

# Phase IA Archaeological Survey

## Bright Mountain Solar Project

City of Bonnyman, Perry County, Kentucky

KYSHPO Registration Number: FY22-4723

Prepared for:

**Bright Mountain Solar, LLC**

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# MANAGEMENT SUMMARY

Project Registration Number: FY22-4723

Involved Agencies: Kentucky State Board on Electric Generation and Transmission Siting  
Kentucky State Historic Preservation Office (KYSHPO)

Phase of Survey: Phase IA Archaeological Survey

Location Information: Bonnyman, Perry County

Survey Area:

Project: An 80-megawatt (MW) solar project consisting of ground-mounted photovoltaic (PV) panels and associated infrastructure.

Facility Area: An approximately 825-acre area that will host the main facility components of the Project.

T-Line Area: A 3.5-mile electric Transmission Line and 1.0-mile electric Alternate Transmission Line associated with the Facility Area.

Buildable Area: The Buildable Area represents the area of potential soil disturbance within the Facility Area.

USGS 7.5-Minute Quadrangle Map: *Krypton, Kentucky and Hazard North, Kentucky*

Archaeology Resources Overview: There are two archaeological sites and four previous archaeological surveys mapped within the Facility Area and T-Line Area.

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Date of Report: September 2022

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# INTRODUCTION

## 1 PURPOSE AND GOALS OF THE INVESTIGATION

Bright Mountain Solar, LLC (the Applicant), a subsidiary of Avangrid Renewables, LLC, is proposing to construct the Bright Mountain Solar Project (the Project), which includes an up to 80-megawatt (MW) photovoltaic (PV) solar project and associated infrastructure located in Bonnyman, Perry County, Kentucky (Figure 1). This report was prepared for the Applicant as part of their due diligence for their application to the Kentucky State Board on Electric Generation and Transmission Siting.

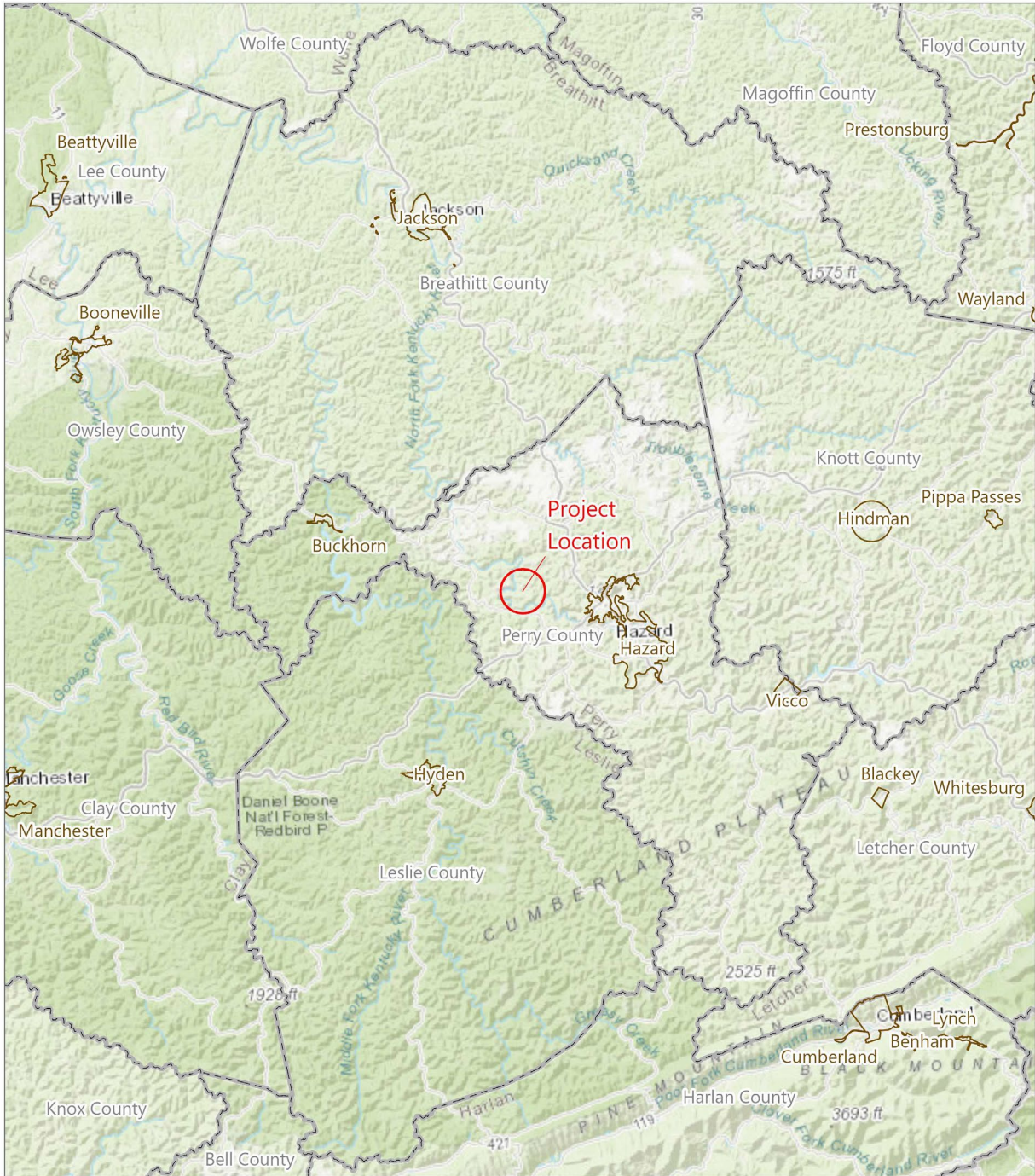
Please note that this report addresses only archaeological resources; information concerning the Facility's potential effect on historic architectural resources is provided under separate cover.

