Andy Beshear
Governor

Rebecca W. Goodman
Secretary
Energy and Environment Cabinet

Commonwealth of Kentucky
Kentucky State Board on Electric Generation and Transmission Siting
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602-0615
Telephone: (502) 564-3940

Michael J. Schmitt
Chairman

July 10, 2020

TO: FILINGS DIVISION

RE: Case No. 2020-00040
ELECTRONIC APPLICATION OF TURKEY CREEK SOLAR, LLC FOR A CONSTRUCTION CERTIFICATE TO CONSTRUCT AN APPROXIMATELY 50 MEGAWATT MERCHANT ELECTRIC SOLAR GENERATING FACILITY IN GARRARD COUNTY, KENTUCKY PURSUANT TO KRS 278.700 AND 807 KAR 5:110

Please file in the administrative record of the above-referenced case the attached copy of the final report of BBC Research & Consulting, "Review and Evaluation of Turkey Creek Solar LLC Site Assessment Report," dated July 6, 2020.

Sincerely,

Kent A. Chandler
Acting Executive Director
Public Service Commission *on behalf* of the Kentucky State Board on Electric Generation and Transmission Siting

Attachment

cc: Parties of Record

BBC RESEARCH & CONSULTING

Review and Evaluation of Turkey Creek Solar LLC Siting Assessment Report

FINAL REPORT

Final Report

July 6, 2020

Review and Evaluation of Turkey Creek Solar LLC Siting Assessment Report

Prepared for

Kentucky State Board on Electrical Generation and Transmission Siting
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602

Prepared by

BBC Research & Consulting
1999 Broadway, Suite 2200
Denver, Colorado 80202-9750
303.321.2547 fax 303.399.0448
www.bbcresearch.com

BBC RESEARCH & CONSULTING

Table of Contents

SECTION A.

General Statement

SECTION A.
General Statement

This document provides a review of the Site Assessment Report (SAR) for the proposed Turkey Creek Solar merchant electric generating facility submitted to the Kentucky State Board on Electrical Generation and Transmission Siting (the "Board"). Turkey Creek Solar, LLC submitted an administratively complete document titled "Application of Turkey Creek Solar, LLC for a Construction Certificate to Construct a Merchant Electric Generating Facility" (the "application") to the Board in March 2020. The SAR and supporting documents and reports were included with the application. Turkey Creek Solar has submitted the SAR to support its application for a certificate to construct a merchant electric generating facility in Garrard County under KRS 278.700 *et seq.* (the Act), passed by the General Assembly of the Commonwealth of Kentucky in 2002. Board staff retained BBC Research & Consulting (BBC) to perform this review.

Provisions of the Act Establishing the SAR Review Process

The part of KRS 278 entitled "Electric Generation and Transmission Siting" defined a class of merchant power plants and required them to obtain construction certificates as a prerequisite to the commencement of actual construction activity. Those statutes also created the Board and gave it the authority to grant or deny construction certificates requested by individual applicants. The Board is attached to the Kentucky Public Service Commission (PSC) for administrative purposes.

The Act created the application process and, within the process, a series of steps for preparing and submitting this report:

- The applicant files for a construction certificate and pays the fees. KRS 278.706.
- The applicant submits required items, including an SAR. KRS 278.706 & KRS 278.708.
- If it wishes, the Board may hire a consultant to review the SAR and provide recommendations about the adequacy of the information and proposed mitigation measures. KRS 278.708.
- The consultant must deliver the final report so the Board can meet its own statutory decision deadline — 120 days or 180 days from receipt of an administratively complete application, depending upon whether the Board will hold a hearing. KRS 278.710.

SAR Review Methodology

BBC undertook the following tasks to review Turkey Creek Solar's SAR and complete this report:

- Reviewed BBC's prior SAR reviews prepared for the Board, including reviews of proposed Kentucky Mountain Power, LG&E Energy Corporation, ecoPower, and SunCoke projects;
- Reviewed the contents of the site assessment and application;
- Identified additional information we considered useful for a thorough review, and submitted questions to the applicant;
- Conducted the required site visit, including obtaining oral and written information supplied by the applicant, on June 11, 2020;
- Completed interviews and data collection with a number of outside sources as sourced in this document; and
- Compiled and incorporated all of the foregoing in the analysis.

Report Format

This report is structured to be responsive to KRS 278 and our contract. It begins with this general statement that introduces the review. In Section B of the report, we present the executive summary. Section C offers detailed findings and conclusions of the study, and in Section D, we present the detailed recommendations concerning mitigation measures and future Board actions.

Certain Limitations

There are inherent limitations to any review process of documents such as the SAR. These must be understood in utilizing this report for decision-making purposes.

Based on previous experience with the SAR review process, BBC has exercised judgment in deciding what information is relevant and what level of detail is appropriate. This relates to project components, geographic extent of impacts, and assessment methodology. Board staff has provided review and guidance in this context.

At this point in the planning process, Turkey Creek Solar has not finalized the specific locations and layout of the solar arrays and other project infrastructure. The SAR, and this review, are based on the best available information at this time.

SECTION B.

Executive Summary

SECTION B.
Executive Summary

This report documents the evaluation of a Site Assessment Report (SAR) in compliance with KRS 278.704 and KRS 278.708. The Kentucky State Board on Electrical Generation and Transmission Siting (the "Board") received an application from Turkey Creek Solar, LLC (Turkey Creek) for approval to construct a commercial, photovoltaic solar merchant electric generating facility in Garrard County, Kentucky, on March 27, 2020. Board staff retained BBC Research & Consulting (BBC), a Denver-based firm, to review the SAR. BBC was directed by Board staff to review the SAR for adequacy, visit the site and conduct supplemental research where necessary and to provide recommendations about proposed mitigation measures. This is the summary of BBC's final report, which encompasses the SAR review, establishes standards for evaluation, summarizes information from the applicant, notes deficiencies, offers supplemental information and draws conclusions and recommendations related to mitigation. Issues outside the scope of KRS 278.708 such as regional economic impact, electricity market or transmission system effects and broader environmental issues were not addressed in this engagement.

Description of the Proposed Facility/Site Development Plan

The SAR provides a description of the proposed Turkey Creek facility in terms of surrounding land uses, legal boundaries, access control, utility service, setback requirements, visual impacts, impacts on surrounding property owners, noise levels and traffic impacts. The proposed Turkey Creek generating facility would be located in central Kentucky, about one mile south of the City of Lancaster and about 35 miles south of the City of Lexington. The proposed Turkey Creek facility would be a 50-megawatt alternating current photovoltaic (PV) electricity generation facility, situated on agricultural land that has historically operated as pasture. Facility equipment will consist of crystalline solar panels, inverters, a substation transformer, and associated wiring. An existing 69 kilovolt transmission line is located on the property and would be used to supply facility-generated electricity to the grid.

Conclusions with respect to other descriptive elements of the facility follow:

- **Surrounding land use —** The site is currently used for agricultural purposes, and the majority of the acreage adjoining the site is also agricultural (36%) or large lot agricultural/residential (51%). In terms of the number of parcels, the majority of adjoining parcels are residential (56%). Parcels used for residential purposes are primarily located northeast of the proposed site, while agricultural and agricultural/residential parcels are located southeast, south, and west of the site. The five large lot parcels classed as agricultural/residential range in distance from 1,120 feet to 3,125 feet from the nearest solar panel. The 23 adjoining residential parcels range in distance from 240 feet to 1,125 feet from the nearest solar panel. Five homes are identified as within 270 feet of a future solar panel. Several light industrial properties are located near the site in the northwest quadrant, between the site and U.S. Highway 27.

- **Proposed access control and security —** Turkey Creek states that the site would be enclosed by a fence meeting national electrical code requirements, typically a six-foot fence with three strings of barbed wire at the top. The proposed access gate will be locked with a standard keyed or combination lock. Emergency personnel will be provided a key or combination for access.

  Relative to other siting applications that BBC has reviewed, the proposed access control for this facility is relatively minimal. However, those prior applications were all for facilities involving fuel combustion to produce electricity (coal or wood). The level of potential risk to surrounding areas associated with a commercial solar facility would seem much lower than for a fossil fuel (or renewable fuel) facility. During the site visit, Turkey Creek representatives also stated that the proposed substation on site would also have its own fence meeting national electric code requirements. NEC 110.31 requires either a 7-foot fence, or a 6-foot fence with three strands of barbed wire above it.

- **Utilities —** The applicant's SAR stated that external utility services should not be required at the site during typical operation. Turkey Creek stated that the project will never require sewer services, but that water may be required for initial landscape installation as well as ongoing vegetation management. The facility will consume service power from the local electric utility in the event that the site is offline when either the sun has set or the facility is unexpectedly out of operation.

