property appraised or the appraisal report, unless arrangements have been made prior to preparation of this report.

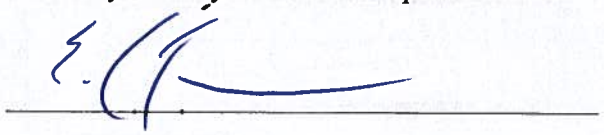
- All data provided in the appraisal reviewed is assumed to be accurate and complete and that there has been no omission of data that would affect the reviewer's conclusions.

I certify that, to the best of my knowledge and belief:

- the facts and data reported by the reviewer and used in the review process are true and correct.
- the analyses, opinion and conclusions in this review report are limited only by the assumptions and limiting conditions stated in this review report and are my personal, impartial and unbiased professional analysis, opinions and conclusions.
- I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- my engagement in this assignment was not contingent upon developing or reporting predetermined results.
- my compensation is not contingent on an action or event resulting from the analyses, opinions or conclusions in this review or from its use.
- my analyses, opinions and conclusions were developed and this review report was prepared in conformity with the Uniform standards of Professional Appraisal Practice

(USPAP) and all federal, state and banking regulations in force and applicable as of the date of this report.

- I have made a personal inspection of the work and subject property under review.
- no one provided significant appraisal, appraisal review or appraisal consulting assistance to the person signing this certification, and I have not provided any prior appraisal service on this property.
- As of the date of this report, E. Clark Toleman, MAI, SRA has completed the continuing education requirements of the Appraisal Institute.
- The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.

Signed: 

ATTACHMENT D

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Review and Evaluation of the Application of Blue Moon Energy LLC for an Approximately 70 Megawatt Merchant Electric Solar Generating Facility and Nonregulated Electric Transmission Line in Harrison County, Kentucky Siting Board Case No. 2021-00414

Economic Impact Analyses

Prepared for

Wells Engineering PSC
6900 Houston Road, Suite 38
Florence, Kentucky 41042

By

Mark M. Watters
Watters Unclaimed Property Consulting LLC
2519 Ashton Court
Cincinnati, Ohio 45244

Before the Kentucky State Board on Electric Generation and Transmission Siting
Case No. 2021-00414

Executive Summary

Based upon the representations of the Applicant through its Economic Impact Analysis and Responses to the Siting Board's Requests for Information, there is a significant, short-term initial economic to both the region and the Commonwealth of Kentucky. During the longer operational (generation) phase, there are lesser-but-positive economic regional impacts. The Applicant's *Blue Moon Solar Economic & Fiscal Contribution to Harrison County & the State of Kentucky* prepared by Mangum Economics, is a thorough report exhaustively detailing and supporting the positive economic impacts the proposed project and facility.

Project Factual Summary

Blue Moon Energy LLC is requesting authorization to construct and operate a 70-megawatt merchant electric solar generating facility and nonregulated electric transmission line in Harrison County, Commonwealth of Kentucky, on 1,581 acres (1,113.07 per Kirkland Appraisal, *Application* Exhibit F) near Cynthiana, Kentucky. The Project specifications involve both electric production and transmission tying into the existing electrical grid through one or more transmission lines that are part of the Project.

Blue Moon Energy LLC is a Delaware-domiciled limited liability company with its principal offices at 123 Mission Street, 18th Floor, San Francisco, California 94105. Blue Moon Energy LLC appears to be a wholly-owned subsidiary of Canadian Solar Inc., Ontario, Canada.

The Construction Phase of the Project is projected to involve a total capital investment of $91.8 million. This is subdivided into architecture, engineering, site preparation, construction, and other development of $28.1 million, of which 74% (or estimated $20.8 million) would be spent in Harrison County; and equipment and other costs of $63.8 million, with no capital equipment purchases expected from within Harrison County.

Review Criteria and Methodology

This review encompasses the entirety of Blue Moon Energy LLC's Application, including its Exhibits, especially "Attachment E", *Blue Moon Solar Economic & Fiscal Contribution to Harrison County & the State of* Kentucky ("Economic Report"), prepared by Mangum Economics, 4201 Dominion Boulevard, Suite 114, Glen Allen, VA 23060, using IMPLAN, and the Responses to the Siting Board Staff's First and Second Requests for Information.