The purpose of this Phase IA Archaeological Survey is to:

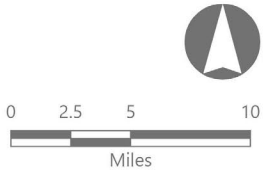
- Determine whether previously identified archaeological resources and/or sites of cultural or religious significance are located within the Project; and,
- Provide background research and historic context for the Project.

This report includes a records review of maps and documents intended to assist in EDR's review of archaeological resources that could potentially be affected by the construction and/or operation of the Project.

All cultural resource services provided by EDR for the Project are under the supervision of a Registered Professional Archaeologist who meets the Secretary of the Interior's Guidelines (per 36 CFR, Part 61) for Professional Qualifications in Archaeology.



-  Municipal Boundary
-  County Boundary



Basemap: USDA NAIP "2019 Kentucky 60 cm" orthoimagery map service

**Figure 1. Regional Project Location**

## 2 PROJECT LOCATION AND DESCRIPTION

Bright Mountain Solar, LLC is proposing to construct an 80 MW solar energy generation facility located in Bonnyman, Perry County, Kentucky (see Figure 1). The Project includes approximately 825 acres for main facility components (the Facility Area) and 4.5 miles of associated electric transmission line infrastructure (the T-Line Area) (Figure 2). The Facility Area is located within a reclaimed mountain top removal coal mine that is bound by the North Fork of the Kentucky River and forested mountain peaks.

The following terms are used throughout this document to describe the proposed action:

<u>Project:</u>	Collectively refers to all components of the Project and associated infrastructure (such as solar panels, collection lines, substation, and other equipment) in Bonnyman, Perry County, Kentucky.
<u>Facility Area:</u>	An approximately 825-acre area that will host the main facility components of the Project.
<u>T-Line Area:</u>	A 3.5-mile electric Transmission Line and 1.0-mile electric Alternate Transmission Line associated with the Facility Area.
<u>Buildable Area:</u>	The Buildable Area represents the area of potential soil disturbance within the Facility Area.

The Facility Area is set in an area of generally moderate topographic relief. This is due primarily to past mountain top removal, particularly over the last twenty years. The Buildable Area within the Facility Area (i.e., area of ground disturbance) is specifically located within areas of the former mountain top removal and will not be located within forested areas. Areas along the northwest boundary of the Facility Area (e.g., outside the Buildable Area) and along the T-Line Area, consist of wooded ridges and valleys with steeply sloped topography. These woodlands are punctuated by creeks and minor tributaries.

The Project will consist of the construction, operation, and decommissioning of PV solar panels mounted on racking, inverters that will convert direct current (DC) electricity to alternating current (AC) electricity, a network of racking-mounted and buried cables to collect the electricity, a collection substation, access roads, laydown yards, and perimeter fencing contained within the Project.



T-Line Area  
— Transmission Line  
— Alternate Transmission Line

Facility Area



Esri ArcGIS Online "World Imagery" map service

**Figure 2. Facility Area and T-Line Area**



### 3 PROJECT COMPONENTS

The Project components and proposed layout are currently under design; however, all Project components will be placed on privately owned land that make up the Facility Area and T-Line Area. Potential project components of the proposed Project may include, but are not limited to:

- Solar Panels and Racking
- Inverters and Collection Lines
- Project Substation, Utility Substation and Gen-Tie
- Access roads
- Laydown Yards
- Pyranometers
- Transmission Lines and associated infrastructure

Relative to conventional energy generation methods of a similar scale, solar facilities result in minimal impacts to the environment. Construction and operation of solar generation facilities require large, contiguous areas of land for the collection and distribution of energy.

## ENVIRONMENTAL SETTING

This section provides information on the environmental setting for the Bright Mountain Solar Project. The section details the geological and floral/faunal data as it pertains to the Project, as well as climate and land use (Sections 4 through 7).

### 4 PHYSIOGRAPHY, GEOLOGY, AND HYDROLOGY

The Project is located within the Cumberland Plateau physiographic province in eastern Kentucky. This province is an area of intricately dissected rocks of Pennsylvanian age and bounded to the west by the Pottsville (or Cumberland) Escarpment. Within the province, the mountain slopes are carved by ravines eroded through thick, flat-lying sequences of Pennsylvanian age coal-bearing elastic rocks. Ravines are tributary to sinuous, narrow valley bottoms which weave between steep valley walls. River valleys widen to a mile or more, with most of the human habitation located on floodplains and low terraces. High terraces, such as those associated with high-level fluvial deposits along the Kentucky River are remnants of earlier valley bottoms. Most of the terrain consists of steep slopes, with topography ranging from 200 feet above mean sea level (amsl) to over 2,000 feet amsl. The mountain slopes underlain by shale and sandstone are mantled by complex accumulations of rock fragments and weathered debris (colluvium) that move downslope by debris avalanche, landslide, creep, and sheet wash. Deeply weathered soils are uncommon and occur on isolated, nearly level ridge crests and high-level terrace deposits. Cliffs of resistant sandstone cap many ridges and spurs (Newell, 2001). Except for changes in biological communities and hydrological regimes, the region's topographic landscape has maintained its present form throughout the period of occupation (Pollack, 2008a:9).

