Request No. 1:

Submit a copy of the leases or purchase agreements, including options, separate agreements, or deeds which Starfire has entered into in connection with the proposed solar facility, including the agreements for each of the parcels of the project.

Response:

Please see the attached which are redacted and attached separately due to file size limits. The highlighted, unredacted documents have been provided separately under seal with a concurrently-filed petition for confidential treatment.

Responding Witness: Jacqui Kitchen

Request No. 2:

Detail any contracts by which Starfire has paid, has negotiated to pay, or which contemplate any compensation to be paid to non-participating landowners located near the project, whether through cash or other consideration. Include the terms of the agreements and which properties are involved, in terms of distance, to the project boundaries.

Response:

Starfire has not executed any contracts with non-participating adjacent landowners related to the construction or operations of the project.

Responding Witness: Jacqui Kitchen

Request No. 3:

State whether a Cumulative Environmental Analysis (CEA) has been completed for the Project. If so, provide that document.

Response:

Please see attached.

Responding Witness: Bob Roy

Cumulative Environmental Assessment

Starfire Phase II Solar Project

Perry & Knott Counties, Kentucky

September 2026

Prepared for

STMO Bn, LLC
515 N Flagler Dr. Suite 250
West Palm Beach, FL 33401

Prepared by

TETRA TECH

4101 Cox Road, Suite 100
Glen Allen, Virginia 23060

Table of Contents

1.0 INTRODUCTION 1

2.0 AIR POLLUTANTS 1

3.0 WATER POLLUTANTS 2

3.1 Surface Water 2

3.2 Groundwater 3

4.0 WASTE 3

5.0 WATER WITHDRAWAL 4

6.0 REFERENCES 5

Acronyms and Abbreviations

BMP	Best management practice(s)
CAA	Clean Air Act
CEA	Cumulative Environmental Assessment
CFC	chlorofluorocarbons
CO	Carbon monoxide
EPA	U.S. Environmental Protection Agency
KAR	Kentucky Administrative Regulations
KDOW	Kentucky Division of Water
KPDES	Kentucky Pollutant Discharge Elimination System
MWac	Megawatts, alternating current
NAAQS	National Ambient Air Quality Standards
NO_x	Nitrous oxides
O_3	Ozone
Pb	Lead
Applicant	STMO Bn, LLC
PJD	Preliminary Jurisdictional Determination
$PM_{2.5}$	Particulate matter less than 2.5 microns in diameter
Project	Starfire Phase II Solar Project
PV	Photovoltaic
SO_2	Sulfur dioxide
SPCC	Spill Prevention, Containment, and Countermeasures Plan
SWPPP	Stormwater Pollution and Prevention Plan
Tetra Tech	Tetra Tech, Inc.
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

STMO Bn, LLC ("Applicant") is proposing to build an approximately 200-megawatt AC (MWac) photovoltaic (PV) solar generation facility called Starfire Phase II Solar (Project) on an approximately 1,273-acre portion of a former coal mine in various reclamation stages (Project Site) spread across Knott and Perry counties, Kentucky.

This Cumulative Environmental Assessment (CEA) has been prepared on behalf of the Applicant by Tetra Tech, Inc. for submittal to the Kentucky Energy and Environment Cabinet. In compliance with KRS 224.10-280, this report evaluates potential project impacts to air pollutants, water pollutants, wastes, and water withdrawal.

2.0 AIR POLLUTANTS

The Clean Air Act (CAA) regulates the emission of air pollutants and enabled the US Environmental Protection Agency (EPA) to establish the National Ambient Air Quality Standards (NAAQS). The criteria pollutants regulated by NAAQS include ozone (O_3), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), nitrous oxides (NO_x), sulfur dioxide (SO_2), and lead (Pb).

Geographic areas are designated as attainment, nonattainment, or unclassified based on NAAQS. Areas with ambient concentrations of the aforementioned pollutants that exceed the NAAQS are designated as nonattainment areas, and emissions sources within these areas are typically subject to more stringent air permitting requirements.

Knott and Perry counties, Kentucky are designated as within attainment for all criteria pollutants (EPA 2026).

Project Site preparation and construction will produce temporary air pollutant emissions; these emissions would result from operation of construction equipment, ground-disturbing activities, and worker and delivery vehicles. The amount of increased air pollutant emissions will vary by weather conditions and construction activity occurring. However, Project emissions would remain well below the NAAQS. All contractors involved with Project construction will be required to implement best management practices (BMPs) to reduce dust or air quality impacts to the greatest extent practicable. These include cleaning and properly maintaining construction equipment, re-vegetating disturbed areas, covering soil piles and truck loads, and wet dust suppression.

Vegetation and tree clearing associated with Project construction is expected to be minimal as the majority of the site is open mining land. Any vegetative debris accumulated during construction and site preparation will be chipped, ground, and composted on site or will be managed at an offsite facility. Any burning of natural materials, including vegetation or vegetation debris, will follow all state and local requirements.

Once constructed, the Project will not produce any emissions during operation. The only emissions associated with the facility will be from maintenance vehicles and personal transportation vehicles of workers used when performing routine operations. Limited site visits are expected, and will be for the purposes of inspections, equipment maintenance, and vegetation management.

3.0 WATER POLLUTANTS

3.1 Surface Water

The Project is located within the Buckhorn Creek watershed (12-digit HUC: 051002010506), Russell Branch-Troublesome Creek watershed (12-digit HUC: 051002010508), and the Lower Balls Fork watershed (12-digit HUC: 051002010505) which drain to Troublesome Creek (Kentucky Division of Water [KDOW] 2026). No waterways within or adjacent to the Project are designated as Outstanding State Resource Waters or other Special Use Waters as defined by KDOW. Some upstream portions of Buckhorn Creek and its tributaries within the same watershed are designated as Outstanding State Resource Waters but are not adjacent to nor will be impacted by the Project (Kentucky Administrative Regulations [KAR] 2022).

Bacon, Farmer, Workman Engineering and Testing, Inc conducted a delineation of wetlands and Waters of the United States at the Project Site on the behalf of the Applicant. This investigation was performed with the goal of informing development of the Project and in support of a Preliminary Jurisdictional Determination (PJD). If any impacts to wetlands and waters are necessary and unavoidable, the Applicant will pursue the appropriate permits through the U.S. Army Corps of Engineers (USACE) and KDOW.

Construction activities may result in increased erosion and sedimentation impacting onsite streams and wetlands. The Project is expected to yield stormwater discharge during construction; the Applicant will comply with KDOW's Construction Storm Water Discharge General Permit for any construction activities that disturb an acre or more. A Notice of Intent will be submitted before any work begins on the site, and the Project will submit a Notice of Termination once work is complete. The Project will comply with all Kentucky Pollutant Discharge Elimination System (KPDES) requirements.

Stormwater discharge will be mitigated utilizing measures such as silt fences, temporary sediment basins and traps, buffer zones around streams and wetlands, and other BMPs in order to minimize the impacts of stormwater runoff. The Applicant will prepare a Stormwater Pollution Prevention Plan (SWPPP) to be implemented throughout all ground-disturbing activities to comply with KDOW requirements. These BMPs will be used from construction through final vegetative stabilization to prevent degradation and minimize sediment runoff into Waters of the United States and Waters of the Commonwealth.

All disturbed areas will be revegetated using a mixture of low growing, non-invasive grass and herbaceous plant seed mix that will be certified weed-free by a reputable dealer. All plantings and other erosion control measures will be inspected and maintained until they are deemed stable.

If necessary, only herbicides that are EPA-approved would be utilized for vegetation control on the site. Any herbicides used will be applied in accordance with label directions to limit any applications near Waters of the United States or the Commonwealth.

After the completion of construction activities, the Project will have little to no impact on surface waters during operations and maintenance. BMPs will be utilized during any activities that may cause runoff of sediments or pollutants.

3.2 Groundwater

Groundwater is any water found under the earth's surface. Groundwater is frequently used as a source of drinking water, and any pollution or contamination poses a potential risk to these waters and thus poses a potential health risk to nearby populations. The main source of these contaminants in the vicinity of the Project is agricultural activities.

Hazardous materials that could potentially contaminate groundwater during construction such as fuels, lubricants and other fluids will be stored on site during construction. However, contractors will utilize BMPs to minimize the risk of leaks and spills and implement plans and procedures to immediately address any spills and leaks that may occur. These practices will limit the risk of potential impacts to groundwater.

The development of the Project is not anticipated to have any negative impacts to groundwater. Precipitation can freely run off of the solar panels and infiltrate into the water table or be collected by surface waters as it would naturally.

4.0 WASTE

All waste generated during the construction and operation of the Project will be disposed of in accordance with all local, state, and federal regulations.

Waste generated during construction activities will include wooden crates, pallets, cardboard boxes and other packaging material, and general trash. Additionally, excess wiring and other random debris could be intermittently produced. No waste will be disposed of at the Project Site. Where practicable, construction waste will be recycled, and any material that cannot be recycled will be disposed of offsite at a permitted facility. Construction contractors and subcontractors will be responsible for proper cleanup, disposal, and storage activities.

Primary construction materials stored on site will be liquids such as: used oil, diesel fuel, gasoline, hydraulic fluid, and other lubricants. Proper containers, specifically designed for management of such materials, will be located at onsite staging areas. The storage containers will have secondary containment in case of tank or vessel failure. Safety data sheets will be available to on-site personnel for all applicable materials.

Fueling of construction related machinery, such as tractors, trucks, and semi- trucks with petroleum-based fuels will take place on the Project Site in specific designated areas. A Spill Prevention, Containment, and Countermeasures Plan (SPCC) will be developed and implemented to minimize the potential for spills of hazardous materials and any resulting impacts. Additionally, spill control kits will be carried on all refueling vehicles.

Paint, degreasers, pesticides, herbicides, air conditioning fluids (chlorofluorocarbons [CFC]), gasoline, propane, hydraulic fluid, welding rods, and janitorial supplies may be stored on site in small quantities (less than 55 gallons, 500 pounds, or 200 cubic feet). No significant environmental impacts

caused by a potential spill are anticipated due to the small quantity of materials and the containment and clean up procedures that will be implemented.

Additionally, portable chemical toilets will be placed on site for construction workers. Licensed contractors will be utilized for pumping sewage from the portable toilets. The sewage waste will be disposed of at a permitted location selected by the chemical toilet contractor. Permanent bathroom facilities are not anticipated.

Little to no waste is expected to be generated from the Project during the operations phase. Any waste generated during maintenance activities will be removed from the site and disposed of in accordance with state and federal regulations.

At the end of the Project's operational life, the Project will follow a decommissioning and site restoration plan to disconnect, remove and recycle the solar array equipment and restore the site. Non-recyclable components will be disposed of in a suitable licensed facility. Once all equipment has been removed, the Site will be restored via topsoiling and seeding following the methodology set forth in the Project decommissioning plan.

No adverse effects from waste generation or disposal in relation to construction or operation of the Project are anticipated.

5.0 WATER WITHDRAWAL

At this time, it is not anticipated that the Project will require external utility services during typical plant operation. If water service is required during construction, the Project will use onsite well water.

Water use related to construction activities will include site preparation such as dust control, equipment cleaning, and grading activities. Proper BMPs outlined in the SWPPP will be followed during any equipment washing and potential dust control discharges. The volume of water required during the construction process is minimal and water resources are not anticipated to be adversely affected.

The Project will minimally and infrequently use water during normal operations and maintenance. Typical rainfall in the region is sufficient to remove dust and other debris from the PV panels. Otherwise, water may be used for vegetation management needs, including screening vegetation installation and during periods of drought.

6.0 CONCLUSION

Project construction and associated land disturbance associated with the proposed Project may result in temporary impacts to environmental resources. The Project will utilize BMPs to minimize potential impacts, including dust minimization measures, erosion control measures, and stormwater control measures. The Project will comply with all KDOW and KPDES requirements. Material containment will abide by the appropriate measures and safe storage requirements through a SPCC Plan. The Project will not generate wastewater during construction or operation. Material waste will be disposed of at appropriate disposal or recycling facilities. Water withdrawal necessary for construction of the Project will source from existing on-site wells.

7.0 REFERENCES

Kentucky Administrative Regulations (KAR). 2022. 401 KAR 10:026 – Designation of uses of surface waters. Table C: Waters with Added Designated Uses. Available online at: https://apps.legislature.ky.gov/law/kar/titles/401/010/026/.

Kentucky Division of Water (KDOW). 2026. KY Watershed Explorer. Available online at: https://experience.arcgis.com/experience/a8a017332225466b9f25a2ed11c21a7c/page/GW%2FSW-Explorer/

U.S. Environmental Protection Agency (EPA). 2026. AirData Air Quality Monitors Interactive Map. Retrieved from https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=5f239fd3e72f424f98ef3d5def547eb5&extent=-146.2334,13.1913,-46.3896,56.5319

Request No. 4:

Provide a narrative description of the location for each of the following site features:

a. Each construction entrance.

b. Each entrance to be used in operations.

c. Operation & Maintenance (O&M) area.

d. Each laydown area.

Response:

a. The Project will have approximately 20 access gates that will be used for construction, as depicted on SAR Attachment 1. All gates will be internal to the Project site and located on private roads. Final access design will be performed by the EPC Contractor. Those gates are further described as follows:

1. East/West gates: Approximately 9 gates will have access from the private main road (and then via adjacent project roads) on the north end of Starfire 2 and will traverse the site in an east/west direction.
2. North/South gates – group 1: Approximately 7 gates will have access from private Starfire Haul Road (and then via adjacent project roads) located in the center of end of Starfire 2 and will traverse the site in a north/south direction.
3. North/South gates – group 2: Approximately 4 gates will have access from a private road to be constructed as part of the project on the east of end of Starfire 2 and will traverse the site in an north/south direction.

b. Applicant anticipates using approximately the same number of entrances used during construction for project operations. Specific operational access points will be determined at a later date.

c. The Operations and Maintenance area will be located within the Project boundary, along the main internal access road and adjacent to the Project Substation. The area will consist of a permanent single-story structure and graveled parking area..

d. Temporary laydown areas will be located at the proposed Project Substation Area, and at several locations throughout the site, fully within the Project's fence line as depicted on the site layout (SAR Attachment 1). Final locations will be identified by the Project's EPC contractor.

Responding Witness: Jacqui Kitchen

Request No. 5:

Explain whether neighbors or adjacent landowners will be affected by noise levels during pile driving.

Response:

Please see the discussion of noise impacts provided in Exhibit J of the Application, SAR Attachment 4, Noise Assessment Study. As noted, impacts are expected to be temporary and will be mitigated by topography of the site, construction hours, distance from areas where pile driving may occur, and other proposed mitigation measures as discussed in the report. Environmental conditions such as wind may also impact noise levels at any given time during the construction phase.

Responding Witness: Matthew Batdorf

Request No. 6:

Provide a detailed table listing all residential structures within 2,000 feet of the Project boundary line. For each structure, provide:

a. Whether the residential structures are owned by participating or non-participating landowners.

b. The distance to the boundary line.

c. The distance to the closest solar panel.

d. The distance to the nearest inverter.

e. The distance to the substation.

Response:

a. Please see attached table.

b. Please see Response to No. 6(a).

c. Please see Response to No. 6(a).

d. Please see Response to No. 6(a).

e. Please see Response to No. 6(a).

Responding Witness: Matthew Batdorf

Residential Structures Within 2,000 Feet						
Residential Structure Number	Acoustics ID	Category	Distance to Project Boundary (Feet)	Distance to Panel (Feet)	Distance to Inverter (Feet)	Distance to Substation (Feet)
1	R-1	Non-Participating	69	979	1,559	11,637
2	R-2	Non-Participating	107	884	1,451	11,504
3	R-3	Non-Participating	55	1,059	1,595	11,587
4	R-4	Non-Participating	63	1,114	1,625	11,566
5	R-5	Non-Participating	Within Project Boundary	1,541	1,995	11,743
6	R-6	Non-Participating	38	1,682	2,231	11,862
7	R-7	Non-Participating	134	2,000	2,488	12,229
8	R-8	Non-Participating	14	1,858	2,416	12,064
9	R-9	Non-Participating	120	2,111	2,658	12,329
10	R-10	Non-Participating	624	2,522	3,174	12,795
11	R-11	Non-Participating	1,018	2,847	3,567	13,160
12	R-12	Non-Participating	1,281	3,128	3,810	13,438
13	R-13	Non-Participating	1,483	3,302	4,010	13,631
14	R-14	Non-Participating	1,866	3,606	4,420	13,953
15	R-15	Non-Participating	1,930	3,651	4,494	14,002
16	R-16	Non-Participating	1,859	3,273	4,295	12,920
17	R-17	Non-Participating	1,806	3,250	4,270	12,869
18	R-18	Non-Participating	1,636	3,549	4,536	12,742
19	R-19	Non-Participating	1,725	3,868	4,849	12,943
20	R-20	Non-Participating	1,747	3,986	4,964	13,004
21	R-21	Non-Participating	1,528	3,904	4,867	12,805
22	R-22	Non-Participating	1,845	4,751	5,693	13,252
23	R-23	Non-Participating	1,867	5,393	6,277	13,055
24	R-24	Non-Participating	1,557	5,225	6,094	12,700
25	R-25	Non-Participating	1,889	5,868	6,698	12,823
26	R-26	Non-Participating	89	4,081	4,846	10,819
27	R-27	Non-Participating	121	3,955	4,703	10,646
28	R-28	Non-Participating	144	3,775	4,495	10,413
29	R-29	Non-Participating	206	3,662	4,349	10,174
30	R-30	Non-Participating	281	3,258	3,881	9,699
31	R-31	Non-Participating	18	2,995	3,549	9,283
32	R-32	Non-Participating	164	3,143	3,693	9,295
33	R-33	Non-Participating	86	3,146	3,663	9,015
34	R-34	Non-Participating	110	3,337	3,844	8,985
35	R-35	Non-Participating	383	4,050	4,557	8,830
36	R-36	Non-Participating	300	3,992	4,518	8,736
37	R-37	Non-Participating	681	3,776	4,665	8,819
38	R-38	Non-Participating	892	3,811	4,693	8,970
39	R-39	Non-Participating	1,304	4,258	5,120	9,536
40	R-40	Non-Participating	1,247	4,090	4,953	9,392
41	R-41	Non-Participating	1,189	4,008	4,871	9,300
42	R-42	Non-Participating	1,302	3,934	4,790	9,316
43	R-43	Non-Participating	1,366	3,933	4,783	9,350
44	R-44	Non-Participating	1,439	4,076	4,924	9,502
45	R-45	Non-Participating	1,554	4,266	5,110	9,692
46	R-46	Non-Participating	1,500	4,048	4,891	9,517
47	R-47	Non-Participating	1,742	4,263	5,090	9,804
48	R-48	Non-Participating	1,779	4,121	4,944	9,705
49	R-49	Non-Participating	1,876	4,148	4,963	9,774
50	R-50	Non-Participating	151	1,576	2,476	7,245
51	R-51	Non-Participating	444	1,370	2,227	7,373
52	R-52	Non-Participating	470	1,479	2,335	7,464
53	R-53	Non-Participating	805	1,719	2,514	7,813
54	R-54	Non-Participating	916	1,701	2,473	7,873
55	R-55	Non-Participating	1,691	1,798	2,256	8,281
56	R-56	Non-Participating	1,913	2,019	2,475	8,479

Request No. 7:

Provide a detailed table listing all non-residential structures located within 2,000 feet of the Project boundary line. For each structure, provide:

a. A description of any structure (barn, commercial building, warehouse, church, etc.).

b. The distance to the boundary line.

c. The distance to the closest solar panel.

d. The distance to the nearest inverter.

e. The distance to the substation.

Response:

a. Please see attached table.

b. Please Response to No. 7(a).

c. Please Response to No. 7(a).

d. Please Response to No. 7(a).

e. Please Response to No. 7(a).

Responding Witness: Matthew Batdorf

Non-Residential Structures Within 2,000 Feet						
Non-Residential Structure Number	Acoustics ID	Category	Distance to Project Boundary (Feet)	Distance to Panel (Feet)	Distance to Inverter (Feet)	Distance to Substation (Feet)
1		Barn	1,666	3,164	4,180	12,733
2		Barn	1,421	3,346	4,325	12,500
3		Barn	1,672	5,383	6,249	12,781
4		Garage	664	1,663	2,492	7,694
5		Barn	332	1,624	2,506	7,423
6	CH-1	Church- Lower Ball United Baptist Church	937	3,436	4,304	8,830
7		Shed	1,386	4,034	4,885	9,435
8		Barn	131	3,319	3,833	9,055
9		Garage	113	3,718	4,440	10,381
10		Shed	61	1,542	2,010	11,789
11		Garage	144	1,970	2,455	12,190
12		Garage	990	2,817	3,542	13,129
13		Barn	762	844	1,390	5,877
14		Barn	1,236	1,635	1,932	7,842
15		Shed	1,292	1,655	1,941	7,889
16		Barn	1,197	3,811	4,745	12,512
17		Trailer	1,922	4,701	5,655	13,326
18		Shed	1,361	5,027	5,893	12,531
19		Garage	1,533	5,233	6,097	12,665
20		Garage	1,837	5,374	6,257	13,022
21		Barn	1,785	5,389	6,269	12,938
22		Barn	1,787	4,061	4,881	9,671
23		Barn	1,663	3,993	4,824	9,553
24		Barn	1,643	3,893	4,715	9,519
25		Barn	1,390	4,003	4,854	9,417
26		Barn	1,342	4,118	4,975	9,473
27		Shed	1,276	3,953	4,813	9,314
28		Shed	1,260	4,013	4,874	9,349
29		Trailer	756	3,637	4,526	8,731
30		Garage	194	1,644	2,544	7,288
31		Shed	381	1,624	2,500	7,464
32		Trailer	331	1,602	2,482	7,418
33		Barn	254	1,428	2,312	7,276
34		Shed	564	1,479	2,318	7,524
35		Shed	709	1,646	2,466	7,713
36		Shed	1,319	4,123	4,981	9,458
37		Barn	1,527	4,095	4,938	9,558
38		Shed	54	1,517	1,984	11,768
39		Shed	15	1,659	2,217	11,841
40		Shed	1,392	3,255	3,901	13,562
41		Shed	1,139	2,983	3,679	13,292
42		Shed	1,873	5,426	6,309	13,044
43		Garage	109	4,063	4,825	10,790
44		Shed	147	4,097	4,855	10,793
45		Shed	113	3,346	3,846	8,969
46		Car Port	126	3,333	3,843	9,041
47		Shed	271	4,002	4,492	8,713
48		Car Port	349	3,943	4,588	8,729
49		Car Port	1,419	3,938	4,786	9,383
50		Shed	1,744	4,306	5,136	9,819
51		Barn	Within Project Boundary	479	923	494
52		Barn	Within Project Boundary	368	792	585
53		Lodge	Within Project Boundary	373	761	699
54		Hunting Cabin	Within Project Boundary	742	1,053	5,200
55		Hunting Trailer	Within Project Boundary	580	1,072	5,025
56		Hunting Trailer	Within Project Boundary	504	944	4,963
57		Hunting Trailer	Within Project Boundary	375	794	4,835
58		Hunting Trailer	Within Project Boundary	598	1,019	5,058
59		Hunting Trailer	Within Project Boundary	648	1,078	5,108
60		Hunting Trailer	Within Project Boundary	693	1,135	5,181
61		Hunting Trailer	Within Project Boundary	679	1,124	5,167
62		Hunting Trailer	Within Project Boundary	410	840	4,870
63		Shed	1,722	2,045	2,373	3,317

Request No. 8:

Confirm whether a battery energy storage energy system (BESS) will be a part of this project. If yes, provide the following:

a. Safety data sheets for the energy storage system.

b. The environmental impact of the battery storage system.

c. Expected life of the batteries.

d. Method to dispose of batteries at the end of the useful life.

e. How the battery storage system installation will comply with National Fire Protection Association Standard 855.

f. The storage capacity.

g. An explanation of whether the BESS system for Starfire 2 will also serve Starfire 1.

