# Review and Evaluation of STMO Bn, LLC (Starfire) Site Assessment Report Case Number: 2024-00255

REPORT

**Report**

May 26, 2025

# Review and Evaluation of STMO Bn, LLC (Starfire) Site Assessment Report Case Number: 2024-00255

**Prepared for**

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# SECTION A.
# General Statement

This document provides a review of the Site Assessment Report (SAR) for the proposed STMO Bn, LLC (Starfire)—hereafter referred to as "Starfire"—merchant electric generating facility submitted to the Kentucky State Board on Electric Generation and Transmission Siting (the Siting Board).

Starfire submitted an administratively complete document titled "Electronic Application STMO Bn, LLC (Starfire) for a Certificate of Construction for an Approximately 210 Megawatt Merchant Solar Electric Generating Facility in Knott, Breathitt, and Perry Counties, Kentucky Pursuant to KRS 278.700 and 807 KAR 5:110" (the "Application") to the Siting Board on February 4, 2025.

The Siting Board assigned the case number 2024-00255 to the Starfire 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 Starfire's 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 Starfire's 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, on April 21, 2025;
- 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 Starfire's 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

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 Electric Generation and Transmission Siting (the Siting Board) received an application from STMO Bn, LLC (Starfire)—hereafter referred to as "Starfire"— on February 4, 2025, for approval to construct a commercial, photovoltaic solar merchant electric generating facility in Knott, Breathitt, and Perry Counties, Kentucky. Siting Board staff retained BBC Research & Consulting (BBC), a Denver-based firm, to review the SAR. BBC was directed 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 and supporting materials provide a description of the proposed Starfire 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 Starfire project is a proposed 210-megawatt (MW) photovoltaic (PV) electricity generation facility situated on a former coal mine site in unincorporated Knott, Breathitt, and Perry Counties, Kentucky, approximately 15 miles northeast of the Perry County seat of Hazard.

The project will have a footprint (area within the fence line) of approximately 1,385 acres across 1,980 acres of land leased to the project. Project components will include photovoltaic (PV) solar modules mounted on single-axis trackers, supported by steel posts. Modules will track the sun and reach a maximum height of 16 feet, with racking systems approximately five feet high and oriented north-south. DC cables will connect modules to combiner boxes and then to inverters, with cabling either trenched or attached to racking

An Operations and Maintenance (O&M) building with associated parking will remain in place during operations. Temporary facilities during construction will include laydown areas, trailers, workforce parking, storage, and water and fuel tanks.

To support wildlife connectivity, the project will include at least one north-south wildlife corridor with a target combined width of 300 feet, utilizing existing vegetation where feasible. Wildlife-friendly fencing will enclose the solar arrays and infrastructure, with alternate fencing used where needed—for example, in agrivoltaic areas with grazing sheep

The primary roadways in proximity to the proposed Starfire site are KY-80, KY-476, and KY-1087. The estimated total population within a one-mile radius of the project is 57 residents, which is lower than the average population (110) within one mile for 17 of the solar facility applications reviewed by the Siting Board since June 2022 providing comparable information. The estimated population of 1,655 residents living within three miles of the proposed facility is slightly less than than the average of 1,714 residents among the other solar facility applications.

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

- **Surrounding land use** — Overall, agricultural land comprises 95 percent of adjoining acres, while about 5 percent is solely residential. Measured by the number of properties rather than their acreage, agricultural uses constitute 46 percent of adjoining parcels, while 54 percent of adjoining parcels are residential. 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 wildlife-friendly perimeter fencing and that the substation and O&M building will be fenced, gated, and locked. In addition, the applicant states that the project will comply with the requirements of the National Electric Safety Code.

- **Utilities —** In their Reponses to the First RFI, the applicant states that auxiliary electrical service will be secured from Kentucky Power.

- **Setback requirements —** According to the applicant, Breathitt, Knott, and Perry Counties do not have an applicable ordinance for projects such as the Starfire. Additionally, there are no neighborhoods, schools, hospitals or other relevant structures within 2,000 feet of the proposed project, and so the applicant does not require a deviation from the setback requirements required by KRS 278.704(2).

- **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 Starfire 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 II of the SAR summarizes the assessment of compatibility with scenic surroundings. The proposed project site is a reclaimed mountaintop coal mine and is substantially elevated above residences and roads in the vicinity. The area is rural with dense vegetation. BBC visited the proposed Starfire project site in April 2025 to review the site and its surroundings.

The proposed Starfire 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. Much of the project's compatibility with the scenic surroundings is dependent on site topography and vegetative screening. In this case, the project site having been a mountaintop coal mine before reclamation reduces potential concerns about scenic compatibility for the proposed Starfire project as the elevation and vegetation would shield surrounding residents and travelers from any view of the project components.

Starfire also commissioned a glare analysis study for the proposed project, which was included as Attachment 6 of the SAR. Some green glare would be seen from a nearby observation point and along an adjacent private road for short periods during a few months of the year. For the viewpoints identified, this level of glare is not expected to be disruptive.

BBC concurs with Starfire's conclusion that the proposed facility would not be incompatible with its surroundings from a scenic standpoint. This assessment recognizes the elevated topography of the site and the existing vegetative screening.

## 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 Starfire facility. Starfire engaged Kirkland Appraisals, LLC—which has conducted property value impact studies for numerous 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 Starfire 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.*[1]

[1] SAR Attachment 2, page 1

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.[2]

Given the low population density and rural setting for the proposed Starfire project—and acknowledging that the reclaimed mountain top coal mine location will 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 nearby properties.

## Expected Noise from Construction and Operation

Noise levels generated by facility construction and operation are addressed in Section IV of the SAR (Anticipated Noise Levels at Property Boundary) and in the Acoustic Assessment—conducted by Tetra Tech—which is included as Attachment 4 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 Starfire project is a rural area with a low population density. 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 applicant's Acoustic Assessment indicates that the projected construction sound level at the nearest sensitive receptor (3,800 feet) would be 61 dBA while a pile driver is in use. This level of noise is approximately equivalent to a household dishwasher and is not hazardous.

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

[2] 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.

## Impacts on Transportation

Section V of the SAR (Effect on Road, Railways and Fugitive Dust) and Attachment 7 of the SAR (Transportation Assessment Report) 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 site, which has a 1,385-acre footprint comprising several fenced sections of solar arrays. Three of the primary roadways surrounding the proposed project site are KY-80, KY-476, and KY-1087. The applicant reviewed available traffic volume data from the Kentucky Transportation Cabinet (KYTC) for count stations located along these three primary roadways.

The Transportation Assessment 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. The highway capacity analysis shows the three primary roadways are expected to operate at an adequate level (LOS B or better) throughout the project's peak construction traffic.

The Traffic Study projects that few vehicles would travel to the project each day during the operational lifetime of the project, and that this level of traffic to the site would have no measurable impact on the level of service or transportation infrastructure.

## Other Considerations

**Applicant economic impact study.** Exhibit I of the Starfire Application (Analysis of Facility's Impact to Regions and State Economies) contains a study of the projected economic impacts from the proposed facility. The analysis was conducted by Mangum Economics using IMPLAN modeling.

Key findings from the analysis include:

- There would be a one-time impact in construction-related employment for the four-county region, including 85 direct and 114 indirect and induced job years; $11.9 million in associated wages and benefits; $46.6 million in economic output; and $2.7 million in state and local tax revenue.

- There would be an ongoing annual economic impact for the four-county region through the operational lifetime of the project, including 1 direct and 8 indirect and induced jobs; $450,000 in associated wages and benefits; and $2.5 million in annual economic output.

The combined level of investment in the region and state projected in the economic impact analysis appears to be roughly consistent with industry standards for a solar project of the size of the proposed Starfire 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.

**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.

Exhibit K of the Application (Decommissioning Plan and Reclamation Cost Estimate) contains a plan for the decommissioning of the proposed facility. Within the plan, Starfire describes the sequence and project components to be decommissioned, including net decommissioning costs accounting for expenses as well as potential salvage revenue.

## Summary Findings

Starfire 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 Starfire project site appears to be appropriately selected in terms of compatibility with the area and access to transmission infrastructure. The mountain topography and vegetation of the reclaimed mine site help the facility to be compatible with the surrounding area.

## Mitigation Recommendations

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

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

1. Starfire should provide a final site layout plan to the Siting Board when site design is finalized and before site preparation begins. 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.** Starfire 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.

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

4. Existing vegetation on the site should be left in place to the extent feasible to help minimize visual and noise impacts.

5. Starfire should proceed with its plan to cultivate 10 acres of native pollinator-friendly species onsite and to additionally reforest 25 acres of the site.

6. Starfire should use panels with anti-reflective coating to reduce glare and corresponding visual impacts.

7. Starfire should be open to communication with adjacent landowners and county officials regarding viewshed impacts and the implementation of strategic vegetative screening, if needed.

8. Communication regarding viewshed impacts and concerns should be incorporated into the Complaint Resolution Program described further in mitigation recommendation #13 later in this section.

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

9. Existing vegetation on the site should be left in place to the extent feasible to help minimize visual and noise impacts and to screen the project from nearby residents.

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

10. Starfire should limit noise-generating construction activity to the hours of 8 AM to 7 PM, Monday through Sunday, and pile driving only between 9 AM and 5 PM, Monday through Saturday.

11. Starfire should notify landowners within 2,000 feet of the project boundary about the construction plan, the noise potential, and mitigation plans one month prior to the start of construction.

12. During construction, Starfire should locate stationary noise-generating equipment, such as air compressors or power generators, as far as practicable from noise-sensitive receptors.

13. Starfire should implement a Customer Resolution Program to address any complaints from surrounding landowners. Starfire 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 –*

14. Starfire should submit a final construction schedule, including updated estimates of on-site workers and commuter vehicle traffic, to the Siting Board prior to commencement of construction.

15. Starfire should develop and implement a robust 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, Starfire 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.

16. Starfire and its construction contractors should comply with all laws and regulations regarding the use of roadways.

17. Starfire 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 Knott, Breathitt, and Perry County Road Departments as needed.

18. Starfire should determine whether shoulder stabilization and/or road widening is necessary on any local route to accommodate deliveries to the site. Starfire should coordinate with the Knott, Breathitt, and Perry County Road Departments regarding any necessary improvements.

19. Starfire should commit to rectifying 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.

20. Starfire 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* –

21. Starfire should commit to prioritizing local hiring and seeking to hire residents from surrounding counties to fill the projected direct construction jobs.

22. Starfire should follow the decommissioning plan laid out in Exhibit K of the Application submitted to the Siting Board; and

23. Starfire should work with the Counties 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 Starfire project regarding scenic compatibility, property values, noise, or traffic.

# SECTION C.
# Detailed Findings and Conclusions

This section provides detailed review and evaluation of each element of the Site Assessment Report (SAR) submitted by STMO Bn, LLC (Starfire)—hereafter referred to as "Starfire"—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 Starfire 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 Starfire facility and site development plan is mainly set forth in Section II of the Application (Description of Proposed Site), Exhibits A and B of the Application (Project Site Maps), and Section I of the SAR (Description of Proposed Project Site). Additional supplementary information comes from various other attachments and exhibits included with the SAR and Application.

**Overview of proposed facility.** The Starfire project is a proposed 210-megawatt (MW) photovoltaic (PV) electricity generation facility situated on a former coal mine site in unincorporated Knott, Breathitt, and Perry Counties, Kentucky, approximately 15 miles northeast of the Perry County seat of Hazard. Figure C-1, on the following page, provides a satellite view of the location of the project site and the communities in this part of Eastern Kentucky.