Bedrock underlying the Project is mapped as Breathitt Formation (USGS and Kentucky Geological Survey, 1988). This group is Pennsylvanian and dominated by sandstone, mudstone, and shale with minor incidents of siltstone, coal, and limestone. The occasional coal seams consist of Pittsburgh (Kentucky) coal lying at the base. Bedrock within this formation is approximately 550 feet thick.

The Project is located within the Kentucky River Basin, which occupies 7,000 square miles in eastern Kentucky (UKY, 2018). The Kentucky River Basin drains a total of 16,000 miles of streams within 42 counties and ranges in elevation from 420 feet amsl to 3,250 feet amsl (Carey, 2009). Several rivers and streams are located adjacent to the Project, including the North Fork Kentucky River, Jake Campbell Branch, Campbell Creek, Little Willard Creek, and Meadow Branch, among others. The Pigeonroost Branch and an unnamed tributary of the Kentucky River intersect through the T-Line Area.

## 5 SOILS

Five soil series are present within the Facility Area (SSURGO, 2022) (Table 1; Figure 3). The Facility Area is dominated by Fairpoint and Bethesda soils, 2 to 70% slopes (FaF), which are commonly found in mined areas (SSURGO, 2022). It is important to note that soils in the Facility Area have been heavily impacted by mountain top removal coal mining and reclamation activities that occurred from 2004 to 2015 and during the twentieth century. A brief description for each mapped soil series is detailed in Table 1.

**Table 1. Soil series within the Facility Area.**

Soil Type	Soil Profile	Drainage	Geographic setting	Percent in Proposed Facility Area	
Fairpoint and Bethesda soils, 2 to 70% slopes, benched, stony (FaF)	<b>Fairpoint</b> Ap: 0-28 cm C1: 28-64 cm C2: 64-81 cm C3: 81-104 cm C4: 104-130 cm C5: 130-147 cm C6: 147-183 cm	<b>Bethesda</b> Ap: 0-30 cm C1: 30-91 cm C2: 91-147 cm C3: 147-183 cm	Well drained	Mountain slopes	75.6%
Shelocta-Cutshin-Gilpin complex, 20 to 75% slopes, very stony (SCF)	<b>Shelocta</b> A: 0-8 cm BA: 8-18 cm Bt1: 18-41 cm Bt2: 41-58 cm 2Bt3: 58-76 cm 2Bt4: 76-86 cm 2Bt5: 86-114 cm 2C: 114-150 cm	<b>Cutshin</b> A1: 0-25 cm AB: 25-48 cm Bw1: 48-76 cm Bw2: 76-127 cm Cr: 127-152 cm	Well drained	Mountain slopes, footslopes	9.1%
Matewan-Marrowbone-Latham complex, 20 to 80% slopes, very rocky (DLF)	<b>Matewan</b> A: 0-8 cm BA: 8-18 cm Bw: 18-54 cm C: 54-70 cm R: 70-95 cm	<b>Marrowbone</b> A: 0-13 cm Bw1: 13-25 cm Bw2: 25-33 cm Bw3: 33-51 cm BC: 51-61 cm R: 61-89 cm	Well drained	Ridges, summit	7.6%
Shelocta-Highsplint-Gilpin complex, 20 to 70% slopes, very stony (uShgF)	<b>Shelocta</b> A: 0-8 cm BA: 8-18 cm Bt1: 18-41 cm Bt2: 41-58 cm 2Bt3: 58-76 cm 2Bt4: 76-86 cm 2Bt5: 86-114 cm 2C: 114-150 cm	<b>Highsplint</b> Oi: 0-5 cm A: 5-15 cm BA: 15-33 cm Bw1: 33-76 cm Bw2: 76-127 cm BC: 127-157 cm	Well drained	Hillslopes, backslope, footslope	5.1%
Nelse, frequently flooded – Urban land, rarely flooded	<b>Nelse</b> A: 0-30 cm C1: 30-76 cm	<b>Urban land</b> No Data	Well drained	Floodplains, stream terraces, toe slopes	2.2%