Response:

a. At this time, Starfire cannot confirm that BESS will be part of this project because it has not made a final decision regarding BESS inclusion. However, the project has been designed to accommodate a co-located BESS adjacent to the project substation shared by Starfire 1 and Starfire 2. The Project is evaluating configurations including solar-plus-storage with up to four hours of discharge duration, and the BESS could have a rating of up to 410 MW x 1,640 MWh, potentially constructed concurrently with Starfire 1 and 2. If selected, the system is expected to use lithium-ion or similar technology with an anticipated useful life of 15–20 years. The BESS is anticipated to have zero emissions during normal operation and will undergo end-of-life recycling or licensed disposal. Unit-specific safety data sheets, final specifications, model number, dimensions, unit

count, PCS/inverter count, footprint, component heights, fencing, and other physical details will be determined once the technology and vendor are selected. The final design will comply with all applicable local, state, and federal regulations, including but not limited to: NFPA 855, UL 9540 and UL 9540A, Kentucky building and fire codes, NFPA 70 (National Electrical Code), and IEEE 1578 requirements for electrolyte spill containment and response. The BESS will incorporate manufacturer-approved controls and protection systems intended to prevent and limit thermal runaway, including battery-management systems, temperature and smoke/heat detection, gas monitoring, ventilation and HVAC systems, emergency shutdown controls, appropriate separation and access controls; fire suppression, alarm, annunciation, remote-alert, and monitoring systems will be designed and maintained in accordance with applicable codes, NFPA 855, manufacturer requirements, and direction from the authority having jurisdiction, with final details—including off-site notification to designated personnel and the responding fire department—established during final design and permitting.

b. Please see above Response to No. 8a.

c. Please see above Response to No. 8a.

d. Please see above Response to No. 8a.

e. Please see above Response to No. 8a.

f. Please see above Response to No. 8a.

g. Please see above Response to No. 8a.

Responding Witness: Jacqui Kitchen

Request No. 9:

Provide a physical description of the BESS area, including size of footprint, height of components, number of BESS units and PCS/inverters, fencing plans, and other physical details.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 10:

Provide information on the specifications, model number, dimensions, useful life, and safety measures for the BESS that will be used.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 11:

Describe the hazard detection systems, such as smoke and heat detectors, as well as gas meters, that will be used within the BESS facility.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 12:

Describe alert systems that will be in place at the BESS facility and who will monitor and maintain those systems. Include in the explanation whether the systems provide remote alerts and annunciation to offsite personnel and the fire department.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 13:

Describe how the BESS facility will be designed to prevent thermal runaway. Include ventilation and air conditioning (HVAC) systems that will be used.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 14:

Describe the fire suppression systems that will be installed at the BESS facility. Include in the response the standards those systems will have to meet, who will monitor and maintain those systems.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 15:

Explain how the BESS facility will comply with IEEE 1578 standards in relation to electrolyte spills.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 16:

Explain whether the BESS facility be designed to withstand environmental hazards that may arise within the area.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 17:

Explain which local fire department will be responsible for serving Starfire 2 and its BESS system.

Describe any communications to date with that fire department to date.

Response:

Please see Response to No. 8.

Responding Witness: Jacqui Kitchen

Request No. 18:

Refer to Application, Site Assessment Report (SAR), Attachment 1, Site Plan Layout.

a. Provide the total number of site access entrances in use during the construction phase.

b. Provide a narrative description of each construction entrance location.

c. Provide a revised site layout map if these locations have changed.

Response:

a. Please see Response to No. 4.

b. Please see Response to No. 4.

c. Please see Response to No. 4.

Responding Witness: Jacqui Kitchen

Request No. 19:

Refer to Exhibit H, SAR, Attachment A, Site Plan Layout.

a. Provide the total number of site access entrances in use during the operations phase.

b. Provide a narrative description of each operation's entrance location.

c. Provide a revised site layout map if these locations have changed.

Response:

a. The final number of operations-phase access entrances will be determined at a later date but will not exceed those used for construction.

b. See Response to No. 19(a).

c. See Response to No. 19(a).

Responding Witness: Jacqui Kitchen

Request No. 20:

Explain whether each entrance available during the construction period and during the operational period will have its own security gate.

Response:

Each access entrance used during construction and operations will have its own security gate which will be a locked when not in use.

Responding Witness: Jacqui Kitchen

Request No. 21:

Provide an update on the status and schedule of construction for the Starfire 1 project and describe the extent (duration) during which construction of the two projects is expected to overlap, if any.

Response:

Starfire 1 and Starfire 2 are expected to be constructed concurrently. Please see Response to Request No. 23.

Responding Witness: Jacqui Kitchen

Request No. 22:

If there is any projected overlap between construction activity on Starfire 2 and construction activity on Starfire 1, describe how that overlap could affect the findings in the Transportation Assessment Report included as SAR, Attachment 6. In particular, explain how any potential overlapping construction activity on Starfire 1 and Starfire 2 could affect the conclusion from the Transportation Assessment Report that "the four 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."

Response: The findings from the Transportation Assessment Report could be affected as follows. Review of potential overlapping construction activity on Starfire 1 and Starfire 2 demonstrates that the four critical roadways will operate at acceptable Level-of-Service (LOS) C, or better, operations during the critical weekday peak hours with Project peak construction traffic overlap of Starfire1 and Starfire 2.

Responding Witness: Matthew Batdorf

Request No. 23:

Refer to SAR, Attachment 6, Transportation Assessment Report. Provide the following:

a. A construction phase timeline.

b. The current best estimate of the number and approximate weight classes of the heavy and light duty trucks anticipated on site per day throughout the construction timeline.

c. The estimated weight of the proposed project's required substation transformer and the truck class necessary for its delivery.

d. The weight limit ratings for each local roadway to be used during project construction.

Response:

a. Please see Response to Request No. 27.

b. See response to Request No. 34 and No. 35

c. At this time, the anticipated transformer weight is approximately 300,000 pounds. 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 pounds. A Class 8 truck is anticipated to be used for delivery.

d. The weight limit ratings for the roads anticipated to be used during delivery and construction phases of the Project are as follow:

1. KY 80 (AAA): 80,000 pound maximum load;

2. KY 476 (AAA route, MP 1.905-22.275): 80,000 pound maximum load; and
3. KY 1087 (AAA route, MP 0-0.8): 80,000 pound maximum load.

Starfire Haul Road is a private road and thus is not in the county road system.

Responding Witness: Matthew Batdorf

Request No. 24:

Provide further information regarding the hours and days of the week that the guardhouse is expected to be manned during construction and during operations.

Response:

The guardhouse is anticipated to be manned 24 hours a day during construction. Use during operations will be determined after construction is complete.

Responding Witness: Jacqui Kitchen

Request No. 25:

Refer to SAR, Attachment 1. The second map indicates that there will be separate access gates to each of the array areas. Confirm that each of the array areas will be individually fenced and describe the hours during which those gates are expected to be locked during construction and operations.

Response:

Each solar panel array area will be individually fenced. Gates accessing each area during construction will be open during active construction within each array. During operation, gates will be locked at all times except while staff are passing into or out of the array area.

Responding Witness: Jacqui Kitchen

Request No. 26:

Refer to the Application, Exhibit A, Sensitive Receptors and Residential Neighborhood Map. This map indicates that there is a University of Kentucky owned forest plot within the proposed project area. Describe any communications to date with the University of Kentucky regarding the forest plot and whether access to the forest plot is expected to continue during and/or after construction of Starfire 2.

Response:

Starfire representatives have previously communicated with representatives of the University of Kentucky to provide a general overview of the Project, confirm that no formal easement is in place for access, and to discuss the locations of property lines as part of Project survey efforts. The University of Kentucky Forest Plot is currently accessed through private roads that will not be impacted by construction or operations and through the existing Starfire mining facility road. The mining road runs through Starfire 1 and 2 and will remain available for use to the University of Kentucky during operations.

Responding Witness: Jacqui Kitchen

Request No. 27:

Provide a detailed description of construction activities, including a construction timeline and schedule by activity, accounting for construction of all Project components. Explain any potential for deviation to that schedule.

Response:

The Project is anticipated to commence construction in 2027 and last approximately 18 to 24 months. Construction will occur sequentially in a given area to complete any clearing and grading activities before commencing installation of Project components. Construction activities may occur concurrently if multiple areas of the site commence installation activities simultaneously. The particular construction activity or set of activities needed on a given portion of the Project depends on the area's existing natural features and the extent of work required to prepare the land for installation of Project components. Deviations from the schedule may occur due to weather conditions and supply chain disruptions but are not anticipated to substantially impede Project construction. Please see below for the estimated construction timeline.

Task	Estimated Duration	Anticipated Timeframe
Permitting & Approvals	24 months	Q1 2026 – Q1 2028
EPC Selection & Contracting	12 months	Q1 2027 – Q4 2027
Final Engineering	12 months	Q1 2027 – Q1 2028
Procurement (Long Lead Equipment)	44 months	Q4 2025 – Q3 2029
Site Preparation & Civil Works	27 months	Q3 2027 – Q4 2028
Pile Installation	7 months	Q3 2028 – Q2 2029
Racking Installation	7 months	Q4 2028 – Q2 2029
Module Installation	7 months	Q1 2029 – Q3 2029
Substation Construction	12 months	Q1 2029 – Q2 2030
Commissioning & Testing	13 months	Q3 2029 – Q3 2030

Responding Witness: Jacqui Kitchen

Request No. 28:

State when the peak construction phases will occur (which month(s) of the full construction period), accounting for construction of all Project components.

Response:

Applicant anticipates that peak construction activities will begin at approximately the fourth month of construction and last approximately nine to twelve months thereafter.

Responding Witness: Jacqui Kitchen

Request No. 29:

Provide the average number of construction workers on-site each day over the course of the construction period, accounting for construction of all Project components.

Response:

Over its entire construction duration, the Project is anticipated to experience an average construction workforce of 100 to 125 workers or approximately 40% to 50% of its peak construction workforce.

Responding Witness: Matthew Batdorf

Request No. 30:

Provide details of any communications to date with the Kentucky Transportation District Engineer regarding the proposed project, traffic impacts, heavy deliveries to site, or mitigation measures.

Response:

Project representatives have had preliminary communications with local county officials and Kentucky Transportation Cabinet transportation engineers, including District 10 and District 12 personnel, regarding road classifications and road use for site deliveries. Formal transportation-agency coordination for Starfire 2 has not yet occurred. As design progresses, Starfire will coordinate as necessary with the KYTC District Engineer and the Knott and Perry County Road Departments to confirm applicable legal requirements, special permits, and any temporary road closures. The county roads around the site are used daily for hauling coal. If required, Starfire will obtain oversize/over-dimensional permits and temporary road-closure approvals.

Responding Witness: Jacqui Kitchen

Request No. 31:

Provide details of any communications to date with the Perry and Knott Counties Road Department regarding the proposed project, traffic impacts, heavy deliveries to site, or mitigation measures.

Response:

Project representatives met with Knott and Perry County Fiscal Courts on multiple occasions to provide information regarding the Project, including site location, potential local road use, connectivity to Kentucky State Routes, and general construction timelines. Project representatives will continue to meet with the counties prior to commencement of construction and work with the road departments as part of this process.

Responding Witness: Jacqui Kitchen

Request No. 32:

Provide the method and route for delivery of the Project Transformer.

Response:

The transformer is expected to be delivered from KY-80, using a heavy-haul configuration modeled as a dual-lane, 10-axle, double-bogie trailer approximately 18 feet wide. From US Highway 80, the Main Power Transformer will be delivered by either: (1) heading north and west on KY 1087 to enter the Project site; or (2) heading north to Starfire Haul Road to enter the project site.

Responding Witness: Jacqui Kitchen

Request No. 33:

Refer to Exhibit H, SAR, Attachment F, Traffic Assessment. Provide the location and weight limit ratings for all bridges within two miles of the Project area. Indicate which bridges will or may be used by Project construction traffic and deliveries.

Response:

The width and weight limit ratings for bridges and culverts within a two-mile radius of the Project are as follows:

a. 097B00054N: culvert on KY 1087 at MP 0.7, 32 inches wide, and no weight limit.

b. 097B00144N: bridge on KY 476 at MP 12.43, 26.25 feet wide, and no weight limit.

It is anticipated that both bridges will be used for construction traffic and deliveries subject to the EPC obtaining any necessary oversize/overweight permits.

Responding Witness: Matthew Batdorf

Request No. 34:

Provide the average daily number of construction vehicles accessing the site by vehicle type (i.e., worker vehicles, delivery trucks, cement trucks, water trucks, etc.).

Response:

The Project's anticipated daily number of construction vehicles is as follows:

a) 110 construction worker vehicles per day;

b) 10 mid-size delivery trucks per day; and

c) 10 semi-tractor trailer size delivery trucks per day.

Responding Witness: Matthew Batdorf

Request No. 35:

Provide the peak daily number of construction vehicles accessing the site, by vehicle type (i.e., worker vehicles, delivery trucks, cement trucks, water trucks, etc.)

Response:

During peak construction, the Projects anticipated daily number of construction vehicles is as follows:

a) 238 construction worker vehicles per day;

b) 10 mid-size delivery trucks per day; and

c) 10 semi-tractor trailer size delivery trucks per day.

Responding Witness: Matthew Batdorf

Request No. 36:

Provide the maximum expected weights for each type of delivery truck, including cement and water trucks.

Response:

See Response to Request No. 37 below.

Responding Witness: Matthew Batdorf

Request No. 37:

Provide the maximum expected load weights for each type of delivery, including cement and water, heavy equipment, gravel for access roads, panels, inverters, BESS units, and the transformer.

Response:

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 pounds (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 and 12 for appropriate permitting if loads exceed 80,000 pounds;

Gravel for access roads will be delivered via standard dump trucks with anticipated weight limits up to 80,000 pounds; and

Solar Panels and inverters will be delivered via standard flatbed or semi-truck with anticipated weight limits up to 80,000 pounds.

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

Responding Witness: Matthew Batdorf

Request No. 38:

Explain whether any oversize or overweight deliveries will require special permits.

Response:

Project representatives will communicate with local county officials and the Kentucky Department of Highways Districts 10 and 12 regarding road use for site deliveries and to determine what, if any, special permits will be necessary. If required, Starfire will apply for any necessary over-size/over-dimensional permits or temporary road closures. Of note, the county roads around the site are used daily for hauling coal.

Responding Witness: Matthew Batdorf

Request No. 39:

Explain whether any improvements to bridges or roadways in the Project area will be necessary prior to construction.

Response:

A majority of the Project delivery routes will use state roads. It is anticipated that upgrades may be necessary for portions of the roadways which have not been maintained. No upgrades to bridges have been identified at this time. However, upon selection of an EPC, the Project route will be evaluated by a structural engineer to determine if any improvements are necessary.

Responding Witness: Matthew Batdorf

Request No. 40:

Refer to Exhibit H, SAR, Attachment F, Traffic Assessment. Provide the plan for repairing Project-related damage to any roadways, railway crossings, or bridges.

Response:

Project representatives will communicate with local and state officials regarding road conditions throughout the construction phase to identify any road damage specifically caused by the Project.

Responding Witness: Matthew Batdorf

Request No. 41:

Explain any specific traffic management strategies to be employed during construction.

Response:

For its specific traffic management strategy, the Project will identify Transportation Demand Management (TDM) strategies prior to construction to utilize during this phase of the Project. The TDM program is anticipated to include the following elements to the extent feasible:

1. Prioritizing use of designated truck routes for deliveries;
2. Placing temporary traffic control signage at key locations leading to the site;
3. Staggering worker start times or multiple shifts;
4. Utilizing metered delivery arrival times;
5. Scheduling worker start times that are outside of the peak commuting hours of the adjacent street traffic;
6. Designating construction staff to serve as flaggers to direct traffic into and/or through temporary traffic control zones as needed; and
7. Ensuring emergency vehicle access to the site at all times.

Responding Witness: Matthew Batdorf

Request No. 42:

Explain whether any traffic stoppages will be necessary to accommodate large truck deliveries. If yes, provide the expected location(s), frequency and length of those stoppages.

Response:

It is anticipated that traffic stoppages may be necessary to accommodate large truck deliveries. The proposed routes for these deliveries will mainly utilize state roads and highways to travel to the Project site. Frequency and length of any stoppage will be discussed with local county officials to ensure that construction-related traffic resulting from the Project will be minimized and appropriately permitted where necessary.

Responding Witness: Matthew Batdorf

Request No. 43:

If applicable, describe odor impacts from diesel fumes or other sources from construction vehicles that may be noticeable to nearby residents.

Response:

Odor impacts associated with construction activities, if any, are expected to be minimal and temporary. Construction activities will comply with applicable fugitive emissions standards, and equipment will be maintained in good working condition to minimize exhaust-related odors.

Responding Witness: Matthew Batdorf

Request No. 44:

Indicate whether the Project site will be irrigated to promote vegetation growth and reduce potential erosion.

Response:

Water will be used during construction as a means of dust control. This use may benefit some seeded areas (roadsides). However, it is not currently planned to irrigate the site to establish vegetation across the full site.

Responding Witness: Bob Roy

Request No. 45:

Refer to the Application, page 4, Item 8. The proposed Starfire 2 project intends to use the same project substation as the Starfire 1 Solar project. Confirm that the transmission route and transmission line from the project substation to the existing Harbert substation will be the same as the Starfire 1 generating facility. If not confirmed, explain the response.

Response:

Starfire 2 will use the same project substation and the same 138 kV transmission route and line from the project substation to the existing Harbert Substation as the Starfire 1 generating facility. Starfire 2 will not require a separate transmission route or separate transmission line between the project substation and Harbert. The shared gen-tie is approximately 24,502 feet (4.64 miles) in length and will connect to the existing Harbert Substation. The route and line remain subject to final engineering, permitting, and interconnection requirements.

Responding Witness: Jacqui Kitchen

Request No. 46:

Provide a topographic profile of the proposed transmission line route between the project substation and the existing Harbert substation.

Response:

See the attached Preliminary Plan & Profile & Structure Information.

Responding Witness: Colin Cannon

SUBJECT:	Preliminary Plan & Profile & Structure Info
LOCATION:	Talcum, Kentucky
PROJECT NAME:	Bright Night - Star Fire Mountain Gen Tie 138kV
PREPARED BY:	PEI

Good morning Mr. Canon,

Please see the attached preliminary Plan & Profile that includes the following:

- Structure Number
- Height of Tower/Pole
- Classification (Deadend Vs Suspension)
- Arm Classifications for both Towers & Poles
- Line Angle for Deadends
- Span Lengths
- Lat/Long Location of Structures/Stations

Table of Contents

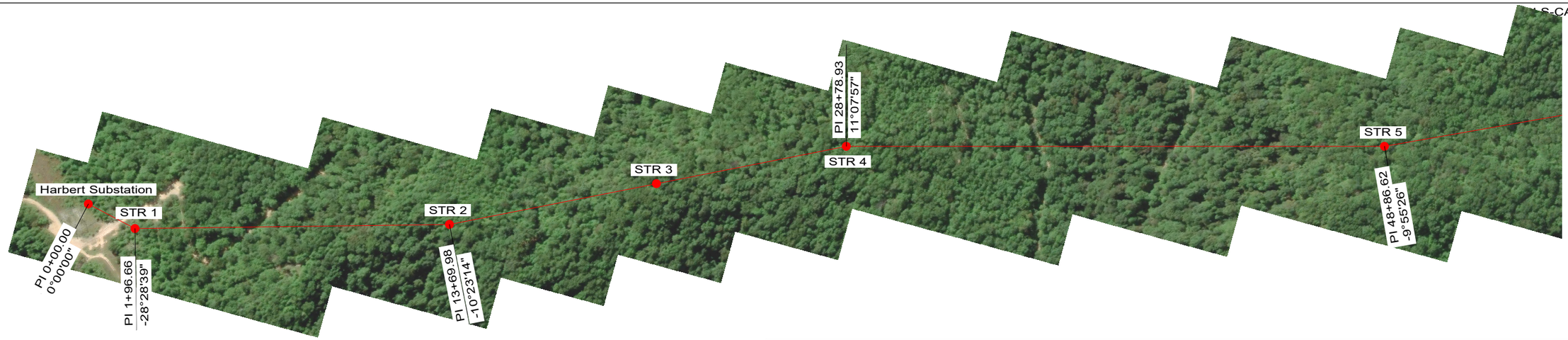
1)Staking Table
2)Preliminary Plan & Profile
3)Reference Structure Photos
    a. Double Circuit Lattice Tower
    b. Double Circuit Steel Monopole w/Davit Arms

1) Staking Table

Structure #	Line Angle	Owner	Pole or Tower Type	Tower Height	Pole Height	Structure Type	Arms	Foundation Type	Longitude	Latitude
Harbert Metering Sub (New Bay)	-	KPCO - AEP/ Bright Night	-	-	-	Substation Pull-off	-	-	-83.04510807	37.43928432
1	-28.4774	BrightNight	DBL CIR LATTICE	110'	-	Deadend	Pointed-Flared	Grillage	-83.04576979	37.43939971
2	-10.3871	BrightNight	DBL CIR LATTICE	100'	-	Deadend	Pointed-Flared	Grillage	-83.04965179	37.43850379
3	-	BrightNight	DBL CIR LATTICE	100'	-	Suspension	Pointed-Pointed	Grillage	-83.05207757	37.43753808
4	11.5028	BrightNight	DBL CIR LATTICE	120'	-	Suspension	Pointed-Pointed	Grillage	-83.05430172	37.43665256
5	-9.9239	BrightNight	DBL CIR LATTICE	150'	-	Suspension	Pointed-Pointed	Grillage	-83.06096829	37.43518801
6	-	BrightNight	DBL CIR LATTICE	120'	-	Suspension	Pointed-Pointed	Grillage	-83.06785373	37.43258896
7	-	BrightNight	DBL CIR LATTICE	100'	-	Suspension	Pointed-Pointed	Grillage	-83.07016654	37.43171581
8	-6.5245	BrightNight	DBL CIR LATTICE	115'	-	Suspension	Pointed-Pointed	Grillage	-83.07278489	37.43072723
9	-	BrightNight	DBL CIR LATTICE	105'	-	Suspension	Pointed-Pointed	Grillage	-83.07909461	37.42759973
10	-17.3567	BrightNight	DBL CIR LATTICE	100'	-	Deadend	Pointed-Flared	Grillage	-83.08094689	37.42668151
11	-	BrightNight	DBL CIR LATTICE	100'	-	Suspension	Pointed-Pointed	Grillage	-83.08479662	37.42312165
12	-	BrightNight	DBL CIR LATTICE	100'	-	Suspension	Pointed-Pointed	Grillage	-83.08846137	37.41973241
13	-	BrightNight	DBL CIR LATTICE	110'	-	Suspension	Pointed-Pointed	Grillage	-83.08989388	37.41840747
14	-	BrightNight	DBL CIR LATTICE	100'	-	Suspension	Pointed-Pointed	Grillage	-83.0932337	37.41531821
15	17.9853	BrightNight	DBL CIR LATTICE	110'	-	Deadend	Pointed-Flared	Grillage	-83.09470547	37.41395675
16	-	BrightNight	DBL CIR Monopole	-	100'	Suspension	Custom Davit Arms	Drilled Concrete Pier	-83.09923312	37.41176553
17	-	BrightNight	DBL CIR Monopole	-	110'	Suspension	Custom Davit Arms	Drilled Concrete Pier	-83.10152785	37.41065485
18	-	BrightNight	DBL CIR Monopole	-	110'	Suspension	Custom Davit Arms	Drilled Concrete Pier	-83.10372135	37.40959309
19	-	BrightNight	DBL CIR Monopole	-	110'	Suspension	Custom Davit Arms	Drilled Concrete Pier	-83.10577972	37.40859668
20	-6.0101	BrightNight	DBL CIR Monopole	-	100'	Deadend	Custom Davit Arms	Drilled Concrete Pier	-83.10816104	37.40744386
21	-	BrightNight	DBL CIR Monopole	-	100'	Suspension	Custom Davit Arms	Drilled Concrete Pier	-83.11004111	37.40630283
22	-	BrightNight	DBL CIR Monopole	-	100'	Deadend	Custom Davit Arms	Drilled Concrete Pier	-83.11115691	37.4056256
Proposed Solar Station	-	BrightNight	-	-	-	Substation Pull-off	-	-	-83.11189364	37.40517845

2) Preliminary Plan & Profile

S-CADD Drawing



200.0 ft. Horiz. Scale

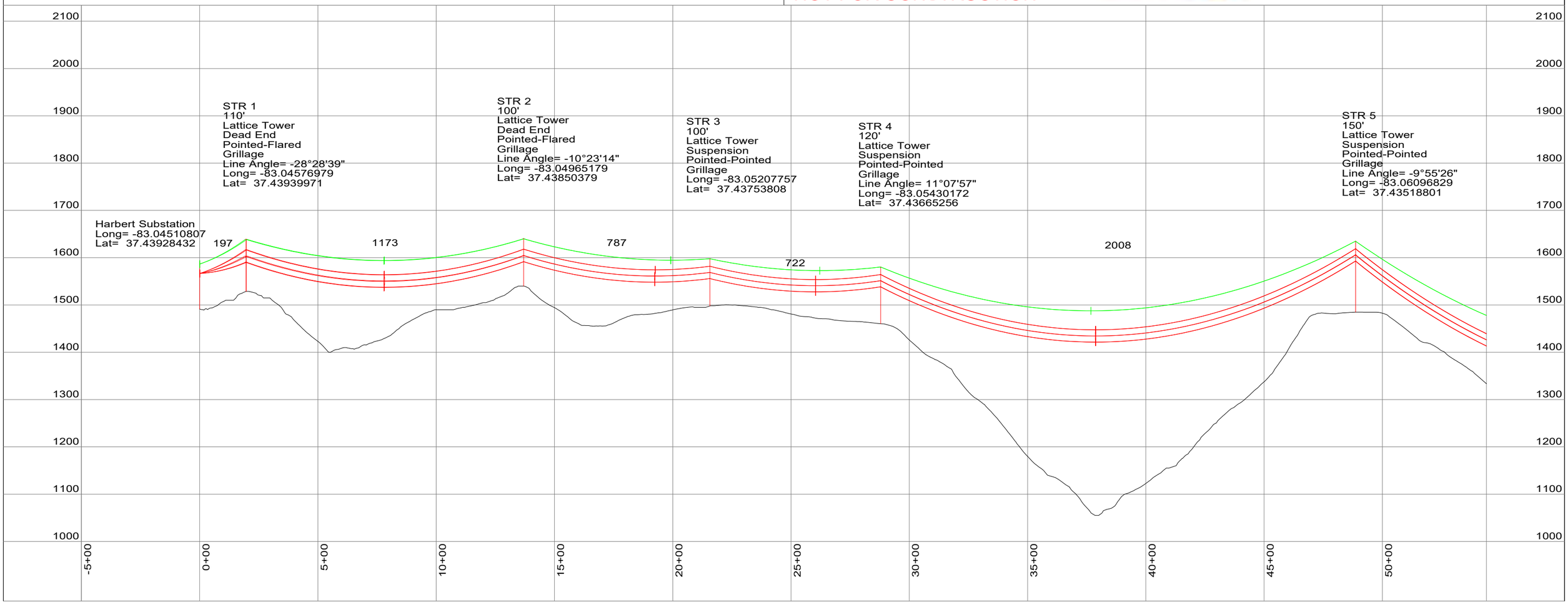
100.0 ft. Vert. Scale

North

PRELIMINARY
NOT FOR CONSTRUCTION

BRIGHTNIGHT
Power when you need it.