**Figure C-1.**
**Location of Proposed Starfire Facility in Eastern Kentucky**

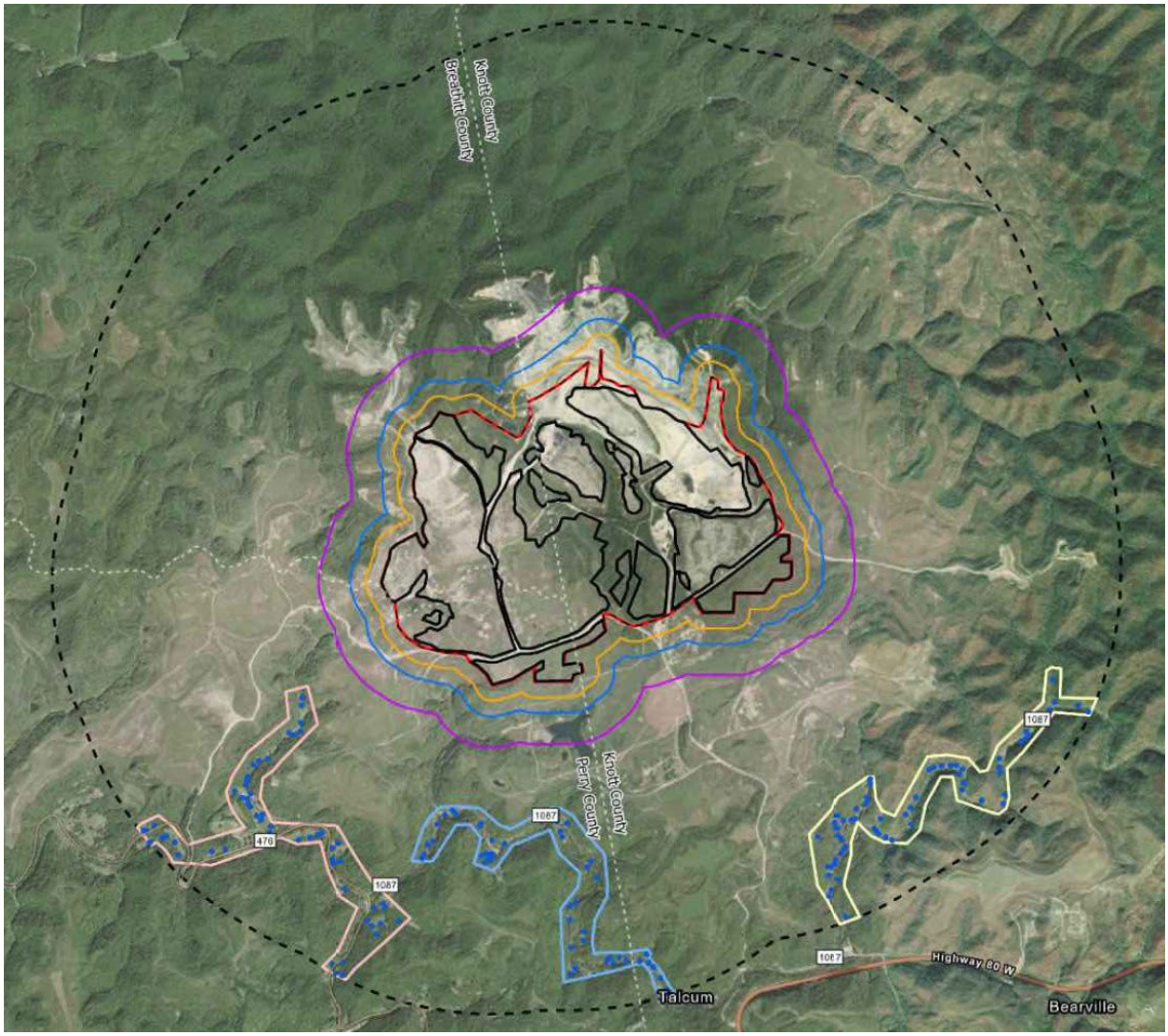

Note: The site of the proposed Starfire facility is marked with a grey geolocation pin.

The City of Hazard, shown in the southwestern corner of Figure C-1, has a population of 5,263[1] and the other unincorporated communities seen in the map have smaller populations. Like most of Eastern Kentucky, the region is hilly and forested and has hosted an active coal extraction industry for many previous decades.

[1] U.S. Census Bureau Decennial Census, 2020

Figure C-2, excerpted from Exhibit A of the Application (Neighborhood Map), shows the proposed project boundary (black-and-red outline). Three neighborhoods are outlined and situated south of the project site within the two-mile radius (black dashed line) of the project boundary, but more than 2,000 feet (purple line) from the project. No residential neighborhoods, schools, public or private parks, hospitals, or nursing homes are within a 2,000-foot radius of the project.[2] There are 10 cemeteries within a two-mile radius of the proposed Starfire project.

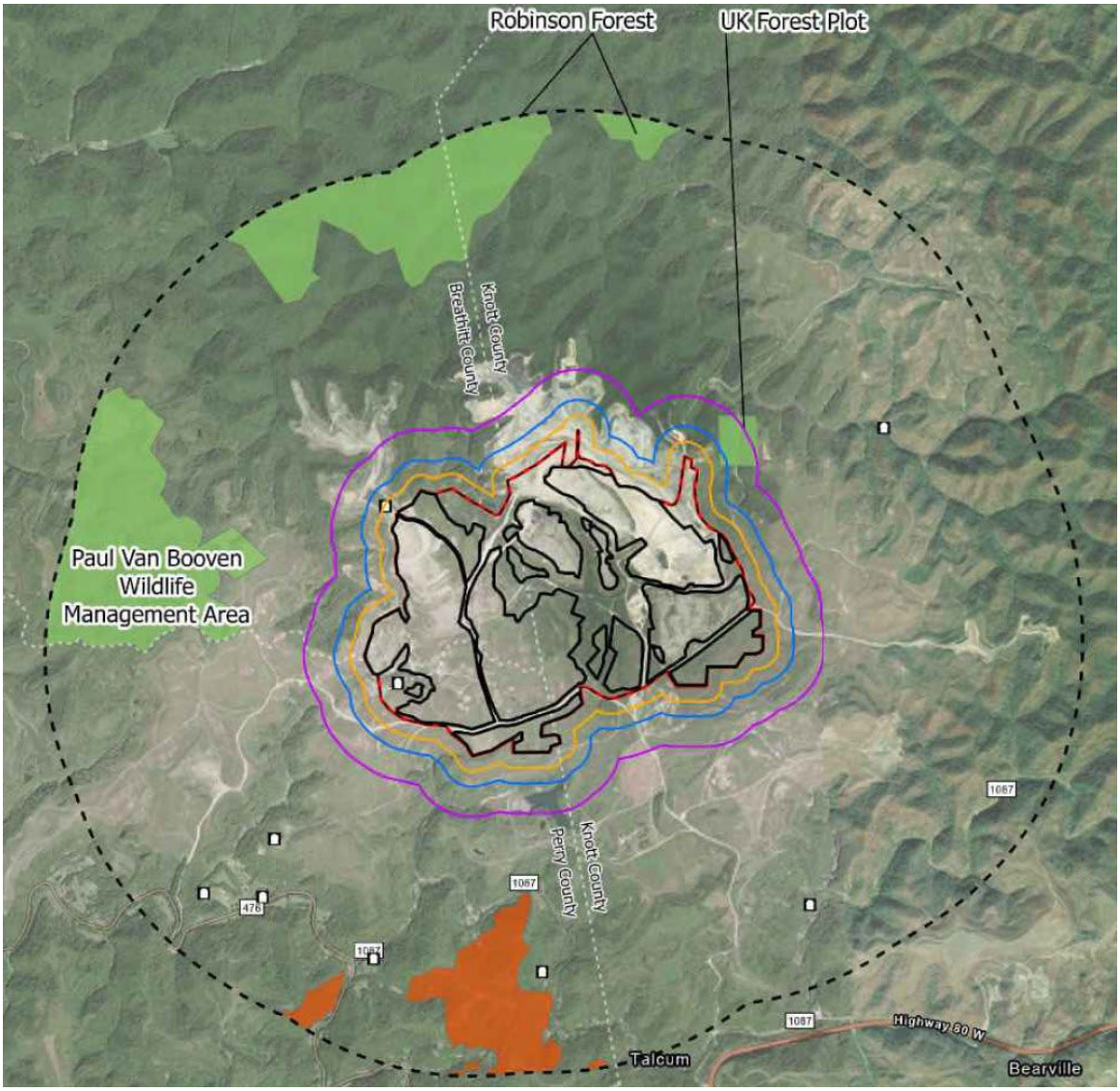
**Figure C-2.**
**Context Map of Proposed Project Site, in Knott, Breathitt, and Perry Counties, KY**




[2] Application, pages 2-3

Figure C-3, excerpted from Exhibit B of the Application (Sensitive Receptors Map), shows state owned management lands, including the University of Kentucky's research area of Robinson Forest, an additional Wildlife Management Area directly west of the site, and an elk regulated area south of the site managed by the Kentucky Department of Fish and Wildlife Resources (shown in orange).

**Figure C-3.**
**Sensitive Receptors Map of Proposed Project Site, in Knott, Breathitt, and Perry Counties, KY**




The project will have a footprint (area within the fence line) of approximately 1,385 acres across 1,980 acres of land leased to the project. Project components will include photovoltaic (PV) solar modules mounted on single-axis trackers (with some stationary panels on steeper slopes), supported by steel posts. Modules will track the sun and reach a maximum height of 16 feet, with racking systems approximately five feet high and oriented north-south. DC cables will connect modules to combiner boxes and then to inverters, with cabling either trenched or attached to racking.

Additional infrastructure includes high-voltage transformers, junction boxes, underground or overhead collection lines, a substation transformer, and an on-site substation. An Operations and Maintenance (O&M) building with associated parking will remain in place during operations. Temporary facilities during construction will include laydown areas, trailers, workforce parking, storage, and water and fuel tanks.

To support wildlife connectivity, the project will include at least one north-south wildlife corridor with a target combined width of 300 feet, utilizing existing vegetation where feasible. Wildlife-friendly fencing will enclose the solar arrays and infrastructure, with alternate fencing used where needed—for example, in agrivoltaic areas with grazing sheep.

**Surrounding land uses.** Attachment 2 of the SAR (Property Value Impact Analysis) provides detail on the composition of the surrounding land. Figure C-4, excerpted from Attachment 2, summarizes the use of land adjoining the proposed project.