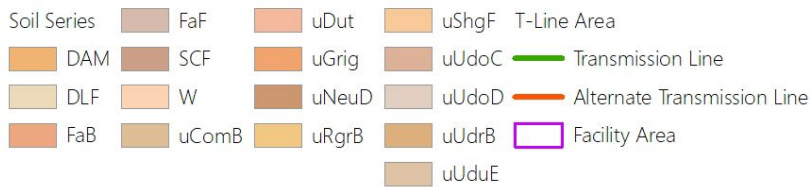
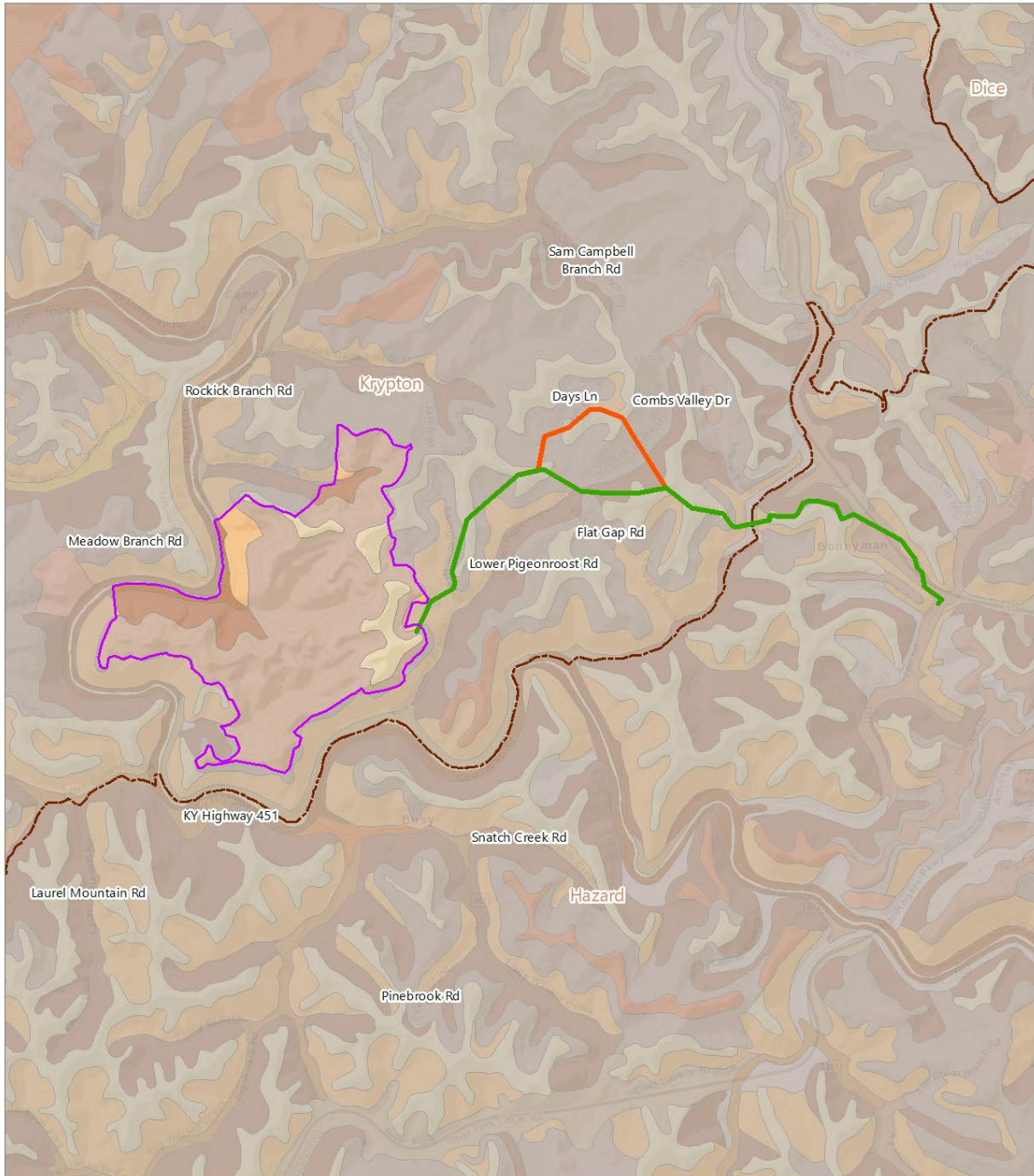
Soil Type	Soil Profile	Drainage	Geographic setting	Percent in Proposed Facility Area
complex, 4 to 25% slopes (UNeuD)	C2: 76-160 cm C3: 160-203 cm			
Water	N/A	N/A	N/A	0.4%

Six soil series are mapped within the T-Line Area. Like the Facility Area, soils in the T-Line Area are dominated by Fairpoint and Bethesda soils, 2 to 70% slopes (FaF), most likely due to the mountain top removal coal mining (i.e., strip mining) that was common in the area during the twentieth century (see Figure 3). A brief description for each mapped soil series is detailed in Table 2.

**Table 2. Soil series mapped within the T-Line Area**

Soil Type	Soil Profile	Drainage	Geographic setting
Fairpoint and Bethesda soils, 2 to 70% slopes, benched, stony (FaF)	<b>Fairpoint</b> Ap: 0-28 cm C1: 28-64 cm C2: 64-81 cm C3: 81-104 cm C4: 104-130 cm C5: 130-147 cm C6: 147-183 cm	<b>Bethesda</b> Ap: 0-30 cm C1: 30-91 cm C2: 91-147 cm C3: 147-183 cm	Well drained  Mountain slopes
Shelocta-Highsplint-Gilpin complex, 20 to 70% slopes, very stony (uShgF)	<b>Shelocta</b> A: 0-8 cm BA: 8-18 cm Bt1: 18-41 cm Bt2: 41-58 cm 2Bt3: 58-76 cm 2Bt4: 76-86 cm 2Bt5: 86-114 cm 2C: 114-150 cm	<b>Highsplint</b> Oi: 0-5 cm A: 5-15 cm BA: 15-33 cm Bw1: 33-76 cm Bw2: 76-127 cm BC: 127-157 cm	Well drained  Hillslopes, backslope, footslope
Matewan-Marrowbone-Latham complex, 20 to 80% slopes, very rocky (DLF)	<b>Matewan</b> A: 0-8 cm BA: 8-18 cm Bw: 18-54 cm C: 54-70 cm R: 70-95 cm	<b>Marrowbone</b> A: 0-13 cm Bw1: 13-25 cm Bw2: 25-33 cm Bw3: 33-51 cm BC: 51-61 cm R: 61-89 cm	Well drained  Ridges, summit
Shelocta-Cutshin-Gilpin complex, 20 to 75% slopes, very stony (SCF)	<b>Shelocta</b> A: 0-8 cm BA: 8-18 cm Bt1: 18-41 cm Bt2: 41-58 cm 2Bt3: 58-76 cm 2Bt4: 76-86 cm 2Bt5: 86-114 cm 2C: 114-150 cm	<b>Cutshin</b> A1: 0-25 cm AB: 25-48 cm Bw1: 48-76 cm Bw2: 76-127 cm Cr: 127-152 cm	Well drained  Mountain slopes, footslopes

Soil Type		Soil Profile	Drainage	Geographic setting
Udorthents-Urban land complex, 0 to 15% slopes (uUdoC)	N/A	N/A	N/A	
Udorthents-Urban land complex, 15 to 35% slopes (uUdoD)	N/A	N/A	N/A	



Esri ArcGIS Online "World Topographic Map" map service

Figure 3. Soil series mapped within the Project.

