March 31, 2024

Solar Generation Siting Final Report – Frontier Solar

KY State Board on Electric Generation and Transmission Siting
Case # 2023-00360

Customer:
Kentucky Public Service Commission

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

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March 31, 2024

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Solar Generation Siting Final Report – Frontier Solar

Synopsis

This document is the Final Report prepared by Elliot Engineering for the Frontier Solar Electric Solar Generating facility in Washington/Marion County, KY.

WEPSC Order: WE240117017
DHEC Order: 9226-24-0003

Public Service Commission PO:
PON2 123 2300003180

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Contents

Attachment – A

Final Assessment Report on Scenic, Environmental, Traffic, Noise & Fugitive dust impacts

Attachment – B

Impact on Property Values

Attachment – C

Economic Impact Analysis

Attachment – D

Information on Sound Dampening as requested by the Siting Board

REVISIONS

Revision	Date Issued	Issue Type	By	Description
0	3-31-24	Final Report	CA	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 Frontier Solar who is applying for a certificate of construction for an approximately 120-megawatt Merchant Electric Solar Generation Facility in Washington/Marion County, KY.

1.1 Scope

As part of the personal service contract for the 'Generation Siting Board 2023, between The Commonwealth of Kentucky Energy Environment Cabinet/Public Service commission and Elliot Engineering, in the matter of the order issued for case number 2023-00360, Elliot 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, 278.708 and submit a Final report on the Solar Generation Siting for the application for a construction certificate by Frontier Solar in Washington/Marion County, KY.

Elliot 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. 20231107_FRON bn, LLC – Frontier Solar Notice of Intent and Election
ii. 20231107_PSC Acknowledgement Letter
iii. NOI
iv. Read_First_ (11/7/2023)
v. 20231108_PSC No Deficiency Letter – Notice of Intent
vi. 20231221_Acknowledgment Letter of Application Fees
vii. SAR_Exhibits_A-F_4860-8337-7561_v.2.
viii. Read_First_4877-1070-1977_v.1.
ix. Frontier_-_Table_of_Contents_4887-6766-6585_v.2.
x. Exhibit_F_(SAR)_ 4863-6804-9497-v.1.
xi. Application_Exhibits_A-E_and_G_4853-4518-0057_v.6.
xii. Application_and_Index_of_Regulatory_Requirements_4853-3685-7753_v.1.
xiii. 20240102_NO Deficiency Letter
xiv. 20240112_Letter Filing Document into the Record
xv. 20240116_Letter Filing Document into the Record

xvi. 20240116_Letter Filing a Document into the Record
xvii. 20240125_PSC_ORDER
xviii. 20240208_DATA_REQUEST
xix. Witness_Verification_Forms(2/24/2024)
xx. Responses_to_RFI_1
xxi. Redacted_PSAs
xxii. Redacted_Leases_1_of_3
xxiii. Redacted_Leases_2_of_3
xxiv. Redacted_Leases_3_of_3
xxv. Redacted_Easements_(Public)
xxvi. Read_First_(2/24/2024)
xxvii. Petition_for_Confidential_Treatment
xxviii. Attachment_RFI_1-33_(1_of_3)
xxix. Attachment_RFI_1-33_(2_of_3)
xxx. Attachment_RFI_1-33_(3_of_3)
xxxi. 20240301_DATA_REQUEST
xxxii. Read_First_(3/11/2024)
xxxiii. Neighborhood_Map_2024-01-16
xxxiv. Motion_for_Deviation
xxxv. CEA
xxxvi. Witness_Verifications(3/17/2024)
xxxvii. Responses_RFI_2
xxxviii. Read_First_(3/17/2024)
xxxix. Witness_Verifications(3/19/2024)
xl. Supplemental_Response
xli. Read_First_(3/19/2024)

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.

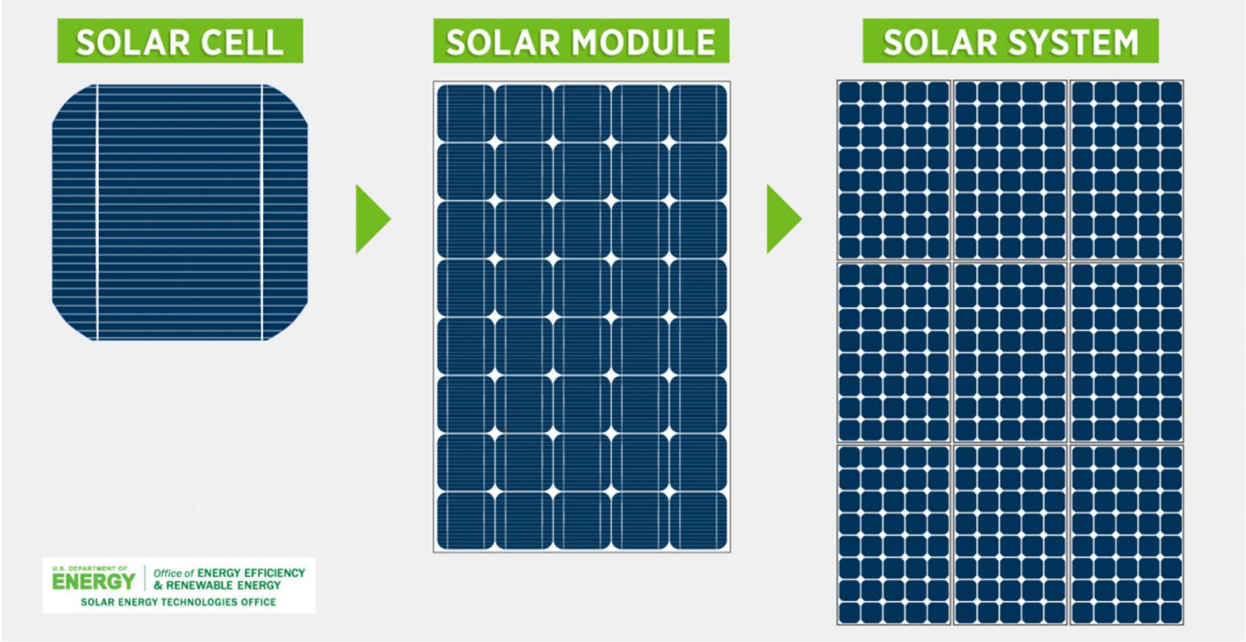

Figure (1)
Solar System[1]

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

[1] 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.

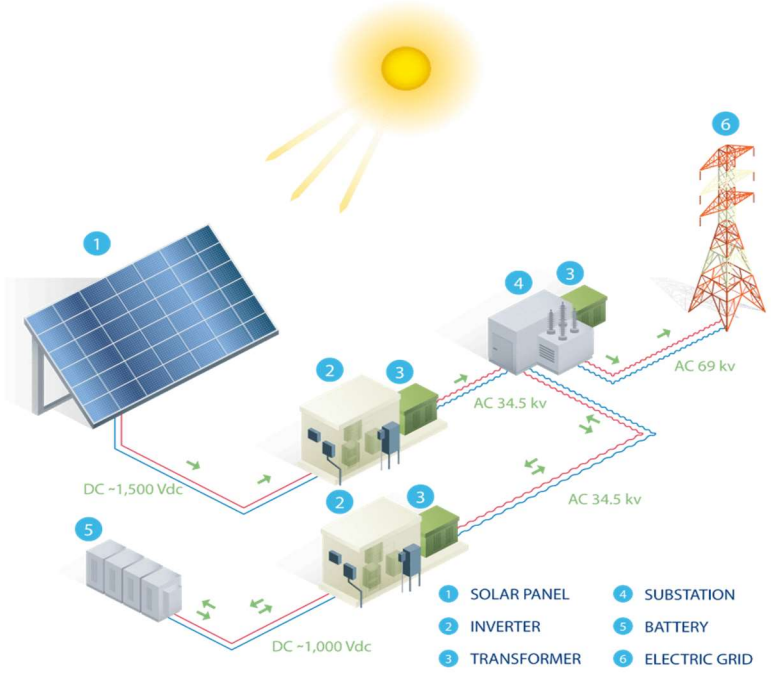

Figure (2)
A Solar Power Plant[2]

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.

Picture (3)
Solar Modules Installed on Farmland[3]

2.3 Role of Inverters

The power produced by a solar system, because of its basic principle of operation, is unidirectional and is in the form of Direct Current or in short, DC. This form of DC Power is not

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

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.

Picture (4)
Industrial Solar Inverter[4]

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

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

Batteries can produce electricity all day long.

Picture (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, to step-up the voltage to a medium level, other than the voltage available at the grid. This is done

[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 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

Picture (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.

Picture (7)
Steel & Concrete Structures of a 2MW Solar farm[7]

[7] Image found from the following website
https://www.energy.gov/eere/solar/solar-integration-inverters-and-grid-services-basics

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 Inverters and the Transformers are responsible for the 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 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 during the operation. 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. In fact, solar energy consumption can have a positive indirect effect on the environment and 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 of the Solar modules.

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

[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/

vi) Provide wildlife habitat

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

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3 Frontier 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, Frontier Solar.

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

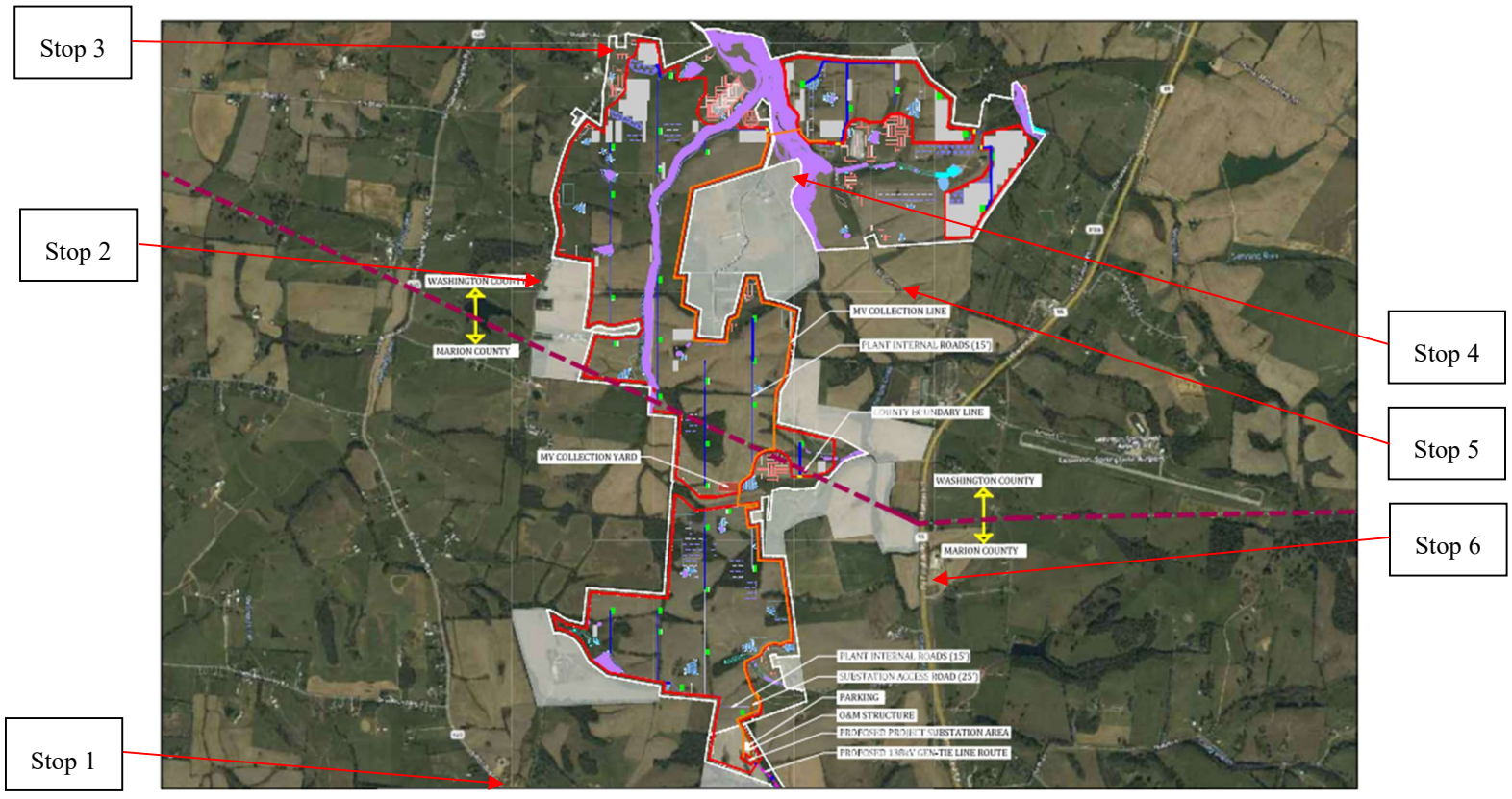
3.1 Initial Review

Elliot 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 Case No. 2023-00360. 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. 2023-00360, Elliot Engineering made a visit to site as organized by the Siting board, on February 23rd, 2024.