- **Setback requirements —** Kentucky statute 278.704(2) states that "…beginning with applications for site compatibility certificates filed on or after January 1, 2015, the proposed structure or facility to be actually used for solar or wind generation shall be required to be at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility." The nearest neighborhood (Merriwood Estates) includes homes ranging in distance from 240 feet to 840 feet from the nearest proposed solar panel. The Garrard County High School is also located within 2,000 feet of the nearest proposed panel. For development of the proposed Turkey Creek facility to proceed as planned by the applicant, a deviation from the setback requirements would be required.

- **Other facility site development plan descriptions provided in the SAR —** Legal boundaries; location of facility buildings, transmission lines, structures; location of access roads, internal roads and railways are all addressed in the SAR. Noise levels are briefly addressed and then evaluated more fully in a subsequent section of the SAR. These materials appear to meet the informational requirements identified in KRS 278.708.

Compatibility with Scenic Surroundings

Visual impact analysis commonly includes a description of the visual setting, visual features of the facility and its appurtenances, and an identification of places where humans might observe the facility or its components. These factors contribute to the evaluation of visual impacts and the facility's compatibility with the existing setting.

The applicant did not include a formal visual assessment in the SAR. However, Attachment A, the Property Value Impact report, provides an analysis of scenic compatibility based on distance between the facility and neighboring homes; topography; and harmony of use in the context of hazardous material, odor, noise, traffic, stigma, and appearance.

Topography of the landscape directly impacts the visibility of the facility. The site is located on higher ground than the nearest neighborhood (Merriwood Estates), which would limit, or possibly eliminate, the view of solar panels from the homes in that neighborhood. In response to a request from BBC, Turkey Creek provided visual simulations of the proposed facility from key observation points at two neighboring properties which are more distant from the nearest solar panels than the homes in Merriwood Estates, but are located on higher ground to the east and would have a view of the proposed facility.

In general, BBC concurs with Turkey Creek's statements that the proposed facility would not be incompatible with its surroundings from a scenic standpoint. This assessment reflects the topography of the site, which limits or eliminates its visibility from homes in Merriwood Estates to the northeast. It also recognizes that solar facilities have a relatively low profile – similar to or lower than most single-family homes – and Turkey Creek has agreed to install vegetative buffers to help screen the site from nearby homeowners to the east and northeast.

Potential Changes in Property Values for Adjacent Property Owners

The central issue related to property values is whether or not, and to what extent, property values of other land owners will change as a result of development and operation of the proposed Turkey Creek facility. Attachment A of the applicant's SAR (the Property Value Impact report) provides a comparative study using data from numerous solar facilities across the US of property values in proximity to such facilities with similar homes which are not in close proximity. The study uses an analysis of comparable home values design that is similar to the approach by which appraisers commonly estimate residential property values.

Regarding the impact of the facility based on distance to the nearest home, Attachment A states that the closest home to the proposed facility site is 240 feet away, further than a distance at which negative value impacts could be felt by neighboring property owners. The Property Value Impact report also presents an assessment of the proposed facility's harmony with the area, noting that solar facilities do not create any hazardous wastes during normal operation, nor do they produce odor; generate noise at levels that have a negative impact on the surrounding properties; or generate vehicle traffic at a significant level.

To obtain further perspective regarding potential effects on property values, BBC reviewed recent studies and articles related to potential concerns regarding solar facility effects on nearby property values. In some cases, recent proposals to construct large scale commercial solar projects have met with substantial public opposition. Although concerns regarding nearby property values have been one of the issues raised by project opponents, no data or analysis has been provided to substantiate that concern.

A more neutral evaluation was provided in a 2018 study conducted by the LBJ School of Public Affairs at the University of Texas. Based on a survey of public sector property appraisers in

counties with commercial solar facilities, the study found that most assessors believed that commercial solar facilities had no impact (66 percent of all estimates) on home prices, or a positive impact (11 percent of all estimates). While some respondents did estimate a negative impact on home prices, assessors who had actual experience in assessing home values near solar facilities expected smaller impacts than those without such experience.

Based upon review of the applicant's SAR, subsequent information obtained during our visit to the site and surrounding areas, and other supplemental research, BBC concludes that the proposed facility is unlikely to have measurable impacts on the property values of adjacent properties or other properties in the vicinity of the project.

Expected Noise from Construction and Operation

The applicant's SAR includes a Noise and Traffic Assessment (Attachment C). The assessment concludes that noise in the assessment area will temporarily increase during business hours throughout the construction phase, and will be due to increased vehicle traffic and machinery operation. However, this elevation in noise emission will not be significant against the background of noise from other sources in the area, including machinery operation from businesses, regular vehicle traffic, and the operation of agricultural equipment.

The assessment further concludes that ongoing noise from the daily operation of the proposed facility's panel tracking motors and inverters will not significantly contribute to noise within the assessment area, particularly with the installation of vegetative buffers as described in the applicant's SAR. Based on the reported noise levels associated with these pieces of equipment and the distance to the nearest homes, BBC estimated that the maximum noise levels at those homes would be approximately equivalent to the noise level of a background conversation heard at a restaurant or the noise level of a standard dishwasher (for the tracking motors) and the noise level found typically found in a library (for the inverters).

Given the moderate decibel ratings of the facility's motors and inverters, the distance between the proposed facility's noise-emitting equipment and the nearest residences, and the installation of vegetative buffers that will mitigate both the visual and audible impacts of the facility, BBC concludes that noise levels at the proposed facility during normal operations will not be a significant concern.

Impacts on Transportation

The proposed facility site is adjacent to two major roadways: SR 39 and US 27, along which two entrances to the site will provide access during construction. It is important to note that the driveway access from SR 39 is also currently used by the Garrard County District #1 Volunteer Fire Department (GCD#1VFD). There is also a third entrance on Crab Orchard Road, on the east side of the site, which will be used only for maintenance access and not for construction. There is no rail access to the site.

At the onset of mobilization, trucks will deliver heavy machinery to the site, and after that there will be daily truck deliveries of installation materials to site. Heavy traffic will occur for the first few weeks after mobilization, but will slow towards the end of the installation period. The project will develop and conduct a traffic management plan to minimize traffic impacts. During

the expected 8-12 month construction phase, between 150 and 300 workers will be employed by the project.[1] To put those numbers in perspective, if a daily peak of 300 workers commuted to and from the site via US 27, it would increase the average daily traffic volume on that road by about 7 percent. If all of the peak construction workforce accessed the site via SR 39, it would increase daily traffic on that road by about 21 percent. Since the average construction workforce is expected to be about half of the potential peak workforce (or approximately 150 workers per day), the average effect on traffic volumes would be about half of the increases described above.

After the construction period at the proposed facility site, traffic volumes in and out of the site will be minimal during daily operations.

Recommendations

In general, the Turkey Creek site appears to have been well selected in terms of both access to existing transmission infrastructure and modest local impacts. The applicant has provided the required information for the site assessment, including responses to BBC's questions following our review of their SAR.

Additional information needed from the applicant. We would suggest that the applicant clarify the apparent discrepancy in terms of the distance between the nearest home and solar panel, which is cited as 240 feet in the Property Value Impact Study and 400 feet in the Noise and Traffic Assessment.

Mitigation recommendations. Turkey Creek has proposed the following mitigation measures in their SAR:

- Planting of native evergreen species as a visual buffer to mitigate viewshed impacts. Plantings to primarily be in areas directly adjacent to the Project without existing vegetation. Trees should be approximately 15 feet wide and at least three feet in height at time of planting;
- Cultivation of at least 2 acres of native pollinator-friendly species onsite; and
- Turkey Creek Solar had an Environmental Site Assessment (ESA) Phase 1 completed for the site, which was provided with their SAR. [2]

BBC supports the foregoing mitigation identified by Turkey Creek. We also recommend the following additional mitigation measures to minimize the impacts of the proposed facility:

- Turkey Creek must ensure that all site entrances and boundaries have adequate signage, particularly in locations visible to the general public, local residents, and business owners.

[1] Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

[2] SAR, Section 6.

- During the construction process, construction activity and delivery of materials to the site should be limited to the hours between 7 AM and 9 PM.

- As indicated in the applicant's Responses to BBC Research and Consulting's First Request for Information (Response 8), the applicant should ensure that "To manage impacts the EPC contractor will develop a traffic management plan to minimize the impacts of this traffic increase and keep traffic safe. Part of this plan will be to maintain all traffic/staging onsite." An important part of that plan will be to establish protocols to make sure the fire department has immediate access to the driveway onto SR 39 when needed.

Subject to review of the additional information needs identified earlier in this section, and to the Siting Board's decision on whether to grant Turkey Creek a deviation from setback requirements identified in KRS 278.704 (2), BBC recommends that the Board approve the application for a certificate to construct based upon the siting considerations addressed in this review. This recommendation presumes that the project is developed as described in the applicant's SAR and supplemental information, and that the mitigation measures above are implemented appropriately. Based upon the information available to BBC at the time of this report and if these presumptions are correct, there are unlikely to be significant unmitigated impacts from construction and operation of the Turkey Creek project regarding scenic compatibility, property values, noise or traffic.