## 6 FLORA AND FAUNA

The Project is located within the Mixed Mesophytic Ecoregion (Braun, 1950). The Mixed Mesophytic Ecoregion is located within the unglaciated Appalachian plateaus and consists of a rich floral diversity with a variety of dominant species. Dominant species within this region include basswood, beech, sweet buckeye, sugar maple, white oak, and red oak. In the past, chestnut also dominated the landscape. However, a blight largely extinguished this tree from the landscape during the early twentieth century (Braun, 1950; Pollack, 2008a:11). Prior to European settlement, almost all of Kentucky was covered by mature deciduous forests, except for occasional glades within central and western Kentucky and patches of cleared areas and secondary growth forests near Native American settlements (Pollack, 2008a:9, 11).

Modern regional faunal species are less diverse than what was present during precontact and early historic periods, although the fauna within the region is comprised of many species and subspecies of mammals. Faunal species were similar to those in the surrounding regions and included megafauna such as mastodon (extinct), mammoths (extinct), giant bison (extinct), giant bear (extinct), and ground sloth (extinct), as well as caribou, elk, horses, antelope, deer, bear, and raccoon (Lane et. al, 1998). Avian fauna included grouse, passenger pigeon (extinct), and wild turkey. The white-tailed deer was an important resource exploited post-Pleistocene, with other species such as fish and mollusks also particularly exploited (Pollack, 2008a:11).

## 7 CLIMATE AND LAND USE

The modern climate is characterized as humid continental with a mix of cold dry air from the north and moist, warm air from the Gulf of Mexico. Rapid weather shifts are not uncommon due to the mixing of different air streams. Average seasonal temperatures range from 24 °F in the winter to 86 °F in the summer. Precipitation averages 47 inches per year. Most of the precipitation occurs in May, June, July, and August.

Prior to the twentieth century, land within the Project was primarily utilized for agricultural or logging purposes, if utilized at all. However, during the twentieth century, significant ground disturbance from strip-mining activities occurred, significantly altering the topography of the Facility Area and portions of the T-Line Area. In general, less disturbance has occurred within the T-Line Area. However, within the western portion of the T-Line Area, ground disturbance associated with the construction of State Route (SR) 15 has occurred. While residential or commercial structures are not present within the Project, these structures are sparsely located directly outside both the Facility Area and T-Line Area.

# CULTURAL CONTEXT

## 8 PREVIOUS RESEARCH AND SHPO CONSULTATION

Agency outreach and consultation has included the following with the Kentucky Heritage Council (KHC) and the Office of State Archaeology (OSA) at the University of Kentucky:

- On March 28, 2022, EDR (on behalf of the Applicant) submitted a request for Archaeological Site and Survey Information from the OSA for the proposed Facility Area.
- On March 31, 2022, EDR (on behalf of the Applicant) submitted a Project Registration Form to the KHC Site Identification Program requesting data on historic resources within and/or near the Facility Area and T-Line Area.
- On April 19, 2022, the OSA responded with the requested data on archaeological sites and surveys for the proposed Facility Area (Site Check Number P325334).
- On May 1, 2022, the KHC responded with historic resources site data within 2-kilometers of the Project and assigned a project registration number (FY22-4723). The 2-kilometer buffer was utilized per recommendations from the KYSHPO.
- On July 11, 2022, EDR (on behalf of the Applicant) submitted a request for Archaeological Site and Survey Information from the OSA for the proposed T-Line Area.
- On July 21, 2022, the OSA responded with the requested data on archaeological sites and surveys for the proposed T-Line Area (Site Check Number P336206).

Previously recorded cultural resources within the Project and surrounding area identified by the KHC and OSA are described in Sections 8.1 through 8.3 and depicted on Figure 4.

As stated above, this report addresses only archaeological resources; information concerning the Facility's potential effect on historic architectural resources is being provided under separate cover.

### 8.1 KHC Previously Recorded Historic Resources

The site data provided by the KHC indicates that there are no historic resources within the Facility Area or T-Line Area. However, one historic structure is recorded within 2-kilometers of the Project (see Figure 4). The historic resource (PE 12), a Greek Revival house dated between 1850 and 1874, is located approximately 1.7 kilometers northwest of the Facility Area in Dunraven, Kentucky. The NRHP Status for the historic resource is "undetermined." However, the KHC states that "Resources for which National Register status is listed as 'undetermined' may include those that have been previously determined eligible for listing in the NRHP as part of a consensus determination between the KYSHPO and a Federal agency, but for which the determination field has not yet been updated."