The locations visited are indicated on the picture below Reference Picture (8).



Picture (8) Frontier Solar Site Visit Locations

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

Picture (9) Stop 1 – View 1

Picture (10) Stop 1 – View 2

Picture (11) Stop 1 – View 3

Picture (12) Stop 2 – View 1

Picture (13) Stop 2 – View 2

Picture (14) Stop 2 – View 3

Picture (15) Stop 2 – View 4

Picture (16) Stop 2 – View 5

Picture (17) Stop 3 – View 1

Picture (18) Stop 3 – View 2

Picture (19) Stop 3 – View 3

Picture (20) Stop 3 – View 4

Picture (21) Stop 3 – View 5

Picture (22) Stop 3 – View 6

Picture (23) Stop 3 – View 7

Picture (24) Stop 4 – View 1

Picture (25) Stop 4 – View 2

Picture (26) Stop 4 – View 3

Picture (27) Stop 5 – View 1

Picture (28) Stop 5 – View 2

Picture (29) Stop 5 – View 3

Picture (30) Stop 5 – View 4

Picture (31) Stop 5 – View 5

Picture (32) Stop 5 – View 6

Picture (33) Stop 5 – View 7

Picture (34) Stop 5 – View 8

Picture (35) Stop 6 – View 1

Picture (36) Stop 6 – View 2

Picture (37) Stop 6 – View 3

Picture (38) Gen-Tie Route – View 1

Picture (38) Gen-Tie Route – View 2

Picture (38) Gen-Tie Route – View 3

Picture (38) Gen-Tie Route – View 4

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 & 710

3.3.1 Review of Application documents

Accordant with KRS 278.706 the applicant, Sebree II Solar LLC, submitted the application documents and a Site Assessment Report addressing the compliances on different requirements of KRS 278.708.

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 accessways, 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.

As per KRS 278.710(1)(c) the 'Economic Impact of the facility' is studied for granting a Construction Certificate.

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

Elliot Engineering reviewed the Site Layout and maps submitted by the applicant and visited the site on February 23rd, 2024. The findings after the site visit are discussed below.

Findings on the Site Layouts & maps

1) Underground communication lines should be identified at the time of construction.

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

The documentation on the legal description of the land was 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.

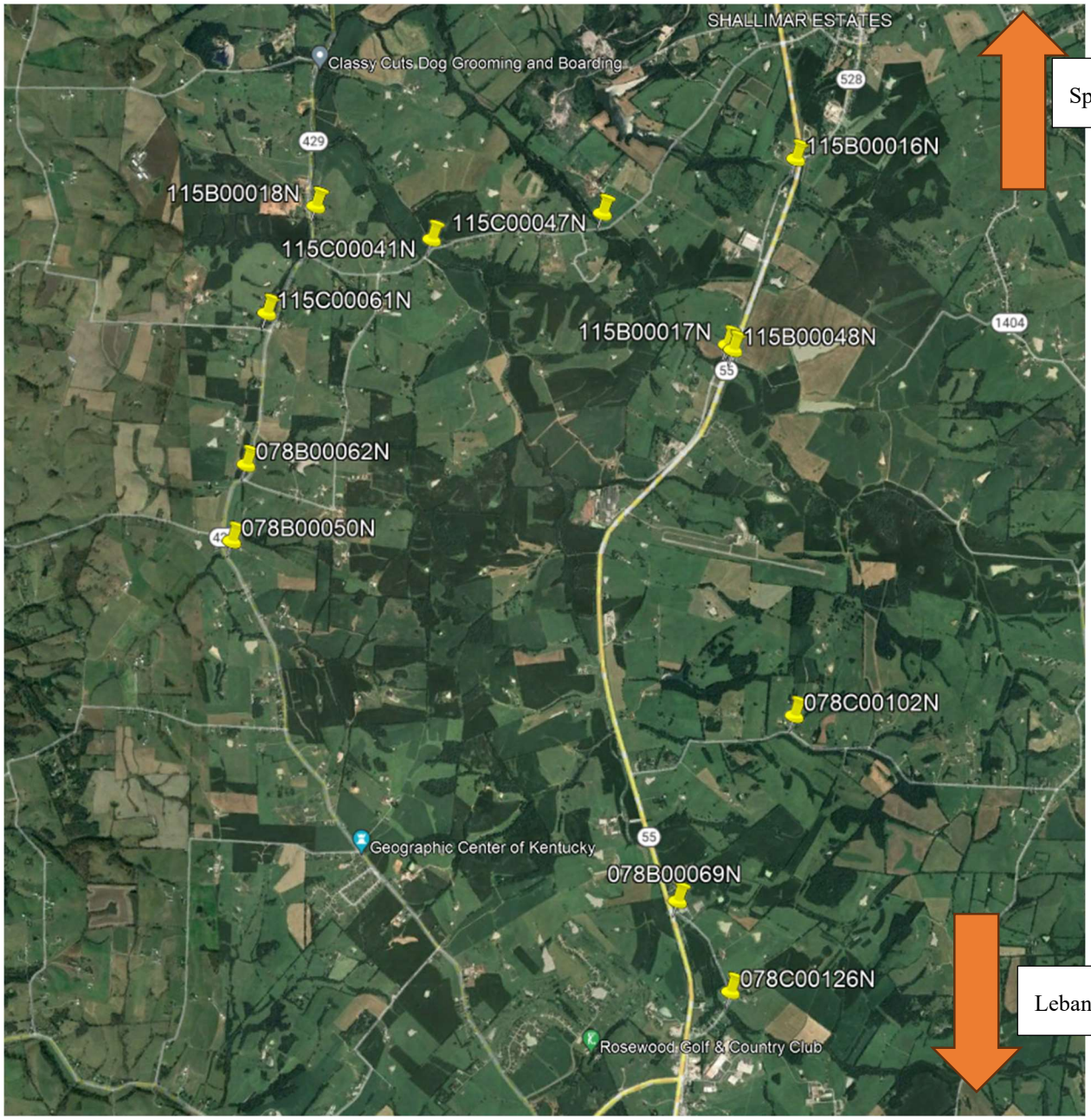
1) Existing Electric services:
   Any new power line should be clear of the existing electric service line, power pole and guy wire. Planned 138kV Transmission lines passes under existing 345kV Transmission line for the substation interconnection. NERC and utility guidelines should be followed for the installation.
2) The Substation will need oil containment for the Transformer to prevent any leakage of oil into nearby bodies of water.

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.
2) Avoid using Oversize trailers for material transport and limit the overall weight as per the bridges and culverts of the surrounding roads. Install new culverts if necessary.



Picture (39) Map showing locations of bridges. NBI numbers taken from https://maps.kytc.ky.gov/bridgedataminer/.

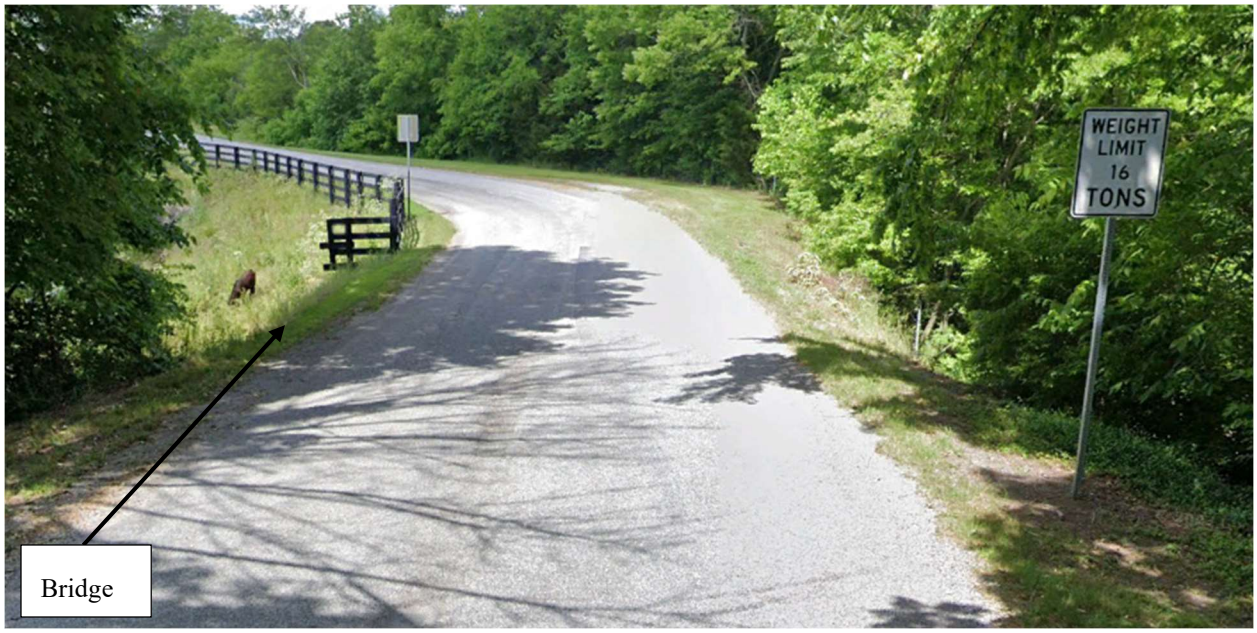
Picture (40) Bridge along St. Rose Road (NBI: 078B00050N)

Picture (41) Bridge along St. Rose Road (NBI: 078B00062N)

Picture (42) Bridge along Springfield Highway (KY-55) (NBI: 078B00069N)

