

**Review and Evaluation of
Dogwood Corners, LLC
Siting Assessment Report
Case Number: 2023-00246**

REPORT

Report

January 12, 2024

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Dogwood Corners, LLC
Siting Assessment Report
Case Number: 2023-00246**

Prepared for

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SECTION A.

General Statement

SECTION A.

General Statement

This document provides a review of the Site Assessment Report (SAR) for the proposed Dogwood Corners merchant electric generating facility submitted to the Kentucky State Board on Electrical Generation and Transmission Siting (the Siting Board). Dogwood Corners LLC submitted an administratively complete document titled “Application of Dogwood Corners LLC for a Certificate of Construction for an Approximately 125 Megawatt Merchant Electric Generating Facility in Christian County, Kentucky” (the “Application”) to the Siting Board on September 5, 2023. The Siting Board assigned the case number 2023-00246 to the Dogwood Corners application. The proposed generating facility is subject to review by the Siting Board under KRS 278.700 *et seq.* (the Act), passed by the General Assembly of the Commonwealth of Kentucky in 2002. Siting 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 Siting Board and gave it the authority to grant or deny construction certificates requested by individual applicants. The Siting 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 Siting 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 Siting Board can meet its own statutory decision deadline — 120 days or 180 days from receipt of an administratively complete application, depending upon whether the Siting Board will hold a hearing. KRS 278.710.

SAR Review Methodology

BBC undertook the following tasks to review Dogwood Corners' SAR and complete this report:

- Reviewed prior SAR reviews prepared for the Siting Board by BBC and others since 2020 for proposed commercial solar generating facilities;
- Reviewed the contents of the Dogwood Corners SAR and Application;
- Identified additional information we considered useful for a thorough review, and submitted questions to the applicant through the Siting Board Staff's requests for information;
- Conducted the required site visit, including obtaining oral information supplied by the applicant, in November 2023;
- 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 BBC's contract. It begins with this general statement that introduces the review. In Section B of the report, we present the executive summary and list all of the mitigation measures recommended by BBC. Section C offers detailed findings and conclusions of the study and provides context for BBC's recommended mitigation measures.

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 most relevant and what level of detail is appropriate. This relates to project components, geographic extent of impacts, and assessment methodology. Siting Board staff has previously provided review and guidance in this context.

While BBC has thoroughly reviewed the information provided in Dogwood Corners' Application and Site Assessment Report and raised questions with the applicant regarding some apparent inconsistencies in that information, we have not conducted an audit of the information and data provided in those documents. Information regarding the layout and features of the proposed project and the surrounding area provided by the applicant are assumed to be accurate for purposes of this review. This review is 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 Siting Board) received an application from Dogwood Corners LLC (Dogwood Corners) on September 5, 2023, for approval to construct a commercial, photovoltaic solar merchant electric generating facility and battery storage system in Christian County, Kentucky. Siting Board staff retained BBC Research & Consulting (BBC), a Denver-based firm, to review the SAR. BBC was directed by the staff to review the SAR for adequacy, visit the site, conduct supplemental research where necessary, and 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, including electricity market or transmission system effects and broader environmental issues, were not addressed in this engagement. This report does evaluate and consider the regional economic impacts of the proposed project and plans for future decommissioning.

Description of the Proposed Facility/Site Development Plan

The SAR provides a description of the proposed Dogwood Corners 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. Additional detail on each topic was provided in the applicant's responses to the First and Second Requests for Information (RFI) from the Siting Board Staff during the SAR review process.

The proposed Dogwood Corners solar facility would be a 125-megawatt alternating current (MWac) photovoltaic electricity generation facility with an additional 25 MWac battery storage system (BESS) situated in Christian County, Kentucky. Christian County is in southwestern Kentucky and borders the State of Tennessee.

The proposed facility would have a fenced footprint of approximately 670 acres and would be situated in a rural area of primarily agricultural and mixed agricultural/residential use, approximately 10 miles from the county seat of Hopkinsville in the northeastern quarter of Christian County.

Several roadways are in proximity to the proposed Dogwood Corners site, which has a non-contiguous footprint comprising separately fenced sections of solar arrays; these can be generally described as project areas that sit in the north, south, east, and west of the site. Primary roadways near to the proposed site include Greenville Road, Goode Road, and Dogwood

Kelly Road. There are a total of seven planned entrances to the project site according to the preliminary site plan.

The estimated total population within a one-mile radius of the proposed project is 98 residents, which is lower than the average population (139) within one mile for nine solar facility applications reviewed by the Siting Board since June 2022.

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

- **Surrounding land use** — Overall, agricultural land comprises 61 percent of adjoining acres, while 31 percent is zoned agricultural/residential, and about 7 percent is solely residential. Land zoned for churches and a cemetery comprised about 0.5 percent of adjoining acres. Measured by the number of properties rather than their acreage, agricultural uses constitute 17 percent of adjoining parcels, while 18 percent of adjoining parcels are agricultural/residential, 60 percent are residential, and 4 percent are for religious or cemetery use. The composition of surrounding land uses — where residential parcels comprise the largest share of adjacent parcels but a much smaller proportion of the total adjacent land area — is typical among the proposed solar facilities that BBC has reviewed for the Siting Board.
- **Proposed access control and security** — The SAR briefly describes proposed access control measures, noting that solar modules and facility infrastructure will be enclosed by perimeter fencing and that a separate fence will enclose the substation and BESS. In addition, the applicant states that the project will comply with the requirements of the National Electric Safety Code. The current preliminary site plan depicts seven access points to the site.
- **Utilities** — The SAR states that auxiliary electrical service, if required, will be secured from certified retail provider Pennyryle Rural Electric Co-Op. Telecommunications service would be requested from a local provider.
- **Setback requirements** — In November 2022, the Christian County Fiscal Court enacted Ordinance 22-004, which mandated a 2,000-foot setback for solar development. In response, Dogwood Corners lodged a case with the Christian County Circuit Court (Case No. 2022-CI-01010), positing that the ordinance is void ab initio as it failed to meet the requirements of KRS Chapter 100. This case is still pending and the viability of the proposed project may hinge on the outcome.
- **Other facility site development plan descriptions provided in the SAR** — Legal boundaries; location of facility buildings, transmission lines, structures; and location of access roads, internal roads, and railways are addressed in the SAR. When considered alongside additional information supplied by Dogwood Corners in their RFI responses during the review process, these materials appear to meet the informational requirements identified in KRS 278.708.

Compatibility with Scenic Surroundings

The applicant did not include a formal visual assessment in the SAR. However, Section 2 of the SAR summarizes the assessment of compatibility with scenic surroundings. The SAR describes the landscape context of the proposed project as “an agricultural and rural residential area of eastern Christian County.”¹ BBC also visited the proposed Dogwood Corners project site in November 2023 to review the site and its surroundings.

Several homes near the project footprint would have relatively unobstructed views of the proposed locations for future solar panels and other equipment if the site is developed. Dogwood Corners project staff have developed a vegetative screening plan and met with adjoining landowners to address concerns about viewshed impacts to surrounding properties. The applicant supplied visual representations of the project’s proposed vegetative screening, consisting of two staggered rows of evergreen trees, in Appendix E of the SAR (Visual Impact Assessment). Dogwood Corners has designed the facility to utilize 500-foot setbacks between project components (e.g., fencing) and any adjacent non-participating residences.

In general, BBC concurs with Dogwood Corners’s conclusion that the proposed facility would not be incompatible with its surroundings from a scenic standpoint, though our assessment is contingent on successful completion of the proposed vegetative screening plans to reduce visual impact – particularly from areas where views into the site are currently relatively unobstructed by topography or existing vegetation. This assessment reflects the topography of the site, the proposed screening plan, and recognizes that solar facilities have a relatively low profile, similar to or lower than most single-family homes.

¹ SAR, page 4.

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 landowners will change as a result of development and operation of the proposed Dogwood Corners solar facility. Dogwood Corners engaged Kirkland Appraisals, LLC—which has conducted property value impact studies for several previous solar applications to the Siting Board—to examine the proposed project’s potential impact on property values.

In a summary statement, Kirkland Appraisals concludes that there will be no property value impacts from the proposed Dogwood Corners facility on adjoining properties and that the proposed facility will be in harmony with the area.

The matched pair analysis shows no impact on home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land where the solar farm is properly screened and buffered. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas and that it would function in a harmonious manner with this area.²

To date, only a small handful of relevant property value impact studies of solar facilities have been conducted by academic researchers or other third-party analysts. Using different methods, and different data sources, recent studies by teams at the Lawrence Berkeley National Lab; the LBJ School of Public Affairs (University of Texas); and the University of Rhode Island have found that there could be small, negative impacts on property values from proximity to commercial solar facilities. Another recent econometric study (at the University of Georgia) focused on solar facilities in North Carolina found no impacts on the value of nearby agricultural land, but did find statistically significant negative effects to the value of smaller residential properties close to solar facilities.³

Given the low population density and rural setting for the proposed Dogwood Corners project—and acknowledging that the project’s proposed vegetative buffers, if well executed, will help obscure the site’s physical elements from nearby residences and neighborhoods—we conclude that the proposed solar facility is unlikely to have measurable adverse impacts on most adjacent properties, but might affect the values of some smaller lot, adjacent residential properties located in closest proximity to nearby solar panels. Plentiful vegetative screening near these properties may reduce this risk.

² SAR Appendix A, page 1.

³ Abashidze, Nino. *Essays on Economic and Health Effects of Land Use Externalities*. (Under the direction of Dr. Harrison Fell). Page 71. University of Georgia, 2019.

Expected Noise from Construction and Operation

Noise levels generated by facility construction and operation are addressed in Section 4 of the SAR (Anticipated Noise Levels) and in the Noise Analysis Report, conducted by Stantec, which is included as Appendix D of the SAR. During project construction—including site preparation, excavation, and solar equipment installation—impacts on nearby noise-sensitive receptors (NSRs) will be generated by construction equipment and vehicles, particularly during pile driving for the solar panel racking. Operational sound levels are expected to be modest and non-disruptive for the operating lifetime of the project.

The setting for the Dogwood Corners project is a rural area with a low population density. The closest non-participating residence is an estimated 518 feet from the nearest proposed solar panel location. During the construction phase, vehicles and machinery such as trucks, bulldozers, excavators, and pile drivers will generate noise onsite while preparing the site and installing the facility's panels, racking, inverters, substation, and associated structures. Maximum noise levels will occur during pile driving of the solar arrays, which is consistent with previous solar project noise impact studies reviewed by the Siting Board.

Information provided in the Dogwood Corners Noise Analysis indicates that the projected maximum construction sound level at the nearest sensitive receptor would be 80.5 dBA while a pile driver is in use. At that noise level, the NIOSH recommended exposure limit is approximately eight hours per day. Without pile driving activity, the projected maximum construction noise level would be 60.2 dBA at the nearest receptor.

During normal operation of the proposed Dogwood Corners solar facility, noise levels from panel tracking motors, inverters, and the substation transformer are unlikely to be disruptive to local residents.

Impacts on Transportation

Section 5 of the SAR (Effect on Road and Railways) and Appendix F of the SAR (Traffic Analysis by Stantec) provide information regarding anticipated impacts on transportation at and around the proposed project site during construction and operation.

Several roadways are in proximity to the proposed Dogwood Corners site, which has a non-contiguous footprint comprising fenced sections of solar arrays. Roadways near the proposed site include Dogwood Kelly Road (two access points to site), Greenville Road (one access point to site), Goode Road (three access points to site) and Fears Road (one access point to the site). Stantec, on behalf of the applicant, reviewed available traffic volume data from the Kentucky Transportation Cabinet (KYTC) for nine count stations located along roadways in the area surrounding the proposed project site.

The Traffic Analysis states that, during the construction phase of the project, traffic flow will be impacted by the commute of construction workers to and from the site (assumed to occur during peak AM and PM hours) as well as the frequent arrival and departure of large trucks necessary for equipment delivery. Modeling the projected peak hour traffic during the project's construction phase (and assuming that existing peak traffic volumes would increase by 50 percent), indicates that the impacted roadways would maintain a high level of service (LOS A).