SECTION C.

Findings and Conclusions

SECTION C.
Findings and Conclusions

This section provides detailed review and evaluation of each element of the SAR as prescribed in Section 5 of KRS 278. It is organized into five subsections:

1. Description of Proposed Facility/Site Development Plan;

2. Compatibility with Scenic Surroundings;

3. Potential Changes in Property Values for Adjacent Property Owners;

4. Expected Noise from Construction and Operation; and

5. Impacts on Transportation.

Although the Board will likely consider economic impacts and other issues in making its decision, these are beyond the present scope of our inquiry and so are not addressed here.

Within each subsection, BBC has followed a consistent pattern. First, BBC describes the generally accepted assessment criteria or methodology necessary to evaluate impacts of a project of this nature. Secondly, we summarize what relevant information was included in the initial SAR. Thirdly, we describe supplemental information about the proposed Turkey Creek facility, along with other information BBC was able to gather about the project and its impacts. Finally, BBC draws its own conclusions about the project's potential impacts and recommended mitigation. We believe that this format transparently presents the basis for our conclusions and recommendations.

Description of Proposed Facility/Site Development Plan

Potential Issues and Standard Assessment Approaches

As required by KRS 278.708(3)(a), the SAR must contain the following information:

- Subsection 1—surrounding land uses for residential, commercial, agricultural and recreational purposes;

- Subsection 2—the legal boundaries of the proposed site;

- Subsection 3—proposed access control to the site;

- Subsection 4—the location of facility buildings, transmission lines, and other structures;

- Subsection 5—location and use of access ways, internal roads, and railways;

- Subsection 6—existing utilities to service the facility;

- Subsection 7—compliance with applicable setback requirements as provided under KRS 278.704(2), (3), and (5); and

- Subsection 8—evaluation of the noise levels expected to be produced by the facility.

BBC found each of these required information items in the SAR and examined them. To some extent, the required elements of the description of the facility and site development plan specified in the legislation overlap with topic-specific evaluations also required in the statute. In particular, the statute calls for specific evaluations of impacts on nearby property values, traffic, and noise levels. Both the applicant's SAR and the BBC team's evaluation provide further detail on these topics in subsequent sections.

Information Provided in the Applicant's SAR

The required description of the proposed facility and site development plan is mainly set forth in Section 1 of the SAR. Other related or supplementary information comes from various other sections of the SAR and application.

Overview of proposed facility. As described in Section 1 of the SAR, the proposed Turkey Creek facility would be a 50-megawatt alternating current photovoltaic (PV) electricity generation facility, situated on agricultural land that has historically operated as pasture. Facility equipment will consist of crystalline solar panels, inverters, a substation transformer, and associated wiring. An existing 69-kilovolt transmission line is located on the property and would be used to supply facility-generated electricity to the grid.

The applicant's SAR presented conflicting information detailing the size of the property and proposed facility at three points within the document. Attachment B of the SAR—describing the proposed site's legal boundaries—states that the overall assemblage of parcels and tracts on which the facility would be constructed totals 762.1 acres; Section 1 of the SAR states that "the project will be situated on up to 520 acres"; and Attachment A of the SAR—the Property Value Impact Report—states that "the proposed solar farm is to be constructed on approximately 297.05 acres out of a parent tract assemblage of 752.80 acres." The BBC team requested clarification of these inconsistencies in our request for information to the applicant.

Surrounding land uses. Section 1.1 of the SAR describes land use classifications of the surrounding land in percentage terms. Attachment A of the SAR presents the same information with additional detail, including a map identifying all adjoining parcels, property owners, present use, acreage, and distance from the home to the facility's nearest solar panel.

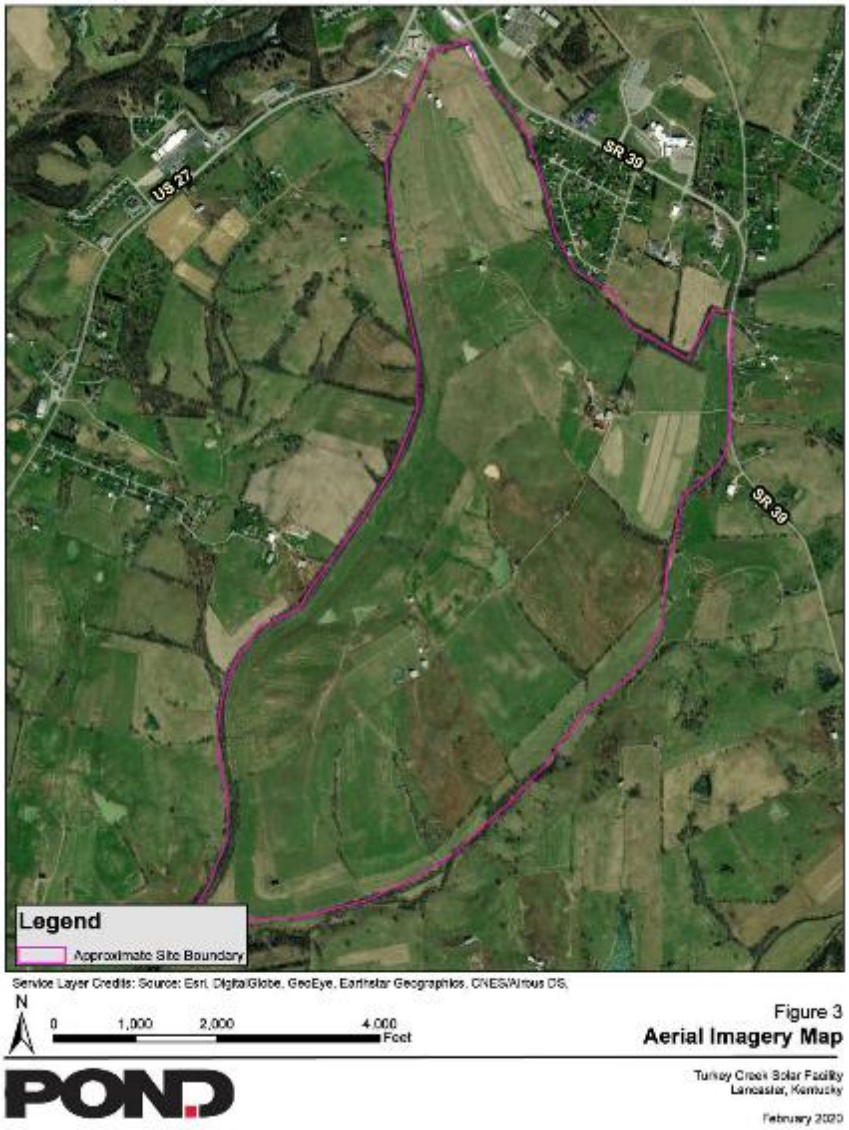
The site is currently used for agricultural purposes, and the majority of the acreage adjoining the site is also agricultural (36%) or large lot agricultural/residential (51%). The majority of adjoining parcels are residential (56%). Parcels used for residential purposes are primarily located northeast of the proposed site, while agricultural and agricultural/residential parcels are located southeast, south, and west of the site.

The five large lot parcels classed as agricultural/residential range in distance from 1,120 feet to 3,125 feet from the nearest solar panel. The 23 residential parcels range in distance from 240 feet to 1,125 feet from the nearest solar panel. Five homes are identified as within 270 feet of a future solar

panel, and eight residential parcels do not have an identified distance between the home and the nearest solar panel.

Figure C-1, copied from the SAR, provides an aerial view of the proposed site. The nearest homes are located in the northeast quadrant, between State Highway 29 (SR 39) and the site. Several light industrial properties are located near the site in the northwest quadrant, between the site and U.S. Highway 27.

Figure C-1, Aerial view of proposed site and surrounding land uses.



Legal boundaries. The legal boundaries of the proposed site are described in Attachment B of the SAR. The site consists of 11 parcels, nine of which are currently owned by Curry Farms FLP Ltd. and total 762.1 acres. The other two parcels and tracts total a little more than 0.8 acres and are currently owned by the Lancaster-Garrard County Industrial Development Authority.

Access control. Section 1 of the SAR provides a brief description of access control and security for the site during operations, indicating that the site would be enclosed by a fence meeting national electrical code requirements, typically a six-foot fence with three strings of barbed wire at the top. The aerial simulation view of the site, provided in Attachment E "Preliminary Site Layout," adds the information that, "The proposed access gate will be locked with a standard keyed or combination lock. Emergency personnel will be provided a key or combination for access."

Location of buildings, transmission lines and other structures. The aerial simulation of the site, presented in Attachment E "Preliminary Site Layout" shows the projected location of the solar arrays, the existing transmission line, and a new electrical substation that would be constructed as part of the project. There appear to be no actual buildings associated with the proposed Turkey Creek facility.