**Figure C-4.**
**Adjoining Parcel Land Use for Proposed Starfire Project**

| | Acreage | Parcels |
|---|---|---|
| Residential | 4.86% | 54.17% |
| Agricultural | 95.13% | 45.83% |
| Commercial | 0.00% | 0.00% |
| Recreational | 0.00% | 0.00% |
| Total | 100.00% | 100.00% |

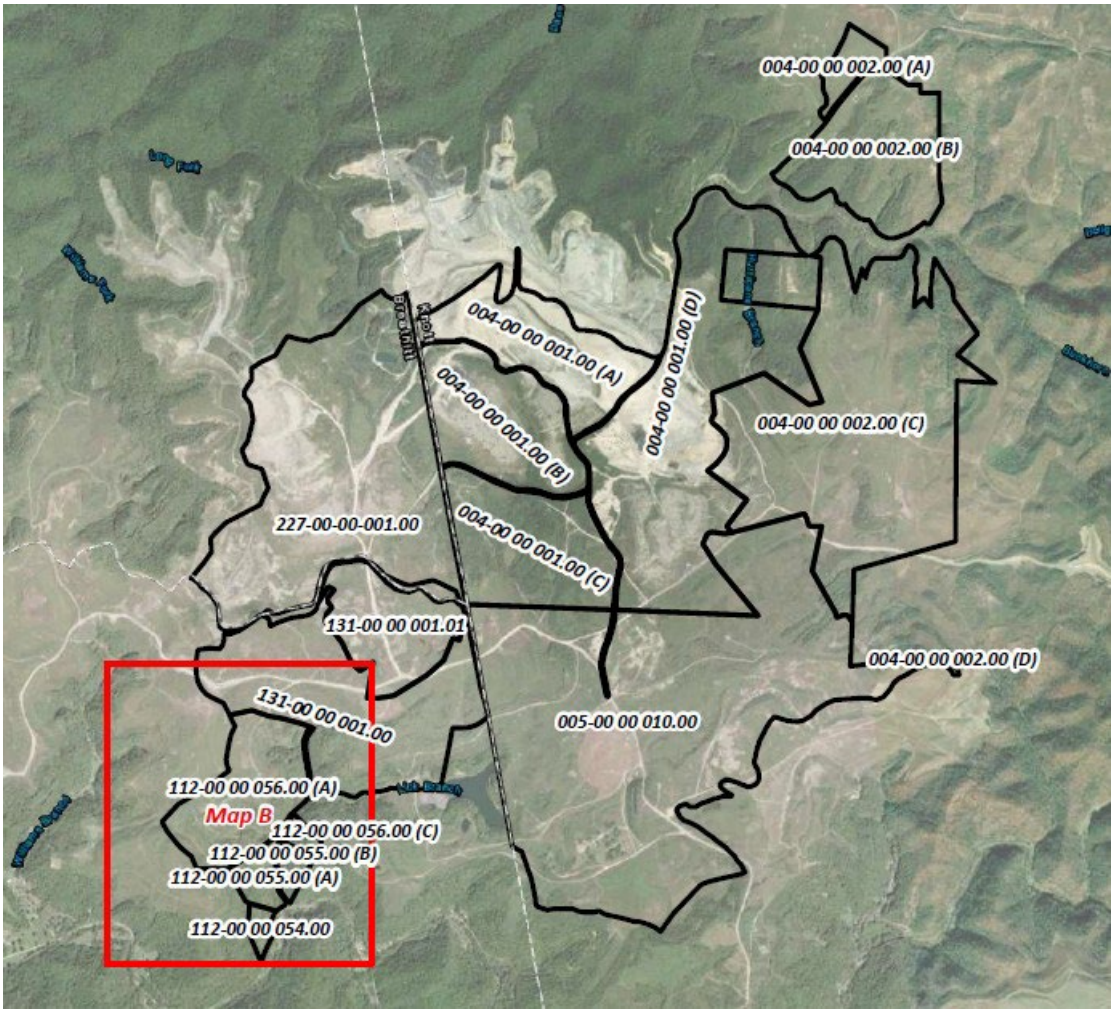
Overall, agricultural land comprises 95 percent of adjoining acres, while 5 percent is solely residential. Measured by the number of properties rather than their acreage, agricultural uses constitute 46 percent of adjoining parcels, while 54 percent of adjoining parcels are residential.

Attachment 2 also provides 2024 population estimates for the surrounding area.[3] In 2024, an estimated 57 people lived within a one-mile radius of the project area; 1,655 within a three-mile radius; and 4,450 within a five-mile radius.

**Legal boundaries.** Attachment 3 of the SAR (Legal Boundaries) contains legal descriptions and parcel maps of the participating parcels for the proposed project site. A total of 18 parcels are identified in Attachment 3 and a parcel map is excerpted here as Figure C-5.

[3] SAR Attachment 2, pages 12-14.

**Figure C-5.**
**Parcel Map for Proposed Starfire Project**




**Access control.** The Starfire SAR briefly describes proposed security measures:

*A guard house will be situated at the base of the main access road leading up to the site, which will be fenced. Access to array areas will be provided via access gates. A wildlife friendly fence with wooden posts and wire mesh will enclose the solar panels and associated infrastructure. A fence meeting National Electric Safety Code (NESC) requirement, typically a six-foot fence that includes three strings of barbed wire at the top will enclose the Project's substation. The Project will comply with federal, state, and local regulations, as applicable, in determining safety signage locations around the facility.*[4]

In the Siting Board's First and Second Requests for Information (RFI), Starfire was asked to provide an updated site layout map depicting necessary information on access points and other features.

**Location of buildings, transmission lines, and other structures.** Page 2 of the SAR states that the locations of project structures are depicted in Attachment 1 of the SAR. BBC viewed Attachment A

[4] SAR, page 2

and found a site layout map with inadequate resolution for examining project components and locations. The applicant was asked in the First and Second Requests for Information (RFI) to supply additional detailed map files for review.

**Location and use of access ways, internal roads, and railways.** Page 3 of the SAR states that the locations of access ways and internal roads are depicted in Attachment 1, however BBC could not locate the information on the referenced map and the applicant was asked to supply an updated map in the First RFI.

There are no railways present at the proposed site.

**Existing or proposed utilities.** The Application states that the project's substation will interconnect with the existing Harbert Substation about 3.6 miles northeast of the project site. The applicant plans to apply for Siting Board approval of the non-regulated transmission line separately from the application to construct the solar generating facility which is the subject of this review.

Electric service necessary for the O&M building may be supplied by Kentucky Power. If water is required during project construction or operation, the applicant anticipates obtaining water from onsite wells or trucking in from an offsite water supplier.[5]

**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."

On page 3 of the SAR, the applicant states:

*Pursuant to KRS 278.708(3)(a)(7), Knott, Breathitt, and Perry Counties, Kentucky, have not enacted any zoning ordinances or setback requirements for the location of the Project and, therefore, no setbacks by such a planning commission exist in any of the counties. Accordingly, the Project will not be required to follow setbacks established by KRS 278.704(3) because no local zoning is present.*

*There are no residential neighborhoods, schools, hospitals, or nursing homes within two thousand (2,000) feet of the proposed structures or facilities of the Project and no request for deviation from KRS 278.704(2) setbacks is therefore necessary.*

**Evaluation of noise levels.** Attachment 4 of the SAR (Acoustic Assessment) provides an assessment of the noise levels that will be generated during the construction and operation of the Starfire facility.

[5] SAR, page 3

During the construction phase of the project, activities on site will generate intermittent noise at the nearest receptors. The applicant estimated a maximum construction noise level from pile driving of 61 dBA at the nearest sensitive receptor. During the operational life of the project, Starfire modeled a maximum daytime noise level of 25 dBA from the substation and inverters.

Noise levels and the details of Attachment 4 are discussed in greater depth and detail on pages 36-42 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 describe the proposed facility and site development plan more fully.

**Overview of proposed facility.** Responding to the First and Second Requests for Information, the applicant supplied additional maps and details about specific aspects of the proposed Starfire project, such as the distribution of Starfire project acreage across the three counties that intersect on site (Figure C-6). Acreage within Knott County constitutes the bulk of the project parcels as well as fenced area.

**Figure C-6.**
**Distribution of Starfire Project Acreage Across Breathitt, Knott, and Perry Counties**

| County | Project Area in County, Measured at Project Boundary (Acres) | Project Area in County, Measured by Fenced Area (Acres) |
|---|---|---|
| Breathitt | 565 | 429 |
| Knott | 1,115 | 710 |
| Perry | 300 | 245 |

Starfire was asked to more fully describe the laydown area to be used during project construction, and in response the applicant stated that the primary laydown area would be located adjacent to the primary site access road along the southern boundary. The laydown area is anticipated to be approximately 15 acres in size.[6]

In response to the Siting Board's First Request for Information regarding a description of the proposed transmission line and installation, Starfire stated:

*The Project will file a separate application for its nonregulated electric transmission line. Currently, the Project estimates an approximately forty to sixty poles will be required along a total length of approximately five miles located within a right of way width of 200 feet. Pole height is yet to be determined but will be included in the Project's forthcoming transmission line application. Height of poles will be determined at time of the forthcoming transmission line application but this would vary depending on the length of span, location, and topography.*[7]

Starfire supplied additional descriptive information about the proposed wildlife fencing:

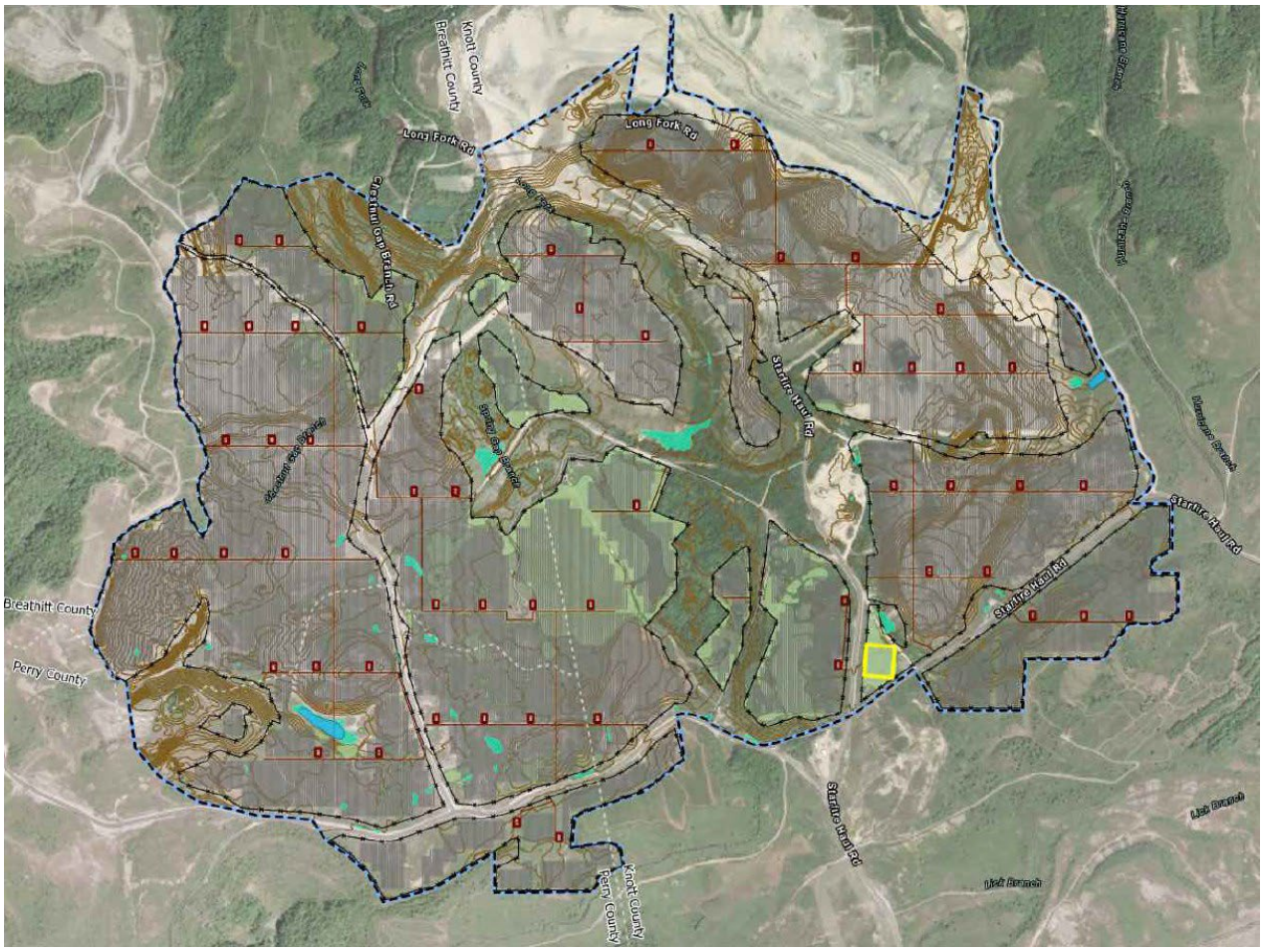
[6] Starfire Responses to the First Request for Information

[7] Starfire Responses to the First Request for Information

*The proposed fencing will consist of wire fencing with a larger mesh size than typical chain link fencing. This mesh size will likely be 4" x 6" and will allow for the movement of small to medium sized mammals across the site. Birds, reptiles, and amphibians will be largely unaffected by fencing. Individual panel areas will be fenced separately to allow for movement of larger animals between array areas and the wider wildlife corridor will allow for more natural movement north to south across the site. No barbed wire fencing will be used for the panel array area fences. The substation fence will be 6 feet in height with a 1-foot extension of barbed wire.*[8]

Additionally, the applicant supplied a map that more clearly delineates the internal workings of the proposed project site, including fencing of the solar arrays and areas of proposed vegetative clearing (shown in Figure C-7 in light green shading) during the construction phase.