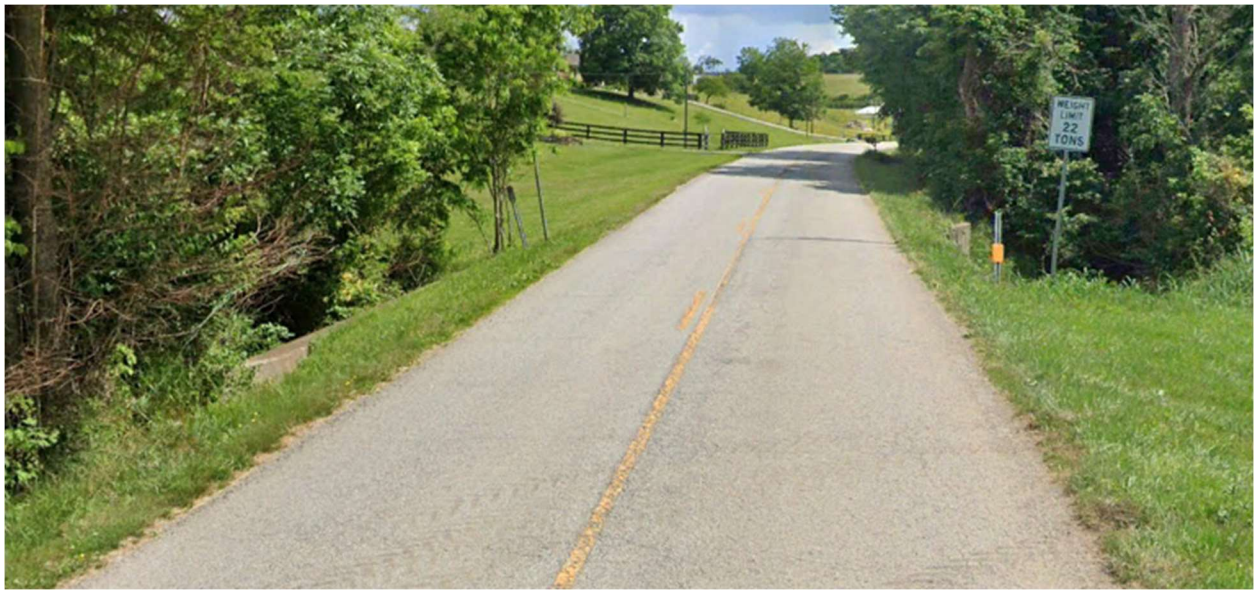
Picture (43) Bridge along Horan Lane (NBI: 078C00102N)

Picture (44) Bridge Radio Station Road (NBI: 078C00126N)

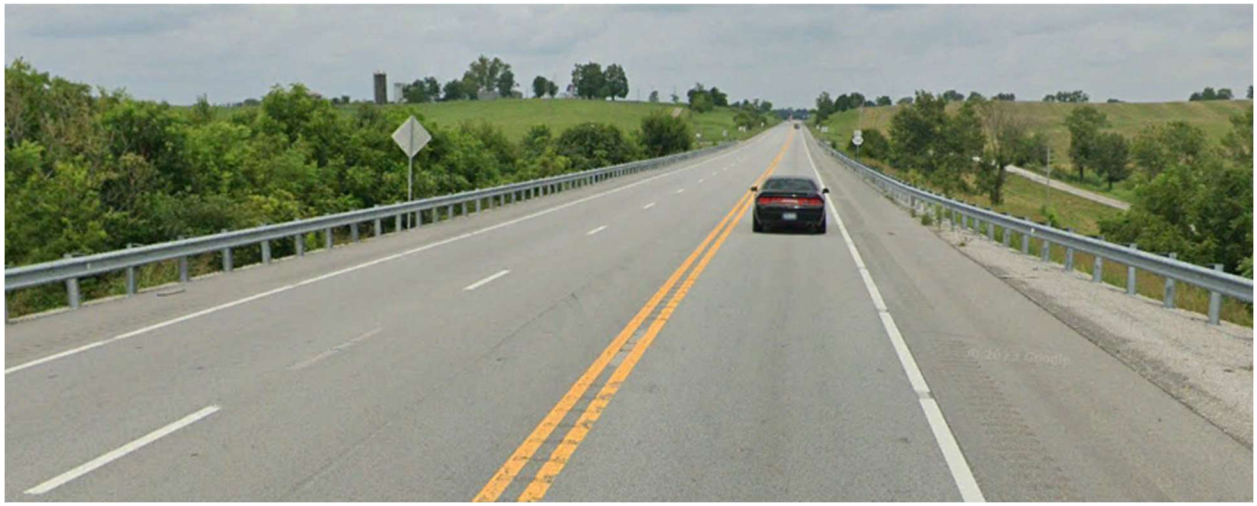


Picture (45) Bridge along Co-op Drive (NBI: 115B00016N)

Picture (46) Bridge along Old Lebanon Road (NBI: 115B00017N)



Picture (47) Bridge along St. Rose Road (NBI: 115B00018N)



Picture (48) Bridge along Springfield Highway (KY-55) (NBI: 115B00048N)

Picture (49) Bridge along Booker Road (NBI: 115C00041N)

Picture (50) Bridge along Booker Road (NBI: 115C00047N)

Picture (51) Bridge along Smith Lane (NBI: 115C00061N)

3) Weight limits of the surrounding roads should be considered when delivering heavy material loads for the project.

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 if the substation control house will have utilities. The applicant has not indicated if water, internet, or phone connection will be provided to the site. As applicable, there should be

necessary drawings created indicating 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 but not practical for a solar power plant. After reviewing the application documents, Layouts & Maps, it was found that the following setback distances are followed,

80’ from property lines
50’ from county roads
250’ from Residences
25’ from Natural drains and Wetlands

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

Elliot Engineering has appointed Thomas Chaney for the Environmental Assessment of site for Noise, Scenic surroundings, historic and archeological, Environmental & Fugitive dust. The summary of review is as below,

Conclusion: “Elliot Engineering engaged Cloverlake Consulting Services to review the adequacy of the applicant’s treatment of the environmental impacts of the Frontier Solar Project. At is conclusion Cloverlake stated the following:

The Applicant has done an adequate job, in most cases, of addressing the concerns raised by the analysis of the adequacy of this Site Assessment Report. Among these are Environmental Permitting, Wetland Delineations, Stormwater, Groundwater, and Endangered Species. Although the set of mitigation strategies in this report does not include a specific dust control plan for the site, nor does it address the treatment and protection of archeologic and historic resources including Cemeteries. It is stated that no Historic and Archeologic Sites are present, but there is still a concern about the level of detail of the analysis done by the applicant and the research done to support that conclusion. One of the biggest concerns in this regard, is the possibility of the existence of family Cemeteries in the project area that could be uncovered and disturbed during construction.

Based on a review of the Frontier Solar Project Site Assessment Report, as well as the Applicant’s responses to the first and second sets of Inquiries from the Staff, by W. Thomas Chaney of

Cloverlake Consulting services, all sections of the report are in compliance with the intent of KRS 278.708. The consultant, however, urges the applicant to consider the recommendations in section 6.1 and 8.0 in the Adequacy Report."

Reference Attachment-A for complete report from Cloverlake Consulting.

3.3.10 278.708(3)(c) Property Values

Elliot Engineering has appointed Clark Toleman for the assessment of the Application document for the impact on Property Values. The conclusion is described below.

Conclusion: "Considering my analysis of the Kirkland Appraisals Impact Study I have concluded that the report is credible and representative of the market conditions that would exist should the Frontier Solar Project be constructed based on the market evidence and interpretation of the data contained in the Impact Study. The report includes a review of published studies on property value impacts associated with solar projects, paired sales analysis in thirty-nine comparable solar projects, and interviews with real estate professionals And real property assessors."

Reference the Attachment-B for complete report from, E. Clark Toleman MAI, SRA.

3.3.11 278.710(1)(c) Economic Impact Analysis

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

Conclusion: "Based upon the representations of the Applicant represented in its Economic & Fiscal Contributions to the Counties of Marion and Washington and to the Commonwealth of Kentucky ("Economic Impact Report"), Application Exhibit E ("Exhibit E") there are positive, significant, short-term initial economic benefits during the Construction Phase for the Commonwealth of Kentucky, and the region, including Marion and Washington Counties. During the longer Operational (generation) phase, there are less impactful, but positive, economic impacts."

Reference the Attachment-C for complete report from Mark M. Watters.

ATTACHMENT A

Kentucky State Board on Electric Generation and Transmission Siting Board Frontier Solar – Case No. 2023-00360

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

By Cloverlake Consulting Services, W. Thomas Chaney, President

March 23, 2024

Table of Contents

Report Section **Page**

Cloverlake Consulting Services December 15, 2023

On Behalf of Elliot Engineering, Florence, Kentucky For Frontier Solar LLC, Project-Kentucky State Siting Board on Electric Generation and Transmission Case No: 2023-00360.

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 of the natural environment including noise, traffic, dust, historic, archeologic resources, and natural resources including endangered plant and animal species groundwater and surface water. Many of the environmental issues regarding this project are addressed in the Cumulative Environmental Assessment filed on March 11, 2024 by the applicant.

At its conclusion this adequacy report shows that the application submitted by the applicant in conjunction with the Cumulative Environmental Assessment Report, mentioned above, Frontier Solar LLC is fully in compliance with the intent of the Kentucky Revised Statutes.

1.0 Project Description

COMPLIANCE FRON bn, LLC (Applicant) is proposing to construct the Frontier Solar Project (the "Project") in the north central portion of Marion County and south-central part of Washington County. The Project is situated on approximately 1,411 acres and will generate 120 megawatts (MW) alternating current (AC) of electricity with photovoltaic solar panels. Arrays of photovoltaic modules will be mounted on single access trackers arranged in rows. Power conversion systems will be distributed throughout the Project area, comprised of approximately 35 power inverters. The equipment will connect via underground electrical wiring to a Project substation interconnect via a 1.7-mile gentie line, that will connect with an existing transmission line on the west side of Route 55 south of the Project.

1.1 Project Land Use- 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 as SAR Exhibit B of the application documents. A summary of the adjoining residential and agricultural uses, with a breakdown of the uses by acreage summarized below.

Adjoining g Use Breakdown	**Acreage**
Residential	3.65%

Adjoining Use Breakdown	Acreage
Agricultural	39.17%
Agri/Res	57.18%
Total	100%

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

1.3 Project Facility Layout and Access- Pursuant to KRS 278.708(3)(a)(3), the proposed facility layout and nonregulated electric transmission route are included in SAR Exhibit A, as well as Exhibit A of the overall application. A fence meeting National Electric Safety Code (NESC) requirements, typically a seven-foot fence, will secure the facility. A farm friendly fence with wooden posts and a wire mesh is being proposed to enclose the solar panels and associated infrastructure. A fence meeting the National Electric Safety Code (NESC) requirements, typically a six-foot chain link fence with three strings of barbed wire at the top, will enclose the Project's substation. The Project will comply with federal, state, and local regulations as applicable in determining safety signage locations around the facility.

1.4 Location of Facility Buildings, Transmission Line and Other Structures- 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 Site Layout and nonregulated electric transmission route in SAR Exhibit A.

1.5 Location and Use of Access Ways, Internal Roads and Railways Pursuant to KRS 278.708(3)(a)(5), proposed access points and internal roads are shown in SAR Exhibit A. No railways are located within the Project.

1.6 Existing and Proposed Utilities to Serve the Project Pursuant to KRS 278.708(3)(a)(6), the Project's onsite substation will connect to the existing electric grid via an approximately 8,739-foot (1.7-mile) overhead nonregulated electric transmission line to be constructed between the Project and the existing 138 kV utility substation, owned and operated by LG&E/KU ("Lebanon Substation"). Limited water and electric service may be required to provide for the operations and maintenance building and is anticipated to be provided by Inter-County Energy Cooperative or Salt River Electric. Additional water resources will be obtained from onsite wells or trucked in from an offsite water purveyor.