POWER ENGINEERS



PLS-CADD Drawing



200.0 ft. Horiz. Scale

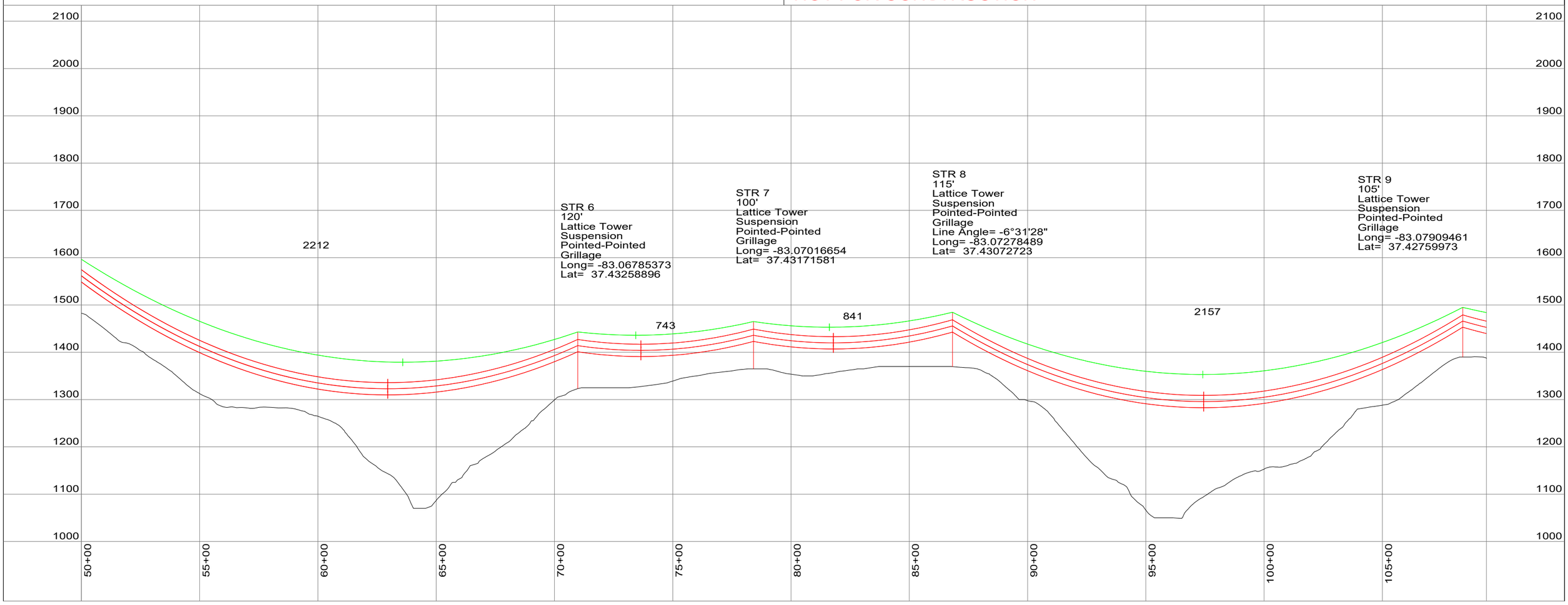
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North

PRELIMINARY
NOT FOR CONSTRUCTION

BRIGHTNIGHT
Power when you need it.

POWER ENGINEERS



PLS-CADD Drawing



200.0 ft. Horiz. Scale

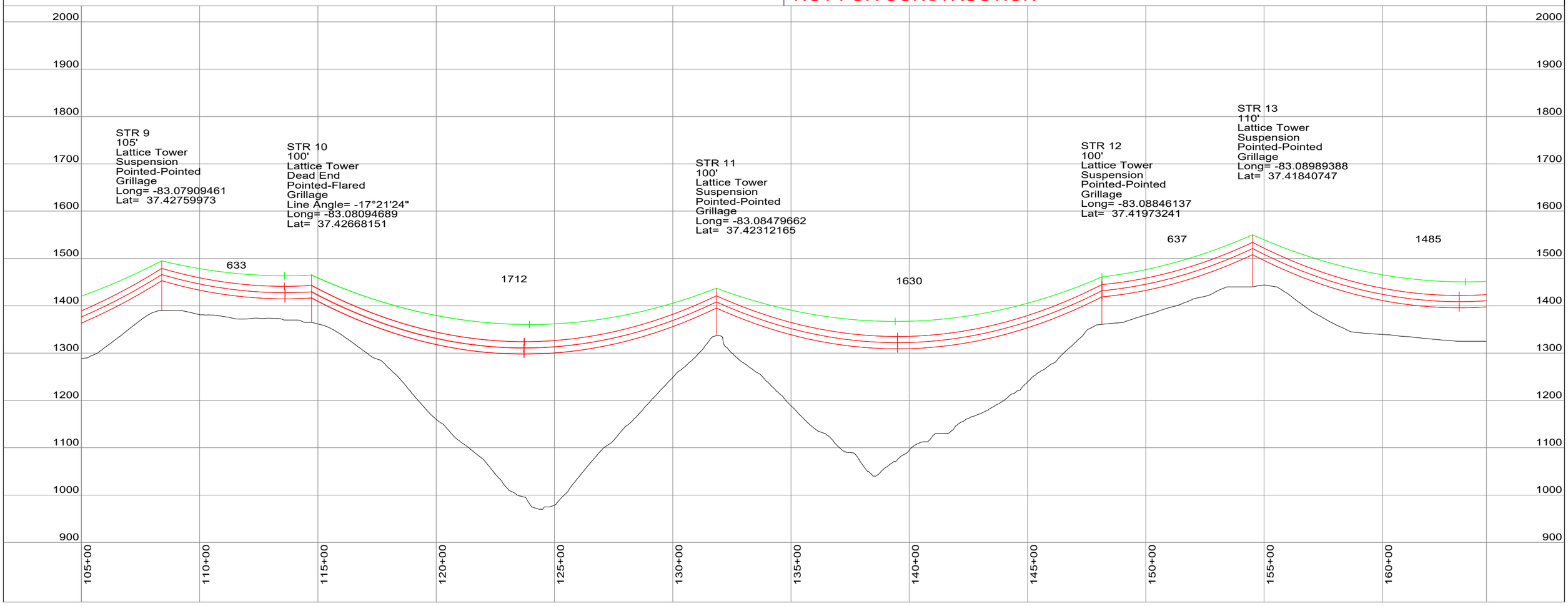
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North

PRELIMINARY
NOT FOR CONSTRUCTION

BRIGHTNIGHT Power when you need it

POWER ENGINEERS



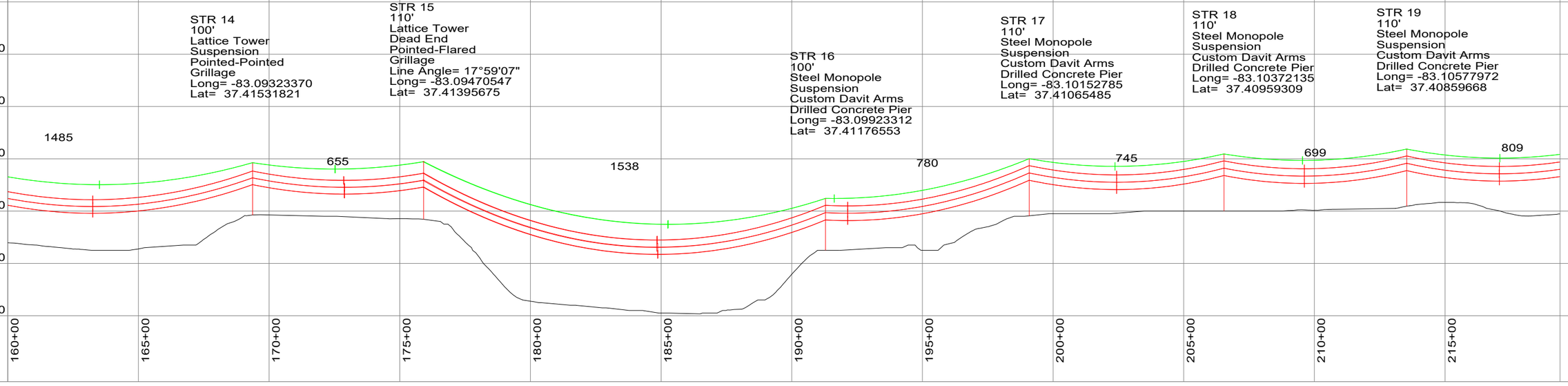


200.0 ft. Horiz. Scale

100.0 ft. Vert. Scale

North

PRELIMINARY
NOT FOR CONSTRUCTION



PLS-CADD Drawing



200.0 ft. Horiz. Scale

100.0 ft. Vert. Scale

North

PRELIMINARY
NOT FOR CONSTRUCTION

BRIGHTNIGHT
Power when you need it.

POWER ENGINEERS

STR 20
100'
Steel Monopole
Dead End
Custom Davit Arms
Drilled Concrete Pier
Line Angle= -6°00'36"
Long= -83.10816104
Lat= 37.40744386

STR 21
100'
Steel Monopole
Suspension
Custom Davit Arms
Drilled Concrete Pier
Long= -83.11004111
Lat= 37.40630283

STR 22
100'
Steel Monopole
Dead End
Custom Davit Arms
Drilled Concrete Pier
Long= -83.11115691
Lat= 37.40562560

Proposed Sub
Substation
Long= -83.11189364
Lat= 37.40517845

809
686
407
269

2400
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300

215+00
220+00
225+00
230+00
235+00

3) Reference Structure Photos

a. Double Circuit Lattice Tower

b. Double Circuit Steel Monopole w/ Davit Arms

A. Double Circuit Lattice Tower





B. Double Circuit Steel Monopole w/ Davit Arms





Request No. 47:

Provide an estimated breakdown by county of the "approximately 1,500 acre-site" and the 1,273 acres that would be within the project fenceline between Knott and Perry counties.

Response:

The approximately 1,273 acres within the Project fenceline include approximately 1083.57 acres in Knott County and 189.8 acres in Perry County. These figures are estimates and may be refined as final parcel and GIS acreage is reconciled. The broader 1500 acres reference is intended to be all inclusive of additional acreage associated with the gen-tie.

Responding Witness: Jacqui Kitchen

Request No. 48:

Provide the existing daytime ambient sound level(s) for the Project site.

Response:

The estimated daytime ambient sound level associated with this land use and Project Site is 40 dBA Leq. The existing daytime ambient sound levels for the Project Site have been estimated according to American National Standard Institute (ANSI) standard S12.9-2013/Part 3. This standard provides ambient sound levels based on land use category and population density. The Project Site would fall into the category of very quiet suburban and rural residential land use. This land use category is described as sparse suburban or rural areas isolated far from significant sources of sound and may be situated in shielded areas such as a small, wooded valley.

Responding Witness: Matthew Batdorf

Request No. 49:

Provide a detailed landscaping and screening plan. Include the following:

a. Identifying the location of proposed screening;

b. The basis for screening locations;

c. The length of different segments of screening;

d. The types of vegetation to be installed;

e. Their height at maturity, length of time to maturity;

f. Plans for on-going maintenance; and

g. Other details related to the proposed screening.

Response:

a. Due to the project location out of view of residential dwellings and neighborhoods, no landscape screening is being proposed for the project. Please refer to SAR II, 14.

b. See Response to No. 49(a).

c. See Response to No. 49(a).

d. See Response to No. 49(a).

e. See Response to No. 49(a).

f. See Response to No. 49(a).

g. See Response to No. 49(a).

Responding Witness: Bob Roy

Request No. 50:

Explain whether there will be vegetation clearing for construction. Provide the number of acres that will be cleared and any permits that will be required.

Response:

Tree removal will be required for construction of the project. Within the Project limits of disturbance (LOD), approximately 38 acres of tree removal may be needed for solar panel arrays. Within that portion of the gen-tie located outside of the array LOD, approximately 56 acres of tree removal may be needed. All other vegetation clearing within the LOD and gen-tie corridor will consist of grading existing conditions that are primarily reclaimed mine lands vegetated with sparse grass and shrubs.

Responding Witness: Bob Roy

Request No. 51:

Provide a map showing all proposed areas of vegetative clearing within the Project site.

Response:

Please refer to Response No. 50. Please also see attached map.

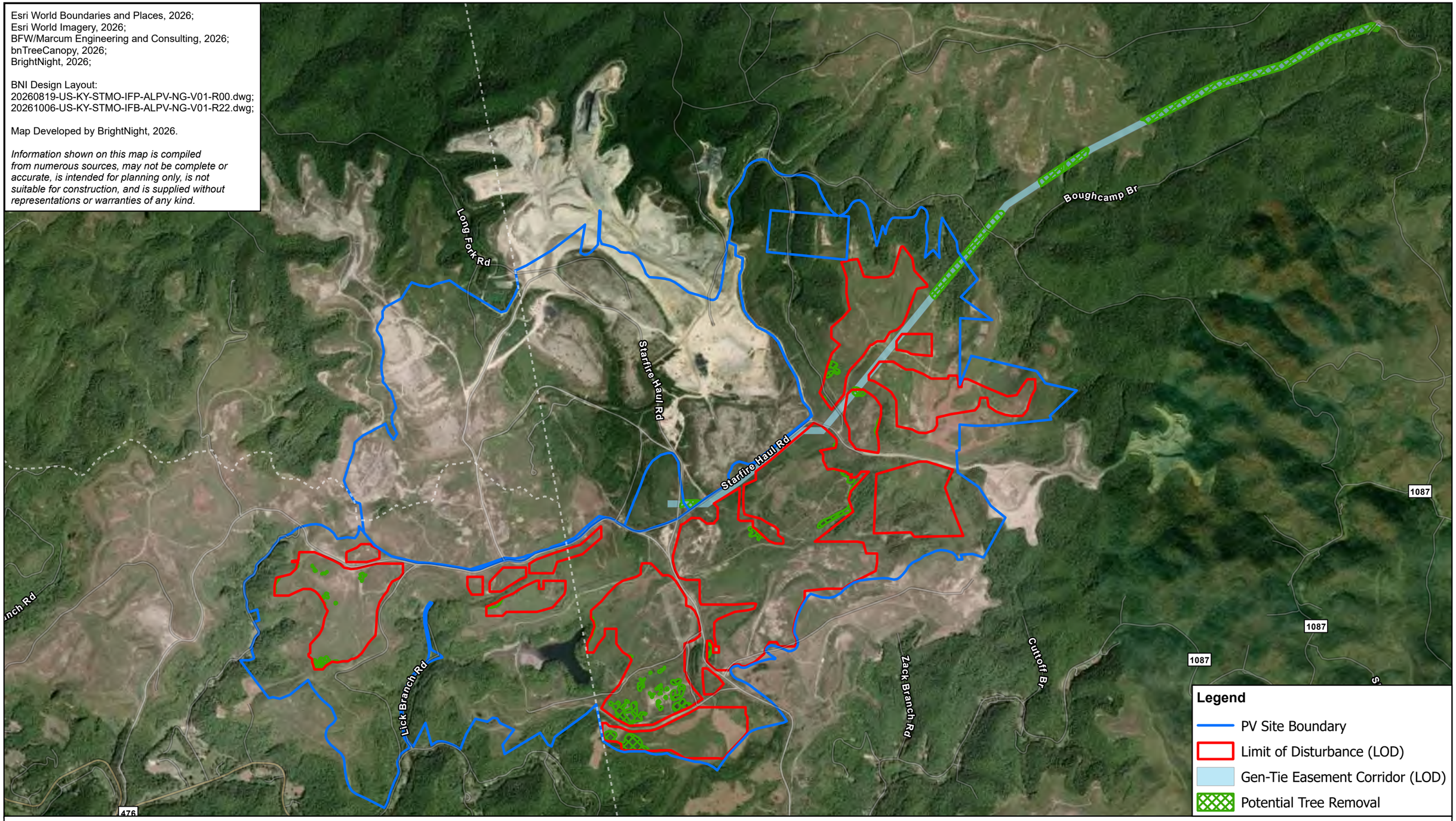
Responding Witness: Bob Roy

Esri World Boundaries and Places, 2026;
Esri World Imagery, 2026;
BFW/Marcum Engineering and Consulting, 2026;
bnTreeCanopy, 2026;
BrightNight, 2026;

BNI Design Layout:
20260819-US-KY-STMO-IFP-ALPV-NG-V01-R00.dwg;
20261006-US-KY-STMO-IFB-ALPV-NG-V01-R22.dwg;

Map Developed by BrightNight, 2026.

Information shown on this map is compiled from numerous sources, may not be complete or accurate, is intended for planning only, is not suitable for construction, and is supplied without representations or warranties of any kind.



BRIGHTNIGHT
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0 1,250 2,500 5,000 Feet
1 inch = 2,500 feet

Potential Tree Removal

Wednesday, October 21, 2026

Starfire Mountain (STMO)

Knott & Perry Co., KY

C:\Users\TomHamill\BrightNight\bnGIS - Documents\Dev\Projects\America_North\US\STMO\Pro\Figure6-STMO-KYSB-Phase2LOD-bnTreeCanopy-v03-Aerial-11x17-L.aprx

Request No. 52:

Provide a photo or visual rendering of the perimeter fencing. Provide visual renderings of Project facilities with and without vegetative screening at highly visible locations around the Project site.

Response:

A sample image of the perimeter fencing planned for the project is attached. No renderings of the fencing with and without vegetative screening are included, as no screening is planned.

Responding Witness: Bob Roy

Typical Agricultural Style Proposed Project Fencing





Request No. 53:

State any concerns or comments provided by representatives of local churches or civic organizations.

Response:

To date, no representatives of local churches have expressed any concerns or provided comments to Project representatives regarding impacts to local churches or civic organizations.

Responding Witness: Jacqui Kitchen

Request No. 54:

Provide any written or oral comments offered by the public or government agencies, from public meetings or through other communication methods, including the Project website.

Response:

During the Project's Public Information Meetings (PIMs) and during subsequent conversations, representatives of the Starfire Community Coalition noted that they had identified community priorities related to local hiring and use of unionized construction labor, community engagement, educational programming, environmental stewardship, potential use of sheep grazing, and funding for locally identified community projects. BrightNight expressed alignment with many of these objectives and is continuing discussions with the Coalition.

Responding Witness: Jacqui Kitchen

Request No. 55:

Explain whether a Complaint Resolution plan has been developed for the Project. If so, provide that document. If not, explain how Starfire will coordinate with local landowners or others in case of complaints or other issues that might arise during the course of construction or operations.

Response:

A formal Complaint Resolution plan has not been developed at this time but will be developed in advance of project construction. The Applicant anticipates developing a program similar to that created for Starfire 1 and other projects under construction and development in Kentucky.

Responding Witness: Jacqui Kitchen

Request No. 56:

Provide a list of all permits required from other local, state or federal agencies for the construction and operation of the Project, indicating the specific agency, permit type and applicability to the Project.

Response:

Please see attached.

Responding Witness: Matthew Batdorf

Starfire II Solar				
Permit/Approval	**Permitting Authority**	**Activities**	**Likelihood to Obtain**	**Permit Submittal Status**
Federal				
Clean Water Act Sec. 404 and/or Section 10 Permit(s)	U.S. Army Corps of Engineers (USACE)	Placement of Dredge or Fill Material in a Waters of the U.S.	To be Determined	Not yet submitted.
Endangered Species Act Section 7 Consultation	U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act-Listed Species and/or Critical Habitat presence; Section 7 Consultation is required if a federal permit or other federal action is required, or the project involves federal funding.	To be Determined	Not yet submitted.
National Historic Preservation Act (NHPA) Section 106	Kentucky Heritage Council — State Historic Preservation Office (KHC-SHPO)	Required if federal permit is required or the project involves federal funding. May require cultural site surveys and historic properties analysis.	To be Determined	Not yet submitted.
Pre-Screening Tool and Determination	Federal Aviation Administration (FAA)	Filing with the FAA must occur prior to construction if certain height, location, frequency, or slope criteria are met or if filing has been requested by the FAA.	Low	Not yet submitted.
Spill Prevention, Control, and Countermeasures (SPCC) Plan	U.S. Environmental Protection Agency (EPA)	Before a facility is subject to the SPCC Rule, it must meet three criteria: 1) it must be nontransportationrelated; 2) it must have an aggregate aboveground storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons; and 3) there must be a reasonable expectation of a discharge into or upon navigable waters of the United States or adjoining shorelines.	Low	Not yet submitted.
State				
Kentucky Endangered Species Protection	Kentucky Department of Fish and Wildlife Resources (KDFWR)	Incidental take of a Kentucky-listed endangered or threatened species.	To be Determined	Not yet submitted.
Construction Certificate	Kentucky State Siting Board	Construction of electric generating facilities and transmission lines that are not regulated by the Kentucky Public Service Commission.	Required	Application submitted; case in progress with KSB.
Plan Review	Kentucky Dept. of Housing, Buildings and Construction	New construction or renovations - Plan review needed to obtain a building permit.	Required	Not yet submitted.
Certificate of Occupancy	Kentucky Dept. of Housing, Buildings and Construction	Issued when construction is found to be in compliance with all applicable building codes and regulations.	Required	Not yet submitted.
Federal Water Pollution Control Act/Kentucky Pollutant Discharge Elimination System (KPDES)	Kentucky Energy & Environment Cabinet (EEC), Division of Water (DOW)	All discharges to waters of the Commonwealth of Kentucky	Required	Not yet submitted.
Kentucky KYR100000 Construction General Permit for Discharges from Construction Activities	Kentucky EEC, DOW	Stormwater runoff from construction areas greater than 1 acre.	Required	Not yet submitted.
Section 401 Water Quality Certification	Kentucky EEC, DOW	Any work or deposit/placement of dredged or fill material in streams or wetlands. Required if Section 404 permitting is required.	To be Determined	Not yet submitted.
State Floodplain Construction General Permit	Kentucky EEC, DOW	All construction across, along, or adjacent to a stream (i.e., the base floodplain) or in the floodway of a stream for which a constrauction permit is required pursuant to KRS 151.250, 44 C.F.R. Part 6, and 44 C.F.R. 64.3.	High	Not yet submitted.
Overweight/Over-dimensional permit(s)	Kentucky Transportation Cabinet (KYTC)	Transportation and use of oversize and/or overweight vehicles on KYTC roads.	High	Not yet submitted.
Encroachment/Driveway Permit(s)	KYTC	Construction of a driveway within a KYTC right-of-way	To be Determined	Not yet submitted.
Utility Crossings	KYTC	Utility work within a KYTC right-of-way.	To be Determined	Not yet submitted.
Zoning permit	Kentucky Airport Zoning Commission (KAZC)	All structures built on or near an airport must be approved/permitted by the KAZC. This includes but is not limited to buildings, antenna towers, water towers, electrical power lines (above ground), runway and taxiway extensions, apron expansion, parking lots and construction cranes.	Low	Not yet submitted.
Local				
No local permits required.				