**Figure C-7.**
**Starfire Project Site Map Including Areas of Proposed Vegetative Clearing**




The proposed Starfire project site occupies land with a long history of surface coal mining and ongoing post-mining activity. While active coal excavation has ceased within the project boundary,

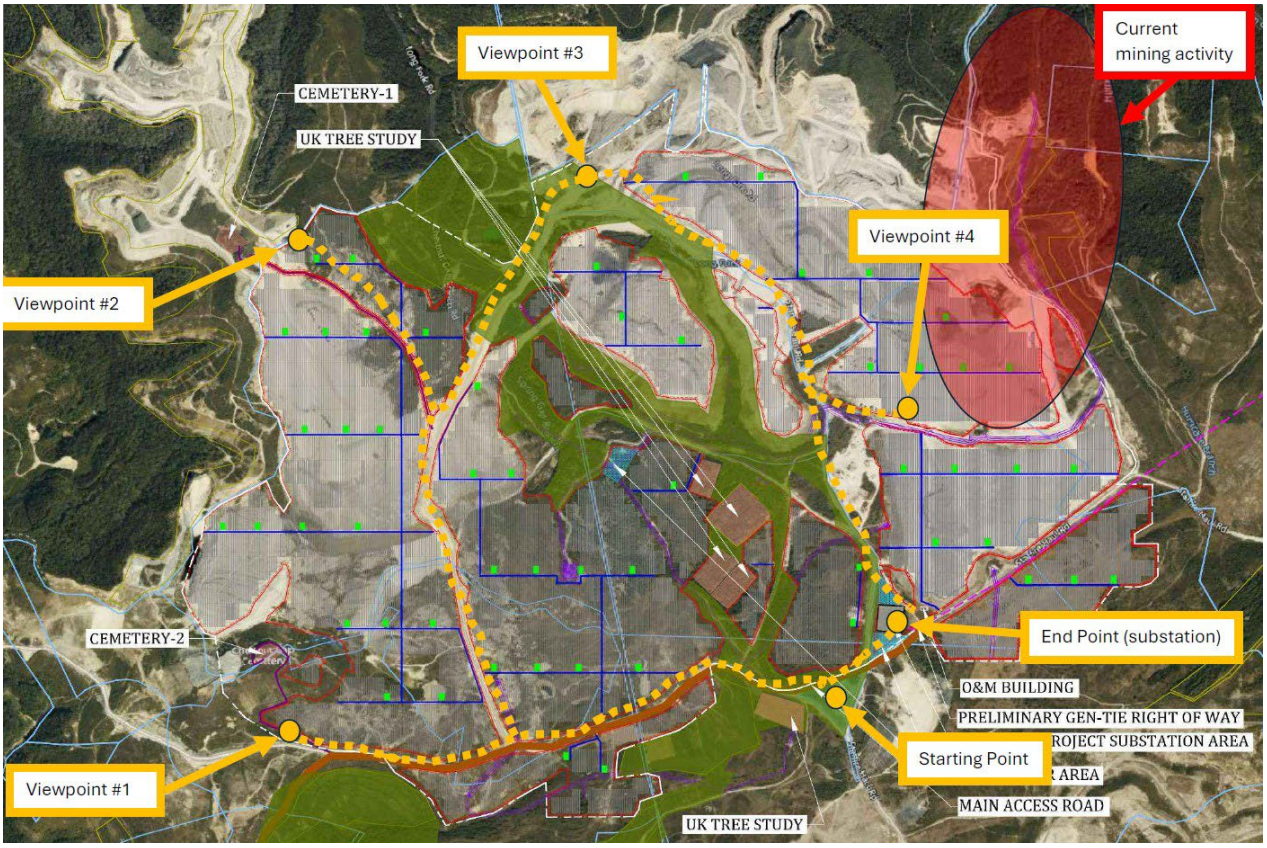
[8] Starfire Responses to the First Request for Information

portions of the site remain under surface mining permits and are progressing through phased reclamation.

The site also includes active reforestation research plots established by the University of Kentucky. These plots have been excluded from solar development and integrated into planned wildlife corridors. Additionally, the applicant has indicated that agrivoltaics (sheep grazing) may be introduced after the project is established, to manage the site for multiple benefits.

These overlapping land uses introduce added complexity for a utility-scale solar facility. Ongoing mining logistics, environmental oversight, and third-party research activities elevate the risk of operational conflicts or miscommunication. Locked gates at each fenced array will help manage access and reduce the likelihood of interference. The project's success will rely on sustained coordination among all parties with active site interests. Figure C-8, provided in the Response to the Second Request for Information, highlights some disparate activity present on the proposed site. (The labelled viewpoints and dotted yellow lines indicate the route used during the site visit on April 21, 2025.)

**Figure C-8.**
**Starfire Project Aerial Map Featuring Viewpoints, Mining Activity, and Tree Research Plots**




In response to questions regarding this topic posed in the Second Request for Information, Starfire stated:

*The Project has held conversations with the current mine operator and the University of Kentucky (UK) about development of the site and the actions and expectations of each party with interests in the area. […] The current mine operator will complete work in Project areas before the start of construction. […] The Project will utilize a different road as the primary access road to the site than the road that is used by mining traffic, thereby avoiding the chance for conflicts with current uses. Discussions with UK have centered around how to best include their tree study plots within the layout of wildlife corridors designed into the site layout and ensuring UK researchers will have full access to the study plots. Finally, the Project's EPC contractor and operations personnel will have communication plans in place if or when conversations with the mining companies or UK are needed.*[9]

**Surrounding land uses.** The composition of surrounding land uses — where residential parcels comprise a substantial amount 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 2020[10], residential land uses have averaged 58 percent of the surrounding parcels, and 8 percent of the surrounding acreage (compared to 54 percent and 5 percent, respectively, for the proposed Starfire site).

Apart from just the immediately adjacent properties, the information provided in SAR Attachment 2 (Property Value Impact Analysis) 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-9, 15 of the 17 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 facilities is 1,714 residents, while the median population estimate for the same radius is 1,155 residents. The proposed Starfire facility has a population density within three miles that sits very slightly below the average, with an estimated 1,655 residents. Twelve of the 17 facilities have also provided estimates of the population living within one mile and within five miles. Among those 12 facilities, Starfire sits near the median for the estimated population living within one mile and within five miles.

[9] Starfire Responses to Second Request for Information

[10] 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, Song Sparrow, Dogwood Corners, Lynn Bark Energy, and New Frontiers Solar Park projects.

**Figure C-9.**
**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 |
| 2023-00263 | September 2023 | Banjo Creek Solar | 33 | 786 | 2,927 | Graves |
| 2023-00360 | December 2023 | Frontier Solar | 123 | 1,155 | 8,811 | Marion; Washington |
| 2024-00105 | May 2024 | Pike County Solar | 203 | 1,048 | 3,425 | Pike |
| 2024-00099 | June 2024 | Weirs Creek Solar | NA | NA | NA | Webster; Hopkins |
| 2024-00104 | June 2024 | Lynn Bark Energy Center | 19 | 1,186 | 3,814 | Martin |
| 2024-00253 | November 2024 | New Frontiers Solar Park | 22 | 2,165 | 4,416 | Breckinridge |
| 2024-00406 | January 2025 | Lost City Renewables | 170 | 996 | 2,360 | Muhlenberg |
| **2024-00255** | **February 2025** | **STMO BN, LLC (Starfire)** | **57** | **1,655** | **4,450** | **Breathitt, Knott, Perry** |
| | | **Average population** | 110 | 1,714 | 6,697 | |
| | | **Median population** | 104 | 1,155 | 3,998 | |

**Access control.** In response to a request in the First RFI regarding access to the site for emergency services personnel, the applicant stated:

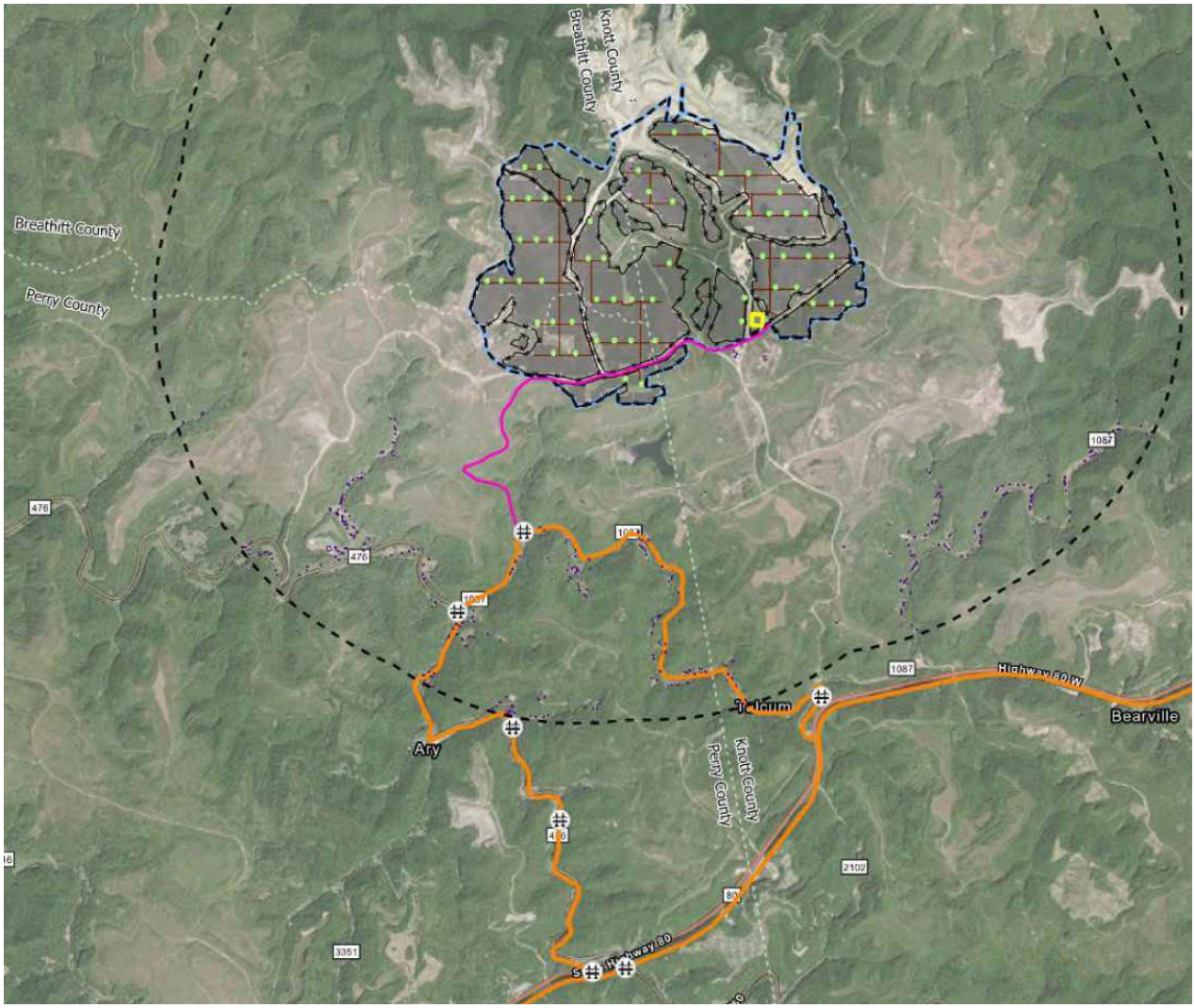
*Starfire will coordinate with local law enforcement and fire services later in the development process. These activities typically occur once an EPC partner is selected for the Project, as EPCs have established safety programs and their involvement is crucial for effective planning and implementation of such protocols. The Project will plan to engage in project-specific training for local emergency services and first responders. Once an EPC is hired, coordination with emergency service providers will begin for both the construction and operations phase.*[11]

The applicant states an intent to coordinate with the Kentucky State Police, the Sheriff's Offices of Knott, Perry, and Breathitt Counties, Perry County Fire & Rescue, and Fisty-Dwarf Volunteer Fire & Rescue.