Methodology. The Economic Report and its analyses of both Construction and Operational Phases of the Project were reviewed to consider:

- Specific aspects of the Project - specific tasks and activities; their chronology and timelines; and the geographic aspects of the Project and their effects;

- The quantification and/or estimation of the above-listed criteria for impact upon state, regional and local areas within the Commonwealth;

- Other civil, social and subjective (non-monetary) economic effects within the community, region, and state; and

- Potential impacts, either positive or negative, to current use or other industries and businesses

- Electrical output compared to current agrarian production.

Basis for Analysis. KRS 278.706 states that any person seeking to obtain a construction certificate to construct a merchant generating facility must file:

> **KRS 278.706**
>
> * * * *
>
> (2) A completed application [including] the following:
>
> (j) An analysis of the propose facility's economic impact on the affected region and the state.

Criteria for analysis. This review and evaluation of Applicant Blue Moon Energy LLC's proposed Solar Energy Project ("Project") is based upon projected short-term Construction- and long-term Operational Phases, as described by the Applicant and detailed by responses to questions posed to that Applicant. The Applicant's Economic Impact Report and their Responses are analyzed for each Phase, using the following criteria:

Direct impacts. Wages paid to employed workers for construction and maintenance Phases.

Indirect Impacts. Purchases of goods, materials and services necessary for the construction and maintenance of the Project facilities

Induced Impacts. Expenditures for goods and services by workers spending portions of their Project-related wages at local and regional third-party businesses

Kentucky Income and Franchise Taxes.

Local Occupational Taxes.

Kentucky Commonwealth and Local Property Taxes.

- Real estate taxes
- Tangible Personal Property Taxes
- Fees in lieu of property taxes

Kentucky Commonwealth Sales Taxes.

Electrical and other Outputs. This criterion is a measure of the value of goods and services produced. Stated differently, "output" is the value of projection by the industry or producer in a calendar year or, in the present case, for the period of production.[1]

By definition, each criterion is reviewed in the context of ***net*** economic impact: the vary terminology demands that in each instance there is an existing "baseline" from which positive or negative economic results may arise.

Applied Review and Analysis

Review Summary

Overall it appears that the proposed Project will likely have some positive economic impact on the local, regional and commonwealth economy. For most criteria there is a positive impact. However, the purported measure of Output is fatally flawed – rather than measuring the value of goods and services produced (for the present Project, electrical output), that analysis seems to measure values based upon indirect or induced impacts of expenditures, not production. Discussion of each criterion follows. All sums are in current dollars:

Direct, Indirect and Induces Impacts

Direct impacts. The applicant has outlined the basis for concluding the Project is projected to produce direct impacts during the Construction Phase of $12.1 million (Commonwealth) and $8.8 million (Harrison County). This represents a projection of 190 statewide and 143 local full-time jobs for the county and region. Current agrarian impact was not reviewed, but usually is modest. Direct impact during the Production Phase is projected as 1 job of modest income ($52,565) with no agrarian income analyzed for netting. The Applicant's solar project is likely to have a significant short-term impact on the regional and Commonwealth economy during the Construction Phase and a modest (if any) impact during Operational Phase.

[1] See, e.g., *Output Data,* https://support.implan.com/hc/en-us/articles/115009505807-Output-Data#:~:text=In%20IMPLAN%2C%20Output%20is%20the%20value%20of%20production,margin%20only%3B%20it%20does%20not%20represent%20revenues%20%28sales%29.

Indirect impacts from purchases of goods and services purchased in conjunction with work capitalized during the Construction Phase is estimated to be $91.8 million.[2] This is further subdivided into $28.1 million for architecture, engineering, site preparation, and other development and construction costs (of which 74%, or $20.8 million, would be attributable to Harrison County); and Capitalized equipment and other costs of $63.8 million in both the county and Commonwealth. These numbers would appear to be in line with similar projects. While not addressed, continued agrarian use would likely hove negligible indirect impacts on the community or Commonwealth.