The Traffic Analysis projects that between one and three employees would be present at the project site during the operational lifetime of the project, and that this level of traffic to the project site would have no measurable impact on traffic flow on nearby roadways.

Other Considerations

Applicant economic impact study. Attachment G to the Dogwood Corners Application (Economic Report) contains a study of the projected economic impacts from the proposed facility. The analysis was conducted by Dr. Paul Coomes, Emeritus Professor of the University of Louisville, using IMPLAN modeling.

Key findings from the analysis include:

- There will be a one-time spike in construction-related employment over a 12-month period. The spike will include about 371 new jobs (direct and indirect) in Christian County in the first year, with a new payroll of \$22.1 million.
- Over the 30- to 40-year operational lifetime of the project, there will be \$5.2 million in property tax revenues paid to local government jurisdictions in Christian County, an average of \$144,000 per year.

The level of investment in Christian County projected in the economic impact analysis appears to be roughly consistent with industry standards for a solar project of the size of the proposed Dogwood Corners solar facility. The overall conclusions that the operating phase will have very modest economic impacts, but that the proposed solar facility will enhance local government revenue while requiring very few services, are consistent with the findings of other commercial solar economic impact studies. The largest impact on employment will be felt during the initial construction period.

Some information that would provide a more complete picture, but which is not provided in the applicant's economic study, includes the direct, indirect, and induced economic benefits from the current use of the site in agriculture; and the potential induced economic benefits from the additional income received by the participating landowners if at least a portion of that income is spent locally. The former would at least slightly reduce the projected net economic benefits from ongoing operations of the facility, while the latter would likely increase those projected net benefits. Neither of these aspects would likely result in a material change to the results of the economic impact analysis.

Facility Decommissioning. In prior solar projects reviewed by the Siting Board, plans and assurances for decommissioning the sites at the end of their functional lives have been an important issue of concern to both the Siting Board and local governments.

Attachment I of the Application (Decommissioning Plan) contains a plan for the decommissioning of the proposed facility. The plan was authored by Stantec on behalf of the applicant. Within the Decommissioning Plan, Dogwood Corners describes the sequence and project components to be decommissioned, including net decommissioning costs accounting for expenses as well as potential salvage revenue.

Summary Findings

Dogwood Corners has generally provided the required information for the site assessment, including responses to BBC's questions (included in the requests for information from Siting Board Staff) following our review of their SAR. The Dogwood Corners site appears to generally be well selected in terms of compatibility with the surrounding area and access to transmission infrastructure. The proposed setbacks and vegetative screening plan should also help the facility be compatible with the surrounding area. However, the project's viability may depend on the resolution of the case currently before the Christian County Circuit Court regarding ordinance setback requirements.

Mitigation Recommendations

Including mitigation identified by Dogwood Corners in their Application and SAR, BBC recommends the following mitigation measures:

Regarding KRS 278.708 (3) (a)– description of the proposed facility –

1. Dogwood Corners should provide a final site layout plan to the Siting Board when site design is finalized. Any change in project boundaries or site layout from the information reviewed during this evaluation—including changes to the locations of solar panels, inverters, transformers, the substation, project fencing or other project facilities—should be clearly documented and submitted to the Siting Board for review.
2. Dogwood Corners or its contractor should control access to the site during construction and operation. All construction entrances should be gated and locked when not in use. The applicant's access control strategy should include adequate signage at all site entrances and boundaries—particularly in locations visible to the public, local residents, and business owners—to warn potential trespassers.
3. According to National Electric Code regulations, the security fence must be installed prior to any electrical installation work. Further, the substation must have its own separate security fence, with locked access.
4. Dogwood Corners should promptly and fully meet the setback requirements of any applicable county ordinance once a decision has been reached in Christian County Circuit Court Case No. 2022-CI-01010. If no applicable ordinance exists, Dogwood Corners should adhere to their proposed 500-foot setbacks for the project.

Regarding KRS 278.708 (3) (b)– compatibility with scenic surroundings –

5. Existing vegetation between the solar arrays and nearby roadways and homes should be left in place to the extent feasible to help minimize visual impacts and screen the project from nearby homeowners and travelers.

6. Dogwood Corners should execute their proposed screening plan—as described in Section 2 of the SAR and depicted in Appendices B and E of the SAR—and ensure the new vegetative buffers are successfully established and develop as expected over time. Should the vegetation intended to provide a visual buffer fail to thrive after planting, Dogwood Corners should replace the trees to maintain the visual buffer.
7. Dogwood Corners should cultivate at least two acres of native pollinator-friendly species onsite.
8. Dogwood Corners should commission a glare study to determine potential effects of glare from solar panels on the surrounding area, including along adjoining roadways.
9. Dogwood Corners should use panels with anti-reflective coating to reduce glare and corresponding visual impacts.
10. Dogwood Corners should be open to communication with adjacent landowners regarding viewshed impacts and the implementation of strategic additional vegetative screening, if needed.
11. Communication regarding viewshed impacts and concerns should be incorporated into the Complaint Resolution Program described further in mitigation recommendation #19 later in this section.

Regarding KRS 278.708 (3) (c)– potential changes in property values and land use –

12. Dogwood Corners’ viewshed screening plan should incorporate particular efforts to reduce impacts on the views from the residential properties that are closest to the proposed project.

Regarding KRS 278.708 (3) (d)– noise impacts –

13. Dogwood Corners should ensure that the noise level at any residential noise receptor (whether belonging to a participating or non-participating landowner) does not reach a hazardous level during construction or operation.
14. Dogwood Corners should conduct construction activity only between 8 AM and 6 PM, Monday through Saturday, and pile driving only between 9 AM and 5 PM, Monday through Friday.
15. Dogwood Corners should prioritize vegetative screen planting before commencing construction activity. This will not only mitigate noise but also allow for the growth of the tree screens during the construction phase, providing a partially established visual screen to protect the viewshed before the facility begins operation.
16. Dogwood Corners should notify residents and businesses within 2,400 feet of the project boundary about the construction plan, the noise potential, and mitigation plans one month prior to the start of construction.

17. If pile driving activity occurs within 1,500 feet of any noise sensitive receptor (e.g., participating residence, non-participating residence, community building), Dogwood Corners should implement a construction method that will suppress the noise generated during the pile driving process. In prior reviews of proposed solar facilities for the Siting Board, mitigation methods have been identified as the semi-tractor and canvas method, sound blankets on fencing surrounding the solar site, or other comparable methods.
18. During construction, Dogwood Corners should locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as practicable from neighboring residences.
19. Dogwood Corners should implement a Customer Resolution Program to address any complaints from surrounding landowners. Dogwood Corners should submit an annual status report on the Customer Resolution Program to the Siting Board, identifying any complaints, the steps taken to resolve those complaints, and whether the complaint was resolved to the satisfaction of the affected landowner.

Regarding KRS 278.708 (3) (e)– transportation impacts and fugitive dust –

20. Dogwood Corners should submit a final construction schedule, including revised estimates of on-site workers and commuter vehicle traffic, to the Siting Board prior to commencement of construction.
21. Dogwood Corners should develop and implement a traffic management plan for the construction phase of the project to minimize impacts on traffic flow and keep traffic safe. As part of this plan, Dogwood Corners should implement ridesharing between construction workers; use appropriate traffic controls; or allow flexible working hours outside of peak hours to minimize any potential delays during AM and PM peak hours.
22. Dogwood Corners and its construction contractors should comply with all laws and regulations regarding the use of roadways.
23. Dogwood Corners should obtain permits from the KYTC and local road authorities as needed for overweight and overdimensional vehicle transport to the site and comply with all permit requirements, coordinating with the KYTC Permits Engineer and the Christian County Road Department as needed.
24. Dogwood Corners should determine whether shoulder stabilization and/or road widening is necessary on any local route (particularly Goode Road) to accommodate deliveries to the site. Dogwood Corners should coordinate with the Christian County Road Department regarding any necessary improvements.
25. Dogwood Corners should commit to rectify any damage to public roads by fixing or fully compensating the appropriate transportation authorities for any damage or degradation to the existing road network that it causes or to which it materially contributes.

26. Dogwood Corners should properly maintain construction equipment and follow best management practices related to fugitive dust throughout the construction process. Dust impacts should be kept to a minimal level.

Regarding economic impacts, project decommissioning, and other issues –

27. Dogwood Corners should commit to prioritizing local hiring and seeking to hire Christian County residents to fill the projected direct construction jobs.
28. Dogwood Corners should follow the decommissioning plan laid out in Attachment I of the Application submitted to the Siting Board; and
29. Dogwood Corners should work with the County to address any concerns that arise at any point regarding its proposed decommissioning plan.

Subject to the foregoing mitigation measures, BBC recommends that the Siting 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. If these presumptions are correct, and based upon the information available to BBC at the time of this report, there are unlikely to be significant unmitigated impacts from construction and operation of the Dogwood Corners solar generation project regarding scenic compatibility, property values, noise, or traffic.

SECTION C.

Detailed Findings and Conclusions

SECTION C.

Detailed Findings and Conclusions

This section provides detailed review and evaluation of each element of the Dogwood Corners LLC Site Assessment Report (SAR) as prescribed in Section 5 of KRS 278.708. It is organized into six 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;
5. Impacts on Transportation; and
6. Other Issues – Economic Impacts, Project Decommissioning, and Site-Specific Considerations

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

In evaluating these components of the SAR, 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 (**Potential Issues and Standard Assessment Approaches**).
- Secondly, we summarize relevant information included in the initial SAR (**Information Provided in the Applicant's SAR**).
- Thirdly, we describe supplemental information about the proposed Dogwood Corners solar project facility, along with other information BBC was able to gather about the project and its impacts (**Supplemental Investigations, Research, and Analysis**).
- Finally, BBC draws its own conclusions about the project's potential impacts and recommended mitigation (**Conclusions and Recommendations**).

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 or proposed utilities to service the facility;
- Subsection 7—compliance with applicable setback requirements as provided under KRS 278.704(2), (3), or (4); 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 Dogwood Corners solar facility and site development plan is mainly set forth in Section 2 of the Application (Description of Proposed Site), Section 1 of the SAR (Proposed Site Development Plan), Appendix A of the SAR (Property Value Impact Report), and Appendix B of the SAR (Preliminary Site Layout). Other related or supplementary information comes from various other sections of the SAR and other attachments included with the Application.

Overview of proposed facility. The proposed Dogwood Corners solar facility would be a 125-megawatt alternating current (MWac) photovoltaic electricity generation facility with an additional 25 MWac battery storage system situated in Christian County, Kentucky. Christian County is in southwestern Kentucky and borders the State of Tennessee.

The proposed Dogwood Corners solar facility would be located in the northeastern quarter of Christian County, approximately 10 miles from the county seat of Hopkinsville. The project site is about 80 miles northwest of Nashville, TN and 80 miles south of Evansville, IN.