Request No. 57:

Provide any materials submitted to other permitting agencies related to this Project.

Response:

No materials have been provided to other permitting agencies at this time.

Responding Witness: Bob Roy

Request No. 58:

Explain in detail what electrical inspections will be conducted by local, county and state agencies for this project.

Response:

The Project's selected EPC contractor will be in charge of construction and will coordinate the appropriate permits with Knott and Perry Counties and other applicable jurisdictions.

Responding Witness: Jacqui Kitchen

Request No. 59:

Provide a copy of the stormwater management plan for the project.

Response:

The Project's selected EPC contractor will develop this plan and obtain the appropriate permits regarding stormwater and groundwater. Therefore, no plan is currently available. When developed, the plan will comply with all applicable regulations.

Responding Witness: Bob Roy

Request No. 60:

Provide any environmental studies that have been completed for the project including Phase I Environmental Site Assessment for the Project.

Response:

The Phase I ESA for gen-tie portion of the Project is attached separate due to size limits. The Phase 1 ESA for the PV array portion of the Project is still in process and will be provided when it is completed.

Responding Witness: Bob Roy

Request No. 61:

Provide any historic or archeologic studies that have been planned or completed for the project site.

Response:

Please see the attached.

Responding Witness: Bob Roy

Starfire Renewable Power Project

Phase II and Gen-Tie Areas

Breathitt, Knott, and Perry Counties, Kentucky

Technical Memorandum

Purpose: Cultural Resources Assessment
Confidential Information – Not for Public Disclosure

Date: September 1, 2026

Prepared By: Melinda Winchester, Architectural Historian, and Matt Mattes, RPA, Archaeologist

Introduction

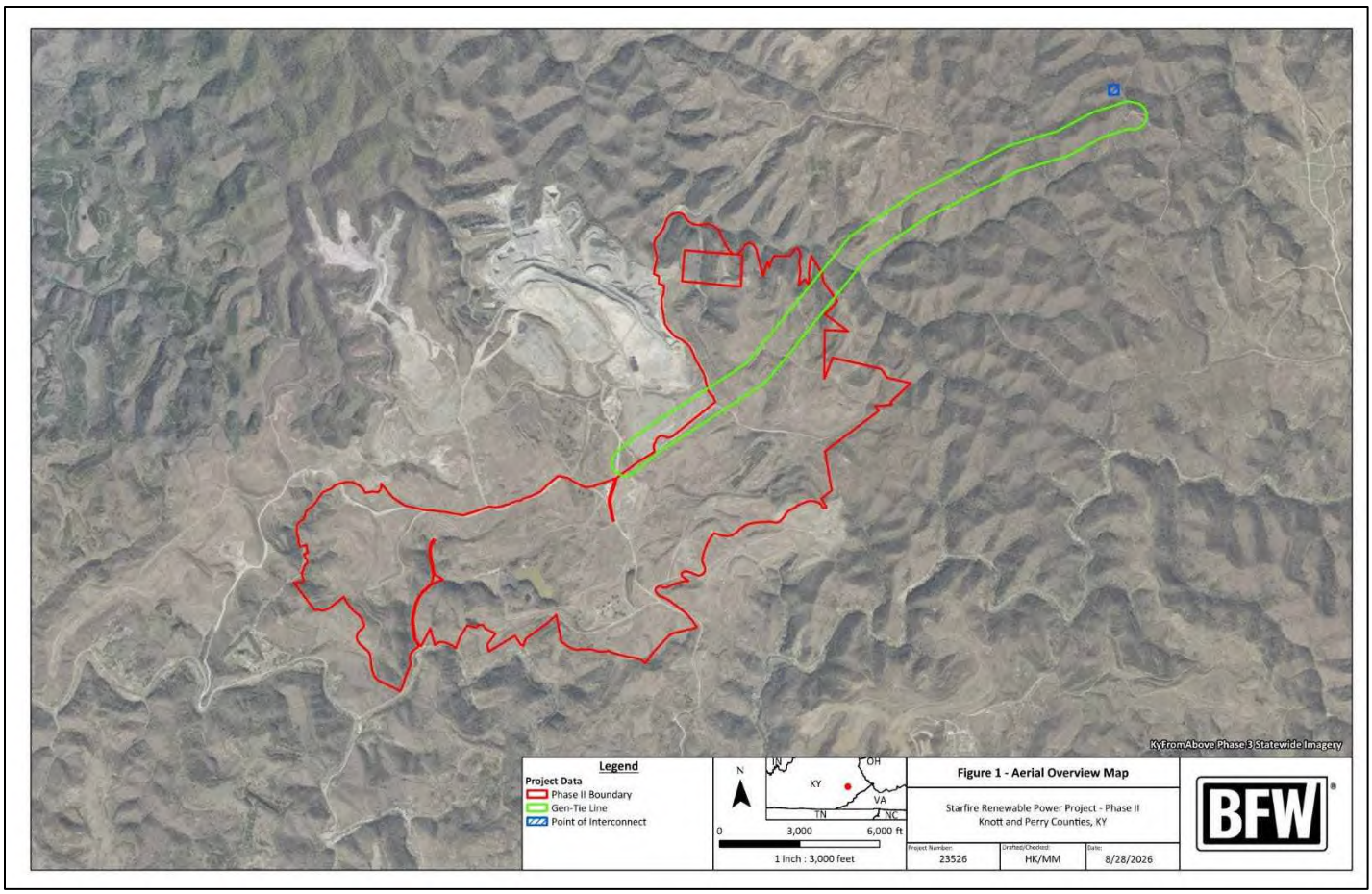
Bacon Farmer Workman Engineering & Testing, Inc. (BFW) was contracted by STMO bn, LLC (STMO) to review cultural resource conditions, including architectural history and archaeological resources, within and adjacent to the proposed Phase II and Gen-Tie areas of the Starfire Renewable Power Project (Project) in Breathitt, Knott, and Perry Counties, Kentucky. The Phase II and Gen-Tie areas are Project components where solar energy generation and transmission facilities would be constructed in Knott and Perry Counties. These areas are depicted in **Figure 1** below and in **Attachment A**. A separate memorandum addresses the Phase I area of the Project in Breathitt and Knott Counties, which is included in **Attachment B.**

The Gen-Tie component of the Project would consist of the development of 5.5 miles of transmission line through an approximately 350-yard-wide (320-meter) corridor, as well as approximately 3.2 acres of associated point-of-interconnect land in the eastern portion of the area. The landscape in the Gen-Tie area consists of rugged, steep, and forested terrain that features a system of recreational off-roading trails and two-track dirt and gravel roads maintained by the Mine Made Adventure Park. The approximate central coordinates of the Gen-Tie area are 37.42405°, -83.08493°. The Phase II component of the Project would involve the installation of solar panels and associated appurtenances across approximately 3,500 acres of reclaimed land associated with the former Starfire coal mine, which operated from the 1960s to 1990s. Development would also occur within adjacent areas of rugged, steep, and forested terrain. The central coordinates of the Phase II area are approximately 37.39702°, -83.11232°. Numerous streams, ponds, and wetlands are present within the Phase II and Gen-Tie areas and are discussed in separate BFW reports.

This memorandum provides baseline documentation of STMO's cultural resources due diligence and preparedness should the Project become a formal undertaking subject to the National Historic Preservation Act (NHPA) and its implementing regulations at 36 CFR Part 800 (Section 106). In the event that the Project constitutes a federal and/or state undertaking, additional cultural resources studies would need to be conducted in accordance with applicable regulatory requirements, including but not limited to Section 106 of NHPA; current (2017) *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* issued by the Kentucky Heritage Council / State Historic Preservation Office (KHC / SHPO); the National Register of Historic Places (NRHP); and the Advisory Council on Historic Preservation (ACHP).

In this memorandum, **Attachment A** includes map **Figures 2** and **3,** as well as a **Photo Log**. **Attachment B** contains the 2023 Phase I Area Cultural Resources Assessment.

Figure 1. Project Area Overview



Archaeological Resources Assessment

BFW received the results of a Scoping Study Records Review from the Kentucky Office of State Archaeology (OSA) on July 10, 2026 (OSA Registration No. S214535). The review addressed data and information pertaining to documented archaeological sites and previously conducted professional archaeological studies within the Phase II and Gen-Tie areas and within a 30-meter (approximately 100-foot) radius. The records review identified 24 archaeological studies conducted within the search area. All of these investigations were completed between 1987 and 2006 for Starfire mining operations. These studies are summarized in **Table A-1**, and their coverage areas relative to the Phase II and Gen-Tie boundaries are shown in **Figure 2** in **Attachment A**. Several of the previous studies included discontinuous field survey areas that were documented within single reports on file with the SHPO and OSA. As shown in **Figure 2** in **Attachment A**, study coverage gaps are primarily concentrated in the central portion of the Phase II area and the western and eastern portions of the Gen-Tie area.

According to OSA records, no archaeological sites have been documented within the Gen-Tie area. However, approximately 70 percent of the Gen-Tie area has not been covered by previously conducted archaeological studies documented in the OSA database. OSA records indicate that three archaeological sites have been documented within the Phase II area. These sites were revisited during targeted, pedestrian field reconnaissance conducted by BFW in July 2026, during which two additional sites were recorded in the Phase II area. At the time of this memorandum, none of these sites have been assessed for NRHP eligibility or formally recorded for NRHP purposes. Of the sites documented in the OSA database, a historic-period farm / residence mapped to the east of an impoundment associated with the Lick Branch (central Phase II area) was found to be no longer present (**Photo 1** in **Attachment A**), and a rockshelter mapped to the west of West Lick Road (western Phase II area) was not located during BFW's field reconnaissance.

During the July 2026 field reconnaissance, BFW located one rockshelter documented in the OSA database on the northwestern bank of the Lick Branch impoundment area (central Phase II area) (**Photo 2**). Additionally, BFW observed a cinderblock structure with historic-age glassware (**Photos 3** and **4**), located east of Williams Branch Road (western Phase II area), and a surface scatter of historic and modern household refuse (**Photos 5** and **6**) on a disturbed hill slope west of Lick Branch Road (center-west Phase II area). **Table 1** summarizes the archaeological sites documented in the OSA database and during the July 2026 field reconnaissance and provides recommendations for the Project for further treatment relative to the current conditions. BFW's field reconnaissance did not include subsurface surveying (i.e., shovel testing) or an intensive-level survey of the total Phase II and Gen-Tie areas.

Table 1. Archaeological Sites

Documentation Information	Description	Project Area Association	NRHP Status	Recommendations
Fiegel, 1996	Rockshelter	Western Phase II, west of West Lick Road	Not Assessed	Site not observed during July 2026 field reconnaissance: attempt revisit if formal Section 106 compliance needed
Vicinity of McIlhany, 1992	Rockshelter	Central Phase II, Lick Branch Impoundment area	Not Assessed	Revisit if formal Section 106 compliance needed
McIlhany, 1993; BFW July 2026 reconnaissance	Historic Farm / Residence	Central Phase II, east of Lick Branch Impoundment area	Not Recorded	No longer present: no further work
BFW July 2026 reconnaissance	Cinderblock structure and historic refuse	Western Phase II, east of Williams Branch Road	Not Recorded	Revisit if formal Section 106 compliance needed
BFW July 2026 reconnaissance	Historic-modern refuse	Center-west Phase II, west of Lick Branch Road	Not Recorded	Redeposited dump site: no further work

It is noteworthy that the 30-meter OSA records search radius would need to be expanded for compliance with KHC/SHPO standards should the Project constitute a formal undertaking subject to review under Section 106 of the NHPA. As a formal undertaking, a 2-kilometer OSA search radius would be employed from the undertaking's limits of disturbance (LOD) rather than the preliminary project boundaries analyzed in the current initial scoping phase. The LOD would constitute the archaeological Area of Potential Effect (APE) in accordance with KHC standards and Section 106 compliance. The renewed records search would also account for any nearby and/or formally registered studies and sites documented between the date of this memorandum and initiation of the undertaking. Further, archaeological studies that have covered the Phase II and Gen-Tie areas, as well as the Phase I area discussed in **Attachment B**, are likely to be determined to be too old for Section 106 compliance based on current (2017) KHC standards. Therefore, renewed field and archival research of a 2-kilometer buffer and the Project LOD is expected to be required should the Project constitute a formal undertaking under Section 106.

To supplement the archaeological records review for the proposed project, BFW also analyzed historic maps, aerial images, and soils data to assess the potential for the presence of undocumented archaeological resources.

Available U.S. Geological Survey (USGS) 7.5-minute topographic maps dating from 1891 to 2022 (USGS, Hazard KY 1891 and 1977; Troublesome KY 1914; Noble KY and Vest KY series [1954, 2010, 2013, 2016, 2019, 2022]; and Jenkins KY 1957 and 1960) were analyzed to assess prior development, apparent impacts, and the potential presence of significant historic-era archaeological resources within the Phase II and Gen-Tie areas for NRHP evaluation purposes. Historic aerial images dating from 1952 to 2024 (NETR, 2026) were also reviewed. The results of map and imagery analysis indicate that the Phase II area and western portions of the Gen-Tie area have been extensively mined since the mid-twentieth century. The 1977 Hazard, KY topographic map provides the first clearly marked mining boundaries, which are shown to expand in subsequent decades based on aerial imagery. Areas that are not clearly stripped in aerial images feature changing gravel road alignments, likely for mining haul routes and other site access improvements. No extant structures of historic age (i.e., greater than 50 years before present) are apparent on topographic maps postdating the 1954 Noble, Jenkins, and Vest, KY depictions; however, numerous structures are shown on earlier maps that cover the Phase II area. Very little development is apparent in maps and imagery covering the majority of the rugged and remote Gen-Tie area east of the mining area, although minimally engineered gravel and dirt roads that currently bisect the area are visible beginning in the 1990s.

With respect to sites recorded in the OSA database and reinvestigated during the July 2026 field reconnaissance, the historic farm / residence recorded by McIlhany (1993) in the central Phase II area is depicted on the 1914 Troublesome, KY topographic map and the 1983 aerial image. However, the resource is no longer present in the 1995 aerial image and a gravel road overlaps its location in the next available image in 2004. The impounding of the Lick Branch in the central Phase II area occurred sometime between 1995 and 2004 and inundated the area immediately south of the rockshelter documented by McIlhany (1992). This rockshelter resource was identified during the July 2026 field reconnaissance. The area west of West Lick Road, where a rockshelter was documented by Fiegel (1996), appears to be heavily mined as of 2004 and rehabilitated to the current conditions by 2022. This resource was not located during BFW's 2026 field reconnaissance and is presumed to no longer be present due to mining activities. The historic-modern refuse scatter identified by BFW on a hill slope west of Lick Branch Road could not be associated with any mapped or photo-indicated development, and the origin of this deposit is unclear. Lastly, the cinderblock structure and glassware observed by BFW in the western Phase II area near Williams Branch Road are not visible in available imagery. However, the resource appears to correspond to a structure located at the eastern end of an unnamed drive mapped on the 1954 Noble, KY map and is no longer plotted on the 1960 Jenkins, KY map.

According to the U.S. Department of Agriculture (USDA) Web Soil Survey database (USDA, 2026), numerous mapped soil types are present within the Phase II and Gen-Tie areas. The reclaimed mine land is mapped as Fiveblock, Kaymine, Fairpoint, and Bethsheda soils, with some areas mapped as Earthen Dam or Dumps (mine and tailings). Most of these soils are characterized as stony or very stony inceptisols and entisols deposited in upland settings that may have archaeological potential if undisturbed. The rugged wooded ridges and valleys are mapped as Shelocta-Cutshin-Gilpin complex, Sheloctoa-Highsplint-Gilpin complex, Handshoe-Fedscreek-Shelocta complex, Matewan-Gilpin-Marrowbone complex, and Cloverlick-Shelocta-Kimper complex. These soils are mapped as very rocky or very stony inceptisols deposited in upland settings and also have archaeological potential if undisturbed.

Current archaeological research indicates that the earliest human occupation of the region dates to transitional Pleistocene-Holocene times (ca. 10,500 years ago), and archaeological site formation is scarce prior to the Holocene. Therefore, archaeological potential is considered to be very low in transitional Pleistocene-Holocene soils and theoretically increases during the Holocene. The archaeological potential of landforms in the region is also related to the depth of A and B soil horizons (i.e., those contemporaneous with human occupation in the region) and the degree of disturbance affecting those horizons. Further, the level of disturbance influences whether archaeological materials are likely to be found intact or occur in redeposited contexts. This, in turn, factors into a site or deposit's significance and integrity for NRHP evaluation and SHPO conservation objectives, as well as a project's anticipated effects on archaeological resources. Soil A horizons have the greatest potential

to contain archaeological deposits on or near the ground surface, whereas Soil B horizons have lower potential but may contain older deposits buried by long-term or punctuated natural colluvial, fluvial, or alluvial processes or more recent built environment earthworks.

Much of the Project footprint within the Phase II and western Gen-Tie area has been extensively mined. Although the vertical and horizontal extent of ground disturbance within reclaimed mine lands in the Phase II and western Gen-Tie areas remains unclear based on available soil mapping and other reviewed sources, A and B soil horizons in these areas are mapped to depths of approximately 20 inches (50 centimeters) below ground surface (bgs). Given the mining history and the relatively shallow depth of these horizons, the potential for archaeological sites and deposits to be present and retain integrity within reclaimed mine lands is considered low. In areas not clearly impacted by mining, such as the eastern Gen-Tie area, A and B horizons of gravelly and rocky sediments are mapped to approximately 8 inches bgs (20 centimeters) and 50 inches bgs (1.5 meters), respectively. As noted above, archaeological potential is greatest in the shallow A horizons and diminishes by depth in the B horizons. Therefore, archaeological potential in the eastern Gen-Tie area is anticipated to be greatest at or near the ground surface. However, trail maintenance associated with the Mine Made trail system, along with erosion of exposed trails is likely to have impacted near-surface contexts in this area.

As a result of the mining activity in the Phase II and western Gen-Tie areas, there is low to moderate potential for significant, intact historic-era or precontact archaeological resources. Review of map and imagery sources and soils data support the assessment that the majority of this landscape has been stripped of theoretically archaeologically sensitive soils. Additionally, BFW's July field reconnaissance in the Phase II area found that a historic farm / residence (McIlhany, 1993) has been destroyed and entirely removed, and that a rockshelter (Fiegel, 1996) is also likely no longer present. However, a rockshelter mapped in the Phase II area along the northern bank of the Lick Branch Impoundment (McIlhany, 1992) remains intact, indicating that the archaeological potential of the Phase II area cannot be entirely discounted. Accordingly, this site warrants further study should the Project require compliance with Section 106 of the NHPA. During BFW's field reconnaissance, two historic-era archaeological resources were identified: a cinderblock structure with glassware near Williams Branch Road and a historic-modern refuse scatter near Lick Branch Road. The presence of these resources convey additional potential for historic archaeological sites within the Phase II area. Further field survey would elucidate their extents and NRHP eligibility. It is anticipated that the historic-modern refuse scatter would be recommended as not eligible for the NRHP due to the nature of its materials, unknown provenance, and degree of disturbance.

The Gen-Tie area east of the mining area may pose a higher degree of archaeological potential than the rest of the Project area since it is minimally developed and contains soils that may be amenable to site preservation where trails have not impacted the area. If present, archaeological materials in this setting of the Project would be expected from the ground surface to approximately 50 inches bgs (1.5 meters) and would be less likely to be present on steep slopes.

Regardless of low archaeological potential inferred from BFW's desktop study and limited field reconnaissance, a Phase I archaeological survey would need to be conducted within the LOD in the Phase II and Gen-Tie areas, should the Project constitute a formal undertaking subject to compliance with Section 106 of the NHPA. The following guidance aligns with the KHC's 2017 specifications for conducting archaeological research:

A Phase I survey would facilitate the evaluation of archaeological sites that were recorded in prior studies but have not been assessed for NRHP eligibility. Due to the age of prior field studies in the Phase II and western Gen-Tie areas, those coverage areas would need to be revisited where there is not substantial and demonstrable mining-related disturbance. The new survey would require a mixed strategy of pedestrian coverage and shovel testing, with wetlands and inundated areas, slopes greater than 20 degrees, and demonstrably disturbed mining areas omitted. Given the expansive Project area and the presence of steep terrain, desktop geomorphological research is recommended before the field survey to determine areas in which slope angles preclude coverage and to devise the appropriate coverage strategy. Areas in which vegetation or other ground cover obscures less than 50 percent of the ground surface would satisfy KHC standards for pedestrian survey methods, with the exception of rockshelters, where a minimum of five shovel probes would be required. Pedestrian survey transects

would be conducted at intervals no greater than 20-meters, and shovel probes would generally be spaced at 20-meter intervals. However, because the Gen-Tie area consists of a linear corridor approximately 350 yards (320 meters) wide, shovel probe spacing would be expanded to 30-meter intervals along both edges of the LOD.

Historic Architectural Resources Assessment

BFW conducted a records search via the KHC Cultural Resource Portal Web Service on July 24, 2026, to determine the number, nature, and location of known historic architectural resources within and adjacent to the Phase II and Gen-Tie Areas. A 0.25-mile buffer around these areas was employed to account for potential indirect impacts (e.g., obstruction of viewshed) on historic architectural resources that may result from Project activities (**Figure 3** in **Attachment A**). The buffer defines the architectural study area and serves as a preliminary delineation of the architectural APE, which would be applied should the Project need to comply with regulatory conditions summarized in the introduction of this memorandum.

The significance of the historic architectural resources identified within the desktop architectural study area was evaluated using NRHP eligibility criteria outlined in 36 CFR Part 60.6. Under these criteria, districts, sites, buildings, structures, and objects may be considered significant if they retain sufficient integrity of location, design, setting, materials, workmanship, feeling, and association, and if they meet one or more of the following conditions: association with events that contributed to broad patterns of American history; association with the lives of significant persons; embodiment of distinctive characteristics of a type, period, or method of construction, representation of the work of a master, or possession of high artistic values; representation of a significant and distinguishable entity; or the potential to yield important information about prehistory or history. For the purposes, of this survey, “historic age” was defined as resources constructed on or before the 50-year NRHP age threshold (i.e., 1976).

A desktop review of the KHC Cultural Resource portal identified one previously identified resource, PE124 (Bridge #097B00007N) over KY476 / Ball Fork Road within the southwest corner of the buffer for the Phase II area. The bridge was documented in 2019 and recommended as eligible for the NRHP. However, it was destroyed by flooding in 2022 and has been replaced with a new bridge. In addition, one coded property, the Chestnut Gap Cemetery, was identified by the KHC portal. The cemetery falls within the northwest edge of the 0.25-mile buffer for the Phase II area. This cemetery was documented as part of the Phase I area of the Project in the Breathitt and Knott Counties report, which is included in **Attachment B**.