Induced Impacts during the Construction Phase are projected to add 100 job equivalent sand $4.6 million to the Commonwealth economy (40 job equivalents and labor income of $1.55 million dollars within Harrison County). During the Operational Phase of production, the induced impact is projected as creating 3 jobs statewide and in Harrison County, resulting in labor income of $137,000 within the state annually (and $118,000 within the county). Although local jobs and income from current agrarian activity. Although not projected, these numbers would be believed to compare favorably to induced impact from current local farming, for which such impacts might be assumed negligible.

Output

The generation of electricity by the Project (Output), is measured by positive cash flow, for the generation and sales of produced electri8ucity. For the reasons below, the projected numbers should probably be ignored and the electrical output, unknown.

For the Construction Phase, the Applicant has asserted an expected economic output of $43.5 million statewide and $26.3 in Harrison County, Kentucky.[3] This assertion is highly questionable, absent more detail of what this output would be. By definition, it is unlikely that the Project and its facility would generate saleable electricity of the purported sums during construction.

For the Production phase, the Applicant has projected output of $425,824 (statewide) and $365,475 (county). These sums for the 40-year term of the Phase seem unrealistically low[4]. The numbers seem linked to the number of employees, not electrical output.

The economic output for current (agrarian) usage was not reviewed.

Tax Impacts

Kentucky taxes for Impact Studies are further grouped as business taxes, employment taxes, sales and use taxes, and property taxes for the purposes of this review.

[2] *Economic Report*, p. 18-19.
[3] Ibid., pp. 2 & 18-20.
[4] Ibid., pp. 2-3 & 20-21.

Business taxes include Commonwealth income, franchise and like taxes.

The Applicant taxpayer is a limited liability company (LLC). LLC's are not directly taxed for income purposes by the Commonwealth, but their ownership may be. LLC members may be taxed as single-member LLC (sole proprietorship which files federal and/or state income taxes); as a partnership whose partners file taxes (liable for self-employment taxes and income taxes); as C corporations, taxed as such; or S Corporations who pay corporate income taxes. In addition, LLC's file an Annual Report with the Secretary of State with a $15 fee.

The Applicant has made no projection of Commonwealth business taxes with supporting information, data or calculations.

Employment taxes would include primarily local occupational taxes. These are sometimes grouped with business taxes as they are local income-based taxes but paid by the employer from withholding of the employees' wages. These taxes have not been specifically identified or segregated within the *Economic Report*; however, for the Construction Phase, the Applicant has identified $2.0 million in state and local tax revenue[5], which may be presumptive of these taxes.

As farming is generally conducted at a loss, these projected amount may be representative of the economic impact of this tax. The Applicant's payment of rental income to landowners may also generate additional income and other business taxes.

Sales and use taxes are taxes paid for purchasing goods and services within the Commonwealth, or with the complementary use tax, for property and services not taxable or undertaxed at the point of origin for which the commonwealth imposes their own tax. The applicant represents the project will pay $0.9 million in sales and use taxes, of which 0.78 are projected to be paid to the Commonwealth. While not necessarily a common appearance by solar generating and transmitting applicants, we note that the Canadian parent company is a manufacturer of solar voltaic modules and other solar energy generation and battery solutions, which, assuming purchasing from the parent comp[any, might account for the in-state sales or use tax revenues.

Property taxes included programs for real and personal property and includes tax alternatives such as IRB and PILOT.

Real estate taxes, currently based upon farm usage, will not change during the short Construction Phase. Current agrarian use taxation yields $2,805 in local and $395 Commonwealth taxes per year. This would accumulate taxes of $112,200 (local) and $15,798 (Commonwealth) real estate taxes over the 40-year Operational Phase. The Applicant has provided the cumulative projected increase in taxes based computation of gross taxes without

[5] *Economic Report*, p.2.

the agricultural exemption net of the current real estate taxes (for which the agricultural exemption has been applied). The net state projected additional real property taxes would increase by $2,172 per year, or $86,895 over the 40-year Operational Phase of production. The local real estate taxes would increase by $617,161.[6]

Personal property taxes are analyzed and projected by applying both statutory tax rates without enhancement or assistance programs; and by application of Industrial Revenue Bonds (IRB) and Payments in Lieu of Taxes (PILOT). Personal property taxes would only be applicable during the anticipated Operational Phase. State tax revenue from the Manufacturing Machinery Tax would be $649,161 and taxation of other personal property, $216,387, or a total of $865,548. Locally, the Harrison School District would receive a projected $814,311 in PILOT payments. Under current land usage, the personal property taxes would be expected to be substantially lower for both Commonwealth and local taxes.