Location and use of access ways, internal roads and railways. Attachment E of the SAR ("Preliminary Site Layout") shows a single proposed access point to the facility (from SR 39, on the east side of the property) and internal roads that would be developed. There is no rail access to the site.

Section 1 of the SAR notes that "the property boundary includes an additional entrance not included in the layout. The additional entrance was discovered during the property boundary survey."

Attachment C "Noise and Traffic Study" notes that "driveway access on SR 39 and US 27 would provide two points of entry to the project site." Apparently the second entrance is from US 27, and Attachment C further notes that both entrances are existing paved driveways near the northernmost potion of the property, but there is no further information in the SAR regarding where the second entrance is located.

Existing or proposed utilities. Section 1 of the SAR states, "At this time, it is not anticipated that the project will need to receive external utility services during typical plant operation." The SAR does not indicate what circumstances, if any, could require external utility services. In its request for information, BBC sought clarification from the applicant regarding what foreseeable circumstances could necessitate external utility services at the site and what those service requirements could be.

Compliance with applicable setback requirements. Section 1 of the SAR ("Description of Proposed Site"), article 4, refers the reader to the Map of Surrounding Residential Neighborhoods in Attachment A of Volume 1 of the application to identify the applicable setback requirements. The same article also notes that Turkey Creek will seek a deviation from the setback requirements.

The map (actually labeled "Turkey Creek Solar Context Map") indicates a number of residential neighborhoods, as well as the Garrard County High School, are located within 2,000 feet of the boundaries of the site. Most of the residential neighborhoods are to the north or northeast of the site. The map is followed by a list of approximately 19 property owners, apparently those that were served with a letter from Carolina Energy regarding the proposed project. While the list is not labeled, Section 6 of the application indicates that, "The project also mailed letters to all adjoining

landowners and to all homeowners in the only adjacent subdivision (Merriwood Estates), notifying them of the public meeting."

Section 5 of the application makes Turkey Creek's argument for a deviation from the setback requirements. This section states: "The City of Lancaster and Garrard County have no established setback requirements for this location, nor has a planning unit enacted any setback requirements for this location." This section goes on to state: "The project will not include any exhaust stacks or wind turbines as part of the facility, therefore there is no established setback requirement from the property boundary of any adjoining property owner to the energy generating facilities."

Evaluation of Noise Levels. Section 4 of the SAR summarizes the evaluation of noise levels associated with the proposed Turkey Creek facility and refers the reader to Attachment C which provides the noise study. The summary in Section 4 notes that the noise produced by the inverters is 67.0 dBA "which … will not be a contributor of noise to the nearest receptor (i.e. single-family home) located at 626 feet away with a planted buffer and a strip of trees between the source and receptor." Attachment C of the SAR states that the dBA estimate for the inverters was measured at a distance of 10 meters.

Attachment C of the SAR also provides a dBA estimate for the proposed facility's panel tracking motors, stating that the motors produce noise of approximately 78 dB. However, the SAR does not indicate at what distance this was measured.

Supplemental Investigations, Research and Analysis

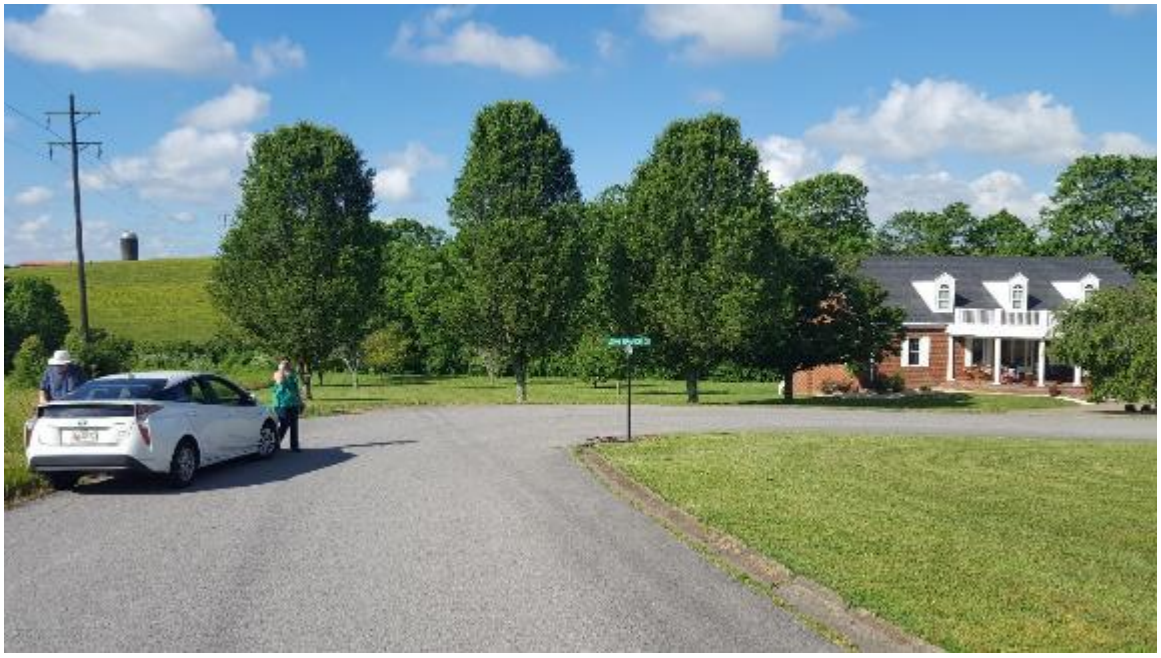
After reviewing the applicant's SAR, the BBC team sought to supplement the information provided in the SAR where necessary to more fully describe the proposed facility and site development plan.

Surrounding land uses. As noted in the review of the SAR provided previously, eight residential parcels identified as being in proximity to the proposed site did not have an identified distance between the home and the nearest solar panel. In its response to BBC's initial questions, Turkey Creek clarified that these parcels did not have an identifiable residence and are either yet to be developed or are being used to provide additional yard area for an existing residence.[1]

During the site visit, the study team also visited nearby areas and took a number of photos to help put the proposed site into additional context. Figures C-2 provides a view towards the site from the nearest residential neighborhood. Figure C-3 provides a view from the central portion of the site, approximately where the new substation would be developed, to the northeast towards the nearest neighborhood.

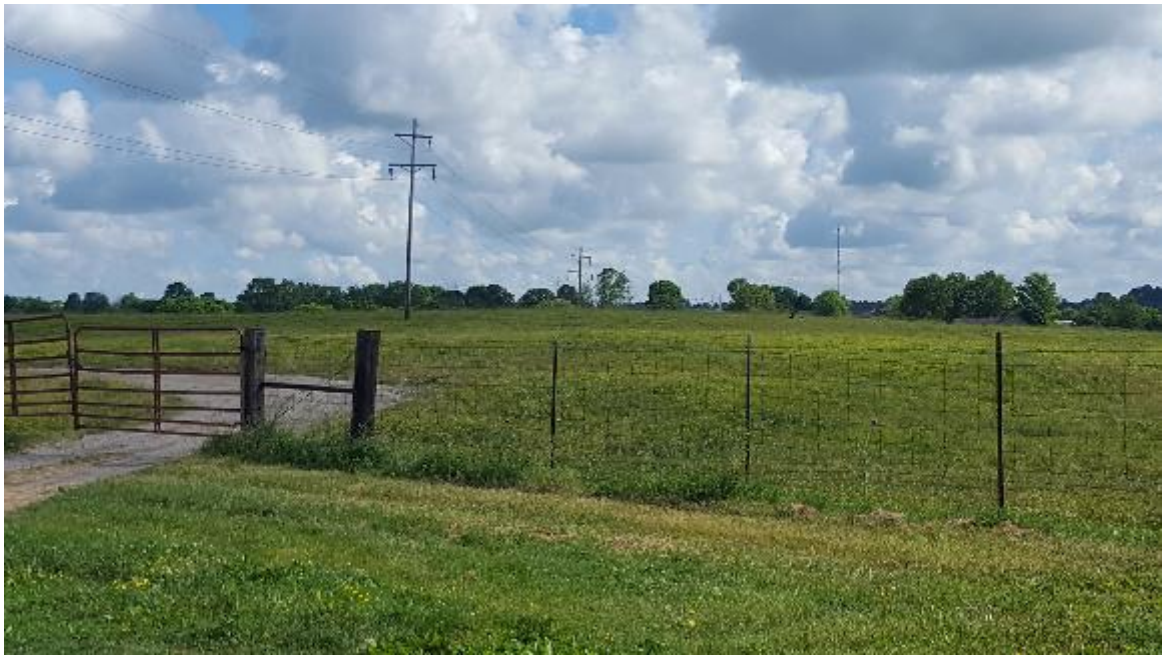
[1]Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

Figure C-2.
Elevated site seen behind SE corner of Merriwood Estates



Source: BBC Research & Consulting, June 2020.