Supplemental archival and cartographic research identified two additional cemeteries within the Phase II and Gen-Tie study areas. The Campbell Cemetery (37.42655°, -83.08462°) is located on Buckhorn Road approximately 0.05 miles (80 meters) north of the Gen-Tie area. The cemetery is in a remote area but is well kept and contains 27 documented internments (**Photo 7**). The Stacy Family Cemetery (37.8504°, 83.13871°) is located within the Phase II area (**Photos 8** to **12**). The cemetery contains 26 documented internments ranging from 1928 to1993. The site also includes a primitive open-air church clad with wood plank siding, a metal roof, wooden pews, and a pulpit. There is also an outhouse constructed of the same materials. Review of aerial imagery indicates that there are several residential structures along the south side of Balls Fork Road along the southern boundary of the 0.25-mile buffer for the Phase II area. A bluff line runs along the majority of the north side of the road in this setting, thus hindering any viewshed of the currently proposed Project. A hunting lodge and RV camp associated with BA Outdoors is located within the Phase II area (37.39012°, -83.11512°) but was constructed sometime between 2018 and 2020 (**Photo 13**).

If the proposed project constitutes an undertaking subject to Section 106 review, the previously identified cultural resources must be reexamined to confirm their NRHP eligibility and to assess the Project’s potential effects on those historic properties in accordance with 36 CFR 800.

Summary and Recommendations

As a result of the OSA records review and BFW’s limited archaeological field reconnaissance in July 2026, five archaeological resources have been documented in the Phase II area and no resources have been identified in

the Gen-Tie area. None of the resources documented in prior studies or during BFW's reconnaissance in July 2026 have been assessed for NRHP eligibility. Prior archaeological field study coverage was conducted in the 1980s and 1990s for Starfire mining undertakings and the documented coverage areas indicate that there are gaps concentrated in the central Phase II area and eastern Gen-tie area. Due to the age of these studies, current KHC requirements for archaeological field research would require renewed investigation of those study areas. Soils data and other archival sources indicate that there is low to moderate potential for the Phase II and Gen-Tie area to contain significant (for the purposes of the NRHP) and intact archaeological resources, with this potential expected to be greater in the Gen-Tie area.

Among the documented resources, one (a historic farm / residence) is known to be no longer present, and one (a rockshelter) has likely been destroyed by mining activity. The three additional resources remain in the Phase II area and include a rockshelter, a cinderblock structure with historic-age glassware, and a historic-modern refuse deposit. The historic-modern refuse deposit is likely to be ineligible for the NRHP due to the nature of its materials, uncertainty about its provenance, and its degree of disturbance. However, this resource should be revisited during any future Section 106-driven field survey in order to collect data for NRHP eligibility recommendations. Similarly, the extant rockshelter and cinderblock structure will require further field investigation to evaluate their NRHP eligibility. Future field surveys should also attempt to relocate the rockshelter that research indicates to have been destroyed by mining activities.

The desktop research and limited field reconnaissance findings presented in this memorandum provides a preliminary overview of the Phase II and Gen-Tie areas' archaeological potential but does not provide sufficient resolution or assurance for KHC review should the Project become a formal undertaking subject to compliance with Section 106 of the NHPA. Pursuant to Section 106, current KHC standards typically require a Phase I archaeological field survey of the APE. Therefore, should the Project constitute a formal undertaking, additional archaeological research would need to be conducted. This additional research would include, but not be limited to, defining the Project's scope and LOD for delineation of an archaeological APE, registering the Project with the KHC, conducting a renewed records search of the APE and a 2-kilometer buffer to characterize regional archaeological conditions and the NRHP status of documented resources in the search area, completing a Phase I survey as described in the *Archaeological Resources Assessment* section of this memorandum, and preparing an archaeological report for KHC review and approval prior to submission to the OSA.

The review of KHC records and supplemental archival sources within the architectural study area (i.e., the Phase II and Gen-Tie areas and a 0.25-mile buffer) identified three undocumented cemeteries, associated structures, and several residences that fall under the 50-year age criterion for NRHP eligibility. Cemeteries in the Project area would need to be avoided during Project implementation in accordance with applicable Kentucky and federal laws. Due to the preliminary identification of historic architectural resources in the Project area, additional field reconnaissance is recommended to ensure a reasonable and good-faith effort to identify NRHP-eligible historic properties consistent with Section 106 requirements. Such investigation would facilitate the evaluation of previously undocumented or unevaluated resources for eligibility under the NRHP criteria and determine whether historic properties are present that may be affected by the proposed Project. In accordance with Section 106 of the NHPA and KHC standards, this field study would include (but not be limited to) coordination with the KHC for establishment of a formal architectural APE that encompasses all areas subject to potential direct and indirect impact resulting from the undertaking, the assignment of KHC Historic Survey Numbers to any newly documented resources, and preparation of an Architectural Cultural Resource Report with NRHP eligibility assessments for KHC's for review, commenting, and approval.

References

Fiegel, K.H. 1996. *An Archaeological Survey Report of Star Fire Mining Company's Proposed Strip Mine in Perry County, Kentucky*. On file, Kentucky Office of State Archaeology, Lexington.

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U.S. Geological Survey (USGS). TopoViewer: 7.5-minute Series: Hazard, KY 1891 and 1977; Troublesome, KY 1914; Noble, KY 1954, 2010, 2013, 2016, 2019, and 2022; Jenkins, KY 1957 and 1960. https://ngmdb.usgs.gov/topoview/viewer/#14/37.4212/-83.1120, accessed 18 August 2026.

Table A-1. Prior Archaeological Investigations

SHPO ID	Author	Year Completed	Description	Project Area Association
060-006	McIlhany, C.W.	1987	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company Expansion Area on Lick Branch in Knott County, Kentucky	South-central Phase II
060-102	McIlhany, C.W.	1989	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company Revised Expansion Area on Lick Branch in Knott County, Kentucky	Central Phase II
060-102	McIlhany, C.W.	1989	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company Revised Expansion Area on Lick Branch in Knott County, Kentucky	South-central Phase II
060-012	McIlhany, C.W.	1989	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company, Addition to Permit Application No. 860-0047 On Lick Branch in Knott and Perry Counties, Kentucky	North-central Phase II
060-012	McIlhany, C.W.	1989	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company, Addition to Permit Application No. 860-0047 On Lick Branch in Knott and Perry Counties, Kentucky	North-central Phase II
060-012	McIlhany, C.W.	1989	A Phase I Investigation of Archaeological Resources at the Star Fire Mining Company, Addition to Permit Application No. 860-0047 On Lick Branch in Knott and Perry Counties, Kentucky	North-central Phase II
060-037	McIlhany, C.W.	1992	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Mine Site on Hurricane Branch in Knott County, Kentucky	Northeast Phase II

SHPO ID	Author	Year Completed	Description	Project Area Association
097-044	McIlhany, C.W.	1992	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 860-0047, Amendment No. 3 on Lick Branch in Perry County, Kentucky	Central Phase II
097-044	McIlhany, C.W.	1992	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 860-0047, Amendment No. 3 on Lick Branch in Perry County, Kentucky	Central Phase II
060-041	McIlhany, C.W.	1992	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 860-0047, Amendment No. 3 on Lick Branch in Perry and Knott Counties, Kentucky	Central Phase II
060-041	McIlhany, C.W.	1992	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 860-0047, Amendment No. 3 on Lick Branch in Perry and Knott Counties, Kentucky	Central Phase II
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	North-central Phase II
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	North-central Phase II
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	Central Phase II

SHPO ID	Author	Year Completed	Description	Project Area Association
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	South-central Phase II
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	South-central Phase II
060-057	McIlhany, C.W.	1993	A Phase I Investigation of Archaeological Resources at the Star Fire Coal Company Permit Application No. 460-0080, Amendment No. 2 on Lick Branch in Perry and Knott Counties, Kentucky	Central Phase II
060-064	Fiegel, K.H.	1994	An Archaeological Survey Report of the Proposed Star Fire Mining Company Mining Operation Between Hurricane Branch and Buckhorn Creek Near Ary, Knott County, Kentucky	Eastern Phase II and western Gen-Tie
060-075	Hand, R.B.	1996	A Coal Mine Survey Along Buckhorn Creek in Knott County, Kentucky	Eastern Phase II and western Gen-Tie
097-067	Fiegel, K.H.	1996	An Archaeological Survey Report of Star Fire Mining Company's Proposed Strip Mine in Perry County, Kentucky	Western Phase II
013-069	Hand, R.B.	1997	A Coal Mine Survey along Spring Gap Branch in Perry, Breathitt & Knott Counties, Kentucky	North-central Phase II

SHPO ID	Author	Year Completed	Description	Project Area Association
013-076	Hand, R.B.	1997	A Coal Mine Survey along Long Fork and Buckhorn Creek in Knott and Breathitt Counties, Kentucky	Northeastern Phase II and western Gen-Tie
013-101	Hand, R.B.	2022	An Archaeological Survey of a Proposed Coal Mine Operation along Chestnut Gap Branch in Breathitt County, Kentucky	Northwestern Phase II
060-162	Hand, R.B.	2006	An Archaeological Survey of the Proposed ICG Hazard, LLC Coal Mine Operation along Balls Fork in Knott County, Kentucky	Southeastern Phase II

Attachment A
Maps and Photo Log

Maps

KyFromAbove Phase 3 Statewide Imagery

Legend

Project Data

- Phase II Boundary
- Gen-Tie Line
- Point of Interconnect

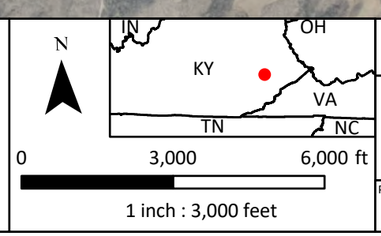
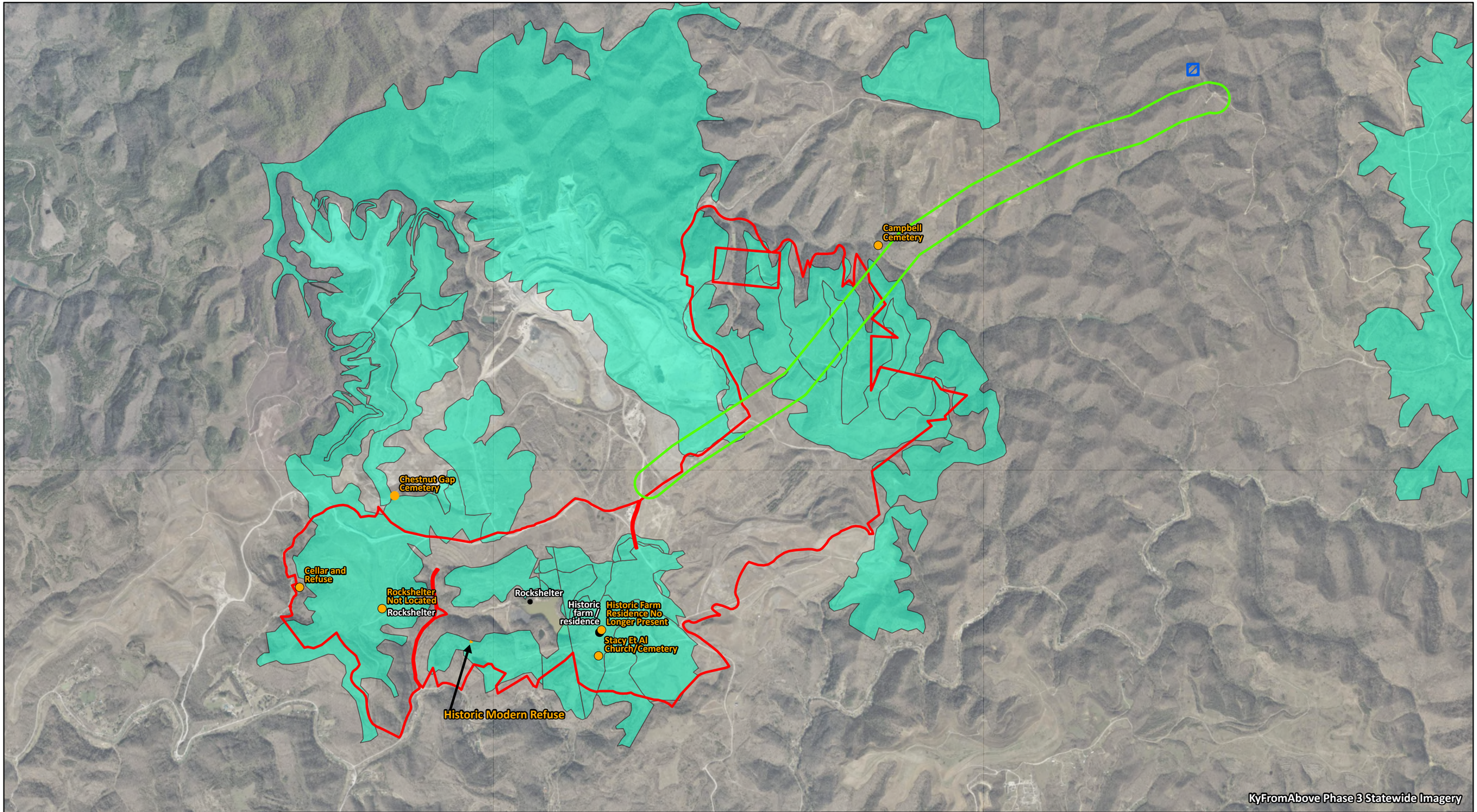


Figure 1 - Aerial Overview Map

Starfire Renewable Power Project - Phase II
Knott and Perry Counties, KY

Project Number:	Drafted/Checked:	Date:
23526	HK/MM	8/28/2026

BFW®



Legend

Project Data
- Phase II Boundary
- Gen-Tie Line
- Point of Interconnect

Field Data
- Cultural Point
- Cultural Polygon

OSA Data
- Archaeological Site Locations
- Archaeological Project Areas

N

IN OH KY VA TN NC

0 3,000 6,000 ft

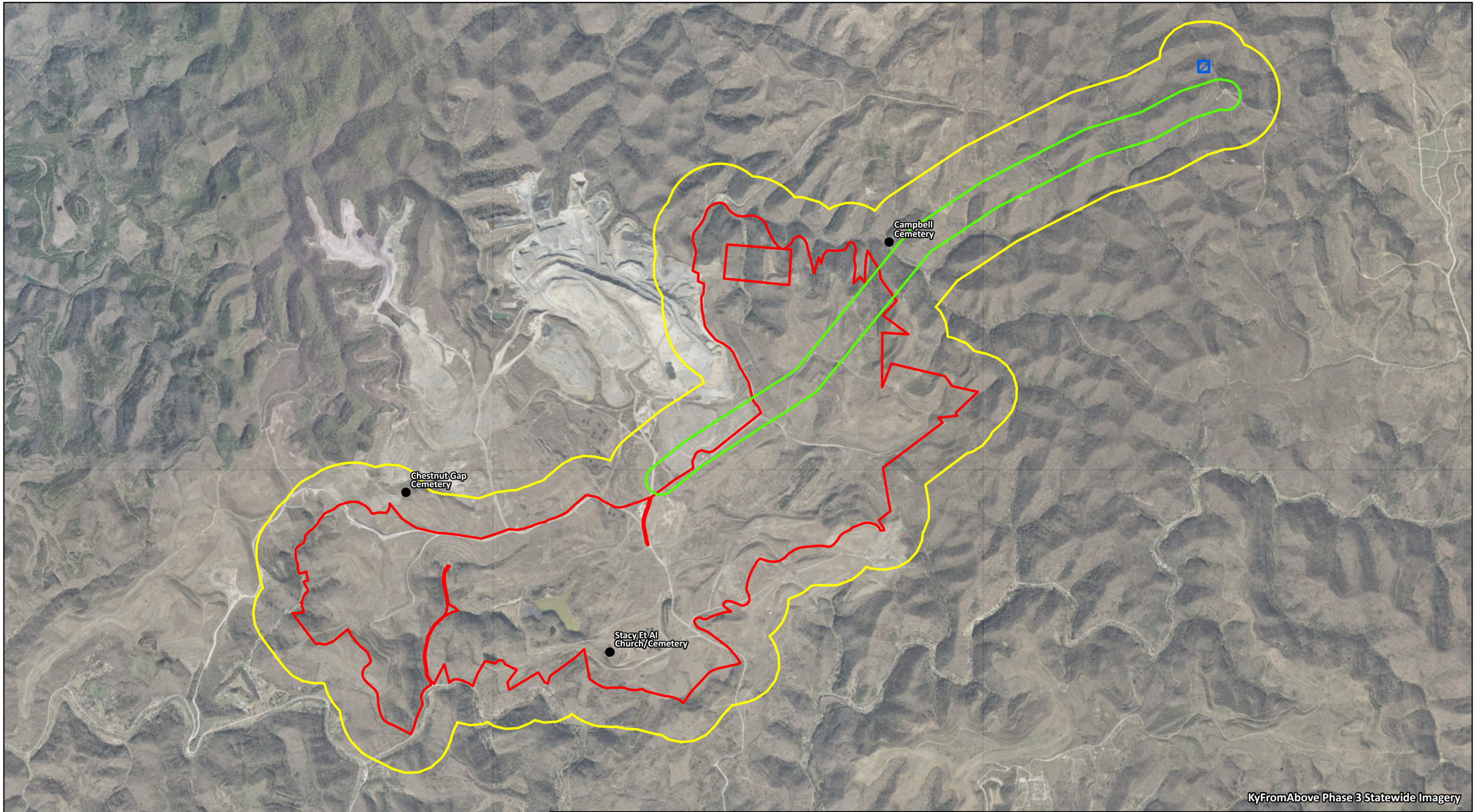
1 inch : 3,000 feet

Figure 2 - Archaeological Overview Map

Starfire Renewable Power Project - Phase II
Knott and Perry Counties, KY

Project Number:	Drafted/Checked:	Date:
23526	HK/MM	8/28/2026

BFW®



Legend

Project Data

- Cemeteries
- Phase II Boundary
- 0.25 Mile Buffer
- Gen-Tie Line
- Point of Interconnect

N

IN OH KY VA TN NC

0 3,000 6,000 ft

1 inch : 3,000 feet

Figure 3 - Architectural Overview Map

Starfire Renewable Power Project - Phase II
Knott and Perry Counties, KY

Project Number:	Drafted/Checked:	Date:
23526	HK/MM	8/28/2026

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Photo Log



Photograph 1: Former location of a historic farm / resident site documented in the OSA database within the central Phase II area, view southwest. July 28, 2026.



Photograph 2: Rockshelter at the northern bank of the Lick Branch impoundment in the central Phase II area, view northwest. July 29, 2026.



Photograph 3: Cinderblock structure in the western Phase II area east of Williams Branch Road, view east. July 30, 2026.



Photograph 4: Glassware in the cinderblock structure in the western Phase II area, east of Williams Branch Road. July 30, 2026.



Photograph 5: Historic-modern refuse scatter on hillslope east of Lick Branch in the center-west Phase II area. July 30, 2026.



Photograph 6: Representative historic and modern beverage cans at the hillslope refuse scatter east of Lick Branch in the center-west Phase II area. July 30, 2026.



Photograph 7: Overview of the Campbell Cemetery located north of the Gen-Tie area, view northwest. Photo obtained from online sources on August 17, 2026.



Photograph 8: Overview of the Stacy Family Cemetery and church in the Phase II area, view north. July 29, 2026.



Photograph 9: Outhouse at that Stacy Family Cemetery and church in the Phase II area, view west. July 29, 2026.



Photograph 10: Overview of the church at the Stacy Family Cemetery in the Phase II area, view north. July 29, 2026.



Photograph 11: Interior of the church at the Stacy Family Cemetery in the Phase II area, view west. July 29, 2026.



Photograph 12: Interior of the church at the Stacy Family Cemetery in the Phase II area, view east. July 29, 2026.



Photograph 13: Modern construction at the BA Outdoors Hunting Lodge and RV Park in the Phase II area, view east. July 29, 2026.

Attachment B
Starfire Renewable Power Project – Phase I Area – Cultural Resource Assessment, 2023

BACON | FARMER | WORKMAN
ENGINEERING & TESTING, INC.
500 SOUTH 17TH STREET | PADUCAH, KY 42003

Technical Memorandum

Cultural Historic Review

In October of 2023, Bacon Farmer Workman Engineering and Testing, Inc. (BFW) was contracted by STMO bn, LLC and BrightNight, LLC (BN) to evaluate potential NRHP eligible non-archaeological resources in the proposed project area in Breathitt, Knott, and Perry Counties, Kentucky. The subject property encompasses approximately 1,800 acres consisting of 17 parcels owned by the same entity. These properties are part of a mining site that is referred to as the Starfire site and include properties owned by Liberty Land, LLC. This area is currently under varying stages of mining and reclamation. As part of this undertaking and in anticipation of a federal nexus, a preliminary Cultural Historic survey was completed to begin the process for Section 106 review. As the project becomes more defined, a more detailed report will need to be completed in accordance with the National Historic Preservation Act (NHPA) and its implementing regulations, 36 CFR Part 800 to identify, document, and assess National Register of Historic Places (NRHP) eligibility and effect for historic-age architectural resources.

Property data records were collected from the Breathitt, Knott, and Perry County Property Valuation Administrator (PVA) Offices. BFW also reviewed historic-period aerial photographs, and topographic maps. Due to the rural nature of the area, historical records, histories, and PVA records provided limited information. This area is also unmapped for any historic Sanborn Fire Insurance maps.

A site check was initiated with the Kentucky Heritage Council Site Check Web Service which identified no previously recorded historic resources within the proposed project Boundary. A reconnaissance level survey of the built environment was conducted to identify and evaluate non-archaeological resources. The area is primarily rural and there are no additional above ground resources within the defined project boundary.

The survey identified one documented cemetery, Chestnut Gap Cemetery located at the southwest corner of the project boundary (37°24’16.80”, -83°08’27.57”). The site is located on a hillside and protected by a chain link fence (See Photos 1-3). The survey concluded there are approximately 22 identifiable internments ranging from 1883-1983.

During onsite reconnaissance for the Phase I Environmental Site Assessment (ESA) which occurred on October 18, 2023, one undocumented cemetery was also identified. This cemetery was the Smokey Hollow Cemetery and lies approximately 600 feet from the project boundary. It appears to have approximately eight internments ranging from 1937-2018. The site was also protected by a chain link fence (See Photos 4-6).

The potential for adverse effects to the two identified cemeteries can be considered low due to the topographic locations and current steps which have already been taken to secure the locations with chain link fencing. Recommendations may include documentation of the internments in the cemeteries if permission is granted by trustees and additional research and evaluation to determine if the cemeteries may be potentially eligible for listing on the National Register of Historic Places under Criteria A, B, C, or D.

Archaeological Review

Kentucky Office of State Archaeology illustrates 13 previously recorded archaeological sites within two km of the project corridor and none within the project area. Eight of these sites are recorded as prehistoric, four historic, and one mixed component historic and prehistoric. The closed recorded site (15Br207) is a cemetery which lies roughly 50 m outside the northwest boundary of the project area. This cemetery was further discussed in the preliminary above ground cultural resource assessment. All other previously recorded sites are no closer than 400 m to the project boundaries. Six previous cultural surveys have included parts of the current project area. None of these surveys recorded culturally significant resources within the bounds of the project.

Review of available historic USGS Topographic Quadrangles illustrates several homesteads within the project area as early as the 1914 Troublesome, KY 15' Quad. These are reduced to a single homestead on the 1954 Noble, KY 7.5' map. This structure is illustrated at the confluence of the Chestnut Gap Branch and Spring Gap Branch in the Breathitt County portion of the project. These maps also indicate that the area had been used for mining activities as early as the 1960 Jenkins 1° x 2° Quadrangle.

Historic aerials of the area are available dating back to 1952 (available through www.HistoricAerial.com). The 1952 aerial of the area reveals no obvious mining activity at the time of the photograph. However, from at least 1983 and all available aerials since, it is evident that mining activities have significantly affected the project area. Based on this imagery it is apparent that no areas within the project boundaries, with the exception of the extant Chestnut Gap Cemetery (briefly described in the above ground assessment), were untouched by the mining.

Based on the above desktop review of the area, it is unlikely that any archaeological survey would produce any culturally significant resources.