**Location and use of access ways, internal roads, and railways.** Responding to the First RFI, the applicant supplied a directional map which is excerpted here as Figure C-10.

[11] Starfire Responses to the First Request for Information

**Figure C-10.**
**Starfire Project Map of Delivery Routes and Internal Access Roads**




In Figure C-10, primary public roadways for vehicle traffic and load deliveries are highlighted in orange, while the proposed site access road is shown in purple. The proposed site access road currently exists but is blocked to through traffic at this time. Internal roads within the project boundary can be seen laid out in a grid pattern among the solar panel arrays.

**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-36.

## 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):

- Starfire should provide a final site layout plan to the Siting Board when site design is finalized and before site preparation begins. 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.

- Starfire 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.

## Compatibility with Scenic Surroundings

This section of the SAR review addresses the compatibility of the proposed Starfire 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 on 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. [12]

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 descending order of structural formality:

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

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

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

## Information Provided in the Applicant's SAR

In compliance with KRS 278.708, Section II of the SAR summarizes the assessment of compatibility with scenic surroundings. The SAR summarizes the impacts to the visual setting of the proposed Starfire project:

*Pursuant to KRS 278.708(3)(b), the Project has been designed to be compatible with the scenic surroundings. The current area around the site consists of coal mines in various stages of reclamation and second-growth forests. […] No vegetative screening is proposed because the site is not visible from any existing surrounding residences due to intervening topography and vegetation. […]*

*Vegetative ground cover on the site will be established to the greatest extent possible, up to a total of ninety percent of the Project footprint. To the extent that it will be consistent with any agrivoltaic areas, the Project will utilize native plants and seed mixes and will not plant invasive species listed as a threat by the Kentucky Exotic Pest Plant Council. The Project will incorporate at least ten (10) acres of pollinator plantings on site, prioritizing, if possible, plantings around existing water basins and wetlands to increase site resiliency. The Project commits to reforesting at least twenty-five (25) acres onsite, with an effort to do so on contiguous acres within the final designated wildlife corridor(s) and consisting of native species, such as white and shortleaf pine. A goal of the Project will be to expand or add to these pollinator and reforestation areas over time and to ultimately encompass at least 100 acres, if proven environmentally and economically feasible.*[13]

Figure C-11 is excerpted from SAR Attachment 5 (Visual Simulations) and depicts a visual simulation of project infrastructure on the existing landscape. The Starfire facility structures are visible in the simulation image only via an x-ray view beneath the trees and other vegetation that obscures the site. Project components would not be visible to the human eye from any viewpoints on the ground.

[13] SAR, page 5

**Figure C-11.**
**Proposed Starfire Project Visual Simulations**


Two additional attachments to the SAR support the finding that the proposed project would be compatible with the surrounding area. First, the Property Value Impact Analysis (Attachment 2) concludes that a solar farm is a compatible use for areas such as the proposed Starfire project site and that it would function in harmony with the area.

Second, the applicant's Glare Hazard Analysis, conducted by Tetra Tech and included as Attachment 6 of the SAR, concludes that the proposed project would be minimally disruptive with respect to glare. Figure C-12 provides a summary of glare predicted to arise from the Starfire project's solar panels.

**Figure C-12.**
**Summary of Predicted Glare**

Note:
No red or yellow glare is predicted for any observation point or route.

| | Glare Receptor | Annual Green Glare (Hours) |
|---|---|---|
| Analysis 1 | Observation Point #9 | 5.0 |
| | Buckhorn Road-2 | 4.0 |
| Analysis 2 | Observation Point #9 | 5.9 |
| | Buckhorn Road-2 | 4.0 |

Some green glare would be seen by drivers on the adjacent Buckhorn Road for a few months of the year. Additionally, one nearby observation point (OP-9) would receive some green glare in those same months:

*Based on the results of the analysis, no glare is expected to surrounding residences because of this Project. Additionally, the sections of Buckhorn Road where glare is predicted is not a through road and is unlikely to impact the general public. OP-9 is located on undeveloped mining land and any glare is unlikely to impact the public.*[14]

The proposed Starfire 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 similar projects, much of the project's compatibility with the scenic surroundings is dependent on site topography and strategic vegetative screening. In this case, the project site having been a mountaintop coal mine before reclamation is a benefit to the proposed Starfire project as the elevation and vegetation would shield the surrounding residents and travelers from a view of the project components.

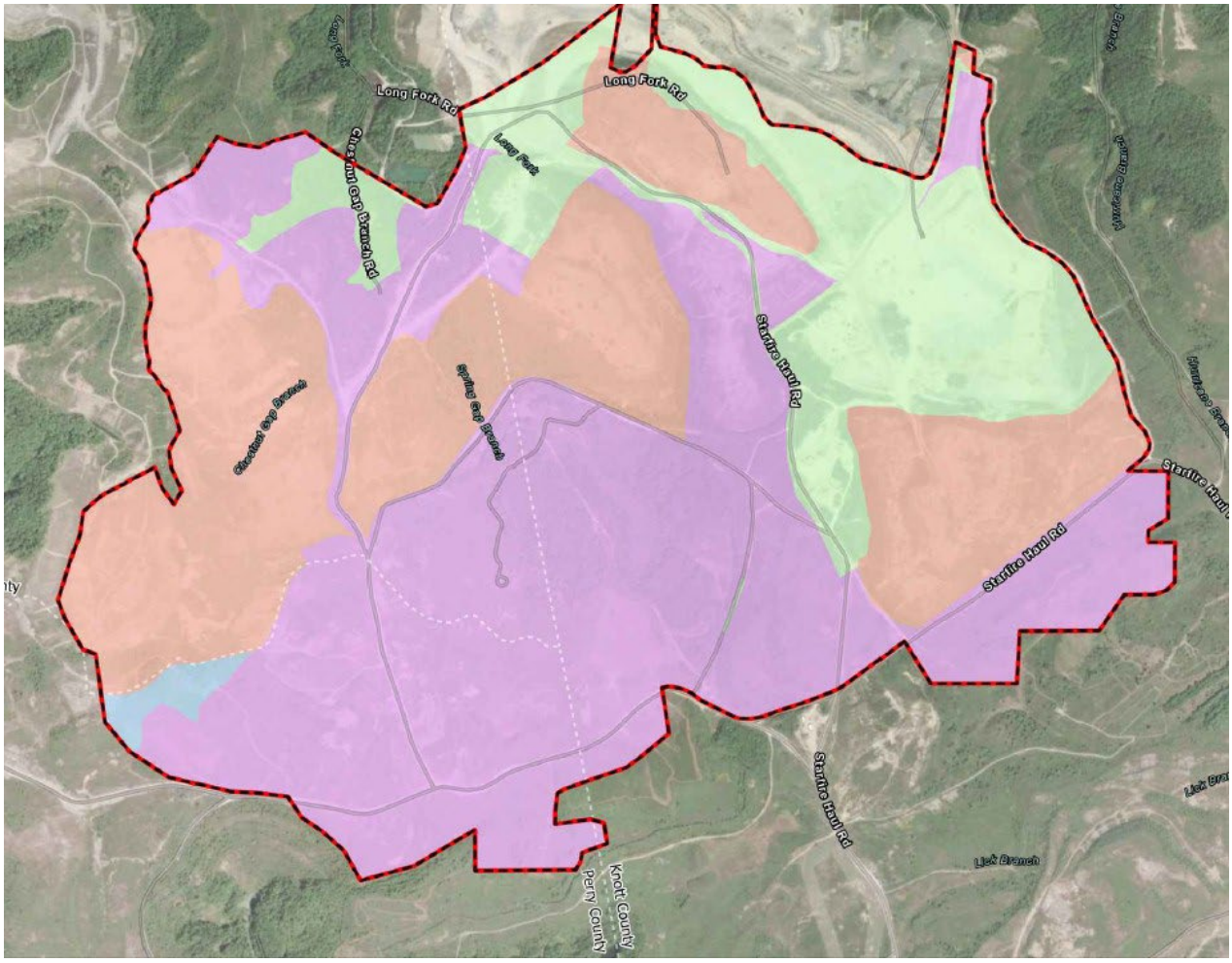
## Supplemental Investigations, Research, and Analysis

The agricultural and low-density residential setting for the Starfire project—in a rural part of three eastern Kentucky counties 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 elevated topography, dense forestation, and status as reclaimed mine land is unusual compared with the majority of these projects.

As shown in Figures C-1 through C-3, the site surroundings are predominantly forested. Figure C-13, on the following page, was supplied by the applicant in their Response to the Second Request for Information and shows the reclamation status of land involved in the proposed Starfire project.

[14] SAR Attachment 6, page 7

**Figure C-13.**
**Starfire Project Site Reclamation Land Status**




Land overlaid in purple signifies that it is fully reclaimed, while orange is in Phase 1 of reclamation, blue is in Phase 2, and green has mining-related activity ongoing.

**Visual assessment.** BBC visited the proposed Starfire project site in April 2025 to review the site and its surroundings. The following pages present photos from the site visit.

**Figure C-14.**
**Mine office buildings near southeast corner of site**

These buildings are at the top of the existing current access road used for mining-related purposes, near the future locations for the solar O&M building and future project substation.

**Figure C-15.**
**Cemetery near SW portion of the site**

**Figure C-16.**
**Reclaimed mining area near NW portion of site**

**Figure C-17.**
**Mining-related equipment in northeast portion of site**

**Figure C-18.**
**Extensively mined area in NE portion of site**

**Figure C-19.**
**Existing perimeter road in proximity to anticipated future substation location in SE portion of site**

**Figure C-20.**
**Bottom of planned access road and intersection with Balls Fork Road north of Ary**

**Figure C-21.**
**Current north end of travel on future access road**

### Conclusions and Recommendations Regarding Compatibility with Scenic Surroundings

The proposed Starfire facility would be located in a rural, hilly area surrounded by some low-density agricultural, residential, and former mining land. There are no residences located within 2,000 feet of the project's boundary, and the site's topography and vegetation means that the proposed Starfire project is very unlikely to be visible from nearby residences. BBC considers that the project would be generally compatible with the scenic surroundings.

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

- Existing vegetation on the site should be left in place to the extent feasible to help minimize visual and noise impacts.
- Starfire should proceed with its plan to cultivate 10 acres of native pollinator-friendly species onsite and to additionally reforest 25 acres of the site.
- Starfire should use panels with anti-reflective coating to reduce glare and corresponding visual impacts.
- Starfire should be open to communication with adjacent landowners and county officials regarding viewshed impacts and the implementation of strategic 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

Starfire engaged Kirkland Appraisals, LLC—which has conducted property value impact studies for many of the previous solar applications to the Siting Board—to examine the proposed project's potential impact on property values.

Attachment 2 of the SAR (Property Value Impact Analysis) 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.

Attachment 2 states that the closest non-participating home to the proposed project will be 4,294 feet from the nearest solar panel.[15] Additionally, surrounding residential density is very low and 95 percent of the surrounding acreage is solely agricultural. In a summary statement, Kirkland Appraisals concludes that there will be no property value impacts from the proposed Starfire facility on adjoining properties and that the proposed facility will be in harmony with the area.