Section 2 of the Application (Description of Proposed Site) supplies an overview of the project. Based on the information provided in the SAR and Application, the proposed facility would have a fenced footprint of approximately 670 acres across eight parcels for which Dogwood Corners has secured

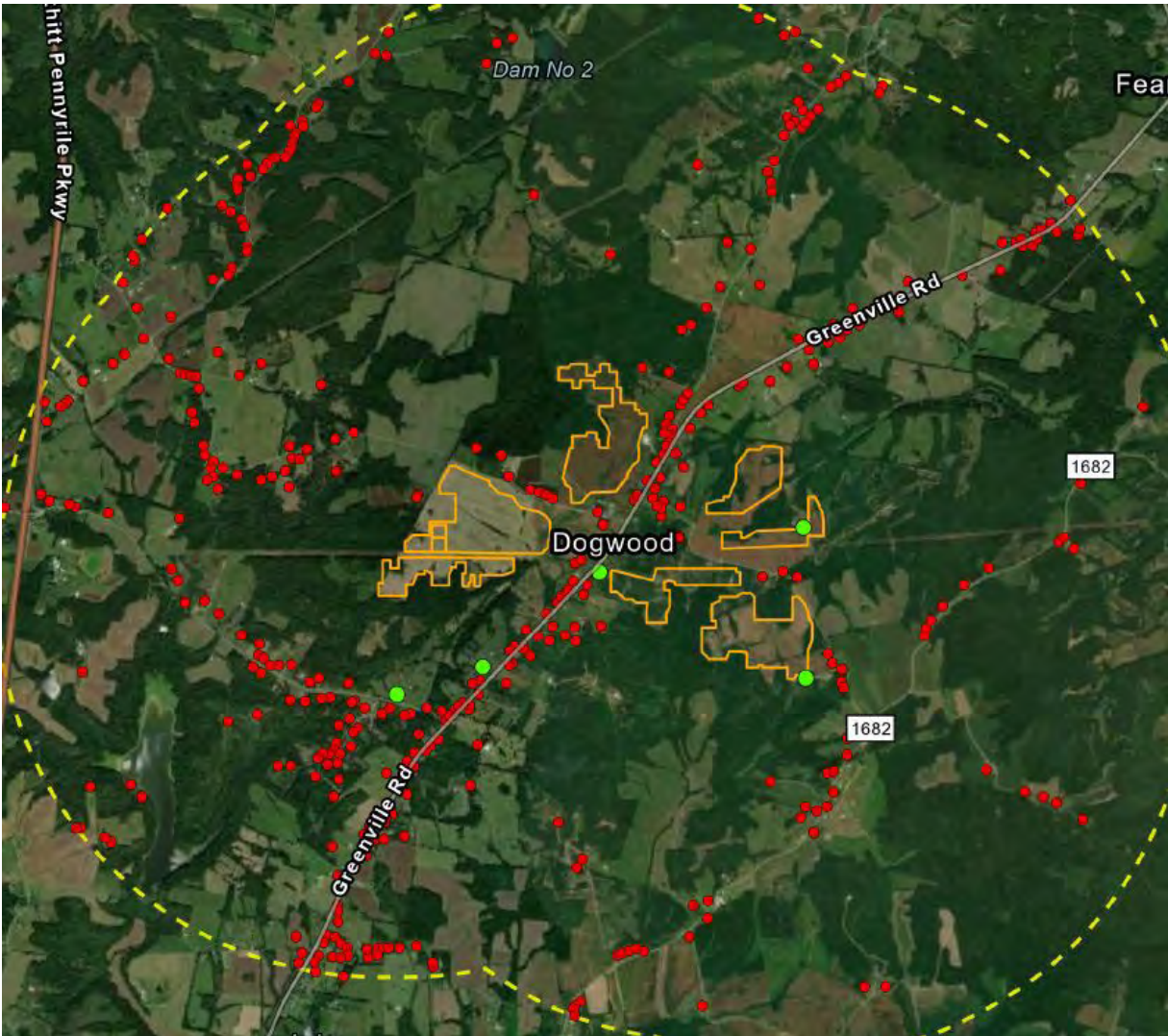
leases with six real estate agreements.¹ Facility equipment would include approximately 273,000 solar modules, 2,600 trackers, 35 inverter stations, one project substation, one battery energy storage system (BESS), and a 500-foot overhead tie-in transmission line to interconnect with the existing onsite transmission line owned by Tennessee Valley Authority (TVA). In addition, the project would include ancillary components such as steel piles, cabling, and perimeter fencing.²

Figure C-1, excerpted from Attachment A to the Application (Context Map), shows the proposed project footprint (outlined in orange), which is dispersed across seven distinct fenced sections clustered near the intersections of Greenville, Dogwood Kelly, and Goode Roads. Additionally, the context map shows individual homes, including both non-participating residences (red dots) and residences owned by participating landowners leasing land to the project (green dots). The project is shown ringed with a two-mile radius (yellow dashed line).

¹ Application, page 4.

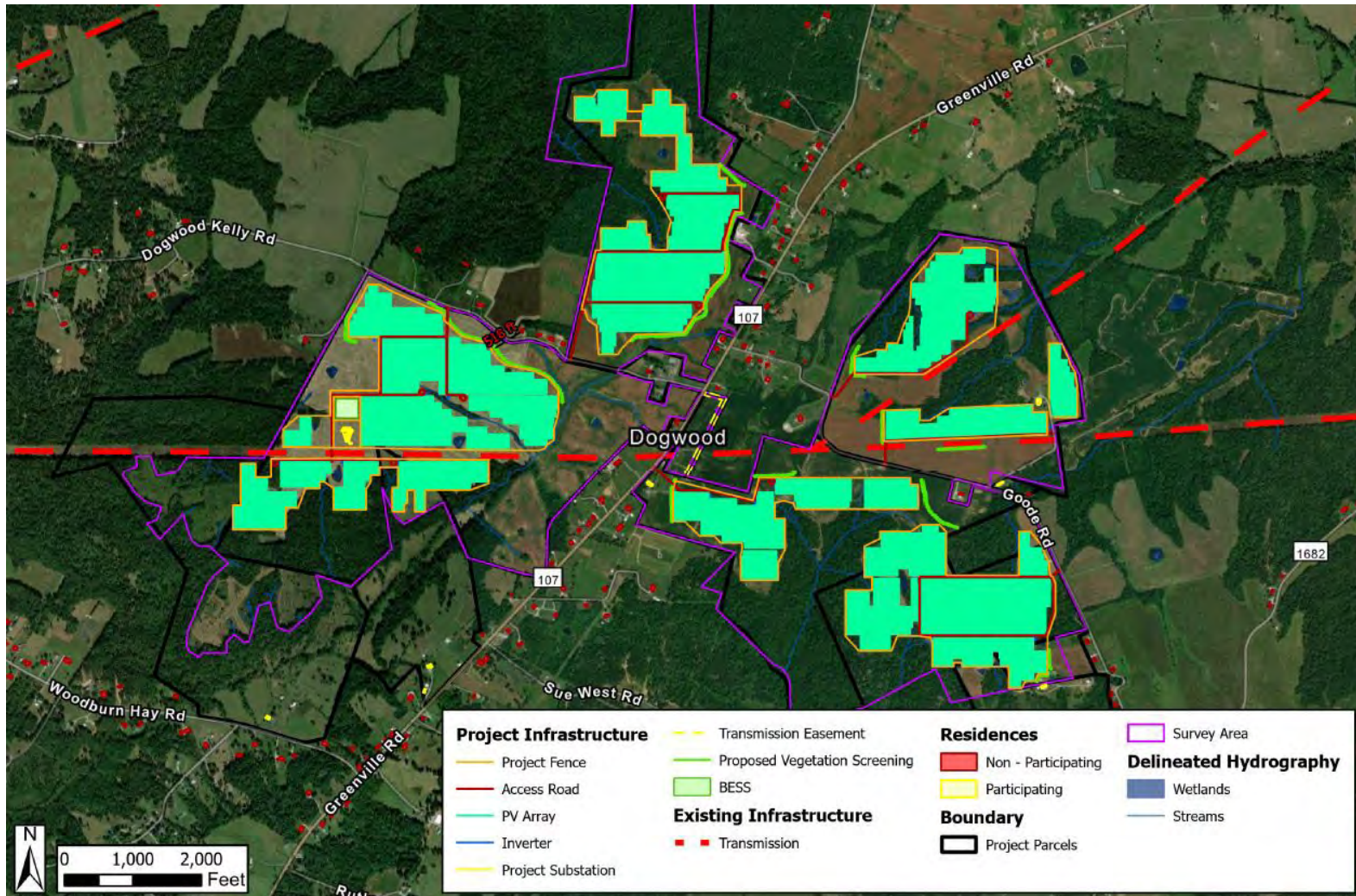
² Application Attachment I, page 4.

Figure C-1.
Context Map for Proposed Dogwood Corners Project



Several roadways are in proximity to the proposed Dogwood Corners site, which has a non-contiguous footprint comprising separately fenced sections of solar arrays; these can be generally described as project areas that sit in the north, south, east, and west of the site. Primary roadways near to the proposed site include Greenville Road, Goode Road, and Dogwood Kelly Road. Figure C-2 is excerpted from Appendix B of the SAR (Preliminary Site Layout) and shows a high-level view of the proposed Dogwood Corners project (project fences outlined in orange surrounding light green areas where solar arrays would be located) with labels for adjacent roads.

Figure C-2.
Dogwood Corners Preliminary Site Layout



The application stated there are no residential neighborhoods, schools, or parks within two miles of the project’s boundary, but did not mention nearby churches or health facilities.³ The applicant stated that no railways are present within the proposed site,⁴ and BBC determined that there are no railway lines in the vicinity of the project. In the Siting Board’s First Request for Information, BBC asked the applicant to provide an updated context map to include the location of any notable community structures.

Surrounding land uses. Appendix A of the SAR (Property Value Impact Report) provides some detail on the composition of the surrounding land. Figure C-3, excerpted from Appendix A, summarizes the use of land adjoining the proposed project.

**Figure C-3.
Adjoining Parcel Land Use for Proposed
Dogwood Corners Project**

	Acreage	Parcels
Residential	7.48%	59.78%
Agricultural	61.44%	17.39%
Agri/Res	30.54%	18.48%
Religious	0.44%	3.26%
Cemetery	0.10%	1.09%
Total	100.00%	100.00%

Overall, agricultural land comprises 61 percent of adjoining acres, while 31 percent is zoned agricultural/residential, and about 7 percent is solely residential. Land zoned for churches and cemetery comprised about 0.5 percent of adjoining acres.

Measured by the number of properties rather than their acreage, agricultural uses constitute 17 percent of adjoining parcels, while 18 percent of adjoining parcels are agricultural/residential, 60 percent are residential, and 4 percent are for religious or cemetery use.

Appendix A also provides 2022 population estimates for the surrounding area.⁵ In 2022, an estimated 98 people lived within a one-mile radius of the project area; 1,131 within a three-mile radius; and 3,589 within a five-mile radius.

Legal boundaries. Appendix C of the SAR (Property Legal) contains the deeds and legal descriptions of participating properties for the proposed project site. In the Siting Board’s First Request for Information (RFI), Dogwood Corners was asked to provide copies of the lease agreements for all participating properties.

Access control. The Dogwood Corners SAR briefly describes proposed security measures:

[...] A fence meeting the National Electric Safety Code requirements, minimum seven feet, will enclose the solar panels and associated infrastructure. A separate fence will enclose the substation and BESS facility. In addition, Dogwood Corners or its contractor will control access to the site during

³ Application, pages 4 and 7.

⁴ SAR, page 3.

⁵ SAR Appendix A, ESRI Housing Profiles, pages 11-13.

*construction and operation. All construction entrances will be gated and locked when not in use. Tennessee Valley Authority (TVA) access to the substation will be part of the Interconnection Agreement between TVA and Dogwood Corners LLC.*⁶

In the Siting Board's First Request for Information, BBC asked the applicant to provide an updated site map to include proposed locations of access points as well as other project features.

Location of buildings, transmission lines, and other structures. Page 2 of the SAR states that the location of the transmission line easement, as well as the substation and battery energy storage system (BESS) are depicted in Appendix B of the SAR (Preliminary Site Layout), which is excerpted in this report as Figure C-2. Dogwood Corners does not propose constructing any buildings as part of the project.

BBC examined Appendix B. These plans depict the proposed substation, BESS, and locations of project components such as fencing, internal access roads, inverters, and solar panels. However, some features of the map were unclear. In the Siting Board's First RFI, the applicant was requested to provide an updated site layout map identifying specific additional features of the proposed project.

Location and use of access ways, internal roads, and railways. Page 3 of the SAR states that the location of access control points and internal roads are depicted in Appendix B of the SAR (Preliminary Site Layout). There are no railways present at the proposed site.

BBC confirmed there are no railways in the vicinity of the site. The preliminary site layout depicts internal roads to provide access to project components such as the solar modules but does not show the access points from public roadways or security gates to the site. In the Siting Board's First RFI, the applicant was requested to provide an updated site layout map identifying access points as well as other additional features of the proposed project.