Figure C-3. View N/NE from approximate location of future substation on site showing transmission line



Source: BBC Research & Consulting, June 2020.

Legal boundaries. BBC believes that the legal descriptions of the parcels that comprise the proposed site, found in Attachment B of the SAR, meet the Kentucky statutory requirements. The applicant clarified the specific acreage involved in the proposed site in response to *BBC Research and Consulting's First Request for Information,* stating that the correct surveyed acreage of the Curry Farms parcels is 762.1 acres and that construction of the proposed project would use up to 540 of those acres.[2]

Access control. Relative to other siting applications that BBC has reviewed, the proposed access control for this facility is relatively minimal. However, those prior applications were all for facilities involving fuel combustion to produce electricity (coal or wood). The level of potential risk to surrounding areas associated with a commercial solar facility would seem much lower than for a fossil fuel (or renewable fuel) facility. The proposed access control measures appear to be consistent with industry standards if Turkey Creek also posts adequate signage to warn potential trespassers. [3] During the site visit, Turkey Creek representatives also stated that the proposed substation on site would also have its own fence meeting national electric code requirements. NEC 110.31 requires either a 7-foot fence, or a 6-foot fence with three strands of barbed wire above it.[4]

Location of buildings, transmission lines and other structures. BBC believes the SAR provides sufficient information and graphical representation of proposed locations of buildings, transmission line, and other structures.

Location and use of access ways, internal roads and railways. In response to requests from BBC and the PSC for information regarding site access and roads, Turkey Creek provided further information about site entrances.[5] The applicant provided an updated map depicting the location of the aforementioned entrances on SR 39 and US 27, along the northern boundary of the proposed facility site, and added a third entrance on Crab Orchard Road, on the east side of the site boundary. This third entrance will be used only for operations and maintenance access, not for construction.

Utilities. The applicant's SAR stated that external utility services should not be required at the site during typical operation, and BBC sought clarification from the applicant regarding any possible circumstances in which such services would be required. In its response to BBC's request for information, Turkey Creek stated that the project will never require sewer services, and that water may be required for initial landscape installation as well as ongoing vegetation management. Lastly, the applicant clarified that the facility will consume service power from the local electric utility in the event that the site is offline when either the sun has set or the facility is unexpectedly out of operation.[6]

---

2 Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

3 Health and Safety Impacts of Solar Photovoltaics. North Carolina Solar Energy Technology Center, North Carolina State University (May 2017). Provided by applicant in Responses to BBC Research and Consulting's First Request for Information.

4 http://www.teces.org/docs/1218.pdf

5 Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

6 Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

Compliance with applicable setback requirements. Kentucky statute 278.704(2) states that "…beginning with applications for site compatibility certificates filed on or after January 1, 2015, the proposed structure or facility to be actually used for solar or wind generation shall be required to be at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility." As noted in the SAR, the nearest neighborhood (Merriwood Estates) includes homes ranging in distance from 240 feet to 840 feet from the nearest proposed solar panel. The Garrard County High School is also located within 2,000 feet of the nearest proposed panel. For development of the proposed Turkey Creek facility to proceed as planned by the applicant, a deviation from the setback requirements would be required.

Conclusions and Recommendations

Based upon review of the applicant's SAR, subsequent conversations with the applicant and additional data collected by the BBC team, we reach the following conclusions concerning the description of the facility and the proposed site development plan:

- The applicant has generally complied with the legislative requirements for describing the facility and site development plan. Additional information provided by the applicant in response to *BBC Research and Consulting's First Request for Information* clarified the location of the two proposed access points for construction and the additional proposed access point for future operations and maintenance.

- The applicant clarified the extent (acreage) of the proposed site and the number of acres within the site that would be used for construction in response to *BBC Research and Consulting's First Request for Information*.

- The access control identified in the SAR is generally consistent with industry standards, but should also include appropriate signage to warn potential trespassers.

- Approval from the Board would be contingent on granting Turkey Creek a deviation from the setback requirements described in KRS 278.704(2) relating to the distance between the facility and nearby neighborhoods and schools.

Recommended mitigation. BBC recommends the following mitigation measures in regard to this portion of the Kentucky statutory requirements (KRS 278.708(3)(a):

- Turkey Creek must ensure that all site entrances and boundaries have adequate signage, particularly in locations visible to the general public, local residents, and business owners.

Compatibility with Scenic Surroundings

This section of the SAR review addresses the compatibility of proposed Turkey Creek facility with the scenic surroundings. This component of the SAR is identified in KRS 278.708(3)(b).

Standard Methodology and Issues for Scenic Studies

Various government agencies throughout the country employ visual assessment methodologies based on professionally accepted techniques. These techniques are fundamentally consistent in their approach to evaluating the elements of a project and its compatibility with existing landscapes and other surroundings.

An example of a visual assessment methodology in use by a state power plant siting agency is the methodology employed by the staff of the California Energy Commission. In California siting assessments, the assessment of potential incompatibility between a project and its scenic surroundings focuses on project structures, such as smoke stacks. Typically, the assessment also addresses project lighting and the potential for visible cooling tower plumes.

A standard visual analysis generally proceeds in this sequence:

- Analysis of the project's visual setting;
- Identification of key observation points (KOP);
- Descriptions of visual characteristics of the project; and
- Evaluation of impacts to KOPs.

A KOP is a location where people may periodically or regularly visit, reside or work within the viewshed of the project's structures or emissions. [7]

In general practice, visual impact evaluations are conducted within one of three general frameworks, depending upon the relevant jurisdiction and its level of involvement at the project site. These are listed in order of structural formality:

- A formal visual resource or scenery management system, typically in effect only on federal lands, such as the U.S. Forest Service Scenery Management System or the U.S. Bureau of Land Management Visual Resource Management System;
- Locally applicable laws, ordinances, regulations or standards, where imposed by state or local governments; and
- The cultural context, including the influence of previous uses on the landscape and public attitudes toward the compatibility of various types of land use.

[7] The viewshed is defined as an area of land, water, or other part of the environment visible to the eye from a vantage point. Conversely, the vantage point is presumed to be visible from locations within the viewshed.

Each framework, in its own way, embodies explicit or implicit consideration of some or all of the standard measures of visual impact: viewer exposure and sensitivity; relative project size, quality, visibility, exposure, contrast and dominance; and prevailing environmental characteristics, such as season and light conditions. Local regulations especially focus on screening of facilities from public view and the effects of glare from outdoor lighting upon adjacent property.

In this instance, the visual impact evaluation followed the third, and least formal, of the three approaches listed above. The selected approach is appropriate given that there is no formal visual resource system, nor are there local ordinances related to visual impacts, in effect for the area surrounding the proposed facility. The primary project features under consideration for scenic compatibility are the solar panels, which would be less than 15 feet in height.[8]

Applicant's Submittal

In compliance with KRS 278.708, Section 2 of the SAR summarizes the assessment of compatibility with scenic surroundings and refers the reader to Sections III-VI of Attachment G for further detail. The referenced attachment should actually be Attachment A, the Property Value Impact report.

Visual assessment. The applicant did not include a formal visual assessment in the SAR. However, Attachment A, the Property Value Impact report, provides an analysis of scenic compatibility based on distance between the facility and neighboring homes; topography; and harmony of use in the context of hazardous material, odor, noise, traffic, stigma, and appearance.

Topography of the landscape directly impacts the visibility of the facility, though Attachment A states that distant views of solar facility panels do not appear to have an impact on property values or development patterns. As shown earlier in Figure C-1, the site is located on higher ground than the nearest neighborhood (Merriwood Estates), which would limit, or possibly eliminate, the view of solar panels from the homes in that neighborhood.

Lastly, the Property Value Impact report presents an assessment of the proposed facility's harmony with the area, noting that solar facilities do not create any hazardous wastes during normal operation, nor do they produce odor; generate noise at levels that have a negative impact on the surrounding properties; or generate vehicle traffic at a significant level. In addition, the analysis states that there is no stigma attached to solar facilities, that they are visually similar in many ways to greenhouses commonly present in similar landscapes, and that they are not at odds with the surrounding agricultural or rural residential landscape.