## 8.2 OSA Previously Recorded Archaeological Sites

The site data provided by the OSA indicates that there are two previously recorded archaeological sites within the Facility Area (15Pe196 and 15Pe197) and no archaeological sites within the T-Line Area. Sites 15Pe196 and 15Pe197 were both recorded in 2001 during a professional reconnaissance and identified as historic farmsteads/residences dating between 1901 and 1950. According to the site data, both sites are recorded as not presently meeting National Register criteria. Based on aerial imagery of the Facility Area, site 15Pe196 has most likely been destroyed since recordation due to strip mining activities between 2004 and 2014. Site 15Pe197 may still be present within the Facility Area, but not within the Buildable Area, as aerial imagery shows the site boundary in a slight incised valley within a woodland (Google Earth, 2022). However, historical aerial imagery from 2004 shows the immediate area to the east of the site as mechanically cleared with a man-made pond nearby (Google Earth, 2022). Therefore, it may be possible that site 15Pe197, similar to site 15Pe196, is no longer present.

## 8.3 OSA Previous Archaeological Surveys

The site data provided by the OSA indicates that there are two previous archaeological surveys within the Facility Area (Surveys 097-088 and 097-100) and two previous archaeological surveys within the T-Line Area (Surveys 097-046 and 097-126). Sites 15Pe196 and 15Pe197, discussed in Section 8.2 above, were both identified from Survey 097-100, which was an archaeological survey of a proposed coal mine operation that eventually caused most of the ground disturbance within the Facility Area. The archaeological surveys are summarized in Table 3 below.

**Table 3. Previous Cultural Resources Surveys within the Project**

KYSHPO ID	Report Title	Authors	Year
097-046	<i>Architectural and Historic Resource Analysis for Kentucky Highway 15, Hazard-Jackson Road, Perry County, Kentucky</i>	Law Environmental, Inc.	1993
097-088	<i>Phase I Archaeological Survey of a Proposed Coal Permit Area in Perry County, Kentucky</i>	Sussenbach, Tom	1999
097-100	<i>An Archaeological Survey of a Proposed Coal Mine Operation Near the Community of Dunraven in Perry County, Kentucky</i>	Hand, Robert B.	2001
097-126	<i>Cultural Resources Assessment, Kentucky Highway 15 Expansion Corridor Perry County, Kentucky</i>	Hadley, M. Craig and Robert S. Webb	1993