Existing or proposed utilities. Page 3 of the SAR states that auxiliary electrical service, if required, will be secured from certified retail provider Pennyryle Rural Electric Co-Op. Telecommunications service would be requested from a local provider. Dogwood Corners does not anticipate requiring retail water service.

Compliance with applicable setback requirements. Kentucky statute 278.704(2) states that "... If the facility is not proposed to be located on a site of a former coal processing plant and the facility will use on-site waste coal as a fuel source or in an area where a planning and zoning commission has established a setback requirement pursuant to KRS 278.704(3), a statement that the exhaust stack of the proposed facility and any wind turbine is at least one thousand (1,000) feet from the property boundary of any adjoining property owner and all proposed structures or facilities used for generation of electricity are two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility, unless facilities capable of generating ten megawatts (10MW) or more currently exist on the site. [...] If the facility is proposed to be located in a jurisdiction that has established setback requirements pursuant to KRS 278.704(3), a statement that the proposed site is in compliance with those established setback requirements."

⁶ SAR, page 2.

In November 2022, the Christian County Fiscal Court enacted Ordinance 22-004, which mandates a 2,000-foot setback for solar development. Dogwood Corners had spoken with County representatives in advance of the ordinance approval, stating their concerns regarding the restrictiveness of the proposed setbacks in addition to other feedback about the ordinance and its development.

After approval of Ordinance 22-004 by the Fiscal Court, Dogwood Corners lodged a case with the Christian County Circuit Court (Case No. 2022-CI-01010) which is still pending, positing that the ordinance is void ab initio as it failed to meet the requirements of KRS Chapter 100.

The Siting Board requested updates on this issue from the applicant in both the First and Second Requests for Information.

Evaluation of noise levels. Section 4 of the SAR summarizes noise impacts from the proposed project and Appendix D of the SAR (Noise Analysis Report) provides the assessment of the noise levels that would be generated during the construction and operation of the Dogwood Corners facility. During the construction phase of the project, activities on site would generate intermittent noise at the nearest receptors (nearby residences). The construction phase is expected to last approximately 12 months and the operation phase between 30 and 40 years.

During construction, the applicant estimated a maximum noise level of 80.5 dBA at the nearest non-participating residence. During the operational life of the project, Dogwood Corners anticipated a maximum daytime noise level of 40.9 dBA from the inverters when measured at the nearest residence.

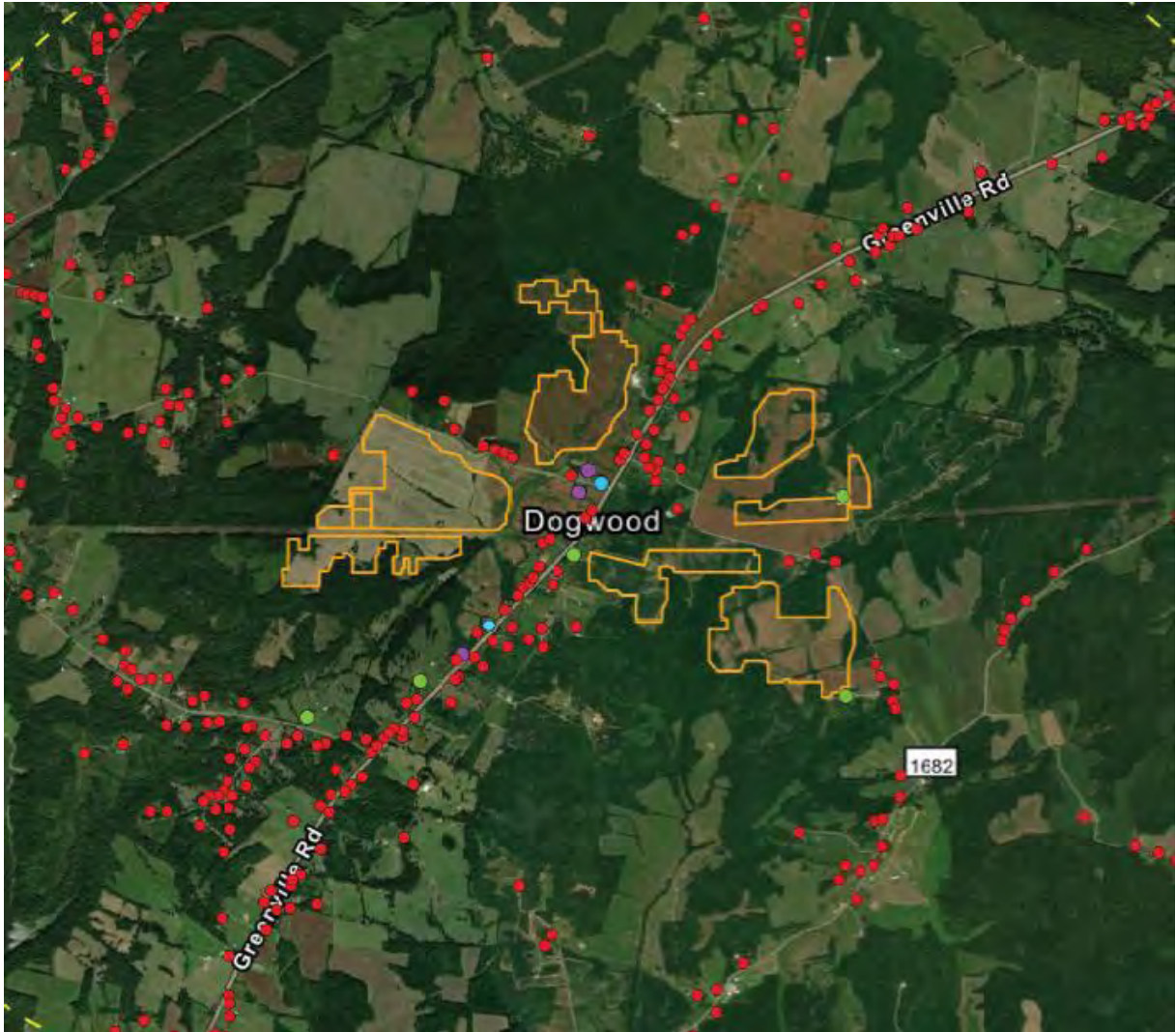
Noise levels and the details of Appendix D are discussed in greater depth and detail on page C-42 of this report section (Expected Noise from Construction and Operation).

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.

Overview of proposed facility. In the Siting Board's First Request for Information, BBC asked the applicant to provide an updated context map to include the location of any notable community structures within that radius. The applicant's updated map is excerpted as Figure C-4 and shows the locations of churches (purple dots), a cemetery (blue dot), participating residences (green dots), and non-participating residences (red dots). Two churches and the cemetery are located near the center of the project footprint, off of Greenville and Dogwood Kelly Roads.

Figure C-4.
Dogwood Corners Context Map with Nearby Churches and Cemetery



Surrounding land uses. The composition of surrounding land uses — where residential parcels comprise the majority of adjacent parcels but a small proportion of the total adjacent land area — is typical among the proposed solar facilities that BBC has reviewed for the Siting Board. Among the facilities BBC has reviewed for the Siting Board since early 2020⁷, residential land uses have averaged 58 percent of the surrounding parcels, and 8 percent of the surrounding acreage (compared to 60 percent and 7 percent, respectively, for the proposed Dogwood Corners site).

⁷ Prior BBC reviews include Turkey Creek Solar, Unbridled Solar, Ashwood Solar, Flat Run Solar, Martin County Solar, Green River Solar, Rhudes Creek Solar, Russellville Solar, Telesto Energy, Pine Grove Solar, and Song Sparrow Solar projects.

Apart from just the immediately adjacent properties, the information provided in Appendix A (Property Value Impact Report) also indicates the low population density surrounding the site up to a radius of five miles. Since June of 2022, the two consulting firms used by most applicants to the Siting Board to evaluate potential impacts on property values—Kirkland Appraisals, LLC and CohnReznick LLP—have also typically provided information obtained from ESRI regarding the estimated number of residents living within a three-mile radius of the proposed facilities. Kirkland Appraisals has also been providing information regarding the number of residents within a one-mile and a five-mile radius of the proposed facilities they have evaluated.

As shown in Figure C-5, eight of the nine facilities reviewed by the Siting Board since June 2022 have provided estimated population densities for a three-mile surrounding radius. The average population estimate for the surrounding three miles among these eight facilities is 2,089 residents, while the median population estimate for the same radius is 1,528 residents. The proposed Dogwood Corners facility has the fourth lowest population density within three miles among the eight facilities, with an estimated 1,131 residents. Five of the nine facilities have also provided estimates of the population living within one mile and within five miles. Among those five facilities, Dogwood Corners has the second lowest estimated population within one mile and the lowest estimated population living within five miles.

Figure C-5.
Estimated Population Totals within 5 miles of Proposed Solar Facilities Reviewed by the Siting Board Since June 2022

Case Number	Filing Date	Facility Name	Radius from Project			County
			1 Mile	3 Miles	5 Miles	
2022-00096	June 2022	Telesto Energy Project	203	6,457	31,123	Hardin
2020-00243	August 2022	Golden Solar	NA	376	NA	Caldwell
2022-00115	October 2022	Thoroughbred Solar	NA	1,924	NA	Hart
2022-00262	November 2022	Pine Grove Solar	232	2,528	7,509	Madison
2022-00131	April 2023	Seebree Solar II	NA	NA	NA	Henderson
2022-00272	June 2023	Hummingbird Energy	109	1,088	4,181	Fleming
2022-00274	September 2023	Bright Mountain Solar	NA	2,647	NA	Perry
2023-00256	September 2023	Song Sparrow Solar	53	562	3,761	Ballard
2023-00246	September 2023	Dogwood Corners LLC	98	1,131	3,589	Christian
Average population			139	2,089	10,033	
Median population			109	1,528	4,181	

Legal boundaries. In response to questions posed by the Siting Board and BBC in the Siting Board’s First RFI, Dogwood Corners submitted redacted copies of the confidential lease agreements for parcels involved in the proposed project to supplement the legal descriptions provided in Appendix C of the SAR. Additionally, the applicant’s response to the First RFI stated that there are 11 parcels leased to the project, not eight parcels as originally stated in the Application.⁸