1.7 County Ordinances Pursuant to KRS 278.708(3)(a)(7), Marion and Washington Counties have not enacted any zoning ordinances or setback requirements for the location of the Project, and, therefore, no setbacks by such a planning commission exist in either county. Accordingly, the Project will not be required to follow setbacks established in KRS 278.704(3) because no local zoning is present. 9. The Applicant will file a request to deviate from the setback requirements provided at KRS 278.704(2) by filing a motion to deviate, pursuant to KRS 278.704(4), and thus it will comply with the relevant setback requirements provided at KRS 278.704

1.8 Noise and Traffic Study- Pursuant to KRS 278.708(3)(a)(8), a noise assessment was completed for the Project and is included as SAR Exhibit D. This assessment evaluated existing noise conditions in the area as well as proposed noise from construction and operation of the Project. Existing noise in the Project area consists of those typical of agricultural operations and rural areas, such as tractors, trucks, and various wildlife noises. The Project site covers a very large area, and the noise levels experienced at any Noise Sensitive Area (NSA) will vary depending on what areas of the site are under construction. Construction site noise is a temporary activity, and there are no known noise limits or standards applicable to construction. Pile driving will be the loudest construction activity, approximately 37,736 piles will be installed. However, piledriving will only occur for limited amounts of time. These temporary impacts are minimized by construction phasing and communication with adjacent landowners. See Table 8 below.

Table 8: Maximum Expected Pile Driving Noise Levels dBA Receiver Maximum Pile Driving Noise Level (dBA)

NSA 1	72
NSA 2	81
NSA 3	76
NSA 4	53
NSA 5	65
NSA 6	62
NSA 7	60
NSA 8	51
NSA 9	49

NSA 10	58
NSA 11	55
NSA 12	53
NSA 13	67
NSA 14	70
NSA 15	80
NSA 16	70
NSA 17	81
NSA 18	76
NSA 19	79
NSA 20	72
NSA 21	63

The noise assessment indicates that during site operation, intermittent noise related to the panel tracking system and the noise of the inverters is expected. The increase in 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 (NSA 17) is approximately 350 feet from any solar panels and approximately 710 feet from an inverter (NSA 3). During average operation, the inverters will be similar in noise level (-42 dBA) to the hum of a refrigerator at the nearest receptor over 60 dBA at one meter from the source, or the level of a normal conversation. Since the nearest receptor is approximately 2,960 feet from the substation, noise emitted from the receptor 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 existing background agricultural noise characteristics..

At the nearest receptors, no prolonged noise levels above background levels are expected either during construction or operations of the Project. Intermittent, repetitive noise will occur above background noise levels during piledriving activities.

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding the Project Description is in compliance with the intent of - KRS 278.708(3).

2.0 Compatibility with Scenic Surroundings

REQUIREMENT: per KRS 278.708 (3)(b), a glare study was completed for the Project by ERM and is included as SAR Exhibit E. According to the glare analysis, vegetation and topography could assist in screening potential glare. Per the document the analysis predicted no red glare at any of the viewpoints accessed. The Project has also provided a series of Visual Impact Illustrations as part of its presentation for the publicly noticed information meeting (see Exhibit B-5 to the Application). The Visual Impact Illustrations demonstrate that the Facility will be compatible with the scenic surroundings and due to the rolling terrain, limited portions of the Facility will be able to be viewed.

Vegetative screening will be implemented to mitigate visual impacts of the facility. The proposed tree species are dwarf eastern white pine, wax myrtle, Nellie Stevens holly, Junior Giant thuj a, eastern red bud, and flowering dogwood. These species will be a minimum of four feet tall when planted and spaced six feet apart. These species, or similar species, will be implemented at the time of procurement and subject to change based on availability, cost, and stakeholder preferences.

The nonregulated electric transmission line will not significantly alter the viewshed due to presence of other existing transmission lines, the rolling topography, and existing vegetation.

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding Compatibility with Scenic Surroundings is in compliance with the intent of KRS 278.708.

3.0 Property Value Impacts (REQUIREMENT: per KRS 278.708 (3)(c)

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 XIV on page 109, reads as follows: "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."

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding Property Value Impacts is in compliance with the intent of KRS 278.708(3)(b).

4.0 Anticipated Noise Levels at Property Boundary (REQUIREMENT: per KRS 278.708 (3)(d))

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 solar facility components. This construction noise is expected to be of short duration at any given location within the Project. The majority of the noise producing activities will occur hundreds to thousands of feet from the nearest noise sensitive receptors. The loudest portion of the construction includes the use of piledrivers to install the solar panel supports. The worst-case maximum noise [Lmax (dBA)] expected to occur at the nearest receptor (NSA 17) is 81 dBA, approximately 350 feet from the nearest pile, which will produce sound levels similar to a lawnmower, farm tractor, or heavy traffic. The model was also evaluated without the inputs of pile driver since that is more typical of ongoing construction sound levels. The sound levels for typical construction onsite range from an air conditioner to normal conversation. Construction activities at the Project site would move around the site and are not anticipated to be performed near a sensitive receptor for more than a few weeks. 19. The nearest receptor will be at least 350 feet from any panel, and approximately 1,170 feet from an inverter. Sound levels from the tracking system can be expected to be the levels of the hum of a refrigerator at the nearest receptor (-45dBA), while the sounds will be much quieter at most receptors. During average operation, the inverters will be similar in noise level (-41 dBA) to a refrigerator at the nearest receptor. According to manufacturer specifications the maximum noise generated by the transformer is expected to be just over 60 dBA (measured at a distance of one meter) or the level of a normal conversation. Since the nearest residential receptor is more than 2,960 feet from the substation, transformers are not expected to add additional noise above background noise. Site visits and maintenance activities including single vehicular traffic and mowing will be negligible as they are similar to existing agricultural noise characteristics. At the nearest receptors, there will be elevated intermittent noise during construction but no one existing NSA will be exposed to the same sound levels over an extended period of time as construction progresses through the site.

The operational noise assessment revealed that Project-generated noise levels would be well below estimated existing conditions at all identified NSA locations during daytime hours with all equipment in operation at full load. See SAR Exhibit D for the full report studying the anticipated peak and average noise levels associated with the facility's construction and operation at the Project boundary.

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding Anticipated Noise Levels at Property Boundary is in compliance with the intent of KRS 278.708(3)(d).

5.0 Effect on Road, Railways, and Fugitive Dust REQUIREMENT: per KRS 278.708 (3)(e); Pursuant to KRS 278.708(3)(e), a traffic impact study was completed for the Project and is included as SAR Exhibit F. It evaluates the Project's impact on road and rail traffic, including anticipated fugitive dust and degradation of roads within vicinity of the facility. 23. The traffic study notes that the Project, with appropriate mitigation measures in place, will not produce significant adverse traffic impacts during construction or operation: "Although no significant, adverse traffic impacts are expected during project construction or operation, using mitigation measures such as ridesharing between construction workers, using appropriate traffic controls, or allowing flexible working hours outside of peak hours could be implemented to minimize any potential for delays during the AM and PM peak hours." 24. The Project will comply with the provisions of 401 KAR 63:010 applicable to controlling fugitive dust emissions. It will utilize Best Management Practices (BMPs) which may include activities such as: appropriate revegetation measures, application of water, or covering of spoil piles, to minimize dust. Additionally, open-bodied trucks transporting dirt will be covered while in transit. During construction activities, water may be applied to the internal road system 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. 25. The Project will not be using railways for any construction or operational activities.

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding the Effect on Road, Railways and Fugitive Dust is in compliance with the intent of KRS 278.708(3)(e).

5.1 Hiring of a Consultant

The board shall have the authority to hire a consultant to review the site assessment report and provide recommendations concerning the adequacy of the report and proposed mitigation measures.

The board may direct the consultant to prepare a separate site assessment report. Any expenses or fees incurred by the board's hiring of a consultant shall be borne by the applicant.

The board has hired Elliot Engineering and Cloverlake Consulting Services to review the adequacy of the Site Assessment Report.

6.0 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.

Pursuant to KRS 278.708(4), the Applicant has implemented or intends to implement the following mitigation measures for the Project: . Frontier Solar's generation 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's design will also incorporate avoidance and mitigation measures for sensitive resources such as wetlands, listed plant and animal species, and sensitive cultural resources. Vegetative screening will be implemented to mitigate any visual impacts of the facility. At the time of planting, these trees will be a minimum of four feet tall and six feet apart. They are expected to grow to heights of 15 to 20 feet. Once the Project enters the operational phase, there will be no hazardous materials, pollutant emissions, or discernible sound outside of the facility.

View scope: The Project is not expected to negatively impact public roadways. Based on the Glare Study (Site Assessment Report(SAR)) Exhibit G), the glare, (green and yellow), and the durations predicted to be experienced at the nearby airports and helipad, flight paths, surrounding roads, residences, and buildings is considered acceptable by existing standards and industry practice. Based on feedback received from the Project's public information meetings, farm-friendly fencing that does not use barbed wire and is composed of wooden posts and a wire mesh rather than chain link fencing will be used to enclose the Project, excluding the substation to allow for safety requirements to be met. The Project has been designed to reduce and minimize the amount of tree clearing required. The Project has further committed to a minimum 300 foot setback from any adjoining nonparticipating residential property.

Noise: Construction noise mitigation measures may include measures such as maintaining construction equipment to ensure proper operation and routinely checking vehicles using internal combustion engines equipped with mufflers to ensure they are in good working order; locating noisy equipment as far as reasonably practicable from noise-sensitive areas and residences; and implementing a complaint resolution program during construction to address any noise-related issues. Potential noise from piledriving and other construction activities will be mitigated by implementing a phased construction schedule and limiting noise-causing activities to certain hours.

Jurisdictional Waters:

The Project has been designed to avoid impacts to Waters of the United States (WOTUS) delineated onsite. However, if impacts 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 United States Army Corps of Engineers (USACE) and the Kentucky Energy and Environment Cabinet — Department of Environmental Protection — Division of Water ("Kentucky DOW"). The regulation and permitting of utility scale solar impacts to stormwater and WOTUS will be addressed separately with each appropriate agency.

The Project has been designed to avoid impacts to WOTUS. However, if impact becomes necessary then the Project will coordinate with the USACE — Louisville District to obtain the appropriate Clean Water Act (CWA) Section 404 permit. If necessary, a CWA Section 401 Water Quality Certification and a floodplain construction permit will be obtained from the Kentucky DOW. As required, the Applicant will obtain permit coverage for crossings from the USACE — Louisville District.

The Project will obtain a Kentucky Department of Environmental Protection Stormwater Construction General Permit from the Kentucky DOW in compliance with the CWA. 10 10 30. Jurisdictional Waters: The Project has been designed to avoid impacts to Waters of the United States (WOTUS) delineated onsite. However, if impacts 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 United States Army Corps of Engineers (USACE) and the Kentucky Energy and Environment Cabinet – Department of Environmental Protection – Division of Water ("Kentucky DOW"). The regulation and permitting of utility scale solar impacts to stormwater and WOTUS will be addressed separately with each appropriate agency. The Project has been designed to avoid impacts to WOTUS. However, if impact becomes necessary then the Project will coordinate with the USACE – Louisville District to obtain the appropriate Clean Water Act (CWA) Section 404 permit. If necessary, a CWA Section 401 Water Quality Certification and a floodplain construction permit will be obtained from the Kentucky DOW. As required, the Applicant will obtain permit coverage for crossings from the USACE – Louisville District. 32. The Project will obtain a Kentucky Department of Environmental Protection Stormwater Construction General Permit from the Kentucky DOW in compliance with the CWA.

The data and conclusions contained in the Site Assessment Report for the Frontier Solar project regarding the Effect on Road, Railways and Fugitive Dust is in compliance with the intent of KRS 278.708(4).