The total increase of all property taxes for the 40-year Operational Phase, for both real estate and personal property taxes, are estimated to be $2,431,472 for local taxes (including PILOT) and $952,443 for Commonwealth taxes, or a total of $2,383,915, and an additional Commonwealth taxes of $952,443 over the same 40-year period.

Conclusions and Recommendations

The construction and operation of the Blue Moon Energy solar project facility in Harrison County, Kentucky will provide economic benefits to the region and Commonwealth.

Overall, the Project will provide significant positive economic effects to the region and Commonwealth during the short Construction Phase. Measurable payroll and associated occupational taxes (although not clearly identified), together with indirect impacts through secondary payroll in the local economy will realize both payroll and occupational tax increases.

During the Operational Phase, the economic impact is expected to be smaller for the region and Commonwealth. A modest payroll, over the county average, will provide employment for a projected 3 individuals (one direct, 2 indirect) with modest local occupancy taxes in- and without Harrison County. With IRD and PILOT agreements in place, over the 40-year life of the Operational Phase, the Applicant represents that property taxes and equivalents will generate net property taxes of $2.4 million.

[6] *Project Report*, pp. 22-23 & 28.

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Electric Generation and Transmission Siting Studies and Analyses – Economic Impact - Solar – Before the Kentucky Board on Electric Generation and Transmission Siting

In RE: Bluebird Solar LLC, Case No. 2021-00141, Application for Certificate to Construct an Approximately 90 Megawatt Merchant Electric Generating Facility in Harrison County, Kentucky (May 2022)

In Re: Sebree Solar, LLC, Case No 2021-00072, Application for Certificate to Construct an Approximately 60 Megawatt Merchant Solar Electric Generating Facility in Meade County, Kentucky (circa November 2021)

In Re: McCracken County Solar LLC, Case No 2020-00392, Application for Certificate to Construct an Approximately 60 Megawatt Merchant Solar Electric Generating Facility in Meade County, Kentucky (circa September 2020)

In Re: Meade County Solar LLC, Case No 2020-00390, Application for Certificate to Construct an Approximately 40 Megawatt Merchant Solar Electric Generating Facility in Meade County, Kentucky (circa September 2020)

As a subcontractor to the primary contractor for such study, reviewed the Applicant project reports of direct, indirect and induced economic impacts on the state and community; state corporate income, personal income, and occupational taxes; real and person property taxes; sales and use taxes; and net output value of goods and services produced.

Tax Studies – Real & Personal Property, Sales and Use, and Local Taxation Including Available Incentives, Deductions and Exemptions

Planning, Design and Analysis of Electrical Power System Upgrades – Tennessee

Performed construction contract review for the purposes of making a proposal for electronic system upgrades, to determine application of major taxes – Income, property sales and use taxes, rates, exemptions, exceptions, and available incentives applicable to Michigan.

Tax Studies – Kentucky Occupational Taxes

Research to identify local occupational taxes for proposed job sites
Prior to initiation and execution of contractor work projects, researched local occupation taxes for applicability, rates, registration and returns.

Tax Studies – Sales and Use Taxation

Planning, Design and Analysis of Electrical Power System Upgrades - Michigan
Performed construction contract review for the purposes of making a proposal for electronic system upgrades, to determine application of sales and use – and state tax exemptions deductions and incentives available.

Taxes Corporate Registration to Do Business and Pay Taxes and Fees

Registration of a Business and For Taxation - Pennsylvania
Made applications with the Pennsylvania Secretary of State for state registration and with the state Department of Revenue for all state and local applicable taxes.

Registration and Management of State Personal and Gross Receipts Taxes

Registration for Taxation – New Mexico
Determine applicable taxes and means of registration for payment of New Mexico personal and gross receipts taxes.