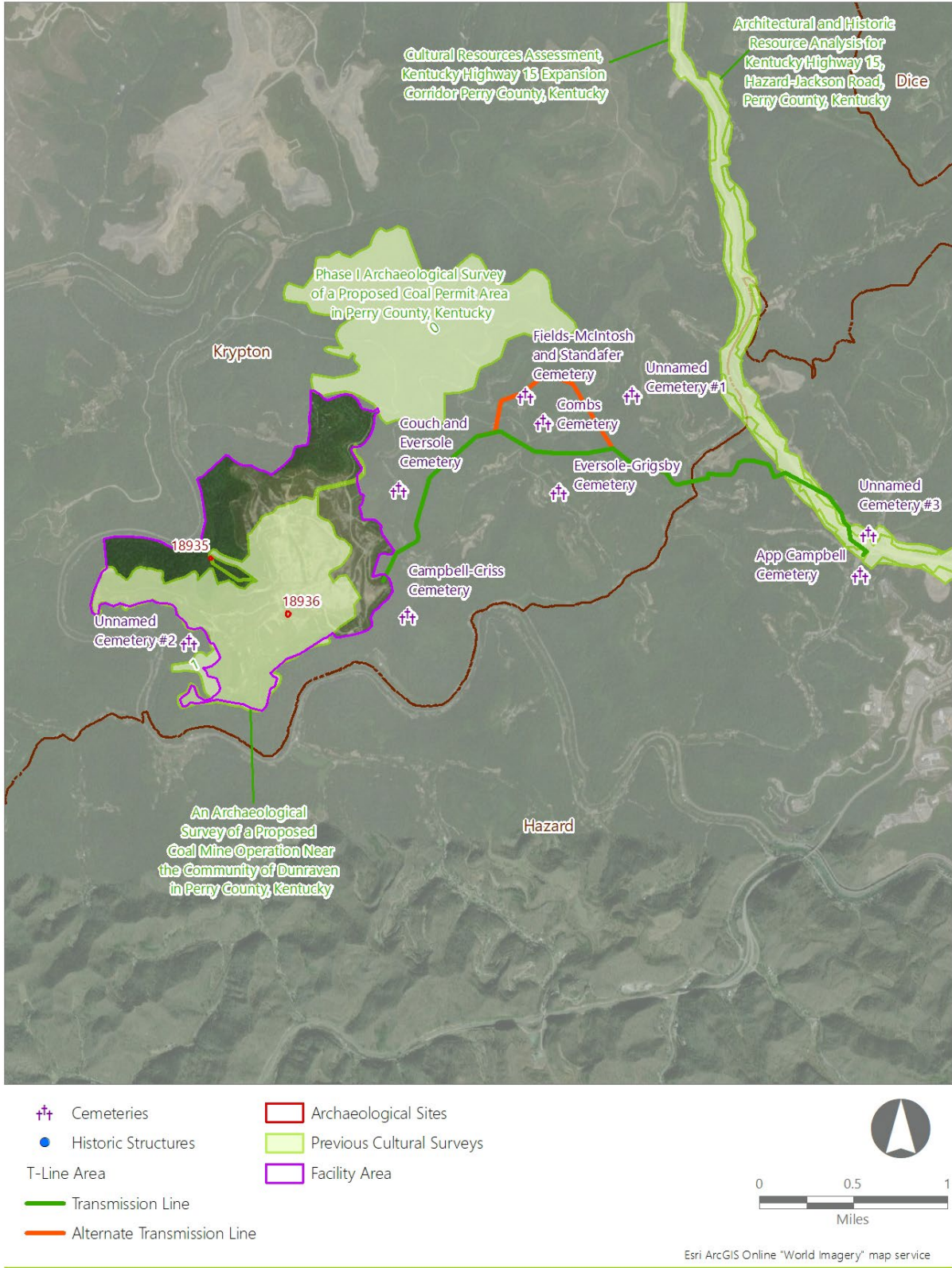
## 8.4 Kentucky Cemeteries

No cemeteries are recorded within the Facility Area or T-Line Area. However, nine cemeteries are mapped within 0.25 miles of the Project based on the 1972 *Krypton, Kentucky* and 1972 *Hazard North, Kentucky* USGS topographic quadrangles, as well as mapping from Findagrave.com (2022a-2022f). Only three of these cemeteries are visible via aerial imagery (Google Earth, 2022). Of these cemeteries, the Fields-McIntosh and Standafer Cemetery is located within close proximity to the T-Line Area, specifically the Alternate Transmission Line on Days Lane Cemetery Road. However, no impacts to the cemetery are anticipated. The cemetery is located approximately 30 meters south of the Alternate Transmission Line based on aerial imagery. The Fields-McIntosh and Standafer Cemetery is a large family cemetery predominantly containing the surname Colwell, Fields, and Standafer (Findagrave.com, 2022f). A total of 73 gravestones have been recorded, with burials ranging from 1909 to 2017. A brief description for each mapped cemetery is detailed in Table 4.

**Table 4. Cemeteries Located within 0.25 miles of the Project.**

Cemetery Name	Location <sup>1</sup>	Number of Gravestones	Earliest Burial	Latest Burial	Distance to Project (miles)
App Campbell Cemetery	37.289569, -83.236374	2	2012	2017	0.11
Campbell-Criss Cemetery	37.28759, -83.28023	5	1997	2019	0.14
Combs Cemetery	37.30195, -83.26672	23	1941	2021	0.16
Couch and Eversole Cemetery	37.29720, -83.28079	19	1945	2020	0.14
Eversole-Grigsby Cemetery	37.29661, -83.26527	4	2011	2020	0.21
Fields-McIntosh and Standafer Cemetery	37.30426, -83.26825	73	1909	2017	0.02
Unnamed Cemetery #1	37.303980, -83.257966	N/A	N/A	N/A	0.25
Unnamed Cemetery #2	37.285735, -83.301410	N/A	N/A	N/A	0.1
Unnamed Cemetery #3	37.292748, -83.235528	N/A	N/A	N/A	0.09

1: Please note that the location of the cemeteries is based on georeferencing from USGS topographic quadrangles and publicly reported data from Findagrave.com. As such, locational data is an approximation and should not be taken as exact.



**Figure 4. Previously Identified Cultural Resources**

## 9 HISTORY OF THE FACILITY SITE

Archives and repositories consulted during EDR’s research for the Project included EDR’s in-house collection of historic and archaeological reference materials. The result of this research is detailed in Sections 9.1 through 9.11, below.

### 9.1 Kentucky Management Areas

Kentucky is divided into seven management areas based on landform divisions and major drainage systems. These management areas also assist with understanding the geographic distribution of Native American archaeological resources (Clay, 1981; Pollack, 2008a:12). The management areas consist of the Purchase, Green River, Salt River, Upper Cumberland, Bluegrass, Upper Kentucky/Licking, and Big Sandy Management Areas. Table 5 details the management areas within Kentucky, including the designated counties and subsections within each area.

**Table 5. Management Areas and Sections within Kentucky**

<b>Management Area</b>	<b>Section</b>	<b>Kentucky Counties</b>
<b>Purchase</b>	Mississippi River	Carlisle, Fulton, Graves, Hickman
	Ohio River I	Ballard, Livingston, McCracken
	Lower Tennessee/Cumberland	Calloway, Lyon, Marshall, Trigg
<b>Green River</b>	Ohio River II	Breckenridge, Crittenden, Daviess, Hancock, Henderson, Union
	Western Coalfield	Butler, Hopkins, McLean, Muhlenberg, Ohio, Webster
	Pennyroyal	Allen, Caldwell, Christian, Logan, Simpson, Todd, Warren
	Upper Green River	Adair, Barren, Casey, Edmonson, Grayson, Green, Hart, Metcalfe, Taylor
<b>Salt River</b>	Salt River	Anderson, Boyle, Bullitt, Hardin, Jefferson, Larue, Marion, Meade, Mercer, Nelson, Oldham, Shelby, Spencer, Washington
<b>Upper Cumberland</b>	Lake Cumberland	Clinton, Cumberland, McCreary, Monroe, Pulaski, Russell, Wayne

<b>Management Area</b>	<b>Section</b>	<b>Kentucky Counties</b>
	Southeastern Mountains	Bell, Harlan, Knox, Laurel, Whitley
<b>Bluegrass</b>	Central Bluegrass	Bourbon, Clark, Fayette, Franklin, Garrard, Harrison, Jessamine, Lincoln, Madison, Montgomery, Scott, Woodford
	Northern Bluegrass	Boone, Campbell, Carroll, Gallatin, Grant, Henry, Kenton, Owen, Pendleton, Trimble
	Eastern Bluegrass	Bath, Bracken, Fleming, Lewis, Mason, Nicholas, Robertson
<b>Upper Kentucky/Licking</b>	Gorge	Estill, Lee, Magoffin, Menifee, Morgan, Powell, Rowan, Wolfe
	Interior Mountains	Breathitt, Clay, Jackson, Knott, Leslie, Letcher, Owsley, Perry, Rockcastle
<b>Big Sandy</b>	Lower Big Sandy	Boyd, Carter, Elliott, Greenup, Johnson, Lawrence, Martin
	Upper Big Sandy	Floyd, Pike