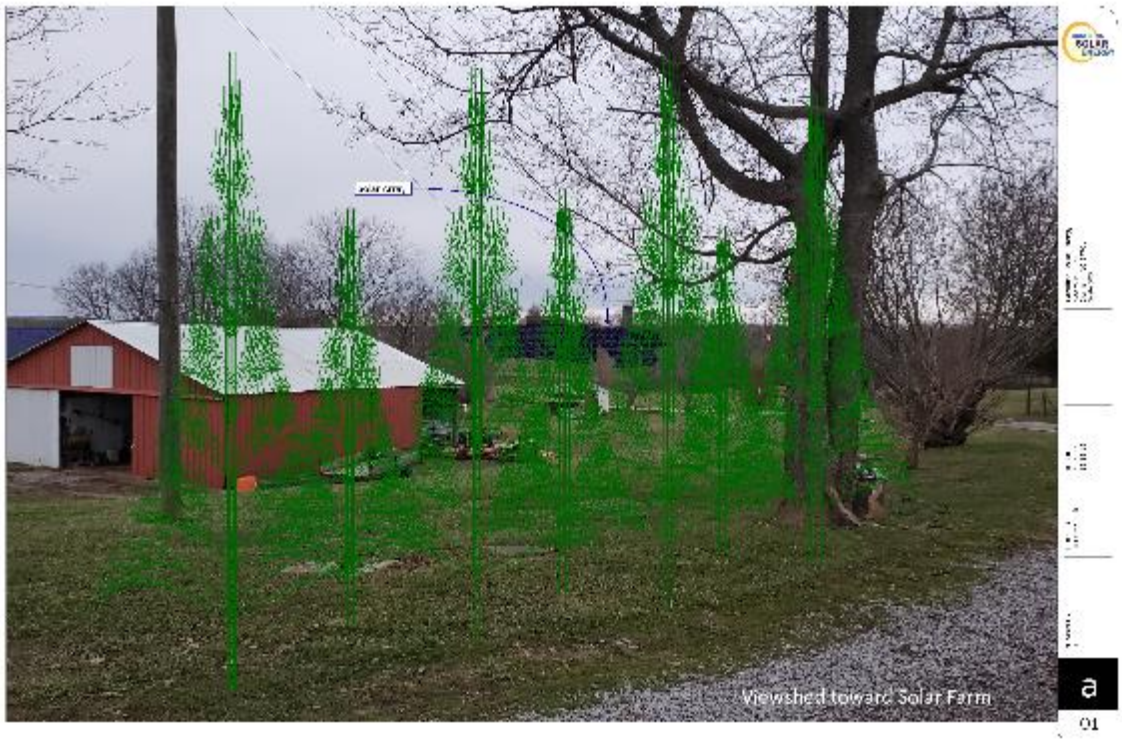
Supplemental Investigations, Research and Analysis

As noted earlier, BBC traveled the surrounding area during our visit to the site and took a number of photographs of the area and site from various locations. We also discussed visual impact considerations with representatives during the visit. In response to a request from BBC, Turkey

[8] SAR, Section 2.

Creek provided visual simulations of the proposed facility from key observation points at two neighboring properties.[9] Those renderings are copied below.

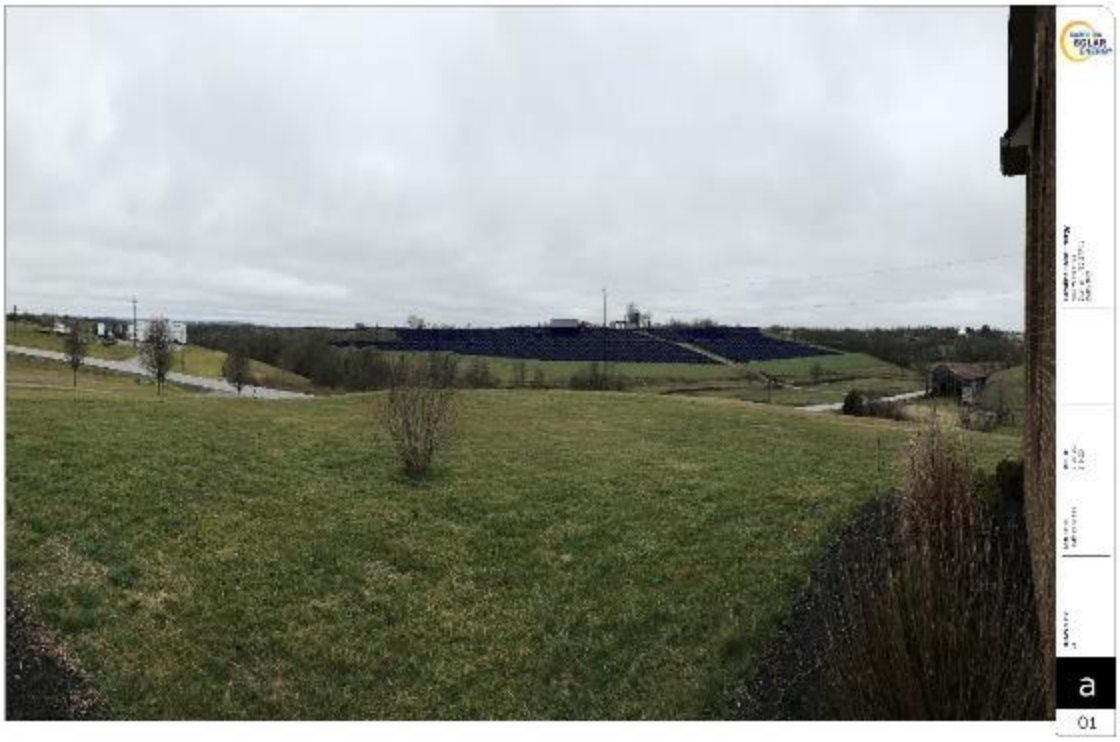
Figure C-4. Visual simulation of Turkey Creek facility from home to east, approximately 570 feet away from nearest panel



Source: Turkey Creek Solar, Responses to BBC Research and Consulting's First Request for Information, Attachment E. June 2020.

[9] Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

Figure C-5. Visual simulation of Turkey Creek facility from home to east, approximately 770 feet away from nearest panel



Source: Turkey Creek Solar, Responses to BBC Research and Consulting's First Request for Information, Attachment E. June 2020.

Conclusions and Recommendations

In general, BBC concurs with Turkey Creek's statements that the proposed facility would not be incompatible with its surroundings from a scenic standpoint. This assessment reflects the topography of the site, which limits or eliminates its visibility from homes in the nearest neighborhood (Merriwood Estates) to the northeast. It also recognizes that solar facilities have a relatively low profile – similar to or lower than most single-family homes – and Turkey Creek has agreed to install vegetative buffers to help screen the site from nearby homeowners to the east and northeast.

Recommended mitigation. BBC recommends the following mitigation measures in regard to this portion of the Kentucky statutory requirements (KRS 278.708(3)(b):

- The study team agrees with Turkey Creek's proposal to plant "a vegetative buffer … if one does not already exist. This buffer will consist of two staggered rows of evergreen shrubs, approximately 15 feet wide and at least three feet in height at time of planting" around "sections of the Project that adjoin roadways and other properties."[10]

[10] SAR, Section 2.

Potential Changes in Property Values for Adjacent Property Owners

Potential Issues and Standard Assessment Approaches

Development of new power plants can raise issues related to potential changes in property values for nearby property owners. These issues may arise from the widespread perception that a power plant and its ancillary facilities—such as ash disposal landfills, overhead electric transmission lines and electric transformer sites—may be "undesirable land uses" whose impacts are expected to be translated economically into negative effects on property values. Studies also show that impacts may extend for some distance from the site, and possibly beyond the immediately adjacent properties. These findings, however, primarily apply to conventional, fossil fuel-fired plants.

Criteria for evaluating property values effects that reflect the concerns of a broad range of interested parties typically include these aspects of the issue:

- Land use compatibility;
- Findings from other empirical studies; and
- Potential for effects to other than adjacent property owners.

Land use compatibility. State and local governments around the country use standards of land use compatibility to minimize the effect of industrial land uses, like power plants, upon nearby properties. KRS Chapter 278 incorporates setback requirements as its primary standard for buffering the siting of power plants. Land use compatibility, in the strict sense of legal use, and in the general sense of reasonably probable use for a given location and "neighborhood," are also factors in a general appraiser's judgment and analysis concerning the "highest and best use" of a property.

Other general issues are also considered to encourage facility siting in compatible settings where negative effects would be minimal to the uses and values of nearby properties. In Wisconsin, for example, the Public Service Commission publishes this general definition of the range of potentially compatible sites for power plants:

Typically, active or vacant industrial lands may be more compatible and urban residential lands may be less compatible with power plants. Generally, sites that are more compatible with present and planned land uses are more desirable, as are those where the plant would comply with existing land use regulations.

General land use planning practice offers the option to adopt or negotiate for performance standards for outdoor lighting, noise, vibration, odor, smoke or particulate matter, and so forth to minimize off-site impacts to adjacent uses.

Findings from empirical studies. Standard real estate appraisals are the most common type of empirical study used to evaluate potential changes to property values. The appraiser generally relies upon an examination of as many actual sales as possible of comparable properties in similar locations and with similar expectations for highest and best use.

Academic studies published in the land and environmental economics literature have used a variety of property value based analyses to estimate the actual effect of power plants and other "undesirable

land uses" whose impacts may have translated economically into negative effects on adjacent property values. So called "undesirable" uses that have been studied in this fashion over time include nuclear and non-nuclear power generation; hazardous, toxic, and nuclear waste disposal; conventional solid waste disposal; waste incineration; and hazardous industrial facilities.