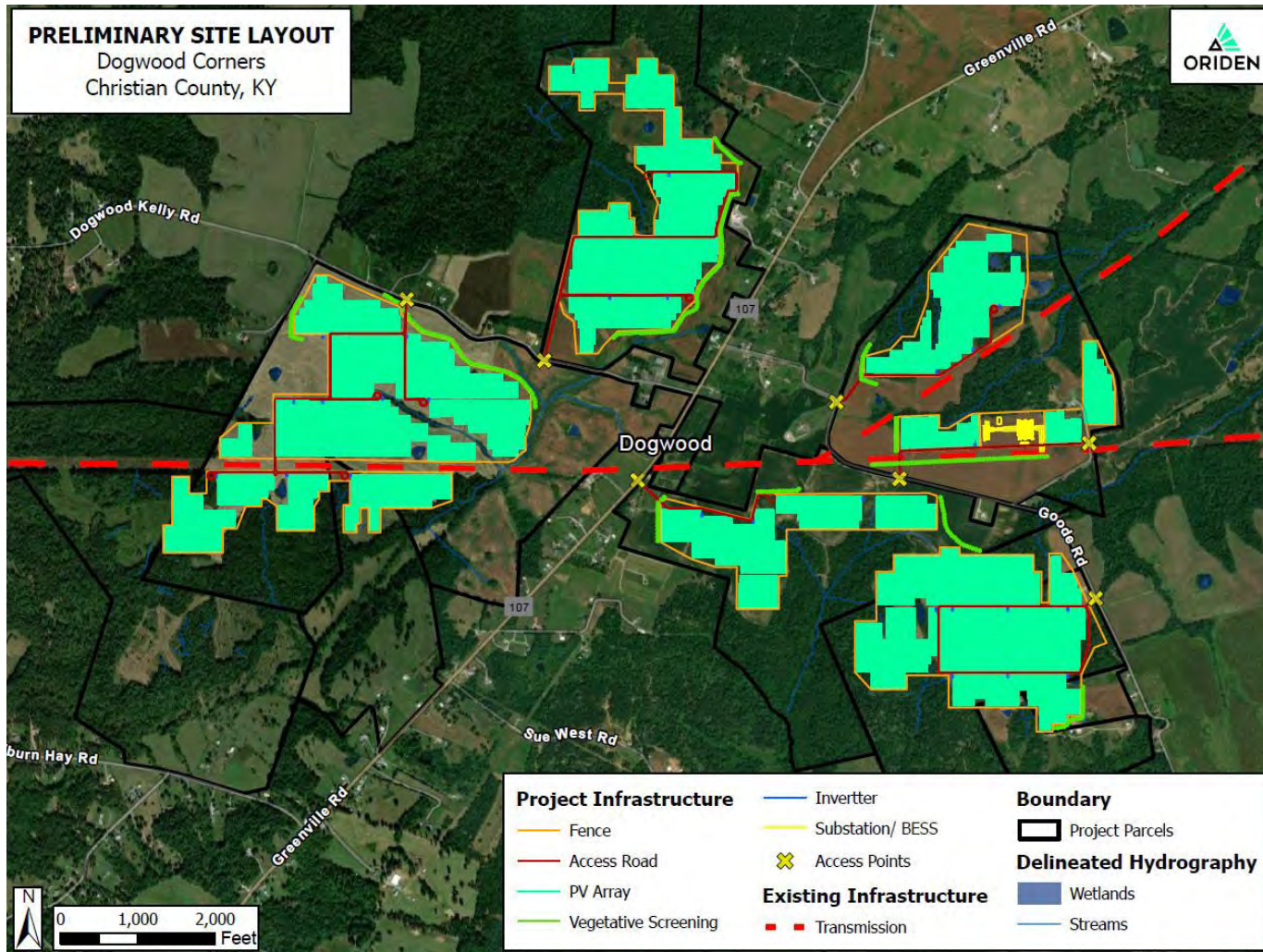
⁸ Dogwood Corners Responses to the First RFI, Staff DR 1-17.

Location of buildings, transmission lines, and other structures. In response to the requests in the Siting Board’s First and Second RFI, Dogwood Corners supplied updated maps of the proposed site layout and locations of project components. The most current update, from the Second RFI, is excerpted below as Figure C-6. Importantly, the applicant has altered the proposed location for the substation and BESS, which are now located in the easternmost pod of solar arrays. Dogwood Corners summarized reasons for this change in their Responses to the Second RFI:

[...] The new substation location is approximately 1,100 feet away from the closest neighbor. Additional screening is proposed around the substation and an analysis of potential sound impacts shows that the substation will not cause an increase in background noise levels at the closest receptor. Dogwood Corners chose the proposed substation location based on the greatest distance to neighboring landowners while considering the following additional factors. Dogwood Corners attempted to reduce land disturbance and potential impacts to natural resources (such as forested habitat, stream and wetland resources) by choosing a location along the 161kV Hopkinsville-Lost City transmission line, to which the project will connect. This prevents the need for installation of an additional transmission line to connect the project to the 161kV Hopkinsville-Lost City transmission line. Dogwood Corners chose a location near TVA’s preferred location at the intersection of the existing 161kV Hopkinsville-Lost City and 69kv transmission lines. Finally, the substation location requires suitable, relatively flat terrain and favorable geotechnical results.⁹

⁹ Dogwood Corners Responses to the Second RFI, Staff DR 2-2.

Figure C-6.
Dogwood Corners Preliminary Site Layout



Location and use of access ways, internal roads, and railways. In the Siting Board’s First RFI, the applicant was requested to provide an updated site layout map identifying access points as well as other additional features of the proposed project. Figure C-6 shows seven access points to the site: two on Dogwood Kelly Road, one on Greenville Road, three located on Goode Road and one on Fears Road, which would be the closest access point for the revised substation location.

Compliance with applicable setback requirements. The Siting Board requested an update from the applicant regarding the status of the case before the Christian County Circuit Court concerning Dogwood Corners and Ordinance 22-004 approved by the Christian County Fiscal Court. While the case before the Circuit Court has been pending, the Fiscal Court has repealed the original ordinance and enacted a new one in November 2023 (Ordinance 23-05), which includes similar setback requirements to the previous ordinance and does not contain a provision allowing for deviation. A decision on the case before the Circuit Court is still pending as of December 20, 2023.

Evaluation of noise levels. BBC’s investigation of the proposed project’s expected noise levels is addressed in full in a subsequent section of our report (Expected Noise from Construction and Operation) which begins on page C-42.

Conclusions and Recommendations Regarding the Description of the Proposed Facility and Site Development Plan

Based upon review of the applicant’s SAR, subsequent information gathered from the applicant, and additional data collected by the BBC team, we reach the following conclusion 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.

Recommended mitigation. Based on our review of the SAR and Application, the applicant’s responses to the RFIs from the Siting Board and BBC, and our visit to site—as well as recent Siting Board orders in other solar cases—BBC recommends the following mitigation measures regarding this portion of the Kentucky statutory requirements (KRS 278.708(3)(a):

- Dogwood Corners should provide a final site layout plan to the Siting Board when site design is finalized. Any change in project boundaries or site layout from the information reviewed during this evaluation—including changes to the locations of solar panels, inverters, transformers, the substation, project fencing or other project facilities—should be clearly documented and submitted to the Siting Board for review.
- Dogwood Corners or its contractor should control access to the site during construction and operation. All construction entrances should be gated and locked when not in use. The applicant’s access control strategy should include adequate signage at all site entrances and boundaries—particularly in locations visible to the public, local residents, and business owners—to warn potential trespassers.
- According to National Electric Code regulations, the security fence must be installed prior to any electrical installation work. Further, the substation must have its own separate security fence, with locked access.

- Dogwood Corners should promptly and fully meet the setback requirements of any applicable county ordinance once a decision has been reached in Christian County Circuit Court Case No. 2022-CI-01010. If no applicable ordinance exists, Dogwood Corners should adhere to their proposed 500-foot setbacks for the project.

Compatibility with Scenic Surroundings

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

Potential Issues and Standard Assessment Approaches

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 smokestacks. 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.¹⁰

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;

¹⁰ 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.

- 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.

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 facilities from public view and the effects of glare from outdoor lighting upon adjacent property.

In this instance, the visual impact evaluation followed the final of the three approaches listed above. The selected approach is appropriate as there is no ordinance specifying conditions relating to scenic compatibility. However, the Application and SAR materials do provide information about visual impacts and a vegetative screening plan.

Information Provided in the Applicant's SAR

In compliance with KRS 278.708, Section 2 of the SAR summarizes the assessment of compatibility with scenic surroundings. The SAR describes the landscape context of the proposed project as “an agricultural and rural residential area of eastern Christian County.”¹¹

Section 2 cites the findings from the Property Value Impact Report, which concludes that a solar farm is a compatible and harmonious use for rural agricultural/residential areas such as the proposed Dogwood Corners project site.

The proposed Dogwood Corners solar project would be a large commercial solar facility similar in size to several previous solar projects reviewed by BBC and other consultants for the Siting Board. As with those previous projects, much of the project's compatibility with the scenic surroundings will depend on site topography and a strategic and well-executed vegetative screening plan.

In addition to the description of proposed vegetative screening, included in Section 2 of the SAR, Dogwood Corners supplied two visual representations of the project's proposed vegetative screening in Appendix E of the SAR (Visual Impact Assessment). These illustrations are excerpted in the following figures and depict current viewpoints onto the proposed site as well as the site with solar equipment installed and proposed vegetative screening in place.

¹¹ SAR, page 4.

Figure C-7.
Dogwood Corners Visual Impact Illustration, Example 1



Figure C-8.
Dogwood Corners Visual Impact Illustration, Example 2



The visual impact of the facility components on the landscape, as seen in the illustrations, is fairly typical of other proposed solar projects that BBC has reviewed for the Siting Board. The vegetative screen can require a few years to fully establish, but from that point offers substantial mitigation for visual impact.

Mitigation measures for visual impacts of the proposed facility are presented in Section 6 of the SAR:

[...] Existing vegetation between solar arrays and nearby roadways and homes will be left in place to the extent feasible to help minimize visual impacts and screen the Project from nearby homeowners and travelers. Dogwood Corners will not remove any existing vegetation except to the extent it must remove such vegetation for the construction and operation (i.e. solar resource optimization) of Project components.

[...] Dogwood Corners shall implement planting of native evergreen species as a visual buffer to mitigate visual viewshed impacts, in areas where those viewshed impacts occur from residences or roadways directly adjacent to the Project and there is not adequate existing vegetation, as shown in the visual screening identified in the application, SAR, and corresponding maps. If it is not adequate, then vegetation reaching a minimum of 15 feet at maturity will be added by Dogwood Corners between Project infrastructure and residences with a line of sight to the facility. Planting of vegetative buffers may be done over the construction period and growing season immediately following construction; however, Dogwood Corners should prioritize vegetative planting at all periods of construction to reduce viewshed impacts. All planting shall be done prior to one year post operation of the facility.

[...] Dogwood Corners shall carry out visual screening consistent with the plan proposed in its application, SAR, and corresponding maps, and ensure that the proposed new vegetative buffers are successfully established and developed as expected over time. All unhealthy, dead, or noncompliant plantings shall be repaired or replaced within ninety (90) days of such occurrence.¹²

Dogwood Corners did not include a glare study with the Application and SAR materials. In the Siting Board's First RFI, BBC asked the applicant whether a glare study had been conducted.

Supplemental Investigations, Research, and Analysis

Visual assessment. BBC visited the proposed Dogwood Corners project site in November 2023 to review the site and its surroundings. The agricultural and agricultural/residential setting for the Dogwood Corners project—in rural Christian County where population density is low—is similar to many other proposed solar projects that have come before the Siting Board. However, the site's natural topography and relatively sparse existing vegetation from nearby key viewpoints mean that the project will be fairly visible to local residents and travelers.

The various distinct areas—or “pods”—of fenced solar generation equipment are accessed from Dogwood Kelly (two access points), Greenville Road (one access point), Goode Road (three access points) or Fears Road (one access point). Photos included here and on subsequent pages of this section show the surrounding area, including churches, homes, access points, and various views of the proposed project site.

¹² SAR, pages 8-9.

Figure C-9.
Baptist Church and a Cemetery in Middle of Site



Figure C-10.
Dogwood Christian Church Across Street from Baptist Church and Cemetery



Figure C-11.
Cemetery Adjacent to Baptist Church



Figure C-12.
Approximate Access Point to North Pod from Dogwood Kelly Road



Figure C-13.
Proposed Panel Area in West Pod from Dogwood Kelly Road



Figure C-14.
More Proposed Panel Areas in West Pod



Figure C-15.
Non-Participating Residence on North Side of Dogwood Kelly Road



Figure C-16.
Approximate Access Point to West Pod from Dogwood Kelly Road



Figure C-17.
Non-Participating Residence Seen from Goode Road



Figure C-18.
Another Non-Participating Residence on South Side of Goode Road



Figure C-19.
Existing Transmission Line on South Edge of East Pod, Near Proposed Future Substation



Figure C-20.
Proposed Panel Area Near Goode Road Access to East Pod



Figure C-21.
Approximate Proposed New Location for Substation and BESS at Eastern End of East Pod



Figure C-22.
View East Towards New Proposed Substation Location with Non-Participating Residence in Distance



Figure C-23.
Goode Road Stream Crossing Near Eastern End of Site



Conclusions and Recommendations Regarding Compatibility with Scenic Surroundings

The proposed Dogwood Corners solar facility would be located in an area of predominantly agricultural and some low-density residential land. While the applicant's proposed 500-foot setbacks are greater than setbacks proposed in most of the other applications BBC has reviewed for the Siting Board, the site's topography and sparse vegetation in key places means that the proposed Dogwood Corners solar project will be visible from a number of nearby non-participating residences. With relatively few natural visual barriers, the applicant's vegetative screening plan is important, in addition to the large setbacks.