Photo 1 - Chestnut Gap Cemetery – View of Wooded Parcel on Hillside



Photo 2 – Chestnut Gap Cemetery



Photo 3 – Chestnut Gap Cemetery



Photo 4 – Smokey Hollow Cemetery



Photo 5 - Smokey Hollow Cemetery



Photo 6 - Smokey Hollow Cemetery

Request No. 62:

Provide a copy of the Groundwater Protection Plan.

Response:

See Response to Request No. 59.

Responding Witness: Bob Roy

Request No. 63:

Provide the Construction Dust Control Plan for the project.

Response:

The Project's selected EPC contractor will develop this plan prior to the start of construction.

Responding Witness: Colin Cannon

Request No. 64:

Provide any communication representatives of Starfire have had with any of the property owners surrounding the project. Explain whether any changes have been made to the project based upon those concerns.

Response:

Starfire representatives have communicated with surrounding property owners through mailed notices, individual landowner meetings, and the Public Information Meetings (PIMs) held in Knott and Perry Counties on May 14, 2026; representative notices and outreach materials are included in Application Exhibit F. Separate discussions with adjoining owners have addressed property-boundary confirmation and surveying. PIM attendees asked about job creation, wildlife impacts, and site maintenance, and the Application reports that no concerns were raised at those meetings that required subsequent attention. Given that no adjoining property owners will have views of the Project or otherwise be impacted by operations, no Project design changes attributable to concerns raised by surrounding property owners were identified in the records reviewed.

Responding Witness: Jacqui Kitchen

Request No. 65:

State the number of residential structures that may have a view of any portion of the Project, including fencing, solar arrays, substation or other infrastructure.

Response:

The Project is not anticipated to be visible from residential structures.

Responding Witness: Matthew Batdorf

Request No. 66:

Provide how many residential neighborhoods exist within 2,000 feet of the Project.

Response:

Two neighborhoods exist within 2,000 feet of the Project boundary. At the time of filing the Application, Starfire indicated its intent to seek a deviation from the setback requirement contained in KRS 278.704(2)(b) in order to place certain generation equipment closer than 2,000 feet from the identified residential neighborhoods. Upon closer examination, the two identified residential neighborhoods are located within 2,000 feet of the Project's boundary but are located more than 2,000 feet to the structures or facilities used in connection with the generation of electricity. The table below shows the distance from the closest point of the nearest receptor (*e.g.*, residential structure) within each identified residential neighborhood to the closest point of major Project site features.

Neighborhood	Distance to Boundary (Feet)	Distance to Fence (Feet)	Distance to Panel (Feet)	Distance to Inverter (Feet)	Distance to Substation (Feet)
1	1,866 (R-14)	3,547 (R-14)	3,606 (R-14)	4,420 (R-14)	13,953 (R-14)
2	1,189 (R-41)	3,907 (R-43)	3,933 (R-43)	4,783 (R-43)	9,300 (R-41)

As shown on the table above, the closest point of the nearest home in each residential neighborhood is located within 2,000 feet of the Project boundary but is located greater than 3,600 feet from a solar panel. Because the distances between the closest receptor in a residential neighborhood and the Project's generation infrastructure is greater than 2,000 feet, these distances do not require a deviation from the setback requirements in KRS 278.704(2). Thus, the Applicant will not seek a

deviation to place generation infrastructure closer than 2,000 feet from a residential neighborhood as previously disclosed to the Siting Board.

Responding Witness: Matthew Batdorf

Request No. 67:

Provide a photo or visual rendering of the perimeter fencing.

Response:

See Response to Request No. 52.

Responding Witness: Bob Roy

Request No. 68:

Provide the total linear, of fence line that will secure the site.

Response:

Approximately 120,000 feet of perimeter fencing will be installed as part of Starfire 2.

Responding Witness: Colin Cannon

Request No. 69:

Provide how many linear feet of collection system cables will be installed throughout the project.

Response:

Approximately 430,000 feet of medium voltage alternating current collection conductor will be installed as part of Starfire 2.

Responding Witness: Colin Cannon

Request No. 70:

Provide any interconnection studies for the project.

Response:

Please see Exhibit C of the Project Application. No additional interconnection studies have been received at this time.

Responding Witness: Jacqui Kitchen

Request No. 71:

Provide a Fire Prevention and Management Plan for the project.

Response:

The Project's selected EPC contractor will develop this plan prior to the start of construction.

Responding Witness: Jacqui Kitchen

Request No. 72:

Provide any geotechnical desktop studies for the project.

Response:

Please see attached separately due to file size limits.

Responding Witness: Colin Cannon

Request No. 73:

Provide a stream and wetland delineation study for the project.

Response:

Please see the studies provided separately due to file size limits.

Responding Witness: Bob Roy

Request No. 74:

Explain whether the site layout plan will be modified based on the Wetland Delineations Study.

Response:

Jurisdictional wetlands and streams identified during the in-field wetland delineations will be avoided to the greatest extent possible for project construction. Impacts to jurisdictional features that cannot be avoided will permitted with appropriate federal and state agencies prior to construction activities impacting those locations. However, modification is not anticipated at this time.

Responding Witness: Bob Roy

Request No. 75:

Provide a Wildlife Concerns Analysis for the project.

Response:

Please see the attached.

Responding Witness: Bob Roy

Starfire Renewable Power Project – Phase II

Knott and Perry Counties, Kentucky

Protected Species Review

Submitted to:

STMO bn, LLC

c/o: Mr. Bob Roy

515 N Flagler Drive, Suite 250

West Palm Beach, FL 33401

Submittal Date:

October 5, 2026

BFW Ref. #23526

October 5, 2026

Mr. Bob Roy
STMO bn, LLC
515 N Flagler Drive, Ste 250
West Palm Beach, FL 33401

RE: Protected Species Review
Starfire Renewable Power Project – Phase II
BFW Project No: 23526

Dear Mr. Roy:

Bacon Farmer Workman Engineering & Testing, Inc. (BFW) is pleased to submit our report documenting the findings of the Protected Species Review for the Starfire Renewable Power Project – Phase II. The study area for the project is located in Knott and Perry Counties, Kentucky, and it includes approximately 3,260 acres. The purpose of this review was to evaluate and document whether suitable habitat is present for protected species with the potential to be present in the vicinity of the project.

The project area contains a mix of reclaimed strip-mined land and rugged wooded terrain. Habitats within the reclaimed mined areas include open field, scrub-shrub habitat, and young forest. Suitable habitat is present within the study area for the gray bat, Indiana bat, northern long-eared bat, tricolored bat, Kentucky arrow darter, and monarch butterfly. The study area is located approximately 1.75 stream miles downstream of a unit of Kentucky arrow darter critical habitat (Unit 1 - upper Buckhorn Creek and Prince Fork).

Approximately 1,038 acres of wooded habitat in the study area provide suitable summer roosting and foraging habitat for the Indiana bat, northern long-eared bat, tricolored bat, and some state-listed bats. Clearing of suitable wooded habitat for permitted projects can often be authorized through arranging a payment to the Imperiled Bat Conservation Fund with the U.S. Fish and Wildlife Service.

We appreciate the opportunity to serve you and look forward to future association with you on this and other projects. If you have questions concerning this report or require further clarification of the findings, please call our office at (502) 526-3613.

Sincerely,

Christian Slone

Christian Slone, FP-A, WPIT
Environmental Scientist

Laura Darnell

Laura Darnell, PWS
Wetland Scientist / Ecologist

Attachment: Protected Species Review Report

TABLE OF CONTENTS

1. INTRODUCTION 1
1.1 PURPOSE 1
2. METHODOLOGY FOR ANALYSIS 2
2.1 DATABASE INQUIRES 2
2.2 DOCUMENT REVIEW 2
2.2.1 Past Biological Surveys by Others 2
2.3 SITE VISITS 2
3. SITE DESCRIPTION 3
3.1 TOPOGRAPHY 3
3.2 GEOLOGY AND SOILS 3
3.3 TERRESTRIAL HABITATS 4
3.3.1 Planted Forestry Research Plot 4
3.4 AQUATIC AND WETLAND HABITATS 5
3.4.1 Streams 5
3.4.2 Wetlands and Open Waters 7
3.5 UNDERGROUND HABITATS AND MAN-MADE FEATURES 7
3.5.1 Mine Portal Records 8
3.6 PROTECTED LANDS IN THE VICINITY 9
4. FINDINGS FOR FEDERALLY-PROTECTED SPECIES AND CRITICAL HABITAT 11
4.1 DESIGNATED CRITICAL HABITATS 12
4.1.1 Kentucky Arrow Darter (*Etheostoma spilotum*) Critical Habitat 12
4.2 MAMMALS 13
4.2.1 Gray Bat (*Myotis grisescens*) 13
4.2.2 Indiana Bat (*Myotis sodalis*) 13
4.2.3 Northern Long-eared Bat (*Myotis septentrionalis*) 15
4.2.4 Tricolored Bat (*Perimyotis subflavus*) 15
4.3 FISH 16
4.3.1 Kentucky Arrow Darter (*Etheostoma spilotum*) 16
4.4 BIRDS 18
4.4.1 Bald Eagle (*Haliaeetus leucocephalus*) 18
4.4.2 Migratory Birds 18
4.5 INSECTS 19
4.5.1 Monarch Butterfly (*Danaus plexippus*) 19
5. STATE-LISTED SPECIES 20
5.1 HABITAT DESCRIPTIONS 20
5.2 STATE-LISTED SPECIES DISCUSSION 22
6. DISCUSSION 23
7. REFERENCES 25

LIST OF EXHIBITS AND TABLES

Exhibit 1. Project Vicinity Map....1
Table 3-1. Mine Portal Records Within or in Close Proximity to Study Area....9
Table 4-1. Summary of Federally-Protected Species....11
Table 4-2. Perennial Stream Habitat Data....17
Table 5-1. Summary of State-Listed Species....21

LIST OF APPENDICES

Appendix A – Figures

Figure 1: USGS Topographic Map

Figure 2: Aerial Photograph Map

Figure 3: Priority Waters Map

Figure 4: Site Habitat Map

Figure 5: Mine Portals Map

Figure 6: Known Indiana Bat Habitat Map

Figure 7: Known Northern Long-Eared Bat Habitat Map

Appendix B – Resource Agency Correspondence

Appendix C – Site Photographs

LIST OF ACRONYMS AND ABBREVIATIONS

BFW	Bacon Farmer Workman Engineering & Testing, Inc.
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
cm	centimeter
DBH	Diameter at Breast Height
ECOS	Environmental Conservation Online System
EEC	Energy and Environment Cabinet
EPA	Environmental Protection Agency
ESA	Endangered Species Act
IBCF	Imperiled Bat Conservation Fund
IPaC	Information for Planning and Consultation
KDFWR	Kentucky Department of Fish and Wildlife Resources
KDOW	Kentucky Division of Water
KFO	Kentucky Field Office
KGS	Kentucky Geological Society
KPDES	Kentucky Pollutant Discharge Elimination System
KRS	Kentucky Revised Statutes
KSNPC	Kentucky State Nature Preserves Commission
MBTA	Migratory Bird Treaty Act
MSL	Mean Sea Level
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
OKNP	Office of Kentucky Nature Preserves
OSRW	Outstanding State Resource Water
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub-Shrub
RBP	Rapid Bioassessment Protocol
RV	Recreational Vehicle
SGCN	Species of Greatest Conservation Need
SKM	Stream Kilometer
SMI	Stream Mile
µS	microsiemens
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

USGS	United States Geological Survey
WMA	Wildlife Management Area

1. INTRODUCTION

Bacon Farmer Workman Engineering & Testing, Inc. (BFW) performed a Protected Species Review for Phase II of the Starfire Renewable Power Project (**Figures 1 and 2**). The project coordinates are 37.4020, -83.1143. The study area for the project is located in Knott and Perry Counties, Kentucky, and it includes approximately 3,260 acres of reclaimed mine land and rugged wooded slopes. The field work for this phase was completed on July 13 through 17 and July 27 through 30, 2026. Figures referred to in this text are included in **Appendix A** at the end of this report.

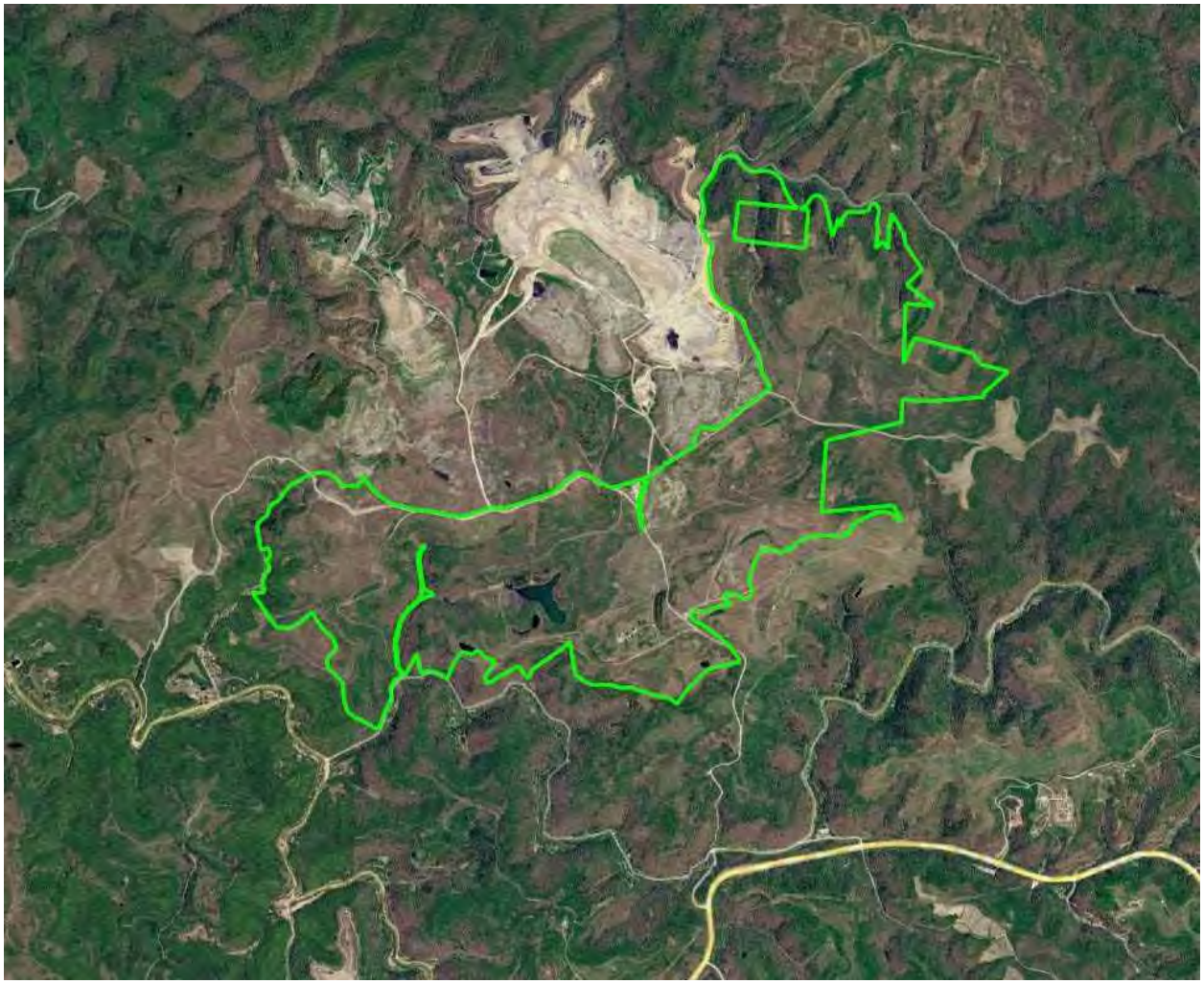


Exhibit 1. Project Vicinity Map

1.1 PURPOSE

The purpose of the assessment was to determine if habitats for protected species were present or potentially present within the study area. The species to be evaluated were identified using the United States Fish & Wildlife Service (USFWS) Information for Planning and Consultation webpage (IPaC) as well as the Natural Heritage Program Database maintained by the Office of Kentucky Nature Preserves (OKNP).

2. METHODOLOGY FOR ANALYSIS

2.1 DATABASE INQUIRES

The protected listed species evaluated were identified using the USFWS IPaC database. The "action area" that was reviewed for the project consisted of the study area boundary as shown in **Figure 1**. An updated IPaC letter with a list of protected species that could be present was generated on September 23, 2026, and is included in **Appendix B**. The species that were evaluated are listed in **Section 4.0** below. Note that if consultation with the USFWS under Section 7 of the Endangered Species Act (ESA) is required, a detailed analysis of project development plans may find that the site assessment area or project action area need to be expanded to include adjacent land that could be affected by the project.

A query was also submitted to the Natural Heritage Program Database maintained for the State of Kentucky by the OKNP on August 11, 2026. The OKNP database includes records for both federally-listed species and state-listed species. The cover letter for the inquiry is included in **Appendix B**.

2.2 DOCUMENT REVIEW

Contextual maps, databases, and scientific publications were reviewed to gather vital background data on physical and biological characteristics of the site, protected species with historical ranges within the site vicinity, and descriptions of listed species and their habitats. These resources were utilized to define habitat characteristics that would be identifiable and aid in assessing potential habitat during the site visit. These resources are listed in **Section 7 (References)** of this report.

2.2.1 Past Biological Surveys by Others

Past mining activities at the Starfire site and nearby mine sites required permits and authorizations from several government resource agencies. As part of this process, threatened and endangered species would be among the issues addressed. Some of the study area may have been overlapped by previous biological surveys.

As part of the Starfire site permitting overview and history, RESPEC prepared a list of biological surveys that were previously conducted on or in the vicinity of the site (RESPEC 2023). The listed activities included surveys and correspondence with government agencies regarding protected species that occurred from 2002 to 2017. Bats and aquatic surveys are among the issues noted. However, BFW has no information at this time regarding the extent or findings of these studies. It is assumed that any listed species captured during biological surveys would be recorded in the Natural Heritage Program Database maintained by the OKNP. An overview of the OKNP records is provided below in **Sections 4 and 5.**

2.3 SITE VISITS

After reviewing the applicable documents, site visits were conducted to characterize on-site habitats and determine if potential suitable habitat was available for the species listed in the database reviews. The site visits for this phase were conducted on July 13 through 17 and July 27 through 30, 2026. The visits were supplemented with habitat observations from site visits that were conducted to assess the Starfire gen-tie corridor and West Lick Road corridor. Those site visits were conducted in March 2026, and the findings were presented in a report (BFW 2026a).

3. SITE DESCRIPTION

The project site is located in the Central Appalachians Level III ecoregion, and the Dissected Appalachian Plateau Level IV ecoregion according to the Environmental Protection Agency's (EPA's) ecoregion mapping system (Woods et al. 2002). This area is composed of narrow ridges, deep coves, and narrow valleys and is mostly forested. Cool, high gradient streams with cobble and boulder substrates and extensive riffles are common. Most of the ecoregion is forested but the forest composition is highly variable and controlled by aspect, slope position, past usage, and degree of topographic shading. Surface and underground coal mining, logging, and both gas and oil production are common in this ecoregion and have degraded some surface waters. Phase II of the Starfire project lies mainly on land which was previously strip mined and reclaimed.

3.1 TOPOGRAPHY

The topography of the study area is a mix of reclaimed mine land and rugged wooded valleys. The majority of the reclaimed mine land is shaped in a benched pattern, with large areas of flat ground interspersed with steep slopes. Most of the reclaimed steep slopes have a series of constructed berms running parallel with the slope contours that have been installed at intervals from the top to bottom of the slope.

The western edge of the site drains westward into several tributaries of Williams Branch, which flows southward and eventually drains into Balls Fork. The west-central section of the site (west of the main north-to-south haul road) drains into Lick Branch, which flows southward and drains into Balls Fork just outside the southern site boundary. The northeastern section of the site drains northward into several tributaries of Buckhorn Creek, which flows westward along the northeastern boundary of the site. The east central section of the site does not have any major extant streams and surface water is retained in low areas without flowing off site. The position of the site in relation to local streams is depicted in **Figure 3.**

Surface elevations in the study area range from a high point of around 1,520 feet above mean sea level (msl) on the highest benched landforms down to around 850 feet at the lower end of Lick Branch. See **Figure 1** for a United States Geologic Survey (USGS) 7.5-Minute topographic map of the site.

3.2 GEOLOGY AND SOILS

According to the available subsurface geologic mapping from the Kentucky Geological Survey, the site is underlain primarily by the Princess Formation on the ridgetops and by the Four Corners Formation and Hyden Formation on hillslopes. The primary lithology of these geologic units are sandstone, shale, coal, and underclay, with some siltstone, limestone, chert, and conglomerate. The valley along Buckhorn Creek is underlain by Alluvium which has a primary lithology of silt, sand, clay, and gravel.

Based on the Natural Resources Conservation Services (NRCS) Soil Survey, numerous mapped soils types are present within the study area. The soil mapping has a marked transition in soil types at the Perry/Knott County line, but this change appears to arise primarily from different classifications in the two soil surveys and not from a change in the underlying soil characteristics. The reclaimed mine land is mapped as mainly Fiveblock, Kaymine, Fairpoint, and Bethsheda soils, with some areas mapped as Earthen Dam or Dumps (mine and tailings) complex. Most of these soils are mapped as stony or very stony. The rugged wooded ridges and valleys are mapped as mainly Shelocta-Cutshin-Gilpin complex, Shelocta-Highsplint-Gilpin complex, Handshoe-Fedscreek-Shelocta complex, Matewan-Gilpin-

Marrowbone complex, and Cloverlick-Shelocta-Kimper complex. Most of these soils are mapped as very rocky or very stony. None of these soils are classified as hydric.

Some small low-lying areas along the larger creeks are mapped as Grigsby fine sandy loam (frequently flooded) and Udorthents-Urban Land-Grigsby complex. Grigsby fine sandy loam (frequently flooded) is listed as having hydric inclusions. A large area of water is mapped at the dammed impoundment in the Lick Branch drainage and some small areas of water are mapped in drainages along the northern end of the site.

3.3 TERRESTRIAL HABITATS

The study area contains a mix of reclaimed strip-mined land and rugged wooded terrain. Habitats within the reclaimed mined areas include open field, scrub-shrub habitat, and young forest. Habitats within unmined areas consist primarily of forest, but the species composition of the forest varies based on factors such as topographic position and management history. See **Figure 4** for a habitat map and **Appendix C** for representative photographs of habitats. The principal terrestrial habitat types observed within the study area are described below.

Reclaimed Open Field: The open fields on former mined lands were revegetated as part of site reclamation, and a mixture of seeded and volunteer plant species are now present. Some of the open field habitat along the southeastern edge of the study area is being used as pasture for cattle and horses. Common plant species in the reclaimed open fields included fescue (*Schedonorus arundinaceus*), Canada goldenrod (*Solidago canadensis*), tall goldenrod (*Solidago altissima*), broomsedge bluestem (*Andropogon virginicus*), Chinese lespedeza (*Lespedeza cuneata*), Chinese silvergrass (*Miscanthus sinensis*), Japanese honeysuckle (*Lonicera japonica*), and blackberry (*Rubus argutus*).

Reclaimed Scrub-Shrub and Forest: These lands were revegetated in a similar manner as the upland field habitats, but natural succession has proceeded so that planted and volunteer woody species have become established and developed canopy cover. The trees and shrubs are primarily fast-growing early-successional species. Common species include autumn olive (*Elaeagnus umbellata*), sycamore (*Platanus occidentalis*), tulip-poplar (*Liriodendron tulipifera*), eastern red cedar (*Juniperus virginiana*), Bradford pear (*Pyrus calleryana*), and sumacs (*Rhus* spp.).

Upland Forest: The unmined forested land within the study area has varying plant communities based on drier conditions on the ridgetops, mesic conditions in the lower valleys, and intermediate conditions on the hillslopes. Common species on the ridgetops and upper hillslopes include chestnut oak (*Quercus prinus*), black oak (*Quercus velutina*), white oak (*Quercus alba*), red maple (*Acer rubrum*), sourwood (*Oxydendron arboreum*), tulip-poplar (*Liriodendron tulipifera*), pines (*Pinus spp.*), and greenbrier (*Smilax rotundifolia*). Common species in the mesic forests in valleys and on lower hillslopes included tulip-poplar, red maple, beech (*Fagus grandifolia*), hemlock (*Tsuga canadensis*), white oak, and American elm (*Ulmus americana*).