*[…] This is a former mine site with topography and existing vegetation providing substantial barriers to visibility of the site.*

*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.*[16]

## 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

[15] SAR Attachment 2, page 5.

[16] SAR Attachment 2, page 1.

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.

- "The results also suggest that experience assessing near a solar installation is associated with a much less negative estimate of impact."[17]

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 is 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 areas[18] had no statistically significant impact on home prices.[19]

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.[20]

In 2023, 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

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[17] *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.

[18] 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 Starfire facility would sit in unincorporated Breathitt, Knott, and Perry Counties, and the surrounding area has a low population density.

[19] *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/

[20] 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.[21] This 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).

Research published in 2024 adds further depth to the literature on property value impacts of utility-scale solar development. A peer-reviewed study[22] analyzed 70 utility-scale solar facilities constructed between 2009 and 2022 across ten Midwestern states. The study found that solar projects were associated with an average *increase* in nearby property values of 0.5 to 2.0 percent. However, the authors noted that this positive effect was more pronounced near smaller projects—those under 20 MW— and was attenuated for larger projects. These findings suggest that property value impacts from utility-scale solar development vary depending on project scale, land use context, and local perceptions. The study is notable for its geographic scope and focus on a region with growing solar investment.

### Conclusions and Recommendations Regarding Potential Changes in Property Values

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.

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[21] *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

[22] *Assessing Property Value Impacts Near Utility-Scale Solar in the Midwestern United States.* 2024. Available at https://www.sciencedirect.com/science/article/pii/S2772940024000249

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, 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-4, about 95 percent of the land use adjacent to the proposed Starfire facility is considered to be agricultural, while about 5 percent of the adjacent land is considered residential. Theoretically, based on some of the recent studies these properties could 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 site's existing vegetation and substantial elevation above neighboring residences will obscure the site's physical elements from nearby residences and roads, we conclude that the proposed solar facility is unlikely to have adverse impacts on adjacent property values.

**Recommended mitigation.** It is important to note that while some of the academic studies discussed above have documented negative impacts on 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.

The topography of the site—which is a reclaimed mountaintop coal mine site in elevated and heavily forested terrain—naturally shields nearby residences from a view of the site or facility components. Consequently, BBC believes the Starfire facility would not cause any adverse impact on nearby residential property values but recommends the following measure to ensure minimal impact to the surrounding properties:

- Existing vegetation on the site should be left in place to the extent feasible to help minimize visual and noise impacts and to screen the project from nearby residents.

## 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 Starfire 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 IV of the SAR (Anticipated Noise Levels at Property Boundary) and in the Acoustic Assessment Report—authored by Tetra Tech—which is included as Attachment 4 of the SAR. During project construction—including site preparation, excavation, and solar equipment installation—noise will be generated by construction equipment and vehicles, particularly during pile driving for the solar panel racking. Operational sound levels are expected to be very modest at the nearest noise-sensitive receptors (NSRs) for the operating lifetime of the project.

**Noise generated during construction.** Typical equipment used in the construction of a solar facility includes vehicles and machinery such as backhoes, bulldozers, excavators, graders, dump trucks, and pile drivers. Provided in the Acoustic Assessment is a summary table of the projected construction noise levels for each phase throughout the lifetime of the proposed Starfire facility. This table is excerpted as Figure C-22.

**Figure C-22.**
**Projected Construction Noise Levels by Phase**

| Construction Phase | Construction Equipment | Individual Equipment Noise Level at 50 feet (dBA, $L_{max}$) | Usage Factor (%) | Composite Equipment Noise Level at NSA-6, 3,828 feet from Project Boundary | |
|---|---|---|---|---|---|
| | | | | Peak, (dBA, $L_{max}$) | Average, (dBA, $L_{eq}$) |
| Site Preparation and Grading | (1) Grader (174 horsepower [hp]) | 85 | 40 | 53 | 50 |
| | (1) Rubber Tired Loader (164 hp) | 80 | 40 | | |
| | (1) Scraper (313 hp) | 85 | 40 | | |
| | (1) Water Truck (189 hp) | 85 | 50 | | |
| | (1) Generator Set | 82 | 50 | | |
| Trenching and Road Construction | (2) Excavator (168 hp) | 85 | 40 | 55 | 51 |
| | (1) Bar Trencher (600 hp) | 82 | 50 | | |
| | (1) Grader (174 hp) | 85 | 40 | | |
| | (1) Water Truck (189 hp) | 85 | 50 | | |
| | (1) Trencher (63 hp) | 82 | 50 | | |
| | (1) Rubber Tired Loader (164 hp) | 80 | 40 | | |
| | (1) Generator Set | 82 | 50 | | |
| Equipment Installation | (1) Crane (399 hp) | 85 | 16 | 61 | 55 |
| | (1) Crane (165 hp) | 85 | 16 | | |
| | (2) Forklift (145 hp) | 55 | 40 | | |
| | (2) Pile Driver | 95 | 20 | | |
| | (6) Pickup Truck/All-Terrain Vehicle | 55 | 40 | | |
| | (2) Water Truck (189 hp) | 85 | 50 | | |
| | (2) Generator Set | 82 | 50 | | |
| Commissioning | (2) Pickup Trucks/ATVs | 55 | 40 | 20 | 16 |

Attachment D states that a maximum noise level of 61 dBA at the nearest noise-sensitive receptor (NSR) is expected during the construction phase of the proposed project when pile drivers would be operating at the site. The nearest NSR (a residence) is located approximately 3,800 feet from the proposed Starfire project boundary and over 4,200 feet from the nearest solar equipment.

*Noise from construction equipment will vary depending on a variety of factors including the number and class of equipment operating at a location at a given time. Received sound levels will also fluctuate, depending on the construction activity, equipment type, and distance between noise source and noise-sensitive receptors. Construction hours of operation are assumed to generally be between 7:00 a.m. and 7:00 p.m. five days per week (Monday through Friday) with noise-producing activities typically from 9:00 a.m. to 5:00PM.*

*Due to the infrequent nature of loud construction activities at the site, the limited hours of construction and the implementation of noise mitigation measures, the temporary increase in noise due to construction is considered to be a less than significant impact.*[23]

Figure C-23 presents the noise level modeling results for all relevant NSRs during the project's construction phase.

[23] SAR Attachment 4, page 6

**Figure C-23.**
**Detailed Construction Noise Level Results**

| NSA ID | UTM Coordinates (meters) | | Distance to Project Boundary (feet) | Site Preparation and Grading | | Trenching and Road Construction | | Equipment Installation | | Commissioning | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Easting | Northing | | Peak (dBA, $L_{max}$) | Average (dBA, $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA, $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA, $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA, $L_{eq}$) |
| 1 | 309258 | 4140751 | 4,788 | 51 | 48 | 53 | 49 | 59 | 53 | 18 | 14 |
| 2 | 309208 | 4140777 | 4,868 | 51 | 47 | 53 | 49 | 59 | 53 | 18 | 14 |
| 3 | 309319 | 4140783 | 4,567 | 52 | 48 | 53 | 50 | 60 | 53 | 19 | 15 |
| 4 | 309332 | 4140868 | 4,363 | 52 | 48 | 54 | 50 | 60 | 54 | 19 | 15 |
| 5 | 309344 | 4141040 | 3,994 | 54 | 49 | 54 | 51 | 61 | 55 | 20 | 16 |
| 6 | 309356 | 4141112 | 3,828 | 53 | 50 | 55 | 51 | 61 | 55 | 20 | 16 |
| 7 | 311044 | 4139797 | 4,440 | 52 | 48 | 54 | 50 | 60 | 54 | 19 | 15 |
| 8 | 310768 | 4139938 | 4,210 | 52 | 49 | 54 | 51 | 60 | 54 | 20 | 16 |
| 9 | 310691 | 4139898 | 4,425 | 52 | 48 | 54 | 50 | 60 | 54 | 19 | 15 |
| 10 | 310796 | 4139902 | 4,289 | 52 | 49 | 54 | 50 | 60 | 54 | 19 | 15 |
| 11 | 309359 | 4141011 | 4,011 | 53 | 49 | 55 | 51 | 61 | 55 | 20 | 16 |
| 12 | 311779 | 4139847 | 4,264 | 52 | 49 | 54 | 50 | 60 | 54 | 19 | 15 |

Due to the distance and variable topography between the nearest NSRs and the Starfire project boundary, the applicant's projected maximum construction noise levels are lower than the noise levels that BBC has observed for most other applications submitted to the Siting Board.

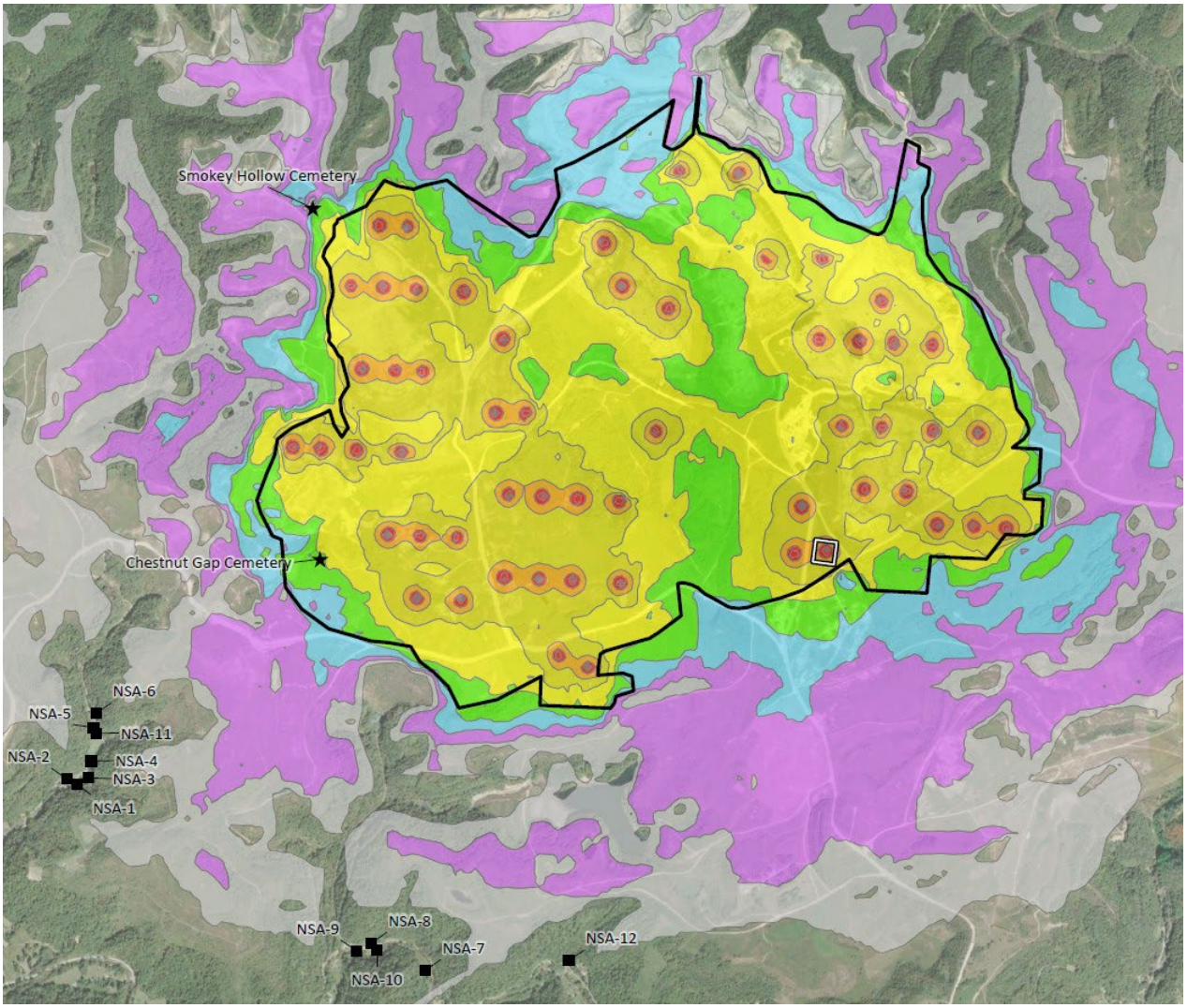
**Noise generated during operation.** During normal facility operation, select solar equipment will generate noise – specifically, the project substation transformer and the project inverters. The Acoustic Assessment in Attachment 2 finds that the highest expected daytime sound level at an NSR due solely to facility operation is 25 dBA, which is approximately equivalent to a whisper.