For example, one study investigated the effect newly opened power plants had on property values in neighborhoods located within five miles of the plant. The study included 60 power plants, several of which were located in Kentucky and the surrounding states. The study found that housing values decreased by 3 to 5 percent between 1990 and 2000 in these neighborhoods compared to neighborhoods located further away from the plant. Another study of 262 undesirable or "noxious" facilities located across the country, including 92 coal, natural gas, or oil-fired power plants (of which two were in the East South Central region that includes Kentucky), illustrates this effect. Power plants were found to significantly decrease property values in the communities where they are located. The literature also includes numerous studies of the effect of electric transmission lines upon property values.

The standard statistical technique for evaluating the potential effects of an environmental amenity (such as beach frontage) or a disamenity (such as proximity to a hazardous waste site) is called hedonic pricing analysis. This technique recognizes that before one can evaluate the impact of an external characteristic on property values, the influences of other important value factors must be isolated and held constant using statistical techniques (e.g. multiple regression analysis). A hedonic pricing model treats the good in question (in this case local property values) as a bundle of amenities (size, aesthetic quality of property, access to local town, etc.) and disamenities (pollution, noise, etc.). Such a model is designed to isolate and quantify the implied effect on overall property value from each amenity or disamenity. Hedonic pricing models have been used to evaluate the impacts of many different factors contributing to the value of a piece of property. Examples include examining the effect of the proximity to hog farms (Palmquist, Roka and Vukina, 1997), beaches (Pompe and Rinehart, 1995), airports, and electric power plants (Blomquist, 1973).

Hedonic models are statistically estimated using multiple regression analysis. However, hedonic studies are complex and require extensive statistical training and large amounts of data. Moreover, not all factors that influence a home's selling price can be measured, and housing markets vary greatly from one region to another.

Potential for more distant off-site effects. Most analyses of property value impacts are local in scope. However, the effect of power plants and other facilities on property values has been shown to extend well beyond the site. This has been shown in at least one study, where negative effects of a small power plant located within the city of Winnetka, Illinois, were significant out to a distance of 11,500 feet, or more than two miles. As noted earlier, these findings also primarily apply to conventional, fossil-fuel fired plants.

Information Provided in the Applicant's SAR

Attachment A of the applicant's SAR (the Property Value Impact report) provides a comparative study of property values in proximity to solar facilities in Kentucky and across the US, using a matched pairs design. The section draws its conclusions regarding the impacts of the proposed facility on adjacent property values based on market analysis of value impacts from numerous other solar facilities.

Regarding the impact of the facility based on distance to the nearest home, Attachment A states that the closest home to the proposed facility site is 240 feet away, further than a distance at which negative value impacts would be felt by neighboring property owners. This section of the Property Value Impact report concludes that there is no impact on the value of adjoining properties at this distance from the proposed facility.

Topography of the landscape directly impacts the visibility of the facility and therefore the potential value impact on adjoining properties. However, Attachment A states that distant views of solar facility panels do not appear to have an impact on property values or development patterns. The report finds that the distant views of solar panels created by the 120 foot topographic shift across the facility property would not have an impact on surrounding property values.

Lastly, the Property Value Impact report presents an assessment of the proposed facility's harmony with the area, noting that solar facilities do not create any hazardous wastes during normal operation, nor do they produce odor; generate noise at levels that have a negative impact on the surrounding properties; or generate vehicle traffic at a significant level. There is no stigma attached to solar facilities, and they are in harmony with the surrounding agricultural and rural residential landscapes.

The Property Value Impact report included in the applicant's SAR concludes that there will be no property value impacts from the proposed facility on adjoining properties and that the proposed facility will be in harmony with the area.

Supplemental Investigations, Research and Analysis

To obtain further perspective regarding potential effects on property values, BBC reviewed recent studies and articles related to potential concerns regarding solar facility effects on nearby property values.

In some cases, recent proposals to construct large scale commercial solar projects have met with substantial public opposition. Notable examples include the proposed 500 MW facility at Fawn Lake, in Spotsylvania County, Virginia and the proposed 120 MW facility in Madison County, Indiana.[11] Although concerns regarding nearby property values have been one of the issues raised by project opponents, no data or analysis has been provided to substantiate that concern.

A more neutral evaluation was provided in a 2018 study conducted by the LBJ School of Public Affairs at the University of Texas. That study contacted public sector property assessors in 430 counties across the United States that had at least one utility-scale PV solar facility in place. Thirty-seven assessors agreed to fill out the on-line survey. Among the findings of that study were that:

- "The majority of responses suggested either no impact (66 percent of all estimates) on home prices, or a positive impact (11 percent of all estimates), as a result of proximity to solar installations."

[11] *When Residents Support Solar – Just Not in My Backyard*. Linda Poon. CityLab.com. November 20, 2019; and *County Council Rescinds Revitalization Area Designation for Lone Oak Solar*. Ken de la Bastide. The Herald Bulletin. January 15, 2020.

- "However, some respondents did estimate a negative impact on home prices associated with solar installations."
- "The results also suggest that experience assessing near a solar installation is associated with a much less negative estimate of impact."[12]

Conclusions and Recommendations

Based upon review of the applicant's SAR, subsequent information obtained during our visit to the site and surrounding areas, and other supplemental research, we conclude that the proposed facility is unlikely to have measurable impacts on the property values of adjacent properties or other properties in the vicinity of the project.

Recommended mitigation. As described in the applicant's SAR, and noted earlier as recommended mitigation for compatibility with scenic surroundings, the primary mitigation for impacts to the adjoining properties will be installation of a vegetative buffer consisting of "two staggered rows of evergreen shrubs at least three feet high at time of planting." This mitigation appears sufficient given the projected negligible visual impacts of the proposed facility on adjoining properties or property values.

Expected Noise from Construction and Operation

This section evaluates the studies and conclusions discussed in the SAR concerning peak and average noise levels associated with construction and operation of the proposed Turkey Creek facility. This component of the SAR is identified in KRS 278.708(3)(d).

Standard Methodology and Issues for Noise Studies

Various governmental agencies throughout the country employ noise assessment methodologies based on professionally accepted techniques. In evaluating the construction and operational stages of a project, these techniques are fundamentally consistent in that they seek to estimate the potential contribution to ambient noise levels at the site in terms of sensitive receptors. Generally, the assessment methodologies are meant to measure the increase in noise levels over the ambient conditions at residential and non-residential sensitive receptors.

A standard noise impact assessment focuses on several key factors:

- Identification of sensitive receptor sites;
- Existing local ambient noise levels;
- Estimated construction or operational noise intensities;
- Distances between noise sources and sensitive receptors;
- Time of day during which peak noises are anticipated;

[12] *An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations.* Project Director: Dr. Varun Rai. Policy Research Project (PRP), LBJ School of Public Affairs, The University of Texas at Austin, May 2018.

- Noise created by transportation features such as conveyors, trucks and rail lines; and

- Calculation of the cumulative effect of the new noise sources when combined with the existing ambient noise level, recognizing that new noise sources contribute to the ambient noise level, but not in an additive way.

Applicant's Submittal

The applicant's SAR includes a Noise and Traffic Assessment (Attachment C). The assessment outlines the nature of the nearest noise receptor site, which is a residential neighborhood that abuts the northeast portion of the proposed site.

Other noise receptor sites include three local businesses: a wrecking yard, an auto body shop, and a flower wholesaler. These three businesses contribute to periodic noise within the area, including from the operation of machinery and the delivery of goods via trucks and cargo vans. Additional contributors to noise levels within the assessment area include traffic traveling on nearby roadways and the transport and operation of agricultural equipment. Noises in the assessment area peak during business hours and range from 80 to 120 dB.

During construction and installation at the proposed site, the use of standard construction equipment and the increase in roadway traffic will temporarily elevate noise levels in the assessment area. However, these increased levels will fall "within acceptable ranges if the noise is of short duration and does not occur between 11pm and 6am."

During standard operation of the proposed facility, the 12 inverters at the proposed site will operate at 67 dB (measured at 10 meters). The noise emitted by the inverters is described as a hum. Additionally, panel tracking motors on the solar panels will operate at an estimated 78 dB no more than one minute out of every 15-minute period. However, the Noise Assessment in Attachment C does not clarify at what distance the motors' decibel rating is measured.

Throughout the lifetime of the proposed facility, one technician would commonly drive in and out of the site for maintenance up to 365 days per year, and two or three technicians would drive in and out of the site up to 70 days per year. Work on site would be conducted at night up to 30 days per year. Technicians will be driving mid- to full-size trucks and "will contribute less to traffic noise than a typical single-family home."