ATTACHMENT E

Response to Noise Abatement Systems for Solar Farm Pile Driving

These are responses to pile driving noise abatement questions asked by Wells Engineering on behalf of the Kentucky Public Service Commission:

There are many ways to shroud and reduce the noise around pile driving at Solar Farm installations. Barriers and noise reducing curtains are on the market that can provide the ultimate, and potentially expensive methods to reduce the noise from pile driving at a construction site.(See the images at the end of this document) Additionally, earthen and concrete block barriers can be constructed and utilized that are less convenient but could possibly be more cost effective.

Specifically, the questions being asked are as follows:

- Is sound blanketing the right or most effective method of noise reduction?
- Is sound blanketing the standard for noise reduction?
- What are the other methods of noise reduction and how effective are they when compared to sound dampening as well as to each other?
- Provide a recommendation on the best(or the most appropriate) method of reducing the noise.

Is sound blanketing the right or most effective method of noise reduction?

There are many products and methods for construction noise mitigation on the market. It depends on the severity of the situation and the level of the sensitivity of the land use being affected by the pile driving noise. Ideally, if the sensitive land use is adjacent to or within 500 feet of the installation, the constructor could use noise shrouds, temporary noise walls or barriers or curtains to reduce noise levels by 15 to 30 dB (A) making the noise less noxious to local residents.

Trans Mountain Energy is an example of a company taking an innovative approach to help reduce noise from pile driving activities for construction at their Westridge Marine Terminal as part of the Trans Mountain Expansion Project.

Contractors for this project will be using ‘noise shrouds’ to cover the hammers that drive piles into the ocean floor for the new marine terminal in the Burrard

Inlet. The shrouds, which are about two stories tall and wide enough to hold a medium-sized SUV, dampen the sound of hammer impact.

The noise shrouds are being sourced from a company based in Germany specifically for the Trans Mountain Energy project and are designed to fit the hammers that drive the piles. This technique has been used in other projects around the world.

These shrouds could also be used on the ground at a Solar Farm installation. These are a very expensive and extreme option to remedy the issue of reducing pile driving noise by 15-30dB(A). (See the photo at the end of this document, photo 1)

Is sound blanketing the standard for noise abatement?

Sound blanketing/shrouding appears to be the most viable option for the application of pile driving for solar farm construction. It should be coupled with understanding the schedules of the affected residents and working with them to do the pile driving at times during the construction day when they may be away from their properties.

What are the other methods of noise reduction and how effective are they when compared to sound dampening as well as to each other?

- Trying to reduce the time required for pile driving by being more time effective with the pile driving.

  This tactic may not be cost or schedule effective.

- Develop a relationship with those living in the residential structures near the area to be impacted that will help them understand the process and utilize a schedule that will less adversely impact them. For example, doing the pile driving when residents are not at home.

  This may not work if the residents don't cooperate.

- Noise mitigation to reduce off-site noise levels due to sheet pile driving may include using alternative tools or equipment. A high-frequency vibratory hammer can be utilized during the sheet pile driving to minimize noise and vibration.

  This could be much more expensive than sound blanketing or shrouding.

- Construction of Earthen or Masonry Temporary Barriers. These barriers would utilize soil and masonry materials that may be readily available at the Pile Driving site.

  This method/tactic would require design and implementation by a qualified noise consultant. It could be less cost effective than renting or purchasing ready-made noise shrouds and barriers.

Provide a recommendation on the best(or the most appropriate) method of reducing the noise.

It is the recommendation of this consultant that ready-made sound reducing barriers or blankets are the most viable option for this application. This should be coupled with interaction with the residents living in noise sensitive land uses.

Photo 1

Examples of Sound Shrouding and Blanketing

The temporary sound barriers shown below are engineered, designed, and manufactured specifically for noise control applications. These sound blankets, or sound curtains, have several different assembly options depending on specific sound control needs. Temporary sound barrier blankets are made for ease of installation and to specified height requirements. The exterior facings of the temporary curtains can withstand very harsh environments and are designed to last through five years of continuous outdoor use.

Other examples of noise walls or shrouds are shown on the next page.


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