6.1 Below are the Additional Mitigation Measures Recommended by the Consultant (Cloverlake Consultants)

Fugitive Dust and PM10

- Even though the application mentions the mitigation measures for Fugitive Dust in more than one section of the Site Assessment Report, the applicant should submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction and ensure that plan is shared with contractors who will build the solar farm.

Protection of Archeologic and Historic Resources including Cemeteries

- The applicant mentions survey work that has been done by TVA within the Project Area and that seems sufficient for projects of this nature. The applicant, however, should develop a plan regarding the protection of historic and archeologic resources and cemeteries if they are uncovered or disturbed during the construction process, no less than 30 days prior to the beginning of construction activities. This is not required by this regulatory process but would be under other requirements including those administered by the Kentucky State Historic Preservation Office. It is suggested that a Historic and Archeologic Consultant be engaged to monitor the construction process. Although the applicant states in the response to the second set of Inquiries that there are no cemeteries in the project area,(the closest one identified as 2.5 miles away) it is not clear what research was done to arrive at this conclusion. In rural Kentucky, there are many family cemeteries that may not be apparent until they are disturbed during a construction process.

7.0 New Electric Transmission Line Associated With the Frontier Solar Project

According to the applicant the Transmission Line associated with this project is not under the jurisdiction of the Siting Board. Has this been determined by the Siting Board?

8.0 Summary of the Adequacy of the Applicants Site Assessment Report

The applicant has done an adequate job, in most cases, of addressing the concerns brought up by the analysis of the adequacy of this Site Assessment Report. Among these are Environmental Permitting, Wetland Delineations, Stormwater, Groundwater, and Endangered Species. Although the set of mitigation strategies in this report does not include a specific dust control plan

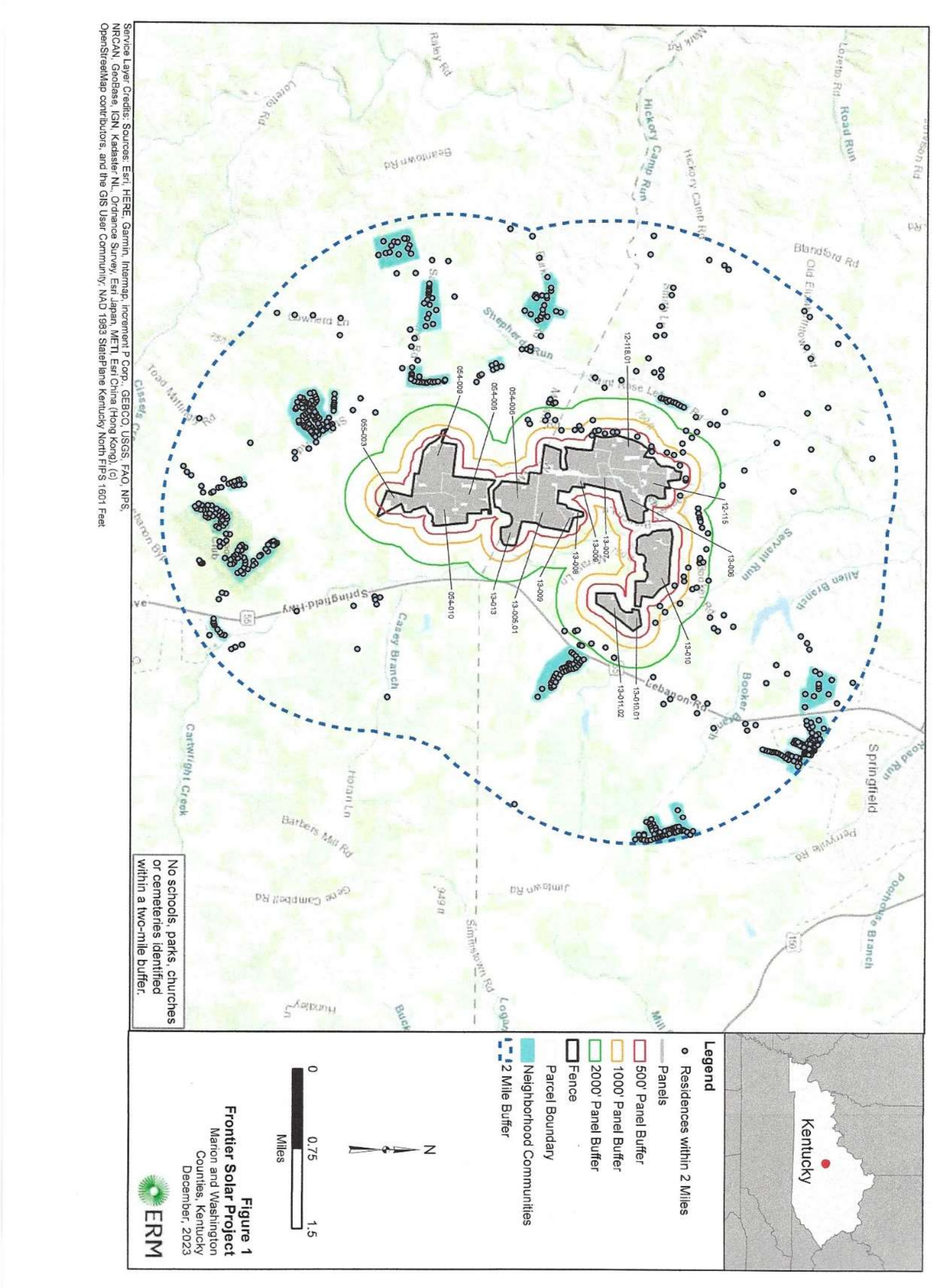
for the site, nor does it address the treatment and protection of archeologic and historic resources including Cemeteries. It is stated that no Historic and Archeologic Sites are present, but there is still a concern about the level of detail of the analysis done by the applicant and the research done to support that conclusion. One of the biggest concerns in this regard, is the possibility of the existence of family Cemeteries in the project area that could be uncovered and disturbed during construction.

Based on a review of The Frontier Solar Project Site Assessment Report, as well as the Applicant's responses to the first and second sets of Inquiries from the Staff, by W. Thomas Chaney of Cloverlake Consulting Services, all the sections of the report are in compliance with the intent of KRS 278.708. The consultant, however, urges the applicant to consider the recommendations in section 6.1 and 8.0 above.

REFERENCES

All the information for this Adequacy Assessment was extracted from the Applicant's Site Assessment Report ,the Applicant's Electric Transmission Line Application, Frontier Solar Project, supplemental reports, appendices, legal filings and a field analysis performed on February 9 and 10, 2024 by W. T. Chaney of Cloverlake Consulting Services.

Context Map


Legend
Residences within 2 Miles
Panels
500' Panel Buffer
1000' Panel Buffer
2000' Panel Buffer
Fence
Parcel Boundary
Neighborhood Communities
2 Mile Buffer
Kentucky
0
0.75
1.5
Miles
N
Figure 1
Frontier Solar Project
Marion and Washington Counties, Kentucky
December, 2023
ERM
No schools, parks, churches or cemeteries identified within a two-mile buffer.
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; NAD 1983 StatePlane Kentucky North FIPS 1601 Feet
Springfield
Springfield Hwy
Lebanon Rd
Hickory Camp Run
Casey Branch
Cartwright Creek
Allen Branch
Servant Run
Booker
Barbers Mill Rd
Simmstown Rd
Jimtown Rd
Perryville Rd
Blandford Rd
Road Run
Beamtown Rd

Gallery of Photographs Taken During The Site Visit by W. T. Chaney on February 9 and 10, 2024


Meraja
NO
THRU
TRUCKS


END STATE
MAINTENANCE

RESUME

W. THOMAS (TOM) CHANEY

PRESIDENT CLOVERLAKE CONSULTING SERVICES

YEARS OF EXPERIENCE

51

EDUCATION

- MBA, Finance and Management Point Park University, 2011
- M.A., Environmental Planning, Eastern Kentucky University, 1973
- A.B., 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 including Wind and Solar Projects
- Harvard Leadership Development Training
- Advanced Project Management Training

CERTIFICATIONS

- 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 several solar projects in Kentucky.

- 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 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.

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ATTACHMENT B

Review Appraisal

Of:

Kirkland Appraisals LLC

Adjacent Property Value Impact Report

Frontier Solar Proposed Project, Case No. 2023-00360

Marion and Washington Counties, Kentucky

Dated December 18, 2023

Date of Review

March 20, 2024

Prepared for:

Mr. Scott H. Campbell, Senior Project Manager

Elliot Engineering, Inc.

6900 Houston Road, Suite 38

Florence, Kentucky

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

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March 22, 2024

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

Re: ***Review Appraisal Report***
Kirkland Appraisals, LLC-Impact Study dated December 18, 2023
Frontier Solar Project, Marion and Washington Counties Kentucky

Dear Mr. Campbell

Following your request, I have carried out an investigation and review of the Kirkland Appraisals Adjacent Property Value Impact Study that estimates the impact in terms of property value to the surrounding properties adjacent to the proposed Frontier Solar Project. The Kirkland Appraisals Impact report is part of the application for PSC Case No. 2023-00360 for the 1,411 acres total with 935 acres having solar panel infrastructure, 120-megawatt solar project to The Kentucky State Board on Electric Generation and Transmission Siting. I have reviewed the Kirkland Appraisals 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 60 parcels that have been identified as adjoining the project tracts.

Considering my analysis of the Kirkland Appraisals Impact Study I have concluded that the report is credible and representative of the market conditions that would exist should the Frontier Solar Project be constructed based on the market evidence and interpretation of the data contained in the Impact Study. The report includes a review of published studies on property value impacts associated with solar projects, paired sales analysis in thirty-nine comparable solar projects, and interviews with real estate professionals and real property assessors.

The following is a summary of my technical review of the Kirkland Appraisals Impact Study 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:	**Frontier Solar Project-PSC No. 2023-00360**
Property Location:	Marion and Washington Counties, Kentucky
Date of Impact Study:	December 18, 2023
Property Type:	Agricultural and Rural Homesites
Land Area:	1,411 Combined acres,120MW
Report Option:	Narrative Impact Study
Intended Use of Review: Siting Board	Kentucky State Electric Generation and Transmission Siting Board

Purpose of this Review

The purpose of this review is to determine if the appraisal report is essentially in compliance with: KRS 278.708 and 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: March 20, 2024**

3. Purpose of the Impact Study

The Impact Study is in three parts, a review of academic and peer authored property value impact studies, research and analysis of existing solar facilities, and interviews with real estate experts market participants and Assessors. The study also includes a review of paired sales before and after solar projects were constructed through-out the United States and considered comparable to the properties adjacent to the proposed 120 MW Frontier Solar Project. 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 in Marion and Washington Counties Kentucky as of December 18, 2023.

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 well 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.