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

- Existing vegetation between the solar arrays and nearby roadways and homes should be left in place to the extent feasible to help minimize visual impacts and screen the project from nearby homeowners and travelers.
- Dogwood Corners should execute their proposed screening plan—as described in Section 2 of the SAR and depicted in Appendices B and E of the SAR—and ensure the new vegetative buffers are successfully established and develop as expected over time. Should the vegetation intended to provide a visual buffer fail to thrive after planting, Dogwood Corners should replace the trees to maintain the visual buffer.
- Dogwood Corners should cultivate at least two acres of native pollinator-friendly species onsite.
- Dogwood Corners should commission a glare study to determine potential effects of glare from solar panels on the surrounding area, including along adjoining roadways.
- Dogwood Corners should use panels with anti-reflective coating to reduce glare and corresponding visual impacts.
- Dogwood Corners should be open to communication with adjacent landowners regarding viewshed impacts and the implementation of strategic additional vegetative screening, if needed.

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

Dogwood Corners engaged Kirkland Appraisals, LLC—which has conducted property value impact studies for several previous solar applications to the Siting Board—to examine the proposed project’s potential impact on property values.

Appendix A of the SAR (Property Value Impact Report) provides a comparative study of property values in proximity to solar facilities in Kentucky and in other states across the US, using a matched pairs design. The study 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.

Appendix A states that the closest home to the proposed project will be 518 feet from the nearest solar panel and that the average distance will be 1,633 feet.¹³ Additionally, surrounding residential density is low and 92 percent of the surrounding acreage is agricultural or agricultural/residential. In a summary statement, Kirkland Appraisals concludes that there will be no property value impacts from the proposed Dogwood Corners solar facility on adjoining properties and that the proposed facility will be in harmony with the area.

The matched pair analysis shows no impact on home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land where the solar farm is properly screened and buffered. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas and that it would function in a harmonious manner with this area.¹⁴

Supplemental Investigations, Research, and Analysis

BBC's investigation of additional research. To obtain further perspective on this issue, BBC reviewed recent studies regarding solar facility effects on nearby property values. As commercial scale solar facilities become more prevalent in the central and eastern portions of the United States, the research and information concerning potential impacts on property values is also continuing to evolve.

In 2018, a study of the potential effects of commercial solar farms on nearby property values was 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 residential property assessors agreed to fill out the on-line survey asking their opinion on the likelihood that a solar farm would impact nearby residential property values. 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.”
- “However, some respondents did estimate a negative impact on home prices associated with solar installations.” In the 23 percent of cases where negative impacts on value were estimated, the negative effect was estimated to increase with closer proximity and larger scale solar installations. Respondents who had actual experience in assessing homes near solar installations estimated a 3 percent decline in value for homes within 100 feet of a 20 MW solar installations and a 5 percent decline in value within 100 feet of a 102 MW solar facility.

¹³ SAR Appendix A, page 5.

¹⁴ SAR Appendix A, page 1.

- “The results also suggest that experience assessing near a solar installation is associated with a much less negative estimate of impact.”¹⁵

A 2020 study published by economists from the University of Rhode Island using the hedonic pricing analysis approach described earlier identified statistically significant negative impacts on home prices due to proximity to commercial solar sites in Rhode Island and Massachusetts —under certain conditions. Of the studies BBC has reviewed, this study appears to be the most robust in the sense that it covers a wide and diverse geographic area, observes hundreds of thousands of home sales transactions over a long period of time pre- and post-solar farm development, and has results that are robust to many different model specifications.

The study, based on “over 400,000 transactions within three miles of a solar site”, found that residential property values in suburban areas within one mile of a solar facility declined by 1.7 percent (on average) compared to surrounding properties, with larger effects on home values within 0.1 miles (500 feet) of a solar site (-7.0 percent). However, solar sites in industrial or rural areas¹⁶ had no statistically significant impact on home prices.¹⁷

Another recent contribution to the research on this topic is the 2019 PhD Dissertation of Dr. Nino Abashidze, an economist at the University of Georgia. Dr. Abashidze used the hedonic pricing model approach and econometric regression analysis to evaluate the effects from proximity to solar farms on both agricultural land values and residential property values in North Carolina. Dr. Abashidze found that proximity to solar farms had no discernable effect on *agricultural* land values (properties 30 acres or larger in size). However, Dr. Abashidze did find statistically significant negative impacts on *residential* property values. Dr. Abashidze’s econometric analysis found that (on average) homes within one mile of solar facilities experienced an estimated nine percent decrease in value, while homes closer to the facilities (within one-half mile) experienced an estimated 12 percent decrease in value. It is also important to note, however, that most of the residential properties in Dr. Abashidze’s analysis were located on relatively small lots (average lot size of 0.9 acres, sample standard deviation in lot size of 1.6 acres) and that the study was based on a relatively small number of home sales transactions compared to the University of Rhode Island study.¹⁸

Most recently, a team from the Lawrence Berkeley National Lab and the University of Connecticut examined the impact of large-scale non-rooftop photovoltaic projects on residential home prices in

¹⁵ *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.

¹⁶ In the study by Gaur and Lang cited below, “rural” is defined as areas with municipal population density of less than 850 people per square mile. The proposed Dogwood Corners facility would sit in unincorporated Christian County, and the surrounding area has a low population density.

¹⁷ *Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island*. Vasunda Gaur and Cory Lang, University of Rhode Island. September 29, 2020. Available at https://works.bepress.com/cory_lang/33/

¹⁸ Abashidze, Nino. *Essays on Economic and Health Effects of Land Use Externalities*. (Under the direction of Dr. Harrison Fell). Page 71. University of Georgia, 2019.

California, Massachusetts, Minnesota, North Carolina, New Jersey, and Connecticut.¹⁹ This 2023 study analyzed data on 1,630 large solar facilities combined with data from the USGS National Land Cover Database (to determine land use type); urban-rural classification data from the US Census Bureau; and CoreLogic home sales data for more than 1.8 million transactions. Overall findings were that homes within half a mile of a large-scale solar project see an average price reduction of 1.5 percent compared to homes more than two miles away from the facility; that there was no statistically significant impact beyond one mile; and that property value impact was only measurable for certain states (Minnesota, North Carolina, New Jersey), for rural homes, and for larger projects located on agricultural land.

The results of this study indicate that, in a rural agricultural context, there is potential for a slight negative impact on property values for homes within one mile of a large solar project. However, the authors note in their discussion the wide variety among the 1,630 solar projects included in the study and that policy practices to mitigate potential negative impacts of solar development include vegetative screening and land use co-location (e.g., integrating solar development and agricultural production).

Conclusions and Recommendations

With the proliferation of commercial solar facilities across the U.S., there is an increasing focus on the potential effects on residential property values from proximity to such facilities.

Most studies sponsored by solar developers have analyzed this question using sales price comparisons of homes near solar facilities to comparable homes that are not proximate to a solar facility, using techniques similar to the approach used in appraising homes. These studies identify similar homes (except for their proximity to solar facilities) and use appraisal techniques, which may be more subjective than the statistical techniques used in econometric studies, to adjust for differences in age, square footage, and other home characteristics. BBC has reviewed several of these studies and can confirm that they have consistently found no impact on property values from proximity to solar installations.

To date, relatively few studies have been conducted by academic researchers or other “third-party” analysts, but the body of research is slowly growing. Using different methods, and different data sources, recent studies by professors at the LBJ School of Public Affairs (University of Texas), the University of Rhode Island, and the Lawrence Berkeley National Laboratory have found that there could be small, negative impacts on property values from proximity to commercial solar facilities. In some studies, those negative effects appear to be more likely in suburban settings, rather than rural settings. Another recent study by a University of Georgia economist of impacts to property values from solar farms in North Carolina – using a hedonic pricing model and econometric approach similar to the University of Rhode Island study – found that solar facilities did not impact nearby *agricultural land* values but did reduce nearby *residential* values (within one mile) by nine to 12 percent, on average. And in the case of the recent 2023 study of property value impacts across six U.S. states,

¹⁹ *Shedding light on large-scale solar impacts: An analysis of property values and proximity to photovoltaics across six U.S. states.* Elmallah, S., Hoen, B., Fujita, K.S., Robson, D., and Brunner, E; Energy Policy 175 (2023) 113425, January 2023. Available at <https://www.sciencedirect.com/science/article/pii/S0301421523000101>

impacts were found in only three states and were limited to rural homes in agricultural settings, with no consideration for the presence or absence of a vegetative screen.

Overall, research and literature on this topic continues to grow and has not reached a consensus on any universal relationship between home values and proximity to nearby solar facilities. Two econometric property value studies indicate that the likelihood of adverse impacts on property values from nearby solar facilities increases with proximity to the solar site and with residential density, and decreases in more rural, agricultural settings. Another study indicates that the land use context and geographic location (e.g., state) of the solar project are essential factors in projecting any possible impacts. The duration of any adverse effects on nearby residential property values has yet to be established.

As shown earlier in Figure C-3, about 92 percent of the land use adjacent to the proposed Dogwood Corners solar facility is considered to be either agricultural or large lot “agri/residential,” while about 7 percent of the adjacent land is considered residential. These properties may be at risk of a reduction in value, though the findings from the studies discussed and cited above are not consistent in determining factors that influence value impacts.

Acknowledging that the project’s proposed vegetative buffers will help obscure the site’s physical elements from nearby residences and roads, we conclude that the proposed solar facility is unlikely to have measurable adverse impacts on most adjacent properties, but might affect the values of some smaller lot, adjacent residential properties – particularly those with homes located in closest proximity to nearby solar panels.

Recommended mitigation. It is important to note that while some of the academic studies discussed above have documented negative impacts to home values, the cause of the impacts has not been well researched. The studies hypothesize that solar farms may act as a visual disamenity, which suggests there is potential to mitigate negative impacts through actions designed to buffer the view of solar facilities from nearby homes. Consequently, BBC believes that Dogwood Corners’ vegetative screening plans may help to minimize any adverse impact on nearby residential property values and recommends the following mitigation.

- Dogwood Corners’ viewshed screening plan should incorporate particular efforts to reduce impacts on the views from the residential properties that are closest to the proposed project.

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 Dogwood Corners solar facility. This component of the SAR is identified in KRS 278.708(3)(d).

Potential Issues and Standard Assessment Approaches

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, 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;
- 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.

Information Provided in the Applicant's SAR

Noise levels generated by facility construction and operation are addressed in Section 4 of the SAR (Anticipated Noise Levels) and in the Noise Analysis Report, conducted by Stantec, which is included as Appendix D of the SAR. During project construction—including site preparation, excavation, and solar equipment installation—impacts on nearby noise-sensitive receptors (NSRs) will be generated by construction equipment and vehicles, particularly during pile driving for the solar panel racking. Operational sound levels are expected to be modest and non-disruptive for the operating lifetime of the project.

Noise generated during construction. Section 4 of the SAR summarizes key findings from the Noise Analysis Report (Appendix D). During the construction phase, Dogwood Corners estimates that the nearest non-participating home (518 feet away from the closest panel) would experience a maximum noise level of 80.5 dBA due to pile driver activity at the project site.²⁰ The applicant states that

²⁰ SAR, Appendix D, page 1.

construction-related activity will be limited to 8 AM to 6 PM Monday through Saturday and pile driving will occur only between 9 AM and 5 PM Monday through Friday. Other non-construction and non-noise generating site activity can occur outside of these days and hours.²¹

The Noise Analysis Report notes that typical equipment to be used in the construction of the Dogwood Corners facility includes vehicles and machinery such as backhoes, bulldozers, excavators, haul trucks, and impact pile drivers; this is similar to all other solar facility applications in Kentucky that BBC has reviewed. The Noise Analysis references standard sound emissions levels for construction vehicles and machinery (as published by the Federal Highway Administration Roadway) and uses the FHWA Roadway Construction Noise Model to evaluate noise during construction.²²

Based on the assumptions and modeling in the Noise Analysis, the applicant provided the following summary of estimated noise levels at the nearest non-participating receptor during the construction phase of the project.