3.3.1 Planted Forestry Research Plot

One forestry research tree plot is located in the north-central section of the Phase II study area and is depicted on **Sheets 7 and 8** of **Figure 4**. Based on information from site management, the tree plot research was run by Donald Graves and Christopher Barton from the University of Kentucky Department of Forestry. The location and composition of the tree plots appears to match the research described in the paper *Surface Mine Reforestation Research: Evaluation of Tree Response to Low Compaction Reclamation Techniques* (Angel et al. 2006). This paper indicates that the following native tree species were planted in 1996 and 1997: white oak, white ash (*Fraxinus americana*), eastern white pine (*Pinus strobus*),

northern red oak (*Quercus rubra*), black walnut (*Juglans nigra*), and yellow poplar (*Liriodendron tulipifera*). One non-native species, royal paulownia (*Paulownia tomentosa*), was also planted in the reclamation cells at a later date. The paper also noted that the native tree species sycamore, black locust (*Robinia pseudoacacia*), and yellow birch (*Betula alleghaniensis*) had established on the site as volunteer species.

In addition, the Starfire project team received email correspondence from Dr. Jeffrey Stringer of the University of Kentucky Department of Forestry in 2023 in which he provided mapped outlines of nine tree plot cells from the above research project. Of these plots, only Plot 1 is located within the Phase II boundary. Dr. Stringer emphasized that it is very important to his department that the project tree plots be retained for continuing research.

3.4 AQUATIC AND WETLAND HABITATS

The position of the site in relation to local streams and watersheds is depicted in **Figure 3.** Many streams are present within and in the vicinity of the study area, primarily in rugged wooded valleys between areas of benched reclaimed mine lands. Several named streams are overlapped by the study area and include Williams Branch, Kitchen Fork, Lick Branch, Buckhorn Creek, Hurricane Branch, John Riley Branch, Squire Branch, and Emory Branch. The habitat quality of the streams in the project vicinity varies and is affected by the land management within a given stream's watershed. Some habitat data for the perennial streams is presented in **Table 4-2** in **Section 4.3** below. Water samples for specific conductivity readings were collected at several of the perennial streams during the field visit; however, due to equipment malfunctions, several perennial streams could not be sampled in these visits.

One stream just outside the eastern edge of the study area (an unnamed tributary to Prince Fork) is designated as an Outstanding State Resource Water (OSRW) by the Kentucky Division of Water (KDOW). This stream is part of a small watershed of streams which have the OSRW designation due to records of Kentucky arrow darter. One stream segment in the group (upper Buckhorn Creek and Prince Fork) is designated as Unit 1 of Kentucky arrow darter critical habitat.

The water/wetland delineation documented many wetlands within the study area, but the majority of these are small wetlands located in isolated low spots. Several larger wetlands, one large pond/lake, and some smaller open water ponds are also scattered through the study area. See **Appendix C** for representative photographs of the streams, wetlands, and ponds observed on the site.

3.4.1 Streams

Buckhorn Creek: Buckhorn Creek is a large perennial stream with a watershed of approximately 8.5 square miles at the project location. Its watershed includes Hurricane Branch, John Riley Branch, and Emory Branch. Within the study area, Buckhorn Creek has an Ordinary High Water Mark (OHWM) approximately 25 to 40 feet wide. During the field visits, Buckhorn Creek contained flowing water with depths ranging from a few inches in riffles to two feet or more in pools. The stream substrate consists of silt, sand, gravel, and cobble.

The reach of Buckhorn Creek within the delineation boundary lies approximately 1.75 stream miles downstream of a unit of Kentucky arrow darter critical habitat (Unit 1 - upper Buckhorn Creek and Prince Fork). In addition, the OKNP review of the project stated that they have a record of Kentucky arrow darter presence within the reach of Buckhorn Creek overlapped by the study area. A reading of water specific conductivity in Buckhorn Creek in the study area gave a value of 700 microsiemens (µS) per centimeter, which is higher than levels that are typically preferred by the Kentucky arrow darter. A reading on an upstream reach of Buckhorn Creek overlapped by the Starfire gen-tie corridor (approximately 1.25 stream miles upstream

of the Phase II study area) in March 2026 gave a value of 576 µS/centimeter (cm) (BFW 2026a). Stream habitat suitability for Kentucky arrow darter is discussed further below in **Sections 4.1 and 4.3**.

Williams Branch: This perennial stream lies within a valley with wooded slopes that extends southwest along the western boundary of the study area. The lower section of the valley contains some flat land which has been developed into houses, lawns, and a paved road. Williams Branch ranges from 8 to 15 feet wide at the OHWM and has a stream substrate of silt, gravel, cobble, and boulders. During the field visit, this stream contained flowing water from two inches to two feet deep. This stream had some habitat degradation from embeddedness and alteration of the stream channel and riparian corridor.

Lick Branch and Kitchen Fork: Lick Branch originates in a valley in the western portion of the study area, where water flows out from a large 21.7-acre impoundment where coal ash refusal fill was deposited as part of mining operations. Lick Branch ranges from 6 to 25 feet wide at the OHWM and contained flowing water from two inches to two feet deep during the field visit. Kitchen Fork is a tributary of Lick Branch which ranges from ten to 20 feet wide at the OHWM and contained flowing water from five inches to one foot deep during the field visit. These streams have a variety of substrate materials including silt, sand, gravel, cobble, boulders, and bedrock. A reading of water specific conductivity on Lick Branch gave a value of 2,700 µS/cm.

Hurricane Branch, John Riley Branch, Squire Branch, and Emory Branch: These perennial streams are tributaries to Buckhorn Creek in the northeastern portion of the site. They have existing or former (breached) impoundments at several locations. These streams generally range from four to 12 feet wide at the OHWM and have stream substrates of silt, sand, gravel, and cobble, with some boulders. During the field visit, these streams contained flowing water from a few inches to 18 inches deep. The stream habitat assessments observed some habitat degradation from embeddedness and sedimentation in the stream channels. Water specific conductivity ratings were collected on John Riley Branch and Squire Branch and gave relatively high readings of 2,150 µS/cm and 1,795 µS/cm, respectively.

Other Perennial Streams: The study area contains ten other perennial streams which are scattered across the site and generally are relatively short tributaries to the named perennial streams. These perennial streams generally ranged from one to seven feet wide at the OHWM and had stream substrates dominated by silt, sand, and gravel with some cobble, boulders, and bedrock. During the field visits, these perennial streams generally contained flowing water from an inch deep in riffles to twelve inches deep in pools.

Intermittent Streams: The study area contains 22 intermittent streams which are scattered throughout the study area and generally flow through wooded valleys. The intermittent streams generally ranged from one to eight feet wide at the OHWM and had stream substrates dominated by silt, sand, and gravel with some cobble and boulders. During the field visits, the intermittent streams generally contained pooled or flowing water from an inch deep in riffle to six inches deep in pools. Water specific conductivity was measured in some of the intermittent streams and the values varied from 740 to 2,700 µS/cm.

Ephemeral Streams: The study area contains 31 ephemeral streams which are scattered throughout the study area and generally flow through wooded valleys or areas of reclaimed mine lands. Most of the ephemeral streams ranged from six inches to four feet wide at the OHWM with bank heights of six inches to 2.5 feet. During the field visits, the ephemeral streams were generally dry or contained water in small pools. The ephemeral stream substrates were generally dominated by silt with some gravel present.

3.4.2 Wetlands and Open Waters

Emergent Wetlands: The delineation of the study area documented 255 wetlands. Of these wetlands, 132 wetlands are less than 0.05 acres, and 177 wetlands are less than 0.10 acres. The majority of the wetlands are small emergent (PEM) wetlands located in isolated low spots. Common plant species in the emergent wetland habitats include black willow (*Salix nigra*), woolgrass (*Scirpus cyperinus*), broad-leaved cattail (*Typha latifolia*), narrow-leaved cattail (*Typha angustifolia*), green bulrush (*Scirpus atrovirens*), and sumpweed (*Iva annua*).

Forested and Scrub-Shrub Wetlands: A few palustrine forested (PFO) and palustrine scrub-shrub (PSS) wetland habitats are scattered through the study area. Common plant species in the forested and scrub-shrub wetland habitats include black willow, sandbar willow (*Salix interior*), river birch (*Betula nigra*), sycamore, false nettle (*Boehmeria cylindrica*), stiltgrass (*Microstegium vimineum*), woolgrass, and sedges (*Carex* spp.).

Open Water Ponds: The delineation of the study area documented 18 open-water ponds totaling 28.23 acres. The largest pond in the study area measures 21.7 acres and consists of an impoundment of Lick Branch where coal ash refusal fill was deposited as part of mining operations. This pond drains to Wetland 53 and Lick Branch on its western side.

Several ponds on site (Ponds 1, 2, 3, 4, 15, and 16) consist of impounded reaches of perennial streams within the study area. Many other ponds (Ponds 5, 6, 7, 8, 10, 11, 12, 13, 14, 17, and 18) are located in isolated low spots and do not regularly drain to streams or other surface waters. Many of the ponds within the study area are fringed with emergent wetlands. Some ponds in the study area may have active or inactive permits through the Kentucky Pollutant Discharge Elimination System (KPDES) or other state or federal regulatory systems.

3.5 UNDERGROUND HABITATS AND MAN-MADE FEATURES

The potential for subterranean habitat such as caves and mines was investigated through a search of available geological data. The Kentucky Geologic Map Service website (KGS 2026) maps all of Knott, Perry, and nearby Breathitt Counties as “non-karst potential.” No karst features, such as sinkholes, are mapped in these counties. The Kentucky Geological Society (KGS) Map Service (KGS 2024) maps the study area as being underlain primarily by geologic units of the Princess Formation and Four Corners Formation. These formations are characterized as being primarily underlain by sandstone, siltstone, shale, coal, underclay, and chert, none of which are prone to karst feature formation.

During the field assessment, one depressional landform was found in the eastern portion of the study area in a flat area with several wetlands (**Sheet 16** on **Figure 4**). This depression was investigated to determine whether an opening was present to an underground conduit. The interior of the depression was thickly vegetated and no opening was observed. The depression is surrounded by a berm which prevents adjacent surface water from entering it.

Some bat species, including Rafinesque's big-eared bat and the eastern small-footed myotis, use protected sites along cliff lines that are adjacent or similar to underground habitats. One rockshelter was documented on the northern side of the large impoundment on Lick Branch and is shown in the project photographs (**Appendix C**). The rockshelter could provide roosting habitat for these bats. Some other exposed rock areas are present in the study area on several steep wooded slopes, and these formations could also provide roosting habitat for these bats.

According to USFWS guidance (USFWS 2026a), abandoned structures (e.g., barns, uninhabited houses, bridges, or culverts) that are planned to be demolished may need to be assessed for bat use for projects where consultation is required under the ESA. No bridges are present within the study area. Structures in the study area include a cluster of buildings

associated with mine land management, a hunting lodge, and an open-air church. The cluster of buildings is located between haul roads at the northern end of the site and consists of an office building and storage buildings which are of modern construction. The hunting lodge and church are both located in the south-central portion of the site. The hunting lodge is of modern construction, and several recreational vehicles (RVs) are parked in its vicinity. The open-air church is associated with an onsite cemetery and consists of wood plank siding, a metal roof, wooden pews, and a pulpit. There is also an outhouse constructed of the same materials.

The latest *Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines* (USFWS 2026a) includes suggested minimum culvert dimensions for determining suitability for some listed bats. The suitable minimum culvert entrance height/diameter varies by species with 4 feet for Indiana bats, 4.5 feet for northern long-eared bats, and 3 feet (commonly) for tricolored bats. The suitable minimum culvert length for all species is 23 feet. Several culverts are present in or adjacent to the study area. However, few of these culverts appear to be suitable for bat roosting.

The inquiry to the OKNP discussed in **Section 2.1** returned some records for protected species within a two-mile buffer around the study area that may be underground hibernacula. These records are listed as Sensitive Elements and specific location data or habitat descriptions are not given. A follow-up inquiry to the OKNP about additional information on these records has been submitted, but no response has been received at this time.

3.5.1 Mine Portal Records

The Kentucky Mine Mapping Information System (KGS 2026) was utilized to obtain shapefiles of mine portal locations and mined out areas. The site is mapped as overlapping several coal beds, and coal mining activity has been extensive on the site. The presence of coal beds in this region of Kentucky has historically driven subsurface mining activity which created underground mine shafts. Mine shafts that have openings to the surface provide potential underground hibernacula and roosting habitat for some species of bats. To investigate the potential for underground mine structures to be present within or in the vicinity of the study area, mine portal data was obtained from the Kentucky Mine Mapping Information System (Kentucky EEC 2026).

For projects requiring agency consultation for protected species, the USFWS generally requests field surveys for potential hibernacula on land within 0.5 mile of the edge of the project footprint (where access can be obtained), as well as documentation through a literature and map review of all known caves and abandoned mines within three miles of the outside edge of the project footprint (USFWS 2026a). However, please note that requirements for surveys and buffers may vary and that the specific requirements for bat habitat assessments on this project would need to be determined through contacting the local USFWS field office. **Figure 5** depicts a three-mile buffer of the study area in relation to mine portal records. The mine portal records within the buffer are classified as either Surface or Drift types. Surface mining generally removes coal through digging material from the land surface, although augers may also be used to drill out coal in hillsides that cannot be reached by contour mining. Drift mining involves horizontal excavation into the side of a hill.

Ten mine portal records have coordinates within the current study area and two additional portal records are located in close proximity to the study area boundary. The mine portal data is summarized in **Table 3-1.**

Table 3-1. Mine Portal Records Within or in Close Proximity to Study Area

Portal ID Number	Type	Location on Figure 4	Status	Comments
02044	Drift	Sheet 5	No opening present	Confirmed closed by site visit
02044-2	Drift	Sheet 4	No opening present	Confirmed closed by site visit
02044-B	Drift	Sheet 4	No opening present	Confirmed closed by site visit
06438	Surface	Sheet 5	Assumed no opening present	Portal location has been re-shaped by mining; portal assumed to be destroyed
08124-3 08124-4 08124-7 08124-11	Surface	Sheet 1,4	No opening present	Cluster of four records with same coordinates; Confirmed closed by site visit
09959	Surface	Sheet 4	No opening present	Confirmed closed by site visit
18670-5	Surface	Sheet 13 (Off-site)	Assumed no opening present	Off-site, no access; Portal location has been re-shaped by mining; portal assumed to be destroyed
Portal A (No official ID#)	Drift	Sheet 3	Assumed no opening present	Portal location has been re-shaped by mining; portal assumed to be destroyed
Portal B (No official ID#)	Drift	Sheet 3 (Off-site)	Unknown	Off-site, no access; Mapped on hillside below mine bench

Most of the mine portal records are located on land which has been reshaped through mining and reclamation activities, and the portal openings have been destroyed. The majority of the on-site portal locations in the study area were visited during the field assessment to verify that no portal openings were currently present.

Three records of surface mining are located within the Starfire Phase I study area which lies north of the Starfire Phase II study area. These records were investigated during an assessment of the Phase I site (BFW 2024). That assessment visit found no mine openings were currently in existence at these locations. No other portal records in the vicinity of the project have been assessed at this time.

3.6 PROTECTED LANDS IN THE VICINITY

A map of protected lands in the vicinity of the study area is included in **Figure 3**. The largest protected land in the vicinity of the Starfire site is Robinson Forest Research Forest and Wildlife Management Area (WMA) which is owned by the University of Kentucky (Kentucky Department of Fish and Wildlife Resources [KDFWR] 2018). Robinson Forest consists of multiple parcels with varying management and land use. The overall forest encompasses

around 14,800 acres that are used for teaching, research, and extension purposes (University of Kentucky 2024). The largest parcel measures approximately 10,030 acres and the closest section is located approximately one mile north of the study area.

Robinson Forest contains some of the least disturbed watersheds in eastern Kentucky, and three streams within the largest parcel of Robinson Forest are designated as critical habitat for the threatened Kentucky arrow darter (USFWS 2016b). These include Clemons Fork, Coles Fork, and Snag Ridge Fork.

A second large area of protected land is present in Paul Van Booven WMA, which is a 2,280-acre parcel located approximately 0.67 mile northwest of the study area. Paul Van Booven WMA is managed by the KDFWR. It contains reclaimed surface mine and forest habitat and the University of Kentucky is conducting several research projects related to forest management and mine reclamation in the parcel (KDFWR 2020).

One small parcel measuring approximately 50 acres is mapped by the Protected Lands Database within the northeastern portion of the study area. The database maps this parcel as being part of the Robinson Forest land holdings. This parcel appears to correspond to a 59-acre outparcel in approximately the same location which is listed as being owned by the University of Kentucky. Where the Protected Lands Database and the Starfire project mapping differ, the Starfire project mapping is assumed to be the authoritative source for the boundaries of the University of Kentucky ownership. The 59-acre outparcel contains a reach of Hurricane Branch which was impounded but has been breached.

4. FINDINGS FOR FEDERALLY-PROTECTED SPECIES AND CRITICAL HABITAT

The site was reviewed to determine if habitats for federally protected species were present or had the potential to exist within the study area depicted on **Figure 1** in **Appendix A**. Note that if consultation with the USFWS under Section 7 of the ESA is required, a detailed analysis of project development plans may find that the site assessment area or project action area need to be expanded to include adjacent land that could be affected by the project. Activities with potential offsite impacts to protected species could include blasting, pile driving, alterations to streamflow or water quality, habitat fragmentation, installation of barriers to wildlife movement, installation of new lighting, and/or construction noise.

The protected species that were included in the IPaC database results are summarized in **Table 4-1** and discussed in the sections below.

Table 4-1. Summary of Federally-Protected Species

Species	Federal Status	General Habitat Description	Supporting/Limiting Factors in Study Area
Gray bat (*Myotis grisescens)*	Endangered	Roosting: Caves and mines Foraging: Stream corridors and waters	No known caves or mines Streams and ponds present
Indiana bat (*Myotis sodalis)*	Endangered	Winter roosting: Caves and mines Summer roosting: Suitable trees, bridges, man-made structures Foraging: Wooded habitat	No known caves or mines Wooded habitat present No bridges present; open air church present Culverts present but most not suitable for bats
Northern long-eared bat (*Myotis septentrionalis)*	Endangered		
Tricolored bat (*Perimyotis subflavus)*	Proposed Endangered		
Kentucky Arrow Darter (*Etheostoma spilotum*)	Threatened, Critical Habitat Present	High-gradient streams with good water quality	Known record of Kentucky arrow darter in Buckhorn Creek Some other perennial streams may provide suitable habitat in some seasons/conditions
Bald eagle (*Haliaeetus leucocephalus*)	Protected by BGEPA and MBTA	Nests in large trees near large bodies of water	One large pond present
Migratory birds	Protected by MBTA	Various	Wooded habitat blocks and various other habitats present
Monarch butterfly (*Danaus plexippus*)	Proposed Threatened	Woodland, field, and suburban areas	Woodlands and fields are present

BGEPA = Bald and Golden Eagle Protection Act; MBTA = Migratory Bird Treaty Act

4.1 DESIGNATED CRITICAL HABITATS

4.1.1 Kentucky Arrow Darter (*Etheostoma spilotum*) Critical Habitat

The Starfire project is located in the vicinity of a cluster of seven stream reaches in the Buckhorn Creek and Quicksand Creek watersheds which are designated as critical habitat for the Kentucky arrow darter (USFWS 2016b). The location of the study area in relation to the closest Kentucky arrow darter critical streams is shown in **Figure 3**. Of these stream reaches, one is located in close proximity to the northeastern edge of the study area. Critical Habitat Unit 1 (upper Buckhorn Creek and Prince Fork) lies approximately 1.75 stream miles upstream of the reach of Buckhorn Creek within the study area.

In the Federal Register notice designating critical habitat, (USFWS 2016b), the USFWS states that:

> **[Unit 1 – Buckhorn Creek and Prince Fork]** is located off Buckhorn Road in the headwaters of the Buckhorn Creek drainage and between Kentucky Highway 1098 (KY 1098) and KY 1087. It includes 0.7 skm (0.4 smi) of Prince Fork from its confluence with Mart Branch downstream to its confluence with Buckhorn Creek and 0.4 skm (0.3 smi) of Buckhorn Creek from its confluence with Prince Fork downstream to its confluence with Emory Branch. Live Kentucky arrow darters have been collected from Unit 1 in Prince Fork and just upstream of the confluence of Buckhorn Creek and Emory Branch. This unit is located almost entirely on private land, except for any small amount that is publicly owned in the form of bridge crossings and road easements. The watershed surrounding Unit 1 is dominated by forest and remains relatively undisturbed; however, downstream reaches of Buckhorn Creek have been degraded by siltation and nonpoint-source pollutants associated with surface coal mining, oil and gas exploration, logging, and runoff from unpaved roads.

The USFWS (2016b) has determined that the five primary constituent elements of critical habitat specific to the Kentucky arrow darter are:

1. Riffle-pool complexes and transitional areas (glides and runs) of geomorphically stable, first- to third-order streams of the upper Kentucky River drainage with connectivity between spawning, foraging, and resting sites to promote gene flow throughout the species' range.
2. Stable bottom substrates composed of gravel, cobbles, boulders, bedrock ledges, and woody debris piles with low levels of siltation.
3. An instream flow regime (magnitude, frequency, duration, and seasonality of discharge over time) sufficient to provide permanent surface flows, as measured during years with average rainfall, and to maintain benthic habitats utilized by the species.
4. Adequate water quality characterized by seasonally moderate stream temperatures (generally ≤24 °C or 75 °F), high dissolved oxygen concentrations (generally ≥6.0 mg/L), moderate pH (generally 6.0 to 8.5), low stream conductivity (species' abundance decreases sharply as conductivities exceed 261 mS/cm and species is typically absent above 350 mS/cm, and low levels of pollutants. Adequate water quality is defined for the purpose of this rule as the quality necessary for normal behavior, growth, and viability of all life stages of the Kentucky arrow darter.
5. A prey base of aquatic macroinvertebrates, including mayfly nymphs, midge larvae, blackfly larvae, caddisfly larvae, stonefly nymphs, and small crayfishes.

Regarding management, the Federal Register (USFWS 2016b) also states that:

> Within Unit 1, the physical and biological features may require special management considerations or protection to address potential adverse effects (*e.g.,* water pollution, siltation) associated with surface coal mining, logging (timber harvests on private land), natural gas and oil exploration, construction and maintenance of county roads (Buckhorn Road), the lack of adequate riparian buffers (near the confluence with Emory Branch), and off-road vehicle use. These threats are in addition to random effects of drought, floods, or other natural phenomena. This unit provides habitat for reproduction and feeding, helps to maintain the geographical range of the species (adds population redundancy), and provides opportunity for population growth.

4.2 MAMMALS

4.2.1 Gray Bat (*Myotis grisescens*)

Habitat Description: With rare exceptions, gray bats live in caves year-round. During the winter, gray bats hibernate in deep, vertical caves. In the summer, they roost in caves which are scattered along rivers. These caves are in limestone karst areas of the southeastern United States. They do not use houses or barns. Gray bats have been documented to regularly migrate 10-271 miles between summer maternity sites and winter hibernacula. Gray bats can fly 12-35 miles during daily flights to feed within riparian and forested habitats. Foraging gray bats fly over open water of rivers, streams, lakes, or reservoirs that are bordered by wooded habitat. Although the species may travel up to 21 miles between prime feeding areas, most data support foraging locations between 2.5 miles from the maternity colonies. There is no designated critical habitat for this species.

Site Assessment Findings: The OKNP database results returned three records for gray bats within a two-mile buffer around the study area. These records are listed as Sensitive Elements and specific location data and habitat descriptions are not given. Based on these records, gray bats are assumed to be present in the vicinity of the study area.

The study area has no known caves or mines and therefore is assumed to have no gray bat roosting habitat. Several streams and ponds within the study area provide suitable foraging habitat for gray bats.

Impacts to water quality to streams within or downstream of the study area could have indirect effects on the gray bat because this could reduce or alter the populations of insects that are a food source for this bat. Implementation of Best Management Practices (BMPs) such as erosion and sediment control measures and maintaining vegetated buffers could minimize these potential impacts.