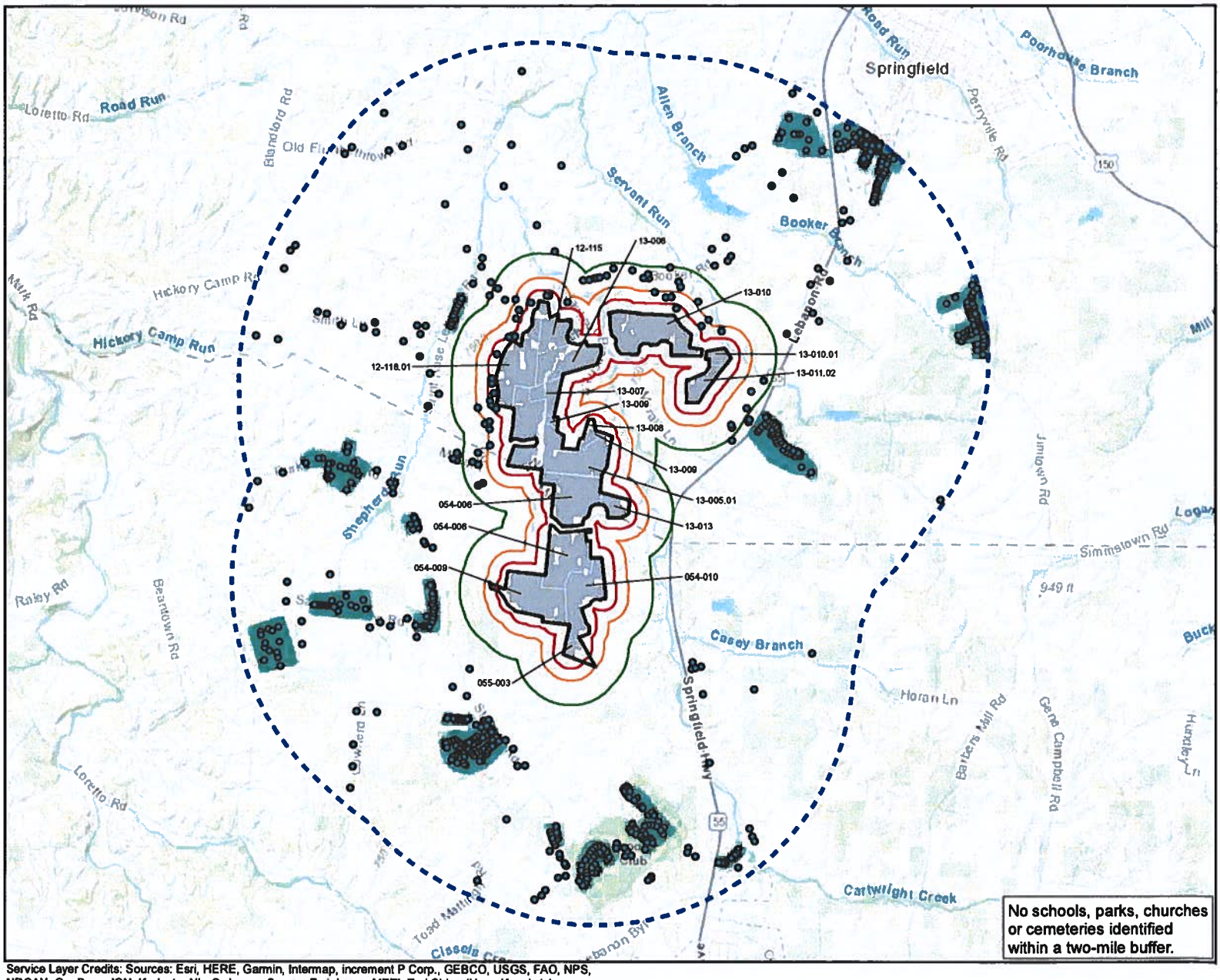
Intend Use of Review Appraisal

This review appraisal is prepared for Elliot Engineering on behalf of the Kentucky State Board on Electric Generation and Transmission Siting Board Case No. 2023-00360.

Date of Impact Study Review

This Review Appraisal is made as of March 20, 2024 with all economic, statistical and market data correlated to this date. The last inspection of the subject property area was made on this date and all physical characteristics are described relative to this date unless otherwise stated within this report

Location Map



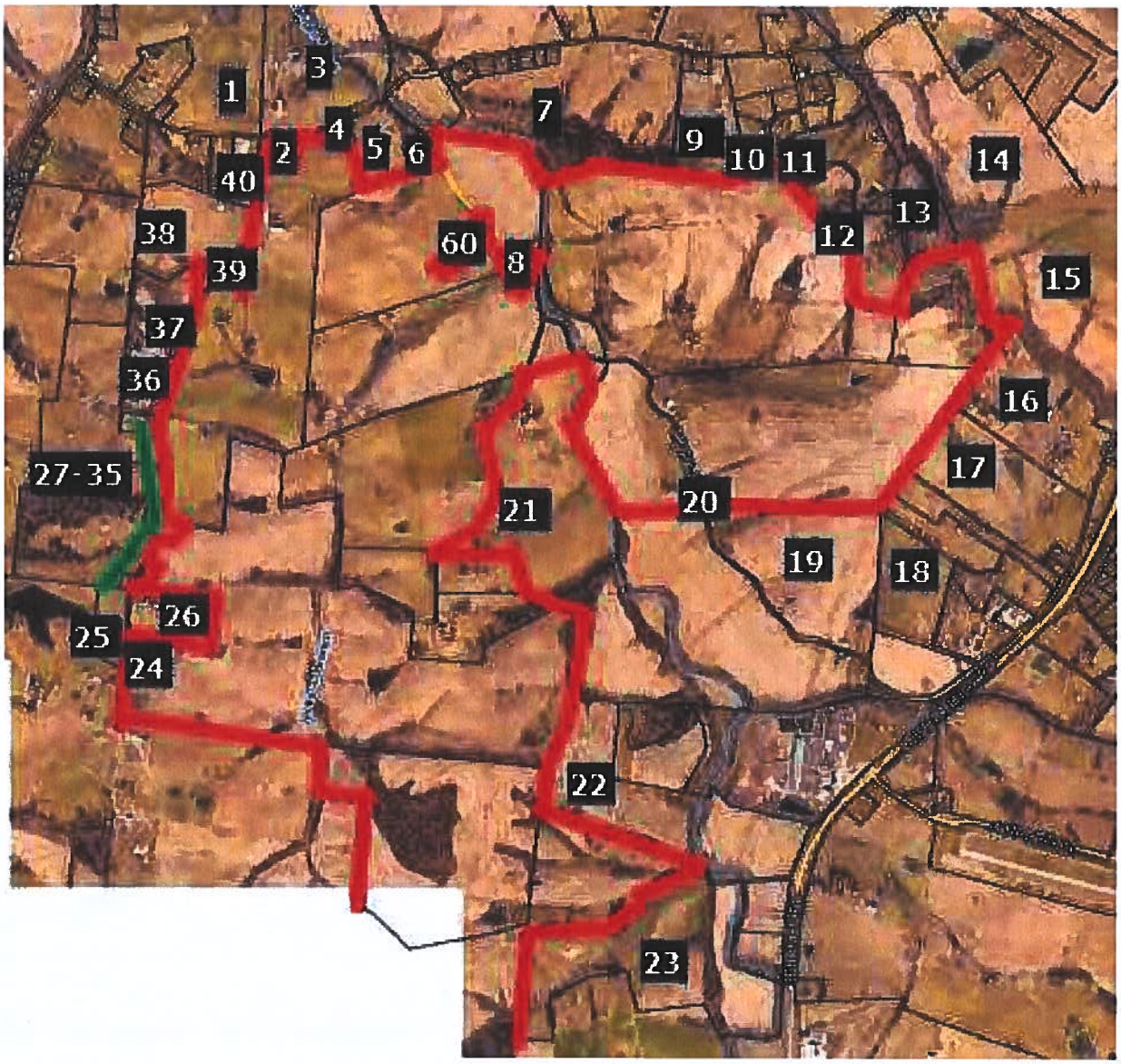
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community; NAD 1983 StatePlane Kentucky North FIPS 1601 Feet

Proposed Project Area

The subject properties are situated in Southern Washington County approximately two miles south of Springfield, and northern Marion County with a total area of 2,622.16 acres in 60 parcels adjacent to the project area of 1,411 acres with an actual project foot print of 935 acres. The project parent parcels extend along the western side of the Highway 55 corridor. The general area is rural in nature being developed as general farms and homesites with level to sloping topography. The 2023 combined County population is estimated to be 32,004. The project proposes that all setback distances will be in compliance with the County zoning ordinance.

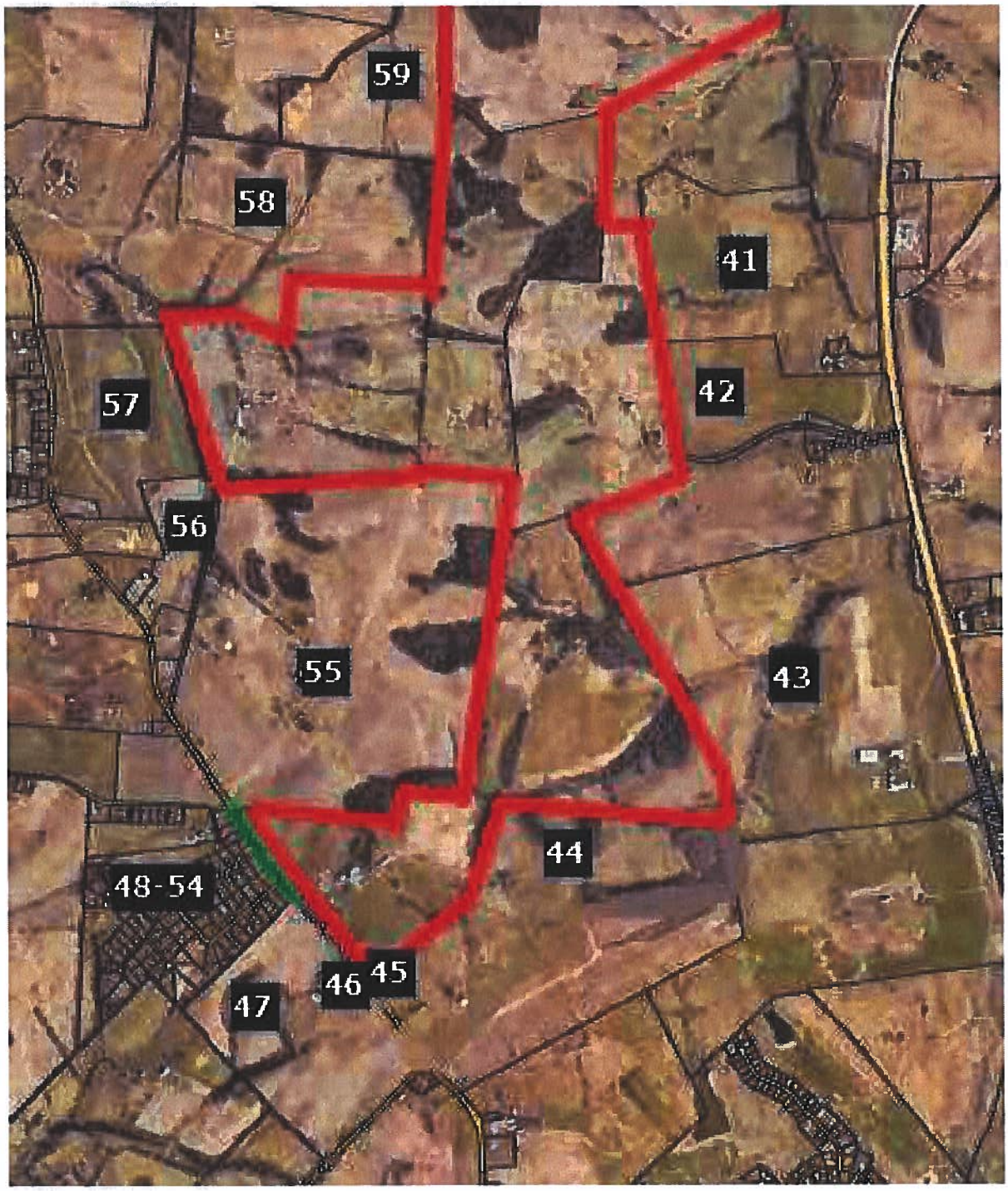
Map of Project Properties

Washington County GIS Map



Map of Project Properties (Continued)