Figure C-24.
Dogwood Corners Projected Construction Noise Levels at Nearest Non-Participating Receptor

	Distance (ft)* fence / panel	Calculated L _{max} (dBA)	Calculated L _{eq} (dBA)
Noise Level at Nearest Residential Receptor (R99) (including pile driver)	514 / 518	80.5	73.6
Noise Level at Nearest Residential Receptor (R99) (minus pile driver)	514 / 518	60.2	57.7

Note: Distance to fence line is used for truck noise during construction; distance to panels incorporated into model for pile driver activity and other heavy equipment.

From the nearest non-participating noise-sensitive receptor to the proposed Dogwood Corners project, the applicant’s projected maximum construction noise level was lower than BBC has observed for several other applications submitted to the Siting Board due to the proposed 500-foot setbacks that are larger than the setbacks seen in most other applications we have reviewed. This level of noise emission is unlikely to cause excessive disturbance.

Construction noise mitigation. In Section 6 of the Dogwood Corners SAR, the applicant describes mitigation measures to be used for construction noise.

*[If] pile-driving activity occurs within 500 feet of a noise-sensitive receptor, Dogwood Corners shall implement a construction method that will suppress the noise generated during the pile-driving process. Dogwood Corners can forego using noise suppression measures if it employs a panel installation method that does not use pile driving, so long as that method does not create noise levels similar to pile driving.*²³

²¹ SAR, page 9.

²² SAR, Appendix D, page 5.

²³ SAR, page 9.

Dogwood Corners' proposed noise mitigation measures are similar to other solar facility applicants whose applications BBC has reviewed. While the mobile nature of pile driving activity subjects nearby noise sensitive receptors to noise levels that are temporary and intermittent, the maximum noise levels from pile driving have the potential to be disruptive.

Noise generated during operation. During normal facility operation, select solar equipment will emit noise – specifically, the project substation transformer and the project inverters. In Section 4 of the SAR, Dogwood Corners states that the highest expected daytime sound level at the nearest sensitive receptor is 40.9 dBA owing to the operation of the facility's inverters; sound generated at nighttime will be much lower as the facility components will be in standby and will not resume electricity generation until the sun rises.

The Noise Analysis Report provides a summary of estimated operational sound levels as experienced at nearby sensitive receptors (Figure C-25).

**Figure C-25.
Dogwood Corners Projected Maximum Operations Noise Levels at Nearest Non-Participating Receptors**

Receptor (Nearest to)	Nearest Panel Tracking System		Nearest Inverter		Nearest Transformer	
	Distance (ft)	dB _A [*]	Distance (ft)	dB _A [*]	Distance (ft)	dB _A [*]
R95 (Substation)	620	<10	953	37.4	1,355	<10
R99 (Panel)	518	<10	1,036	36.7	2,821	<10
R98 (Inverter)	543	<10	634	40.9	2,574	<10
Note	Operates 1 minute every 15 minutes during daylight hours		Continuous low hum during daylight hours		Substation area	

The Noise Analysis Report summarizes the impacts of operational noise emissions as follows:

During site operation, intermittent noise related to the panel tracking system and the constant noise of the inverters is expected. The nearest non-participating receptor (R99) is more than 518 feet from any panels and approximately 1,036 feet from an inverter. Maximum sound levels from the tracking system are expected to be inaudible at the nearest receptor (R99, <10 dBA).

It should be noted that the trackers and the inverters for the panels themselves will not operate at night when residential receptors are most sensitive. During average daytime operation, the inverters will be similar in noise level (~40.9 dBA max) to a quiet library at the nearest receptor (R98). According to manufacturer specifications the loudest the transformer is expected to be is just over 60 dBA at 1m from the source, or the level of a normal conversation. Since the nearest receptor (R95) is over 1,355 ft from the substation, transformers are not expected to add additional noise above background noise as the noise levels are barely audible (<10 dBA). Site visits and maintenance activities including single

*vehicular traffic and mowing will be negligible as they are similar to the background agricultural noise characteristics. All site visits, outside of emergency maintenance, will occur during daylight hours.*²⁴

Supplemental Investigations, Research, and Analysis

Noise analysis adjustments based on substation relocation. In their Responses to the Siting Board's First and Second Requests for Information, Dogwood Corners updated the location of the proposed project's substation and BESS. In light of this, the Siting Board requested an update to the operational noise analysis based on a new location for the substation transformer. The applicant responded that the nearest non-participating noise receptor at the new substation location was at a distance of 1,100 feet (a change from 1,355 feet for the original substation location) and that this change would not cause an increase in background noise levels at the closest receptor.²⁵

Pile driving noise estimates for KY solar projects. BBC compared the projected construction and operational noise levels from the Dogwood Corners project to previous estimates for other Kentucky solar projects we have reviewed for the Siting Board over the past four years.²⁶ We found that the noise level estimates in Dogwood Corners Noise Analysis Report for pile driving activity are consistent with noise level projections from these other proposed solar facilities. Figure C-26 summarizes the pile driving noise levels estimated in several proposed solar facility applications.

²⁴ SAR Appendix D, page 8.

²⁵ Dogwood Corners Responses to the Second RFI, Staff DR 2-9.

²⁶ In addition to the proposed Dogwood Corners project, BBC has also reviewed the proposed Turkey Creek, Unbridled, Ashwood, Flat Run, Martin County, Green River, Rhudes Creek, Russellville, Telesto, Pine Grove, and Song Sparrow solar facilities.

**Figure C-26.
Estimated Noise Levels from Pile Driving,
KY Solar Project Proposals (dBA)**

	Maximum estimated noise level at 50 ft (dBA)
<i>Dogwood Corners</i>	
Pile driver (impact)	101.0
Pile driver (sonic)	95.0
<i>Song Sparrow Solar</i>	
Pile driver	100.0
<i>Pine Grove Solar</i>	
Pile driver	101.0
<i>Telesto Energy</i>	
Pile driver (impact)	90.0
<i>Russellville Solar</i>	
Pile driver (impact)	102.0
<i>Rhudes Creek Solar</i>	
Pile driver & other equip.	90.0
<i>Green River Solar</i>	
Pile driver	94.9
<i>Martin County Solar</i>	
Pile driver (impact)	101.0
Pile driver (sonic)	95.0
<i>Flat Run Solar</i>	
Pile driver	100.6
<i>Ashwood Solar</i>	
Pile driver (impact)	101.0
Pile driver (sonic)	95.0
<i>Unbridled Solar</i>	
Pile driver (impact)	101.0
<i>Turkey Creek Solar</i>	
Pile driver (impact)	101.0
Pile driver (sonic)	96.0

Commonly accepted noise level exposure limits. BBC researched noise level exposure limits advocated by public health agencies such as the CDC and the National Institute for Occupational Safety and Health (NIOSH). NIOSH has a recommended exposure limit of 85 dBA (note that decibels are measured on a logarithmic scale).²⁷ Figure C-27 identifies the time that it takes for a person to reach their full daily noise dose based on differing levels of noise exposure.

²⁷ Noise and Hearing Loss Prevention. The National Institute for Occupational Safety and Health. <https://www.cdc.gov/niosh/topics/noise/default.html>

Figure C-27.
Time to Reach 100 Percent of Daily Noise Dose

Source: Centers for Disease Control and Prevention, The National Institute for Occupational Safety and Health, Guidance and Regulations

Time to reach 100% noise dose	Exposure level (dBA)
8 hours	85
4 hours	88
2 hours	91
1 hour	94
30 minutes	97
15 minutes	100

At 80.5 dBA—the reported maximum noise level experienced during pile driving at the nearest non-residential noise receptor in Dogwood Corners’ noise analysis—the 100% daily noise dose would be reached in more than 8 hours. This level of noise is not hazardous but warrants management to ensure that no noise sensitive receptor experiences continuous exposure to pile driver noise for eight hours in a single day.

Conclusions and Recommendations

During construction, noise from the pile drivers will have the most substantial impact on the nearest noise receptors. However, maximum noise levels at the nearest receptors are not projected to reach a hazardous level, and the activity of pile driving is intermittent and unlikely to disturb any one receptor for an extended period.

During normal operation of the proposed Dogwood Corners facility, noise levels from inverters and the substation transformer are unlikely to be disruptive to local residents.

The area in which the proposed project site sits is a working agricultural and rural residential landscape bordered by roadways. It is unlikely that the noise levels at the site during facility operation will be incongruous with the existing noise profile of the area.

Recommended mitigation. Dogwood Corners should clarify precisely where pile driving will occur and mitigate hazardous or annoying noise as necessary, depending on the proximity to nearby residences. Further:

- Dogwood Corners should ensure that the noise level at any residential noise receptor (whether belonging to a participating or non-participating landowner) does not reach a hazardous level during construction or operation.
- Dogwood Corners should conduct construction activity only between 8 AM and 6 PM, Monday through Saturday, and pile driving only between 9 AM and 5 PM, Monday through Friday.
- Dogwood Corners should prioritize vegetative screen planting before commencing construction activity. This will not only mitigate noise but also allow for the growth of the tree screens during the construction phase, providing a partially established visual screen to protect the viewshed before the facility begins operation.
- Dogwood Corners should notify residents and businesses within 2,400 feet of the project boundary about the construction plan, the noise potential, and mitigation plans one month prior to the start of construction.

- If pile driving activity occurs within 1,500 feet of any noise sensitive receptor (e.g., participating residence, non-participating residence, community building), Dogwood Corners should implement a construction method that will suppress the noise generated during the pile driving process. In prior reviews of proposed solar facilities for the Siting Board, mitigation methods have been identified as the semi-tractor and canvas method, sound blankets on fencing surrounding the solar site, or other comparable methods.
- During construction, Dogwood Corners should locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as practicable from neighboring residences.
- Dogwood Corners should implement a Customer Resolution Program to address any complaints from surrounding landowners. Dogwood Corners should submit an annual status report on the Customer Resolution Program to the Siting Board, identifying any complaints, the steps taken to resolve those complaints, and whether the complaint was resolved to the satisfaction of the affected landowner.

Impacts on Transportation

This portion of the SAR review examines the impacts of the proposed Dogwood Corners solar facility on road 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

Section 5 of the SAR (Effect on Road and Railways) and Appendix F of the SAR (Traffic Analysis by Stantec) provide information regarding anticipated impacts on transportation at and around the proposed project site during construction and operation.

As discussed in earlier sections of this report, several roadways are in proximity to the proposed Dogwood Corners site, which has a non-contiguous footprint comprising fenced sections of solar arrays. Roadways near the proposed site include Dogwood Kelly Road (two access points to site), Greenville Road (one access point to site), Goode Road (three access points to site) and Fears Road (one access point to the site).

Stantec, on behalf of the applicant, reviewed available traffic volume data from the Kentucky Transportation Cabinet (KYTC) for nine count stations located along roadways in the area surrounding the proposed project site. The KYTC count stations are located along Greenville Road as well as along five other roads in the region.

The Traffic Analysis states that, during the construction phase of the project, traffic flow will be impacted by the commute of construction workers to and from the site (assumed to occur during peak AM and PM hours) as well as the frequent arrival and departure of large trucks necessary for equipment delivery. Modeling the projected peak hour traffic during the project's construction phase (and assuming that existing peak traffic volumes would increase by 50 percent), the results in Appendix F state that the impacted roadways would maintain an acceptable level of service (LOS A for all road segments assessed).²⁸ However, the projected volume of construction traffic will be a noticeable increase from the limited number of vehicles currently using the roads directly adjacent to the proposed project.

The Traffic Analysis projects that between one and three employees would be present at the project site during the operational lifetime of the project, and that this level of traffic to the project site would have no measurable impact on traffic flow on nearby roadways.²⁹

In the First RFI, BBC requested more information about the estimated number and class of delivery trucks anticipated on site and the load weight of the substation transformer delivery, as well as documentation of any correspondence between Dogwood Corners and the KYTC District Engineer or the Christian County Road Department.