*Operational sound levels were modeled and evaluated at the closest NSAs to the Project area. Anticipated Project sound sources consist of the collector substation main power transformer and inverter skids. Modeling results show that noise levels resulting from Project operations will be under the U.S. EPA sound level criterion of 55 dBA $L_{dn}$. Overall, sound emissions associated with the Project are expected to remain at a low level, consistent with other solar energy facilities of similar size and design sited in the State of Kentucky.*[24]

Figure C-24 presents the noise contour map for daytime operational noise during the proposed project's lifetime, excerpted from Attachment 4. Red dots within the project boundary (the black line) are indicative of the project inverters, and the substation is pictured with a red square icon on the southeastern boundary of the site. Noise sensitive receptors are indicated with black square icons in the southwestern area of the map, and no residential NSRs are within 2,000 feet of the project.

[24] SAR Attachment 4, page 12

**Figure C-24.**
**Starfire Project Operational Acoustic Modeling Results**




Noise contours overlaid in purple correspond to 35-40 dBA; blue are 40-45 dBA; green are 45-50 dBA; yellow are 50-55 dBA; dark yellow are 55-60 dBA; orange are 60-65 dBA; and red are more than 65 dBA.

Given the context, landscape, and distance around the proposed project site, the Acoustic Assessment concludes that the increase in noise emission resulting from operation of the proposed Starfire facility is unlikely to cause disturbance.

## Supplemental Investigations, Research, and Analysis

In the course of responding to the Siting Board's First and Second Requests for Information, Starfire provided information on the non-residential noise receptors within 2,000 feet of the project boundary, attached here as Figure C-25.

**Figure C-25.**
**Construction Noise Levels at Non-residential Receptors within 2,000 Feet of Project**

| Receptor | UTM Coordinates (meters), 17N | | Distance to Project Boundary (feet) | Site Preparation and Grading | | Trenching and Road Construction | | Equipment Installation (Includes Pile Driving) | | Commissioning | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Easting | Northing | | Peak (dBA, $L_{max}$) | Average (dBA $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA $L_{eq}$) | Peak (dBA, $L_{max}$) | Average (dBA $L_{eq}$) |
| NONRESIDENTIAL00001 | 312841 | 4141640 | 183 | 80 | 76 | 81 | 78 | 88 | 81 | 47 | 43 |
| NONRESIDENTIAL00002 | 312867 | 4141611 | 298 | 75 | 72 | 77 | 74 | 84 | 77 | 43 | 39 |
| NONRESIDENTIAL00003 | 312849 | 4141577 | 391 | 73 | 69 | 75 | 71 | 81 | 75 | 40 | 36 |
| NONRESIDENTIAL00004 | 313504 | 4142740 | Within Project boundary | 91 | 87 | 93 | 89 | 99 | 93 | 58 | 54 |
| NONRESIDENTIAL00005 | 312973 | 4142685 | Within Project boundary | 91 | 87 | 93 | 89 | 99 | 93 | 58 | 54 |
| NONRESIDENTIAL00006 | 312259 | 4142812 | Within Project boundary | 91 | 87 | 93 | 89 | 99 | 93 | 58 | 54 |
| NONRESIDENTIAL00007 | 312426 | 4142466 | Within Project boundary | 91 | 87 | 93 | 89 | 99 | 93 | 58 | 54 |

Seven agricultural outbuildings and industrial structures are either within the project boundary or within the 2,000 foot radius of the Starfire project. Noise modeling indicates that the noise levels during pile driving would be 99 dBA at the location of the nearest structures.

**Pile driving noise estimates for KY solar projects.** BBC compared the projected construction and operational noise levels from the Starfire project to previous estimates for other Kentucky solar projects we have reviewed for the Siting Board over the past four years.[25] We found that the noise level estimates in the Starfire Acoustic Assessment Report for pile driving activity (95 dBA at 50 feet) is within a range consistent with the 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.

[25] In addition to the proposed Starfire solar project, BBC also reviewed the proposed Turkey Creek, Unbridled, Ashwood, Flat Run, Martin County, Green River, Rhudes Creek, Russellville, Telesto, Pine Grove, Song Sparrow, Dogwood Corners, Lynn Bark Energy, and New Frontiers Solar Park facilities.

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

| | Maximum estimated noise level at 50 ft (dBA) |
|---|---|
| *Starfire Solar* | |
| Pile driver | 95.0 |
| *New Frontiers Solar Park* | |
| Pile driver | 101.0 |
| *Lynn Bark Energy* | |
| Pile driver | 101.0 |
| *Dogwood Corners* | |
| Pile driver (impact) | 101.0 |
| Pile driver (sonic) | 95.0 |
| *Song Sparrow Solar* | |
| Pile driver | 100.0 |
| *Pine Grove Solar* | |
| Pile driver | 101.0 |
| *Telesto Energy* | |
| Pile driver (impact) | 90.0 |
| *Russellville Solar* | |
| Pile driver (impact) | 102.0 |
| *Rhudes Creek Solar* | |
| Pile driver & other equip. | 90.0 |
| *Green River Solar* | |
| Pile driver | 94.9 |
| *Martin County Solar* | |
| Pile driver (impact) | 101.0 |
| Pile driver (sonic) | 95.0 |
| *Flat Run Solar* | |
| Pile driver | 100.6 |
| *Ashwood Solar* | |
| Pile driver (impact) | 101.0 |
| Pile driver (sonic) | 95.0 |
| *Unbridled Solar* | |
| Pile driver (impact) | 101.0 |
| *Turkey Creek Solar* | |
| Pile driver (impact) | 101.0 |
| Pile driver (sonic) | 96.0 |

The Starfire Acoustic Assessment models noise levels at nearby receptors based on a pile driver noise measurement that is within range of the majority of pile driver noise estimates from previous solar facility applications before the Siting Board.

**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).[26] 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.

[26] 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 61 dBA—the reported maximum noise level expected during pile driving at the nearest residential NSR—the level of noise is not hazardous.

## Conclusions and Recommendations

During construction, noise from the pile drivers will have the most substantial impact on the noise levels emanating from the site. 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 single NSR for an extended period.

During normal operation of the proposed Starfire facility, it is unlikely that noise levels from inverters and the substation transformer will be audible at the nearest residences.

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

- Starfire should conduct construction activity only between 8 AM and 7 PM, Monday through Sunday, and pile driving only between 9 AM and 5 PM, Monday through Friday.
- Starfire should notify landowners of outbuildings within 2,000 feet of the project boundary about the construction plan, the noise potential, and mitigation plans one month prior to the start of construction.
- During construction, Starfire should locate stationary noise-generating equipment, such as air compressors or power generators, as far as practicable from noise-sensitive receptors.
- Starfire should implement a Customer Resolution Program to address any complaints from surrounding landowners. Starfire 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 impact of the proposed Starfire 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 V of the SAR (Effect on Road, Railways and Fugitive Dust) and Attachment 7 of the SAR (Transportation Assessment Report) provide information regarding anticipated impacts on transportation at and around the proposed project site during construction and operation.

Three of the primary roadways surrounding the proposed project site are KY-80, KY-476, and KY-1087; these routes are estimated by the Transportation Assessment to be most impacted by increased vehicle traffic during the project's construction phase rather than the operational life of the project when the facility is managed by few employees and few daily trips will be taken to site.

Figure C-28 shows the summary of trip generation resulting from the proposed project construction, including both commuter vehicles and vehicle deliveries.

**Figure C-28.**
**Trip Generation Summary - Peak Construction Period**

| Time Period/ Direction | Project Trips | | | |
|---|---|---|---|---|
| | Workforce Trips[1] | Non-Heavy Vehicle Deliveries[2] | Heavy Vehicles[3] | Total |
| **Weekday AM Peak Hour** | | | | |
| Enter | 238 | 1 | 1 | 240 |
| Exit | 0 | 1 | 1 | 2 |
| Total | 238 | 2 | 2 | 242 |
| **Weekday PM Peak Hour** | | | | |
| Enter | 0 | 1 | 1 | 2 |
| Exit | 238 | 1 | 1 | 240 |
| Total | 238 | 2 | 2 | 242 |
| **Weekday Daily** | | | | |
| Enter | 263 | 10 | 10 | 283 |
| Exit | 263 | 10 | 10 | 283 |
| Total | 526 | 20 | 20 | 566 |

At the peak of the construction phase, the Starfire project is projected to generate 526 daily weekday trips include both the morning and evening commute hours. The Transportation Assessment includes a capacity analysis conducted using Highway Capacity Software and traffic volume data from KYTC stations on the primary roadways serving the site. The findings of the capacity analysis are as follows:

*The HCS two-lane highway analysis results show that the three critical roadways are expected to operate with minimal delay at LOS B or better operations during the critical weekday peak hours with Project peak construction traffic. This indicates that Routes 80, 476 and 1087 in the site vicinity have ample capacity to support the peak construction activity associated with the proposed Project (typically, LOS D or better operations are considered acceptable).*[27]

Few vehicles would travel to the project each day during the operational phase of the project, and this level of traffic to the site would have no measurable impact on the LOS or transportation infrastructure.

The Transportation Assessment Report concludes by stating:

*The peak construction workforce levels […] are expected to generate approximately 242 trips during the weekday morning peak hour and 242 trips during the weekday evening peak hour during peak construction. Peak construction activities are currently anticipated to occur for a period of approximately seven to nine months. The remainder of the construction period is anticipated to generate fewer vehicle trips. These trip generation estimates are conservative as the majority of peak hour trips are likely to occur outside of the typical weekday commuter peak hours of the adjacent street traffic. Capacity analyses of the critical roadways serving the site (Routes 80, 476 and 1087) indicate*

[27] SAR Attachment 7, page 6

*ample capacity to support the Project's temporary peak construction operations. […] Furthermore, the Project will generate even less traffic post construction with only occasional routine inspection and maintenance of the solar panels and supporting equipment.*[28]

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 Starfire and the KYTC District Engineer or the Knott, Breathitt, and Perry Counties Road Department.

Regarding fugitive dust, the SAR states that Starfire will use cleaning stations, water trucks, and dust screens to minimize dust.[29]

## 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. Some of the 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.

Regarding potential damage to local roadways, the most concerning delivery to the 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 consulted the Kentucky Transportation Cabinet's Department of Overweight/Over-dimensional Vehicles 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 potential challenges with load clearances, particularly during delivery of the power transformer, depending on the exact configuration of the delivery load.