Marion County GIS Map



Surrounding Uses

#	MAP ID	Owner	GIS Data Acres	Present Use	Adjoin Acres	Adjoin Parcels	Distance (ft) Home/Panel	L.F Adjacent
1	06-074.02	Simms	58.06	Agricultural	2.21%	1.67%	N/A	1
2	12-118	Osborne	1.10	Residential	0.04%	1.67%	315	665
3	12-113	Osborne	75.92	Agricultural	2.90%	1.67%	N/A	430
4	12-117	Harmon	1.26	Residential	0.05%	1.67%	300	515
5	12-116.01	Wheatley	13.46	Residential	0.51%	1.67%	N/A	1340
6	12-116	Wheatley	1.19	Residential	0.05%	1.67%	740	695
7	12-100	Donathan	72.11	Agri/Res	2.75%	1.67%	N/A	2945
8	13-006.01	Mudd	2.00	Residential	0.08%	1.67%	465	1145
9	12-096.04	Cissell	24.69	Agri/Res	0.94%	1.67%	955	890
10	12-096.19	Graves	1.99	Residential	0.08%	1.67%	N/A	410
11	12-096.01	Graves	3.55	Residential	0.14%	1.67%	325	1
12	12-096.11	Nance	22.48	Agri/Res	0.86%	1.67%	580	2745
13	12-096.22	Smith	15.22	Residential	0.58%	1.67%	970	925
14	12-096.09	Hamliton	80.33	Agricultural	3.06%	1.67%	N/A	1605
15	19-002	Pinkston	105.00	Agri/Res	4.00%	1.67%	2,570	1330
16	19-005	Campbell	48.00	Agri/Res	1.83%	1.67%	1,470	2765
17	19-006	Smith	53.78	Agri/Res	2.05%	1.67%	1,765	1255
18	19-012.02	Haydon	34.27	Agricultural	1.31%	1.67%	N/A	140
19	13-012	Moraja Farms	172.00	Agri/Res	6.56%	1.67%	2,035	4300
20	13-011.01	Mattingly	1.61	Residential	0.06%	1.67%	1,470	645
21	13-007	Warren	135.00	Agri/Res	5.15%	1.67%	590	700
22	19-024	Mattingly	59.00	Agricultural	2.25%	1.67%	N/A	880
23	13-013.02	Mattingly	77.32	Agricultural	2.95%	1.67%	N/A	3950
24	13-005	Spaulding	1.30	Residential	0.05%	1.67%	960	875
25	07-020.01	Smith	5.50	Residential	0.21%	1.67%	N/A	95
26	13-004	Smith	13.95	Residential	0.53%	1.67%	945	2515
27	07-019	Sandusky	0.50	Residential	0.02%	1.67%	1,165	150
28	13-003	Spaulding	0.73	Residential	0.03%	1.67%	980	300
29	07-021.01	Spaulding	34.77	Agri/Res	1.33%	1.67%	945	360
30	13-005.02	Spaulding	1.00	Residential	0.04%	1.67%	385	680
31	07-021	Noel	0.81	Residential	0.03%	1.67%	395	160
32	07-022	Mclain	0.35	Residential	0.01%	1.67%	395	95
33	07-024	Spaulding	7.05	Residential	0.27%	1.67%	300	335
34	07-025	Sutherland	39.66	Agri/Res	1.51%	1.67%	325	435
35	07-026	Compton	2.15	Residential	0.08%	1.67%	320	150
36	07-027.01	Edelin	20.89	Agricultural	0.80%	1.67%	N/A	1435
37	07-027	Smith	1.03	Residential	0.04%	1.67%	300	180
38	07-029	Osborne	26.99	Agri/Res	1.03%	1.67%	695	1
39	13-001	Hardin	2.00	Residential	0.08%	1.67%	300	980
40	07-030	Osborne	5.00	Residential	0.19%	1.67%	695	800
41	054-011	Mattlingly	119.00	Agricultural	4.54%	1.67%	N/A	1400
42	054-012	Mattlingly	141.10	Agricultural	5.38%	1.67%	N/A	2560
43	055-004	Mattlingly	233.00	Agri/Res	8.89%	1.67%	4,495	3060
44	055-041	Odaniel	110.54	Agricultural	4.22%	1.67%	N/A	4420
45	055-003A	Odaniel	1.00	Residential	0.04%	1.67%	4,830	635
46	055-009-01	Reynolds	1.54	Residential	0.06%	1.67%	4,970	205
47	055-009	Reynolds	100.00	Agricultural	3.81%	1.67%	N/A	230
48	055-010-02-30	Mc clung	0.73	Residential	0.03%	1.67%	4,505	220
49	055-010-02-29	Smith	0.72	Residential	0.03%	1.67%	4,455	200
50	055-010-02-12	Reynolds	0.71	Residential	0.03%	1.67%	4,395	195
51	055-010-02-01	Gonzales	0.69	Residential	0.03%	1.67%	4,365	200
52	055-010	Kraft	0.69	Residential	0.03%	1.67%	4,365	95
53	055-010-05-02	Mattingly	0.73	Residential	0.03%	1.67%	4,335	60
54	055-048	Masterson	0.44	Residential	0.02%	1.67%	4,140	210
55	055-002	Parrott	292.00	Agri/Res	11.14%	1.67%	3,085	10225
56	054-008	Jeffries	20.48	Agricultural	0.78%	1.67%	N/A	170
57	054-008-02	Young	71.02	Agricultural	2.71%	1.67%	N/A	3215
58	054-007	Reynolds	240.00	Agri/Res	9.15%	1.67%	3,805	6935
59	054-005-02	Reynolds	59.17	Agricultural	2.26%	1.67%	N/A	2715
60	12-115	Smith	5.59	Residential	0.21%	1.67%	475	2150
		Total	**2622.166**		**100.00%**	**100.00%**	**1,839**	

Methodology to Indicate Effect on Adjoining Properties

The Kirkland Appraisals 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 fourteen states plus two in Kentucky. This is a quantitative analysis of paired-sales 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 Appraisals Impact Study applied the paired sales analysis to adjoining properties around existing solar farms in fourteen states including Illinois, Indiana, Georgia, Florida, North Carolina, South Carolina, Virginia, Michigan, Ohio, Tennessee, Maryland, Minnesota, Arizona, and Texas plus two solar farms in Kentucky. The survey employes test area sales that are adjoining a solar farm and Control sales that are not adjoining solar farm. The survey is done in the surrounding states including solar farms with the analysis of sales analyzed and broken into subset of Kentucky with boarder states, southeastern states, national data base and larger solar farms 20 to 80 MW. The result indicates no change to positive impact effect on adjoining property value. The general conclusion would indicate a neutral overall effect on the market value of adjoining properties to solar farms generally and would therefore have a neutral impact on adjoining properties in the proposed Frontier Solar project. The closest residence in the subject project has greater distance then paired sales in this study.

Conclusion of Solar Farm Impact

The evidence presented in the Kirkland Appraisal Impact study including the paired sales analysis is a strong indicator that proximity to the proposed Frontier Solar Project will have a neutral impact on the adjoining property value when the set back and buffer screening is in place. The proposed 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. A review of published research material on this subject is included in this Impact Study which also indicates the neutral effect on the adjoining property to solar farm projects of similar size and neighborhood characteristics as found in the proposed Frontier Solar project.

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.

E. Clark Toleman, MAI, SRA
Kentucky Certified General Appraiser No. 109

QUALIFICATIONS OF THE APPRAISER

E. Clark Toleman MAI, SRA

PROFESSIONAL MEMBERHIPS:

MAI Member of the Appraisal Institute
SRPA MAI No. 7572
SRA General Certification – Kentucky Real Estate Appraisers Board No. 109

Real Estate Broker – State of Kentucky
Member of Lexington Board of Realtors
Member of Kentucky Association of Realtors
Member of National Association of Realtors

EDUCATION: West Australia Institute of Technology, Perth, Australia – Business Studies Major in Real Estate Valuation

Completed all course requirements for the Australian Institute of Valuers, the American Institute of Real Estate Appraisers and Society of Real Estate Appraisers. Appraisal seminars related to Conservation Easements, partial interests and Federal guidelines for Federal Land Acquisition.

Participate in continuing education through seminars and courses by the Appraisal Institute.

EXPERIENCE:
Full time career in all phases of Real Estate. Employed in Property Management, Office of Development, Leasing and Valuation. Real Estate Appraiser in Lexington, Kentucky since 1974. Owner and Manager of Investment Property. Self- employed and owner of E. Clark Toleman Real Estate Appraisal Services.

APPRAISAL CLIENTS:

Financial Institutions:

Bank of Lexington, First Security National Bank, Bank One, Citizens Fidelity Bank in Lexington, First National Bank of Louisville, Fifth Third Bank of Campbell County, PNC Bank, Franklin Bank, MCNB Bank, First Capital Bank, Community Trust Bank, First Southern National Bank. Recent non-bank lender clients include: Realty Investment

Company, Memphis, Tennessee; New York Life, Atlanta, Georgia, Cincinnati Insurance Co.

GOVERNMENT INSTITUTIONS:

Lexington Fayette Urban County Government, Corps of Engineers, Department of Justice, General Services Administration, U.S. Postal Service, Census Bureau, Resolution Trust Corporation, FDIC, FSLIC, Commonwealth of Kentucky, Transportation Cabinet, Bluegrass Airport Board, LexTran Board, State of Kentucky Kentucky Office of the Courts, LFUCG Division of Water Quality, University of Kentucky, Kentucky State University, Kentucky Community and Technical College System, Eastern Kentucky University, Division of Real Property State of Kentucky, Louisville Regional Airport Board, Lexington KY Airport Board.

APPRAISED FOR:

Major horse farms, full range of commercial properties, multi-family residential, condemnation cases for both Plaintiff and Defendant, IRS, utility companies, four flood control lane projects, Urban Renewal, major industrial properties and highway right of way. Appraisals conducted on conservation easements for individuals the State of Kentucky for the PACE program and the Lexington Fayette Urban County Government for the Purchase of Development Rights, on Farm Properties, Marathon Oil Co. for R/W easements, CSX Railroad, Norfolk Southern Railway, Cincinnati Insurance, Safe Co Insurance, LexTran, and Southern States.

QUALIFIED AS EXPERT IN REAL ESTATE VALUES:

Federal Court of Kentucky- Eastern and Western Division. Testified in Local Tax Appeal Cases, Circuit Court of Clark, Pike, Montgomery, Bourbon, Woodford, Jessamine, Bell, Johnson, Jefferson, Anderson, Franklin, Boone, Campbell, Scott, Lawrence, Clay, Whitley, Pulaski, Kenton, and Martin County, Kentucky, and the United States Bankruptcy Court.

ATTACHMENT C

Watters
UNCLAIMED PROPERTY CONSULTING LLC

CELL 513.225.6158
OFFICE 513.232.1769
2519 Ashton Court
Cincinnati, Ohio 45244-2810

Review and Evaluation of the *Electronic Application of FRON bn, LLC (Frontier Solar) for a Certificate of Construction for an Approximately 120 Megawatt Electric Generating Facility and Nonregulated Electric Transmission Line in Marion and Washington Counties, Kentucky, Pursuant to KRS 278.700 and 807 KAR 5:110*

Siting Board Case No. 2023-00360

Review of *Economic & Fiscal Contributions to the Counties of Marion and Washington and to the Commonwealth of Kentucky* ("Economic Impact Report")

Application Exhibit E

Prepared for

David H. Elliot Company (Elliot Engineering)
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

Executive Summary

Based upon the representations of the Applicant represented in its *Economic & Fiscal Contributions to the Counties of Marion and Washington and to the Commonwealth of Kentucky* ("*Economic Impact Report*"), *Application Exhibit E ("Exhibit E")* there are positive, significant, short-term initial economic benefits during the Construction Phase for the Commonwealth of Kentucky, and the region, including Marion and Washington Counties. During the longer Operational (generation) phase, there are less impactful, but positive, economic impacts.