Supplemental Investigations, Research, and Analysis

Vehicle load weights and compatibility with local roadways. BBC conducted further research on the weight limits and vehicle classes permitted to travel on specific roadways in Kentucky. The primary roadways serving the project area are rated for weight limits of 80,000 pounds, 44,000 pounds, or 36,000 pounds (KYTC Truck Weight Classification). Any vehicle loads exceeding these limits could subject the roadway and shoulder to damage or degradation. The smaller, local roads transited by delivery trucks may be more susceptible to degradation from heavy loads.

²⁸ SAR Appendix F, page 7.

²⁹ SAR Appendix F, page 7.

Regarding potential damage to local roadways, the most concerning delivery to site would be that of the proposed project's substation transformer. A 2012 publication on Large Power Transformers (LPTs) by the U.S. Department of Energy states:

Transporting an LPT is challenging – its large dimensions and heavy weight pose unique requirements to ensure safe and efficient transportation... When an LPT is transported on the road, it requires obtaining special permits and routes from the department of transportation of each state on the route of the LPT being transported. According to an industry source, obtaining these special permits can require an inspection of various infrastructure (e.g., bridges), which can add delay. In addition, transporting LPTs on the road can require temporary road closures due to traffic issues, as well as a number of crew and police officers to coordinate logistics and redirect traffic.

BBC contacted the Kentucky Transportation Cabinet's Department of Overweight/Over-dimensional Vehicles regarding their permitting process. BBC then utilized the KYTC Route Evaluation online tool to ascertain potential route restrictions for oversized deliveries. The BBC team input information for several sample configurations into the KYTC Route Evaluation tool and found that there could be problems with load clearances, particularly during delivery of the power transformer, dependent on the exact configuration of the delivery load.

Any local roads that are not state routes are not covered by KYTC permits and must instead be permitted through the appropriate County entity. However, overall BBC finds that the limitations and challenges of the primary roadways adjacent to the proposed Dogwood Corners project site are comparable with those of several other recent solar facility applications reviewed and approved by the Siting Board over the past few years.

In the First RFI, BBC requested further information from the applicant regarding planning or correspondence between Dogwood Corners and the KYTC District Engineer or the Christian County Road Department. The applicant responded that no formal communication had yet occurred with either entity.³⁰ BBC expects that advance planning between Dogwood Corners and the KYTC (as well as the Christian County Road Department, as applicable) can mitigate problems resulting from overweight and over-dimensional load delivery.

Delivery vehicles. Responding to the First RFI, Dogwood Corners stated that many specific details about the number of vehicles traveling to site during construction are not yet known. Commuter vehicles, equipment delivery vehicles, and heavy and light duty trucks will arrive at the project site daily.

Regarding fugitive dust—such as that generated by frequent traffic of heavy or light duty trucks—Dogwood Corners states that they will follow best management practices including proper construction equipment maintenance and the use of water trucks.³¹

³⁰ Dogwood Corners Responses to the First RFI, Staff DR 1-36.

³¹ SAR, page 10.

Conclusions and Recommendations

During construction, daily deliveries on semi-truck trailers and workforce commuter traffic will substantially increase the amount of traffic on roadways near the project site. However, all impacted roadways are projected to maintain a high level of service (LOS).

Delivery of the project's substation transformer will likely present some challenges given the load ratings of surrounding roadways, but, in general, challenges can be overcome with careful advance planning with the KYTC and Christian County Road Department and by utilizing an appropriate traffic management plan.

Recommended mitigation. BBC recommends the following measures to mitigate potential impacts on traffic and the local road network:

- Dogwood Corners should submit a final construction schedule, including revised estimates of on-site workers and commuter vehicle traffic, to the Siting Board prior to commencement of construction.
- Dogwood Corners should develop and implement a traffic management plan for the construction phase of the project to minimize impacts on traffic flow and keep traffic safe. As part of this plan, Dogwood Corners should implement ridesharing between construction workers; use appropriate traffic controls; or allow flexible working hours outside of peak hours to minimize any potential delays during AM and PM peak hours.
- Dogwood Corners and its construction contractors should comply with all laws and regulations regarding the use of roadways.
- Dogwood Corners should obtain permits from the KYTC and local road authorities as needed for overweight and overdimensional vehicle transport to the site and comply with all permit requirements, coordinating with the KYTC Permits Engineer and the Christian County Road Department as needed.
- Dogwood Corners should determine whether shoulder stabilization and/or road widening is necessary on any local route (particularly Goode Road) to accommodate deliveries to the site. Dogwood Corners should coordinate with the Christian County Road Department regarding any necessary improvements.
- Dogwood Corners should commit to rectify any damage to public roads by fixing or fully compensating the appropriate transportation authorities for any damage or degradation to the existing road network that it causes or to which it materially contributes.
- Dogwood Corners should properly maintain construction equipment and follow best management practices related to fugitive dust throughout the construction process. Dust impacts should be kept to a minimal level.

Other Issues

While not specifically required under the statutes authorizing SAR reviews by consultants for the Siting Board (KRS 278.708), it has become customary to consider additional issues in these reviews, including economic impacts and project decommissioning. This final portion of this section of BBC's report includes these aspects.

Economic Impacts

Current economic conditions and trends. As discussed previously, the proposed Dogwood Corners solar facility would be located in the northeastern quarter of Christian County, approximately 10 miles from the county seat of Hopkinsville. Christian County sits on the state border of Kentucky and Tennessee (directly north of Tennessee's Montgomery County), and the Dogwood Corners project site is about 40 miles north of Clarksville, the fifth-largest city in Tennessee. Fort Campbell, a US Army post, is also located along the state border between Christian and Montgomery Counties.

Christian County has maintained a stable population over the past two decades, with approximately 73,000 residents as of 2020 - nearly identical to the total population in both 2000 (72,000) and 2010 (74,000).

Per capita personal income in Christian County was just under \$43,000 in 2022. There are about 71,000 jobs located in Christian County as of 2022. The largest employment sector is government (51% or 35,929 jobs), almost all of which is military (42% of total jobs and 56% of total earnings³²) owing to the presence of Fort Campbell. Manufacturing (8.3%), health care and social assistance (5.9%), and retail trade (5.8%) are the next largest employment sectors. The farming and construction sectors each account for 2 percent of total employment in the County.³³

There were about 245,000 acres of cropland in Christian County as of the last Census of Agriculture in 2017, about 3.7 percent of the more than 6.6 million acres of cropland across all of Kentucky. Cropland in Christian County increased slightly by about 6,000 acres (2.5%) over the ten-year period between the 2007 and 2017 Censuses of Agriculture. Across Kentucky as a whole, cropland decreased by about 650,000 acres (9%) over the same period.³⁴

Applicant economic impact study. Attachment G to the Dogwood Corners Application (Economic Report) contains a study of the projected economic impacts from the proposed facility. The analysis was conducted by Dr. Paul Coomes, Emeritus Professor of the University of Louisville, using IMPLAN modeling.

Key findings from the analysis include:

- There will be a one-time spike in construction-related employment over a 12-month period. The spike will include about 371 new jobs (direct and indirect) in Christian County in the first year, with a new payroll of \$22.1 million.

³² U.S. Bureau of Economic Analysis, Table CAINC5N Personal Income by Major Component and Earnings by NAICS Industry.

³³ U.S. Bureau of Economic Analysis, Table CAEMP25N Total Full-Time and Part-Time Employment by NAICS Industry.

³⁴ 2017 Census of Agriculture and 2007 Census of Agriculture. County Data. U.S.D.A. National Agricultural Statistics Service.

- Over the 30- to 40-year operational lifetime of the project, there will be \$5.2 million in property tax revenues paid to local government jurisdictions in Christian County, an average of \$144,000 per year.

Review and assessment of applicant economic information. The level of investment in Christian County projected in the economic impact analysis appears to be roughly consistent with industry standards for a solar project of the size of the proposed Dogwood Corners facility. The overall conclusions that the operating phase will have very modest economic impacts, but that the proposed solar facility will enhance local government revenue while requiring very few services, are consistent with the findings of other commercial solar economic impact studies. The largest impact on employment will be felt during the construction period.

Some information that would provide a more complete picture but which is not provided in the applicant's economic study includes the direct, indirect, and induced economic benefits from the current use of the site in agriculture; and the potential induced economic benefits from the additional income received by the participating landowners if at least a portion of that income is spent locally. The former would at least slightly reduce the projected net economic benefits from ongoing operations of the facility, while the latter would likely increase those projected net benefits. Neither of these aspects would likely result in a material change to the results of the economic impact analysis.

Recommended mitigation. BBC recommends the following measures in regard to potential economic impacts:

- Dogwood Corners should commit to prioritizing local hiring and seeking to hire Christian County residents to fill the projected direct construction jobs.

Project Decommissioning

In prior solar projects reviewed by the Siting Board, plans and assurances for decommissioning the sites at the end of their functional lives have been an important issue of concern to both the Siting Board and local governments.

Applicant project decommissioning plan. Attachment I of the Application (Decommissioning Plan) contains a plan for the decommissioning of the proposed facility. The plan was authored by Stantec on behalf of the applicant.

The anticipated lifetime of the proposed Dogwood Corners solar project is 30 to 35 years.³⁵ As required by KRS 278.706, decommissioning activities will be completed within 18 months of the project ceasing to sell electricity.

³⁵ Attachment I, page 1.

Equipment and vehicles required for decommissioning will be similar to those required for project construction, such as bulldozers, cranes, dump trucks, front-end loaders, water trucks, and other ancillary equipment.³⁶ Decommissioning activities include the removal of all project components, including solar modules; tracking system and steel piles; inverters and transformers; electrical cabling; substation, transmission tie-in line, and BESS components; site access roads; and perimeter fencing. Figure C-28, excerpted from Attachment I, is a table identifying the type and quantity of components to be removed upon project decommissioning.

Figure C-28.
Primary Components of Dogwood Corners Solar Project to be Decommissioned

Component	Quantity	Unit of Measure
Solar Modules (approximate)	273,052	Each
Tracking System (equivalent full trackers)	2,626	Tracker
Steel Piles (trackers and inverter station)	34,558	Each
Inverter Stations	35	Each
Overhead Electrical Collection Cable	6,000	Linear Foot (estimated)
Subsurface Electrical Collection Cables and Conduits (to be abandoned at depth greater than three feet)	35,470	Linear Foot (estimated)
Perimeter Fencing	79,788	Linear Foot
Access Roads (approximate)	31,057	Linear Foot
BESS (25 MW/100 MWh)	1	Each
Overhead Tie-in Transmission Line (approximate)	500	Linear Feet
Project Substation	1	Each

Project components in either working or salvageable condition may be sold in the secondary market or as salvage, providing revenue to offset decommissioning costs. Project components that are not suited for resale or salvage will be disposed of at an approved solid waste facility.³⁷

The sequence of decommissioning begins with reinforcing internal roads and other site groundwork, then progresses to the removal of physical project components, and concludes with the restoration and revegetation of disturbed land to allow a return to pre-construction land use to the extent possible. The decommissioning plan provided appears adequate and details the installation placement and subsequent removal of each type of project equipment at the facility.

Figure C-29 shows the estimated net \$3.9 million decommissioning cost (\$6.2 million in costs and \$2.3 million in estimated salvage revenue) of the facility, as excerpted from Attachment I.

³⁶ Attachment I, page 8.

³⁷ Attachment I, pages 4-5.

**Figure C-29.
Estimated Net
Decommissioning Costs
for Dogwood Corners
Solar Project**

Item	(Cost)/Revenue
Decommissioning Expenses (Solar Project)	(\$5,775,411)
Decommissioning Expenses (BESS Project)	(\$382,550)
Potential Revenue – salvage value of panel components and recoverable materials	\$2,258,366
Net Decommissioning Cost	(\$3,899,595)

Recommended mitigation. To mitigate concerns regarding decommissioning:

- Dogwood Corners should follow the decommissioning plan laid out in Attachment I of the Application submitted to the Siting Board; and
- Dogwood Corners should work with the County to address any concerns that arise at any point regarding its proposed decommissioning plan.