In their Response to the First RFI, Starfire provided the weight limits for the anticipated roadways to be used for construction traffic:

[28] SAR Attachment 7, page 8

[29] SAR Attachment 7, page 7

*The width and weight limit ratings for the roads anticipated to be used during delivery and construction phases of the Project are as follows.*

- *KY 80 (AAA): Four 12-foot lanes with 10-foot paved shoulders and 14-foot raised mountable median; 80,000 lb. maximum load.*
- *KY 476 (AAA route, MP 1.905-22.275): 20-foot lane width with 0-3-foot paved shoulders; 80,000 lb. maximum load.*
- *KY 1087 (AAA route, MP 0-0.8): 20-foot lane width with no paved shoulders; 80,000 lb. maximum load.*
- *Starfire Haul Road is a private road and thus is not in the county road system.*[30]

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 Starfire 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 Starfire and the KYTC District Engineer or the respective Knott, Breathitt, and Perry County Road Departments. The applicant responded that project representatives have contacted the KYTC regarding road classifications and plan to coordinate with the KYTC District Engineer as well as the Knott, Breathitt, and Perry Counties Road Department to discuss construction and operation of the proposed Starfire project as the design of the project progresses.[31]

**Delivery vehicles.** Responding to questions posed in the First RFI, Starfire supplied information regarding delivery load weights for varying truck types:

*Maximum expected load weights for delivery trucks will vary depending on the type of material or equipment being transported. All deliveries will comply with KYTC regulations and applicable roadway weight limits. At this time, anticipated truck types and weight loads are as follows:*

- *Cement and water trucks with anticipated weight limits up to 80,000 lbs. (fully loaded);*
- *Weight limits for heavy equipment transport vary based on the specific equipment being transported, but the Project will coordinate with KYTC District 10 for appropriate permitting if loads exceed 80,000 lbs.;*
- *Gravel for access roads will be delivered via standard dump trucks with anticipated weight limits up to 80,000 lbs.; and,*

[30] Starfire Responses to Siting Board Staff's First Request for Information

[31] Starfire Responses to Siting Board Staff's First Request for Information

- *Solar panels and inverters will be delivered via standard flatbed or semi-truck with anticipated weight limits up to 80,000 lbs.*[32]

Regarding the delivery of the substation transformer to site, Starfire states:

*At this time, the anticipated transformer weight is approximately 300,000 lbs. Per best practices and following KYTC heavy haul requirements, Starfire plans to deliver the transformer using an engineered trailer solution that minimizes per axle weight to less than 40,000 lbs. Class 8 truck is anticipated to be used for delivery.*[33]

BBC expects that the ongoing planning between Starfire, the KYTC, and the Knott, Breathitt, and Perry County Road Departments can mitigate problems resulting from overweight and over-dimensional load delivery.

## Conclusions and Recommendations

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

While temporary traffic congestion during peak commute times may occur, particularly due to the influx of construction workers and delivery vehicles, overall transportation impacts are likely to be limited. The project site is located on and adjacent to a formerly active surface coal mine that has supported large-scale hauling operations. Surrounding roadways have historically accommodated frequent travel by heavy equipment and commuting worker vehicles.

Delivery of the project's substation transformer will likely present some challenges given the load ratings of some surrounding roadways, but, in general, challenges can be overcome with careful advance planning with the KYTC and with the respective counties' road departments, 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:

- Starfire should submit a final construction schedule, including updated estimates of on-site workers and commuter vehicle traffic, to the Siting Board prior to commencement of construction.

- Starfire should develop and implement a robust 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, Starfire 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.

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[32] Starfire Responses to Siting Board Staff's First Request for Information

[33] Starfire Responses to Siting Board Staff's First Request for Information

- Starfire and its construction contractors should comply with all laws and regulations regarding the use of roadways.

- Starfire 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 Knott, Breathitt, and Perry County Road Departments as needed.

- Starfire should determine whether shoulder stabilization and/or road widening is necessary on any local route to accommodate deliveries to the site. Starfire should coordinate with the Knott, Breathitt, and Perry County Road Departments regarding any necessary improvements.

- Starfire should commit to rectifying 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.

- Starfire 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 Starfire facility would be located in unincorporated Knott, Breathitt, and Perry Counties, approximately 15 miles northeast of the Perry County seat of Hazard. While Breathitt and Perry Counties did not experience any notable change in population between the 2010 and 2020 Census (with county populations of 13,700 and 28,500 respectively), Knott County population declined by approximately 2,000 residents or 13 percent (2020 population of 14,251).

In 2023, per capita personal income in Kentucky was $55,360 compared with $42,633 in Breathitt County, $44,273 in Knott County, and $46,219 in Perry County.[34] The three counties had an estimated combined civilian labor force of 18,833 in 2023, and the largest employment sector is health care and social assistance.[35]

**Applicant economic impact study.** Exhibit I of the Starfire Application (Analysis of Facility's Impact to Regions and State Economies) contains a study of the projected economic impacts from the proposed facility. The analysis defines the relevant region as comprising Breathitt, Knott, Perry, and Floyd Counties. Floyd County, with county seat Prestonburg, is situated east of the project location and supports a larger population (35,942) than any one of the three counties in which the Starfire project is located.

Key findings from the analysis include:

- There would be a one-time impact in construction-related employment for the four-county region, including 85 direct and 114 indirect and induced job years; $11.9 million in associated wages and benefits; $46.6 million in economic output; and $2.7 million in state and local tax revenue.

- There would be an ongoing annual economic impact for the four-county region through the operational lifetime of the project, including 1 direct and 8 indirect and induced jobs; $450,000 in associated wages and benefits; and $2.5 million in economic output.

Figures C-29 and C-30, on the following page, summarize these regional impacts.

[34] U.S. Bureau of Economic Analysis, Table CAINC1

[35] U.S. Census Bureau American Community Survey 2023 5-Year Estimates.

**Figure C-29.**
**Estimated One-Time Economic and Fiscal Impact on the Region from Construction of the Starfire Project**

| Economic Impact | Employment (Job Years) | Wages and Benefits | Output |
|---|---|---|---|
| 1st Round Direct Economic Activity | 85 | $7,260,700 | $29,968,500 |
| 2nd Round Indirect and Induced Economic Activity | 114 | $4,681,700 | $16,612,400 |
| Total Economic Activity | 200 | $11,942,400 | $46,580,900 |
| **Fiscal Impact** | | | |
| State and Local Tax Revenue | | | $2,668,800 |

**Figure C-30.**
**Estimated Annual Economic Impact on the Region from the Ongoing Operation of the Starfire Project**

| Economic Impact | Employment | Wages and Benefits | Output |
|---|---|---|---|
| 1st Round Direct Economic Activity | 1 | $107,700 | $512,700 |
| 2nd Round Indirect and Induced Economic Activity | 8 | $341,700 | $1,958,200 |
| Total Economic Activity | 9 | $449,400 | $2,470,900 |

Conversion of the project site from its current land use to a solar generation facility would result in significantly greater fiscal contributions to local and state governments. Under existing conditions, the site generates minimal tax revenue. The Starfire facility would incur substantially higher tax payment obligations or, alternatively, a negotiated PILOT arrangement. As shown in Figures C-31 and C-32, either mechanism would generate substantially more local revenue than the current use.

**Figure C-31.**
**Estimated Cumulative Starfire Revenue (Scenario 1) Compared to the Site's Current Use**

| Scenario 1 – Taxation | Breathitt County | Knott County | Perry County | Total Local Revenue | Total State Revenue |
|---|---|---|---|---|---|
| Scenario 1 Revenue | $2,703,100 | $4,291,600 | $1,189,600 | $8,184,200 | $7,958,200 |
| Current Use Revenue | $30,900 | $131,800 | $28,200 | $190,900 | $21,400 |
| Fold Increase over Current Use | 87 | 33 | 42 | 43 | 372 |

**Figure C-32.**
**Estimated Cumulative Starfire Revenue (Scenario 2) Compared to the Site's Current Use**

| Scenario 2 – PILOT | Breathitt County | Knott County | Perry County | Total Local Revenue | Total State Revenue |
|---|---|---|---|---|---|
| Scenario 2 Revenue up to | $3,591,000 | $6,804,000 | $2,205,000 | $12,600,000 | $2,531,900 |
| Current Use Revenue | $30,900 | $131,800 | $28,200 | $190,900 | $21,400 |
| Fold Increase over Current Use | 116 | 52 | 78 | 66 | 118 |

**Review and assessment of applicant economic information.** The combined level of investment in the region and state projected in the economic impact analysis appears to be roughly consistent with industry standards for a solar project of the size of the proposed Starfire 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.

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

- Starfire should commit to prioritizing local hiring and seeking to hire residents from surrounding counties 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.** Exhibit K of the Application (Decommissioning Plan and Reclamation Cost Estimate) contains a plan for the decommissioning of the proposed facility. The plan was authored by Tetra Tech on behalf of the applicant.

The anticipated lifetime of the proposed Starfire project is 40 years.[36] As required by KRS 278.706, decommissioning activities will be completed within 18 months of the project ceasing to sell electricity. Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation.[37]

Equipment and vehicles required for decommissioning will likely be similar to those required for project construction, such as cranes, excavators, backhoes, bulldozers, dump trucks, front-end loaders, deep rippers, water trucks, disc plows, tractors, and ancillary equipment. Decommissioning activities include the removal of all project components, including solar modules; mounting system and steel piles; inverters; electrical cabling; substation; structures; site access roads; and perimeter fencing. Figure C-33, compiled using information from Exhibit K, identifies the type and quantity of components to be removed upon project decommissioning.

[36] Application Exhibit K, page 3.

[37] Application Exhibit K, page 1

**Figure C-33.**
**Primary Components of Starfire Project to be Decommissioned**

| Component | Quantity | Unit of Measure |
|---|---|---|
| Solar panels | 472,824 | Count |
| Two-string trackers | 1,127 | Count |
| Three-string trackers | 5,082 | Count |
| Wildlife fencing | 142,425 | Linear feet |
| Inverter/transformers | 55 | Count |
| Access roads | 59,774 | Linear feet |
| O&M building | 1 | Count |
| Substation | 1 | Count |

Project components in either working or salvageable condition may be sold in the secondary market or as salvage, providing revenue to offset decommissioning costs.

*The decommissioning and restoration process includes removal of all above-ground structures and; removal of below-ground structures up to a depth of three (3) feet, unless otherwise requested by the landowner; and re-grading and re-seeding disturbed areas and otherwise returning the land to a substantially similar state as it was prior to the commencement of construction.*

*It is assumed that the Project would incur costs for removal and disposal of the PV arrays and other Project facilities as well as costs for the restoration of the Project area. Above-grade steel, aluminum, and copper materials typical have significant scrap value to a salvage contractor. All recyclable materials will be recycled to the extent possible, while all other non-recyclable waste materials will be disposed of in accordance with state and federal law.*[38]

Figure C-34 shows the estimated net $9.5 million decommissioning cost of the facility ($12.9 million in costs and $3.4 million in estimated salvage revenue), as described in Exhibit K.

**Figure C-34.**
**Net Decommissioning Cost Summary for Starfire Project**

| Item | Cost or Revenue |
|---|---|
| Decommissioning expenses | $12,919,378 |
| Potential scrap metal credit | -$3,377,842 |
| Net decommissioning cost | $9,541,536 |

[38] Application Exhibit K, page 4

The decommissioning plan provided appears adequate and details the installation placement and subsequent removal of each type of project equipment at the facility. Regarding financial assurance, the applicant states:

*STMO is required to issue a performance bond or similar security in compliance with the requirements of KRS 278.706(2)(m)(5). The performance bond shall consist of cash, a letter of credit, surety bond, or other financial sureties as may be approved by the Siting Board and the Energy and Environment Cabinet. To identify any changes in the estimated net salvage cost of decommissioning the Project, the estimate will be reviewed and updated every five (5) years. Should the five-year review indicate an increase is warranted, the bond amount may be increased proportionate to the rise in these costs.*[39]

**Recommended mitigation.** To mitigate concerns regarding decommissioning:

- Starfire should follow the decommissioning plan laid out in Exhibit K of the Application submitted to the Siting Board; and
- Starfire should work with the Counties to address any concerns that arise at any point regarding its proposed decommissioning plan.

[39] Application Exhibit K, page 7