4.2.2 Indiana Bat (*Myotis sodalis*)

Winter Habitat Description: Indiana bats hibernate during winter in caves or, occasionally, in abandoned mines. For hibernation, they require cool, humid caves with stable temperatures, under 50° F but above freezing. Very few caves within the range of the species have these conditions. Hibernation is an adaptation for survival during the cold winter months when no insects are available for bats to eat. Bats must store energy in the form of fat before hibernating. During the six months of hibernation, the stored fat is their only source of energy. If bats are disturbed or cave temperatures increase, more energy is needed and hibernating bats may starve.

There is designated critical habitat for this species, but none of this critical habitat is in southeastern Kentucky where the project is located.

Summer Habitat Description: After hibernation, these bats migrate to their summer habitat in wooded areas where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females may roost in larger groups of up to 100 bats or more.

Suitable summer habitat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded corridors may be dense or loose aggregates of trees with variable amounts of canopy closure. A potential roost tree for Indiana bats would include live trees and/or snags ≥ five (5) inches in diameter at breast height (DBH) that have exfoliating bark, cracks, crevices, and/or hollows. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat.

Indiana bats and northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges and bat houses (artificial roost structures); therefore, these structures should also be considered potential summer habitat.

Site Assessment Findings: Maps depicting point-based locations of known habitat for the Indiana bat within Kentucky have been developed by the USFWS as of 2025 and the portions of these maps that include this project are depicted in **Figure 6**. “Known habitat” refers to suitable summer or winter habitat located within a determined distance of an occurrence record for a bat species (USFWS KFO 2026). The majority of the study area is overlapped by a “Known Summer 1” habitat circle for the Indiana bat.

The OKNP database results returned four records for Indiana bats within a two-mile buffer around the study area. Based on these records, Indiana bats are assumed to be present in the vicinity of the study area.

No caves or underground mines were identified within the action area during this assessment. Therefore, it does not appear that winter roosting habitat for the Indiana bat is present within the study area. The study area contains an open-air church and some outbuildings that could provide suitable summer roosting habitat for bats.

Many wooded areas that provide potential summer roosting and foraging habitat for the Indiana bat are present within the study area. These include rugged wooded slopes along stream valleys and scattered wooded habitat on both flat and sloped reclaimed mine land. Approximately 1,038 acres of suitable wooded habitat was mapped within the study area and is depicted on **Figure 4.** Of this total, approximately 584 acres are located in the “Known Summer 1” habitat zone and approximately 454 acres are located in a “Potential” habitat zone.

Clearing wooded areas that provide potential summer roosting and foraging habitat (**Figure 4**) would reduce the amount of available habitat within the study area for the Indiana bat. Clearing suitable habitat could have direct impacts on the Indiana bat if individuals were present in trees during clearing activities. The potential for these direct impacts would be limited to the seasons when the bats would be present in the area. For “Potential” habitat zones as mapped by the USFWS Kentucky Field Office (KFO), the Occupied season is defined as April 1st though October 15th. In addition, the interval from May 15 through July 31 is defined as a more sensitive Pup Season, when bats too young to fly could be present in trees and would be highly vulnerable because they would be unable to escape a felled tree.

Tree clearing could also have indirect impacts to the listed bats if the bats formerly used the cleared trees for roosting and foraging and then had to expend time and energy finding new

habitat. Habitat loss could result in cumulative effects on the listed bat species when considered in combination with known unrelated future non-federal activities that are reasonably certain to occur within the action area and are likely to affect the species.

Clearing suitable wooded habitat for permitted projects in Kentucky can often be authorized through arranging a payment to the Imperiled Bat Conservation Fund (IBCF) with the USFWS. More information about the IBCF is presented in **Section 6** below. The authorization to use the program is at USFWS discretion and is not available for every project although denials are often related to unique habitats or resources at a project location. If a payment to the IBCF is not allowed, the USFWS could require a presence/absence survey for bats which could be conducted as a mist net survey or acoustic survey.

4.2.3 Northern Long-eared Bat (*Myotis septentrionalis*)

Winter Habitat Description: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible. The USFWS determined that designating critical habitat for the northern long-eared bat is not prudent.

Summer Habitat Description: Summer habitat for the northern long-eared bat overlaps greatly with Indiana bat habitat (**Section 4.2.2**) but additionally includes the use of trees as small as three (3) inches DBH.

Site Assessment Findings: Maps depicting point-based locations of known habitat for the northern long-eared bat within Kentucky have been developed by the USFWS as of 2025 and the portions of these maps that include this project are depicted in **Figure 7**. The study area is not overlapped by a known habitat circle for the northern long-eared bat but a “Known Summer 1” habitat circle for this species is located just north of the project.

The OKNP database results indicated that a northern long-eared bat occurrence record has a location that is overlapped by the study area. The database also returned 25 records of northern long-eared bats within a two-mile buffer around the study area. Based on these records, northern long-eared bats are assumed to be present in and around the study area.

No caves or underground mines were identified within the action area during this assessment. Therefore, it does not appear that winter roosting habitat for northern long-eared bats is present within the study area. The study area contains an open-air church and some outbuildings that could provide suitable summer roosting habitat for bats.

Many wooded areas that provide potential summer roosting and foraging habitat for the northern long-eared bat are present within the study area. Approximately 1,038 acres of suitable wooded habitat was mapped within the study area and is depicted on **Figure 4.** Clearing wooded areas that provide potential summer roosting and foraging habitat (**Figure 4**) would reduce the amount of available habitat within the study area for this species. Potential effects to the northern long-eared bat from tree clearing would be similar to those described for the Indiana bat in **Section 4.2.2**.

4.2.4 Tricolored Bat (*Perimyotis subflavus*)

Winter Habitat Description: During the winter, tricolored bats are often found in caves and abandoned mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts where they exhibit shorter torpor bouts and forage during warm nights.

Summer Habitat Description: During the spring, summer, and fall, tricolored bats are found

in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures. The tricolored bat will use similar habitat as the Indiana bat (**Section 4.2.2**) and northern long-eared bat (**Section 4.2.3**).

Tricolored bats are expected to be federally listed as Endangered in the near future; once tricolored bats are listed, additional evaluation may be needed to determine the presence or absence of this species.

Site Assessment Findings: The OKNP database results indicated that a record of the tricolored bat has a location that is overlapped by the study area. The database also returned 14 records of tricolored bats within a two-mile buffer around the study area. Based on these records, tricolored bats are assumed to be present in and around the study area.

No caves or underground mines were identified within the action area during this assessment. Therefore, it does not appear that winter roosting habitat for the tricolored bat is present within the study area. The study area contains an open-air church and some outbuildings that could provide suitable summer roosting habitat for bats.

Many wooded areas that provide potential summer roosting and foraging habitat for the tricolored bat are present within the study area. Approximately 1,038 acres of suitable wooded habitat was mapped within the study area and is depicted on **Figure 4.** Clearing wooded areas that provide potential summer roosting and foraging habitat (**Figure 4**) would reduce the amount of available habitat within the study area for this species. Potential effects to the tricolored bat from tree clearing would be similar to those described for the Indiana bat in **Section 4.2.2**.

4.3 FISH

4.3.1 Kentucky Arrow Darter (*Etheostoma spilotum*)

Habitat Description: This small fish is endemic to the upper Kentucky River drainage in Bell, Breathitt, Clay, Estill, Floyd, Harlan, Jackson, Knott, and Knox Counties, Kentucky. It occurs in high-gradient streams with cool or cold-water temperatures (23°C/73°F or less). Suitable streams are well forested headwater streams and may have seasonally intermittent flows, although the darter sometimes moves into larger streams and small rivers. The darter is usually found in areas with rocky substrates and with cover provided by bedrock ledges, boulders, and woody debris at depths from 10-45 cm. It primarily occurs in pools and transitional areas above and below riffles.

The Federal Register posting establishing critical habitat for the Kentucky arrow darter presented some benchmarks for adequate water quality in streams that provide high-quality habitat for the Kentucky arrow darter. These included seasonally moderate stream temperatures (generally ≤24 °C or 75 °F), high dissolved oxygen concentrations (generally ≥6.0 mg/L), moderate pH (generally 6.0 to 8.5), low stream conductivity (species' abundance decreases sharply as conductivities exceed 261 mS/cm and species is typically absent above 350 mS)/cm, and low levels of pollutants.

Critical habitat for the Kentucky arrow darter has been designated, and Unit 1 is located in the vicinity of the study area (**Figure 3**). Critical habitat is discussed further in **Section 4.1**.

Site Assessment Findings: The OKNP database results indicated that a record of the Kentucky arrow darter is overlapped by the study area. This record is located in a reach of Buckhorn Creek. The database also returned two other records for the Kentucky arrow darter within a two-mile buffer around the study area.

The study area contains several perennial streams with flows and substrate material that could be suitable for the Kentucky arrow darter. However, due to human activities including mining and logging in the watershed of the project, some streams may not have adequate water quality to provide suitable Kentucky arrow darter habitat.

During the field assessment, measurements of specific conductivity were collected in some of the perennial streams in the study area. Specific conductivity is often used as a proxy of water quality in the Eastern Kentucky Coalfield region (USACE, Undated). Conductivity readings are presented in **Table 4-2** along with habitat and watershed data. Due to equipment malfunctions, specific conductivity readings could not be taken on all the perennial streams during the field assessment.

Table 4-2. Perennial Stream Habitat Data

Stream Name	RBP Assessment Score	Specific Conductivity Reading (mS/cm)	Watershed
Perennial Stream 1	101	---	Reclaimed mine land, forest
Perennial Stream 2 (Williams Branch)	123	---	Reclaimed mine land, forest
Perennial Stream 3	95	---	Reclaimed mine land, forest
Perennial Stream 4	75	>1,990*	Reclaimed mine land, forest
Perennial Stream 5	69	---	Reclaimed mine land
Perennial Stream 6	73	---	Reclaimed mine land
Perennial Stream 7 (Kitchen Fork)	140	---	Reclaimed mine land, forest
Perennial Stream 8 (Lick Branch)	135, 154	2,700	Reclaimed mine land, forest, large pond with coal ash refusal fill
Perennial Stream 9	150	---	Reclaimed mine land, forest
Perennial Stream 10	147	740	Reclaimed mine land, forest
Perennial Stream 11	159	1,760	Reclaimed mine land, forest
Perennial Stream 12 (Buckhorn Creek)	130	700	Reclaimed mine land, forest
Perennial Stream 13 (Hurricane Branch)	108, 145	---	Reclaimed mine land, forest
Perennial Stream 14	106	---	Reclaimed mine land, forest
Perennial Stream 15	136	---	Reclaimed mine land, forest
Perennial Stream 16 (John Riley Branch)	129	2,150	Reclaimed mine land, forest
Perennial Stream 17 (Squire Branch)	122	1,795	Reclaimed mine land, forest

Stream Name	RBP Assessment Score	Specific Conductivity Reading (mS/cm)	Watershed
Perennial Stream 18 (Emory Branch)**	---	---	Reclaimed mine land

*Stream tested with a low-range water quality measuring unit that presents values over 1,990 µS as out of range.

**Due to accessibility issues, Emory Branch was delineated with a desktop review.

The critical habitat posting in the Federal Register (USFWS 2016b) indicates that Kentucky arrow darter abundance decreases sharply as conductivities exceed 261 mS/cm and the species is typically absent above 350 mS/cm. Although not all the perennial streams in the study area could be sampled for water quality during the field assessment, the streams with samples were all outside the range of specific conductivity typically favored by the Kentucky arrow darter. Based on the specific conductivity readings outside the range typically tolerated by the species, the high proportion of reclaimed mine land in the perennial stream watersheds, and the separation of some stream reaches from downstream waters by ponds or intermittent stream reaches, it does not appear that most of the perennial streams within the study area provide suitable habitat for the Kentucky arrow darter.

However, the Kentucky arrow darter has been documented in the reach of Buckhorn Creek within the study area, so it appears that Buckhorn Creek provides suitable habitat for the Kentucky arrow darter in some seasons or conditions. Some of the higher quality perennial streams within the study area may also provide suitable habitat for the Kentucky arrow darter in some seasons or conditions.

4.4 BIRDS

4.4.1 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle was formerly listed under the ESA but was delisted due to successful recovery efforts for the species. However, bald eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA).

Habitat Description: Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; or rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage.

Site Assessment Findings: No records of bald eagles were returned from the inquiries to the USFWS and OKNP. The site contains several ponds, of which the largest is the 21.7-acre pond located on an impoundment of Lick Branch in the west-central portion of the study area. The largest streams around the site are Buckhorn Creek along the northeastern edge of the study area and Balls Fork just south of the study area. Although these streams and the large pond could be used by bald eagles, these waters appear to be smaller than streams and lakes where eagles typically nest. No bald eagles or potential nests were observed within the study area or in wooded habitat visible from within the study area during the field assessments.

4.4.2 Migratory Birds

The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the

USFWS. The USFWS has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and the USFWS encourages implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Site Assessment Findings: Large areas of wooded habitat are present that could provide nesting habitat for migratory birds. The study area contains approximately 1,038 acres of wooded habitat. The study area also contains large areas of reclaimed mine lands with open field and scrub-shrub vegetation which could provide nesting habitat for grassland and shrubland bird species.

4.5 INSECTS

4.5.1 Monarch Butterfly (*Danaus plexippus*)

Habitat Description: The USFWS issued a proposed rule on December 12, 2024 to list the monarch butterfly as a Threatened species. Monarch butterflies have a migratory life cycle and the monarchs in this region overwinter in Mexico and spend other parts of the year migrating, foraging, and breeding in eastern North America. Monarchs use a variety of habitats that include mixed and coniferous woodlands, hedgerows, savanna, grassland, old fields, and suburban areas. They obtain nectar from a variety of flowers but require milkweed plants (*Asclepias* sp.) as a host plant to feed the larval (caterpillar) life stage.

Site Assessment Findings: The study area contains open fields, scrub-shrub habitat, and wooded habitat that could be inhabited by the monarch butterfly. However, many of the onsite habitats are relatively disturbed and the surrounding area provides similar habitat for the monarch.

5. STATE-LISTED SPECIES

The site was also reviewed to determine if state-listed species and their habitats had the potential to exist within the study area. State-listed species for Kentucky have been established through regulations such as KRS Chapter 146.610, which authorized the OKNP to develop and maintain lists of state threatened and endangered plants. However, the state-listed species do not have statutory protection and KRS Chapter 146.615 specifically states that "The lists promulgated under KRS 146.610 shall not serve to impede the development or use of public or private lands." Natural resource agencies such as the USFWS could request project measures to minimize impacts to state-listed species on projects where they have jurisdiction, and concerns about impacts to state-listed species could potentially be raised in projects with public comment periods or opposition.

The state-listed species to be evaluated were identified through a review of the Natural Heritage Program Database maintained for the state of Kentucky by the OKNP. The OKNP database output generated one set of records for occurrences that overlapped the study area and a second set of records for occurrences within two miles of the study area. The cover letter for the inquiry is included in **Appendix B**.

Several OKNP records were returned for federally-listed or proposed species. These included the gray bat, Indiana bat, northern long-eared bat, tricolored bat, and Kentucky arrow darter. These species were discussed in **Section 4** above.

Elk (*Cervus canadensis*) are a regulated game species native to Kentucky. Elk were present within the state until the mid-1880's, when the population was eliminated due to habitat degradation and overhunting. Elk were reintroduced to the state in 1997 through 2002. Currently wild elk are known to be present within and in the vicinity of the Starfire site and signs of elk were observed during the field visits. However, although elk in Kentucky are protected by hunting regulations, they do not have a state-listed species status. There are no restrictions that relate to habitat alteration or other types of indirect impacts to elk.

5.1 HABITAT DESCRIPTIONS

The state-listed species that were included in the Kentucky Natural Heritage Program Database results are summarized in **Table 5-1** and discussed in **Section 5.2** below. Some of these species are also listed as Species of Greatest Conservation Need (SGCN) in the State Wildlife Action Plan developed by the KDFWR.

Table 5-1. Summary of State-Listed Species

Species	OKNP State Status	KDFWR Status	Habitat Description	Last OKNP Observation Year	Suitable Habitat in Study Area?
Birds					
Common Raven (*Corvus corax*)	State Threatened	SGCN	Various situations from lowlands to mountains, especially in vicinity of cliffs	2015	Yes
Henslow's Sparrow (*Centronyx henslowii*)	State Special Concern	SGCN	Open fields & meadows with relatively thick/dense grass interspersed with weeds or shrubby vegetation	2010	Yes
Fishes					
Northern Brook Lamprey (*Ichthyomyzon fossor*)	State Threatened	SGCN	Small to medium-size upland streams	1947	Yes
Macroinvertebrates					
A Rhyacophilid Caddisfly (*Rhyacophila appalachia*)	State Historic Occurrence	SGCN	Streams with good water quality	Pre-1975	Yes
Mammals					
Eastern Small-Footed Myotis (*Myotis leibii*)	State Threatened	SGCN	Winter habitat is caves, mines, protected sites along cliff lines, abandoned buildings. Summer habitat is currently unknown.	2006	Yes
Evening Bat (*Nycticeius humeralis*)	None	None	Colonial species that roosts in trees and houses	2013	Yes
Little Brown Bat (*Myotis lucifugus*)	State Threatened	SGCN	Wide range of habitats including human-made structures, caves, and hollow trees	2009	Yes
Rafinesque's Big-Eared Bat (*Corynorhinus rafinesquii*)	State Special Concern	SGCN	Caves, protected sites along cliff lines, large, hollow trees, old mine portals, abandoned tunnels, cisterns, seldom-used buildings	2011	Yes

Species	OKNP State Status	KDFWR Status	Habitat Description	Last OKNP Observation Year	Suitable Habitat in Study Area?
Mussels					
Elktoe (*Alasmidonta marginata*)	State Threatened	SGCN	Occurs in large to medium size streams but more typical of smaller streams	1995	Yes
Plants and Lichens					
Appalachian Rosinweed (*Silphium wasiotense*)	State Threatened	SGCN	Dry-mesic forest, usually somewhat open due to disturbance	1987	Yes
Gorge Goldenrod (*Solidago faucibus*)	State Special Concern	SGCN	Gorgelike areas where rivers and creeks are entrenched in the surrounding terrain	1982	No

5.2 STATE-LISTED SPECIES DISCUSSION

The project area contains a mix of reclaimed strip-mined land and rugged wooded terrain. Habitats within the reclaimed mined areas include open field, scrub-shrub habitat, and young forest. Habitats in unmined areas consist mainly of forest, but the species composition of the forest varies based on factors like topographic position and management history. Aquatic and wetland habitats include Buckhorn Creek, Williams Branch, Lick Branch, several other named perennial streams, intermittent streams, ephemeral streams, wetlands, and open water ponds. It appears that there is suitable habitat within the study area for most of the state-listed species.

It appears that many of the records for state-listed species are located within nearby Robinson Forest, which has many high-quality habitats. As a research forest, Robinson Forest is also likely to be surveyed more frequently than surrounding areas, resulting in a higher number of biological observations and rare species records compared to the surrounding land.

The OKNP database output returned four records for state-listed species which overlapped the study area: These included three records for the common raven (*Corvus corax*) and a record for the northern brook lamprey (*Ichthyomyzon fossor*). The common raven was recorded in reclaimed mine habitats within the past 20 years. Based on the location of this record within the study area and the continued presence of suitable habitat, the common raven may be present in the study area.

The northern brook lamprey record dates from over 75 years ago and appears to have a generalized location associated with Balls Fork and Troublesome Creek which are located south of the study area. The northern brook lamprey could be present in perennial streams within the study area with good aquatic habitat and water quality.

6. DISCUSSION

Once detailed designs are developed for a portion or the entire site, an analysis of the project area can be performed to develop determinations of whether the project activities will potentially impact federally-listed species.

Several construction activities may require agency permits. Coordination may be required with the USFWS, U.S. Army Corps of Engineers (USACE), and/or Kentucky state agencies on construction projects prior to conducting tree thinning, tree removal, in-stream work, or the filling of wetlands, streams, or ponds. Section 7 of the ESA requires consultation with the USFWS for projects that receive a federal permit, federal funding, or federal oversight, and Section 10 of the ESA applies to many activities that may affect listed species and their habitats, even without a federal nexus.

Suitable habitat is present within the study area for the gray bat, Indiana bat, northern long-eared bat, tricolored bat, Kentucky arrow darter, and monarch butterfly. Although the study area contains suitable habitat for bald eagles, use of the area would likely be limited to temporary foraging activity or passage through the site.

Bats: The OKNP database has several occurrence records within two miles of the study area for the gray bat, Indiana bat, northern long-eared bat, tricolored bat, and several state-listed bats. The OKNP database also has one record for the northern long-eared bat which is located inside the study area boundary. Based on these records, these bat species are assumed to be present in the vicinity of the study area and may be present within the study area boundary. The majority of the OKNP records are classified as sensitive elements with restricted location information. No caves or mines were found within the study area during the assessment.

The study area contains approximately 1,038 acres of wooded areas that provide suitable summer roosting and/or foraging habitat for these bat species. Clearing suitable wooded habitat for permitted projects can often be authorized through arranging a payment to the IBCF with the USFWS. Authorized payments to the IBCF are calculated on a per-acre rate based on current real-estate values along with multipliers related to the presence or absence of known bat habitat in the area and the time of year that clearing would be conducted. A per-acre payment to the IBCF for the project would cover potential effects to multiple bat species, and separate or duplicate payments for individual bat species are not required.

Based on available maps from the USFWS, the majority of the study area is located within a “Known Summer 1” habitat zone for the Indiana bat. Therefore, per-acre rates for authorized clearing through the IBCF are expected to be $8,400 per acre for clearing during the unoccupied season (October 16 through March 31) or $11,200 per acre for clearing during the summer occupancy season (April 1 to May 14 and August 1 to August 15). The remainder of the area is located in a “Potential” habitat zone where per-acre rates for authorized clearing through the IBCF are expected to be $2,800 per acre for clearing during the unoccupied season (October 16 through March 31) or $5,600 per acre for clearing during the summer occupancy season (April 1 to May 14 and August 1 to October 15). Authorization to pay into the IBCF for clearing during the pup season (May 15 to July 31) may be granted at USFWS discretion at an elevated rate for a limited number of acres. Projects that clear over 100 acres of suitable wooded habitat would require project-specific review from the KFO.

Kentucky Arrow Darter: The Kentucky arrow darter has been documented to occur in three stream reaches within two miles of the study area. One of these stream reaches is the section of Buckhorn Creek overlapped by the study area. Measurements of specific conductivity in Buckhorn Creek showed values above the range which is typically preferred by the Kentucky arrow darter. However, specific conductivity can vary by season and precipitation, so it

appears that Buckhorn Creek provides suitable habitat for the Kentucky arrow darter in some seasons or conditions. Some of the higher quality perennial streams within the study area may also provide suitable habitat for the Kentucky arrow darter in some seasons or conditions.

Kentucky Arrow Darter Critical Habitat: The study area does not overlap any units of critical habitat for the Kentucky arrow darter. However, the study area is close to Critical Habitat Unit 1 (upper Buckhorn Creek and Prince Fork), which lies approximately 1.75 stream miles upstream of the reach of Buckhorn Creek within the study area. One stream just outside the northeastern boundary of the study area drains to Unit 1 and is designated as an OSRW due to the presence of Kentucky arrow darter.

The USFWS has stated that "within Unit 1, the physical and biological features may require special management considerations or protection to address potential adverse effects (*e.g.,* water pollution, siltation) associated with surface coal mining, logging (timber harvests on private land), natural gas and oil exploration, construction and maintenance of county roads (Buckhorn Road), the lack of adequate riparian buffers (near the confluence with Emory Branch), and off-road vehicle use" (USFWS 2016b).

Some of the primary constituent elements of Kentucky arrow darter critical habitat depend on water quality and quantity in the stream reach. Significant alternations to land use in the watershed of the critical habitat stream reaches could adversely affect the habitat quality of the critical habitat. Use of water quality BMPs and maintaining forest cover in the watershed may minimize these potential impacts.

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Request No. 76:

Provide any Bat Mist Net Surveys for the project.

Response:

No bat mist net surveys have been completed at the project site.

Responding Witness: Bob Roy