The Noise Assessment in Attachment C of the applicant's SAR concludes that noise in the assessment area will temporarily increase during business hours throughout the construction phase, and will be due to increased vehicle traffic and machinery operation. However, this elevation in noise emission will not be significant against the background of noise from other sources in the area, including machinery operation from businesses, regular vehicle traffic, and the operation of agricultural equipment. Ongoing noise from the daily operation of the proposed facility's panel tracking motors and inverters will not significantly contribute to noise within the assessment area, particularly with the installation of vegetative buffers as described in the applicant's SAR.

Supplemental Investigations, Research and Analysis

BBC requested further details from the applicant regarding noise level measurements taken for inverters to be used at the proposed facility. In the SAR and its relevant attachments, Turkey Creek states that the facility's tracking motors emit noise at a level of 78 dB when measured at a distance of 10 meters. The SAR also states that the facility's inverters emit noise at a level of 67 dB, but does not clarify at what distance that noise emission was measured. BBC submitted a written request for this information to the applicant. The applicant responded to BBC's inquiry by clarifying that both measurements were taken at a distance of 10 meters.[13]

BBC researched sound attenuation principles to approximate the noise levels from the proposed facility's panel tracking motors and inverters that would be audible at the nearby affected properties. Across an open area with neither reflective surfaces nor absorbent barriers, sound attenuates at approximately 6 dB for every doubling of distance and can be estimated using the inverse square law.[14]

Using this calculation (and noting that the distance from the solar panels to the nearest home is reported as 400 feet in Attachment C, but 240 feet in Attachment A) the maximum noise level of the facility's panel tracking motors (78 dB at 10 meters) would be between 56.3 dB and 60.7 dB at the nearest residence. This range would be approximately equivalent to the noise level of a background conversation heard at a restaurant or the noise level of a standard dishwasher. For the proposed facility's inverters (67 dB at 10 meters), the noise level would be about 41 dB when measured at the nearest residence 626 feet away (as noted in Attachment C) - or, approximately the background noise level heard in a library.[15]

However, it is important to note that these estimations are approximated for a landscape with no absorbent barriers. It is not possible calculate in advance the precise effect that vegetative buffers and topographical shift will have on facility noise attenuation, but the effects will certainly be to further reduce noise levels from the noise producing equipment at the nearest residences, 400 and 626 feet away, below the decibel levels calculated above.

Conclusions and Recommendations

The noise generation from a solar facility's panel tracking motors and inverters is not substantial, particularly when compared with conventional power plants and associated equipment. Given the moderate decibel ratings of the facility's motors and inverters, the distance between the proposed facility's noise-emitting equipment and the nearest residences, and the installation of vegetative buffers that will mitigate both the visual and audible impacts of the facility, BBC concludes that noise levels at the proposed facility during normal operations will not be a significant concern.

There is more potential for noise impacts during construction, including during the delivery of materials to the proposed site. While such noise would be an inevitable effect from the construction

---

[13] Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

[14] Estimating Sound Levels with the Inverse Square Law. Georgia State University. http://hyperphysics.phy-astr.gsu.edu/hbase/Acoustic/isprob2.html

[15] American Academy of Audiology.

process, limiting the times of day during which construction and delivery noise could occur would reduce the potential for adverse impacts to adjacent or proximate residences.

Recommended mitigation. Noise levels at the proposed facility site will not be substantial relative to existing noise from agricultural operations on the site property and will not negatively affect adjoining properties. No additional mitigation measures are required. During the construction process, construction activity and delivery of materials to the site should be limited to the hours between 7 AM and 9 PM.

Impacts on Transportation

This portion of the SAR review examines the impacts of the proposed Turkey Creek facility on road and rail transportation. This also includes traffic effects, such as congestion, safety, fugitive dust, and degradation of the transportation infrastructure. This component of the SAR corresponds to KRS 278.708(3)(e).

Potential Issues and Standard Assessment Approaches

Development of a new power plant can raise a variety of potential traffic related issues. These issues may arise from the movement of construction workers and heavy and oversized loads during the construction process and added congestion during both construction and subsequent operations.

Standard components of the evaluation of traffic related impacts include:

1. Identification of access methods, and a description and visual portrayal of primary access routes to the site during construction and during operation.

2. Description of baseline traffic conditions: existing traffic counts, road capacity and level of service and any major existing constraints (e.g., bridge weight limitations, etc.).

3. Identification of any special transportation requirements during construction (e.g., the need to reinforce or "ramp over" existing bridges, detours, temporary closures, etc.).

4. Projection of traffic volumes related to construction and operation.

5. Determination of whether the additional traffic, during construction and operation, would lead to congestion, changes in the level of service of the existing road network or additional road maintenance costs.

Information Provided in the Applicant's SAR

The applicant's SAR supplies a Traffic Study in Attachment C (Noise and Traffic Assessment). The proposed facility site is adjacent to two major roadways: SR 39 and US 27, along which two entrances to the site will provide access during construction. There is no rail access to the site.

The SAR includes a table itemizing the average daily traffic (ADT) of three points along these two major roadways, as measured by the number of vehicles traveling in both directions at a point during a 24-hour period. The ADT for SR 39 milepoint 5.9 is 2,830; for SR 39 milepoint 6.2 it is 2,706; and for US 27 milepoint 1.1 it is 8,912. The eight- to 12-month construction period of the proposed facility

will increase weekday traffic volume in the assessment area by an undefined amount, peaking during morning and evening commute times.

After the construction period at the proposed facility site, traffic volumes in and out of the site will be minimal during daily operations. The site will primarily be unattended, with "approximately two employees making site visits a few times a week to inspect the site, ensure proper equipment operation, and note any maintenance needs." Traffic to site will slightly increase during seasonal landscaping and vegetation maintenance. Technicians and employees will drive mid- to full-size trucks and will be accessing the site during standard business hours.

Supplemental Investigations, Research and Analysis

In response to BBC's request for information regarding the precise locations of the two entrances described in the SAR, Turkey Creek provided further information about site access.[16] The applicant provided an updated map depicting the location of the entrances on SR 39 and US 27, on the northern boundary of the proposed facility site, and added a third entrance on Crab Orchard Road, on the east side of the site. This third entrance will be used only for maintenance access and not for construction.

Figure C-6 shows the existing paved driveway which would provide access during construction from the northeast corner of the site on SR 39. This drive is currently used by the Garrard County District #1 Volunteer Fire Department (GCD#1VFD). The fire station is nearby to the right but not shown in the figure.

Figure C-6. Existing NE access from SR 39 to be used during construction (facing site)

[16] Turkey Creek Solar LLC Responses to BBC Research and Consulting's First Request for Information. June 1, 2020.

Figure C-7 shows the proposed future NW construction access to the site from US 27. The entrance to this access road is adjacent to an automotive body shop.

Figure C-7. From proposed NW entrance on US27 toward site

In response to another of BBC's requests for information on peak and average traffic impacts at the proposed site, the applicant clarified the anticipated traffic volumes throughout the mobilization and construction periods. At the onset of mobilization, trucks will deliver heavy machinery to the site, and after that there will be daily truck deliveries of installation materials to site. Heavy traffic will occur for the first few weeks after mobilization, but will slow towards the end of the installation period. The project will develop and conduct a traffic management plan to minimize traffic impacts. During the expected 8-12 month construction phase, between 150 and 300 workers will be employed by the project.[17]

To put those numbers in perspective, if a daily peak of 300 workers commuted to and from the site via US 27, it would increase the average daily traffic volume on that road by about 7 percent (600/8912 = 6.7%). If all of the peak construction workforce accessed the site via SR 39, it would increase daily traffic on that road by about 21 percent (600/2,830 = 21.2%). Since the average construction workforce is expected to be about half of the potential peak workforce (or approximately 150 workers per day), the average effect on traffic volumes would be about half of the increases described above.

[17] Ibid.

Conclusions and Recommendations

After construction, the proposed Turkey Creek facility would have very little impact on traffic flows and the local transportation infrastructure, likely comparable to or less than the effects from a typical single-family home.

During the 8 to 12-month construction period, however, there could be noticeable effects on traffic volumes during the beginning of the day and end of the day peak periods – particularly on SR 39. There is also some potential for conflicts with the GCD#1VFD in regard to the use of the driveway shared by the proposed NE access and the fire department.

Recommended mitigation. As indicated in the applicant's Responses to BBC Research and Consulting's First Request for Information (Response 8), the applicant should ensure that "To manage impacts the EPC contractor will develop a traffic management plan to minimize the impacts of this traffic increase and keep traffic safe. Part of this plan will be to maintain all traffic/staging onsite."[18] An important part of that plan will be to establish protocols to make sure the fire department has immediate access to the driveway onto SR 39 when needed.

[18] Ibid.

*James W Gardner
Sturgill, Turner, Barker & Moloney, PLLC
333 West Vine Street
Suite 1400
Lexington, KENTUCKY 40507

*M. Todd Osterloh
Sturgill, Turner, Barker & Moloney, PLLC
333 West Vine Street
Suite 1400
Lexington, KENTUCKY 40507