Project Factual Summary

Frontier Solar LLC is requesting certificates of construction to build and operate an up to 120-megawatt alternating current (MW) merchant electric solar generation facility and a nonregulated electric transmission line in accordance with KRS 278.704 and 278.714 in Kentucky counties of Marion and Washington.[1]

This Project is proposed to be completed in two phases, to include an unincorporated 1,411 acres of 21 parcels with 15 owners, located in these counties. Current usage is primarily agrarian.[2] When completed, the two phases will generate up to 190 MW using a common connection with an existing 138 kV substation owned and operated by Louisville Gas & Electric and Kentucky Utilities (LG&E/KU), located on Radio Station Road in Lebanon, KY.[3]

This Application is for **Phase I** of the Project. This Phase is projected to generate up to 120 MW from approximately 1,085 acres of the total. The site will comprise properties located east and west of KY Route 55, between Springfield and Lebanon, in Marion and Washington Counties.[4]

FRON bn, LLC is a limited liability company with its principal address at 515 N. Flagler Dr., Suite P-200, West Palm Beach, FL, 33401, telephone no. (850) 963-7724. The *Economic Impact Report* was prepared by Mangum Economics, 4198 Cox Road, Suite 104, Glen Allen, VA 23060, telephone number: (804) 322-7777. The Project Team crating the report was headed by Martina Areal, M.B.A., Director, Economic Development & Energy Research, with credits for A. Fletcher Mangum, Ph.D., Founder and CEO, and Rebecca Kyle, Senior Research Analyst.

The Phase is projected to have a total capitalized investment of $149.4 million, not all of which will be invested in-state.

[1] *Application.* Page 1.
[2] Ibid., page 2, paragraph 3.
[3] Ibid., page 3, paragraph 4.
[4] *Application Exhibit E,* page 1.

The Construction Phase estimated total in-state spending is projected to be $41.3 million; the total economic impact from labor is estimated to be $32.8 Million in economic output (including purchases of goods and services) $7.3 million from 151 jobs (51 direct, 94 indirect and induced jobs); and one-time tax revenues of all types are estimated at $1.2.[5]

The Operational (generation) Phase of projected 40 years expects 8 jobs (direct, indirect and induced) statewide with *annual* spending of $0.4 million for salaries, maintenance and repair, vegetative control, and other operations and total annual economic output of $1.3 million. Taxes during this phase are estimated to be $4.8 million state and $8.6 million over the 40-year life of the Project. The report is silent as to any positive or negative economic impact resulting from post-Project remediation of the involved properties.

The *Economic Impact Report* provides details including a breakdown between state and regional economic criteria. Individual county impacts, except for taxes, are not segregated, presumably because the two counties make up a significant part of the region.

Review Criteria and Methodology

This review encompassed the entirety of Frontier Solar LLC's Application, including its *Economic Impact Report* (Exhibit E) that uses IMPLAN modeling.

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

- Specific aspects of the Project - tasks and activities; their chronology and timelines; and the geographic aspects of the Project and their consequences;
- 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;
- Potential impacts, either positive or negative, to current use or other industries and businesses, and residents; and
- 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:

[5] Application, page 11, paragraph 32; *Application Exhibit E,* page 1.

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 Frontier Solar 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 to following inquiries are analyzed for each Phase, using the following criteria:

Direct impacts. Wages paid to employed workers for Construction and Operational Phases.

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

Induced Impacts. These are socioeconomic changes arising as a result of increases in local spending as a result of the Project.

Taxes.

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 (IRB and PILOT)

Kentucky Commonwealth Sales Taxes.

Other Benefits. Includes other contributions to the Commonwealth and the region.

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.[6]

[6] 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.

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

The analyses were conducted on a statewide-, regional- and county basis.

Applied Review and Analysis

Review Summary

The *Application* and *Economic Impact Report* (Exhibit E), are represented as being limited to **Phase I** of a two-phase overall project. This review of the economic impact analysis is made on the presumption that this factual representation is correct and that all representations of benefits were computed and represented as relating solely to **Phase I**.

On those bases and the computations related, the proposed Project, Phase I, are expected to have positive economic impacts on the regional and commonwealth economy, particularly during the Construction Phase. During the Operations Phase, a more modest but significant long-term and steady stream of employment, output and tax revenues benefitting individual citizens, the state and local economy are expected. All sums are in current dollars:

Construction Phase[7]

Economic Impact Assumptions

The Applicant projects a total capitalized investment everywhere during the Construction Phase of $149.4 million, comprising architecture, engineering, site preparation, and other costs of $68.9 million; capital equipment costs of $80.5 million (no in-state purchasing); and 151 direct, indirect and other jobs.[8]

Direct, Indirect and Induces Impacts

The applicant has outlined the basis for concluding the Project is projected to produce direct state impact during the Construction Phase of $7.28 million, from 151 new jobs in-state.[9] These numbers may include local and temporarily labor re-locating to Kentucky for construction.

The impact for the region is projected to produce 58 jobs and labor income of $2.59 million.[10]

[7] *Economic Impact Report*, page 14 – 16.
[8] Ibid., page 16.
[9] Ibid., pages 1 and Table 1, page 16.
[10] Ibid., page 15.

These numbers appear to be in line with similar projects.

Output

The Construction Phase is predicted to produce statewide economic output of $32.8 and regionally, $17.76 million.[11]

Tax Impacts

The only taxes reviewed and discussed for the Construction Phase were grouped as $1.2 million in state and local employment taxes.[12]

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.

Operations Phase[13]

Economic Impact Assumptions

The Applicant assumes a 40-year operational life for the solar project. Operations are projected to create $1.3 million annually for salaries, vegetative control, maintenance and repairs, and other expenditures. The project will employ one technician for 60% of the job's time and employ locally for site care. The Applicant will make lease payments to lessors of real estate used in the facility (amounts of lease payments remain confidential).

Direct, Indirect and Induces Impacts

Employment during the Operational Phase is expected to utilize 3 direct and 5 indirect or induced hired resources; regionally, there will be one direct employee (presumably, the technician, employed 60% of the time with the project) and 3 additional indirect and induced employments. Projected annual labor income is $403,600 statewide and $225 regionally.

Output

Output is projected to be $1.29 million statewide, and $797,000 within the region. These totals are consistent with other projects in the state.

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[11] *Economic Impact Report*, pages 15-16
[12] Ibid., page 15.
[13] Ibid, pages 16 – 26.

Fiscal/Tax Impacts – Operational Phase

Fiscal Impact Assumptions

The following assumptions were used by the applicant to predict tax impacts arising from this Phase of the Project:

- The total projected capitalized investment of over $149.4 million are further detailed as:
  - Manufacturing machinery, $103.3 million
  - "Other" tangible personal property, $25.5 million
  - Real property improvements, $4.5 million
  - And a residual for civil site improvements
- Manufacturing and tangible personal property would be depreciated under the Revenue Cabinet's Class IV schedule
- Existing real estate acreage would be reassessed for commercial use
- The capital investment is assumed to be equally divided between Marion and Washington Counties
- The operational life of the generation would be 40 years; and
- Current tax rates for all property types for all taxing jurisdictions would remain at their current published rates throughout the operational life

The Applicant's projections do not take into consideration indirect (or induced) economic activity that may impact values and taxes attributable to the operations of solar generation on the site.

Taxes

Kentucky taxes for the *Economic Impact Report* review were grouped as business taxes, employment taxes, sales and use taxes, and property taxes for the purposes of this review.

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.

Employment taxes would include primarily state income and local occupational taxes. These taxes for the Construction Phase and are not projected, but should be modest.

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). As the Applicant projects that most sales and services will be purchased from out-of-state and in-state purchases minimal, these taxes are not projected, but likely would be minimal.

Property taxes include both real estate and personal property taxes:

Real estate taxes, currently based upon farm usage, should not change during the short Construction Phase. During the Operational Phase, the Applicant is projecting annual state real estate taxes of $17,500 (or $701,000 over the 40-year operational life); annually $60,100 taxes in Marion County ($2.4 million lifetime); and $67,900 annually for Washington County ($2.7 million total). These would appear consistent with similar projects.[14]

Personal property taxes. Tangible personal property is subject to depreciation, the annual depreciated property value (that generally decreases annually) being the base for the local personal property taxes. The applicant, through the Economic Impact Report, pages 21 – 26, has provided its calculations for review. They appear reasonable.

For the 40-year life of the Operational Phase, the total local taxes are estimated as $4.0 million and $4.6 million, for Marion and Washington Counties, respectively, including both county jurisdictions and school taxes. The total state personal property taxes are projected to be $2.4 million. This projection and its computation are reasonable.

The Applicant does not appear to be utilizing either Industrial Revenue Bond (IRB) agreements or Payments in Lieu of Taxes (PILOT) agreements that could reduce projected taxes.

Remediation Phase

There was no analysis of economic impact during the remediation following the Project, but such should be deemed to have minimal impact as decommissioning intends to return the real estate to its original condition. Labor and material costs, plus any incidental taxes, would usually be minimal.

Conclusions and Recommendations

The construction and operation of the Frontier Solar project facility in Marion and Washington Counties, Kentucky will provide significant positive economic benefits to the region and Commonwealth.

[14] *Economic Impact Report*, page 19.

Measurable employment, payroll and associated occupational taxes, together with indirect and induced impacts will realize both payroll and occupational short-term tax increases during the Construction Phase.

During the Operational Phase, the economic impact is expected to be smaller annually for the region and Commonwealth, but over the 40 year life, significant. A modest payroll will provide employment for a few individuals with modest state income and local occupancy taxes in the Commonwealth and Graves County. Personal property (and manufacturing taxes) and real estate taxes will increase annually and provide steady income to their recipient governments.

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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 Solar Generating Facility in Harrison County, Kentucky (September 2022)

In Re: Blue Moon Energy LLC, Case No. 2021-00414, Application for Certificate to Construct an Approximately 70 Megawatt Merchant Electric Solar Generating Facility and Nonregulated Electric Transmission Line 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)

In Re: Sebree Solar II, LLC, Case No. 2022-00131, Application for a Certificate to Construct an Approximately 150 Megawatt Merchant Solar Electric Generating Facility in Henderson County, Kentucky (circa July 2022)

In Re: Golden Solar, LLC, Case No. 2020-00243, [Application] for Certificate of Construction for an approximately 100 Megawatt Merchant Electric Solar Generating Facility in Caldwell County, Kentucky (circa November 2022)

In Re: Banjo Creek Solar LLC, Case No. 2023-00263, Electronic Application . . . for a Certificate of Construction for an Approximately 120 Megawatt Electric Generating Facility in Graves County, Kentucky

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.

4 Recommendations & Mitigations Measures

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

1. Create an over-all plot plan indicating all water bodies, bridges, railroad crossings, culverts, access roads, power lines, residential and public structures, etc.
2. For locating the Solar Modules and Other associated equipment of the plant maintain sufficient clearance from the existing power lines.
3. Construct new bridges or culverts wherever necessary for equipment transportation.
4. 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.
5. 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.
6. 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.
7. 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.

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 experienced 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.

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