The Project is located within the Upper Kentucky/Licking Management Area, which encompasses 17 counties and 5,305 square miles within eastern Kentucky and is subdivided into the Gorge and Interior Mountains Section (the Project is located within the Interior Mountains Section). This Management Area contains over 4,000 recorded precontact archaeological sites, with more sites recorded in this region than any other since 1987 (Stackelback and Mink, 2008:90). Within the management area, the Interior Mountains Section contains fewer identified archaeological sites than the Gorge Section. The most common precontact site type is rockshelters (40% of all sites) followed by open habitation without mounds (30% of all sites). As of 2008, no military or non-mound earthwork sites have been identified (Stackelback and Mink, 2008:89-91). The Kentucky/Licking Management Area contains the highest number of sites listed on the National Register, with most concentrated within the Red River Gorge Geological Area (located approximately 40 miles northwest from the Facility Area). A history of Upper Kentucky/Licking Management Area is detailed in Section 10, below.

**9.2 Pre-European Contact Context**

Present day Kentucky falls within the Southwest of the modern United States, presenting similar cultural chronological patterns to surrounding southwestern, as well as midwestern, states. A commonly accepted

chronology for Kentucky's pre-contact period includes the Paleoindian (Early, Middle and Late), Archaic (Early, Middle, and Late), Woodland (Early, Middle, and Late), Mississippi, and Fort Ancient. The time periods used for changes in this chronological sequence are based on multiple factors including but not limited to environmental conditions, changing technologies, settlement patterns, subsistence, trade, and typological assessments. As such, chronological dates should be viewed as general guide points for changes occurring over time.

### 9.2.1 Paleoindian Period (9500-8000 B.C.)

Archaeological evidence for the Paleoindian Period within Kentucky dates from 9,500 to 8,000 B.C., although people likely lived in Kentucky prior to this (Pollack, 2008a:4; Maggard and Stackelbeck, 2008:110; Dillehay 1997; Adovasio et. al, 1999). Currently, the first peoples known to have lived in Kentucky were the Paleoindians. The environment during this time was climatically cooler and moister than at present. In addition, the circum-glacial coniferous forests, grasslands, or areas with mosaic vegetation began to be replaced with closed-canopy mixed deciduous hardwood forest (Pollack, 2008a:4-5). Early, Middle, and Late subperiods are recognized within the Paleoindian period, described individually below.

*Early Paleoindian (?-9000 B.C.)*. The Clovis complex (9,500-8,000 B.C.) represents the earliest widely documented occupation in the state of Kentucky (Maggard and Stackelbeck, 2008:115, 126). Artifacts associated within this subperiod include projectile points, large bifaces, blades, polyhedral and conical blade cores, side and end scrapers, graters, unifacial and flaked tools, and bone and ivory implements. Fluted and finely worked lanceolate projectile points represent the most diagnostic artifact type recovered from Clovis sites (Maggard and Stackelbeck, 2008:115; Boldurian and Cotter, 1999; Haynes, 2002; Frison, 1999; Stanford, 1999; Sanders, 1990). No Clovis site contains all the described tool classes, with many typically containing one or a few individual tool classes, suggesting that sites were occupied for relatively short periods and that different activities may have been pursued in distinct locations across the landscape. Sites with high artifact densities are rare but may indicate a more intensive or repeated occupation of the area. The Adams site in Christian County, Kentucky, and the Carson-Conn-Short site near Kentucky Lake, Tennessee are notable examples of these rare high-density sites (Maggard and Stackelbeck, 2008:116; Anderson, 1996; Stanford, 1999). It is unclear if these high-density sites represent intensive quarries or workshops, repeated occupations, seasonal meeting spots, or combinations of each (Sanders, 1990; Tankersley, 1996).

Most of the Clovis sites in Kentucky are represented by small, ephemeral occupations. The deposits are also typically shallow in depth and contain a low number of artifacts, which provides evidence for few subsistence or economic activities (Anderson, 1996; Gramly and Yahnig, 1991; Ray, 2003; Goodyear, 1999). These sites could represent short-term habitations, temporary use sites, and kill-butcher sites, among others. A few cave and rockshelter sites in Kentucky may contain Clovis-dated materials, such as the Enoch Fork Shelter (15Pe50) in Perry County. However, none of these sites have provided documented *in situ* diagnostic Early Paleoindian artifacts (Bush, 1988; Evans, 1995).

Subsistence information for Clovis sites within Kentucky is rare. However, research from across North America indicates that Clovis subsistence closely resembled the subsistence practices utilized during the

Early and Middle Archaic (i.e., broad-spectrum) (Maggard and Stackelbeck, 2008:121). At some sites within Kentucky, there is also evidence of a diverse range of faunal species, such as small mammals, fish, reptiles, and birds (Graham et al., 1981; Graham and Kay, 1988; Maggard and Stackelbeck, 2008:121). According to Maggard and Stackelbeck (2008:121), "In spite of the number of sites and finds, archaeologists still know very little about the timing of Clovis occupation, the range of different types of Clovis sites, or Clovis subsistence practices."

*Middle Paleoindian (9000-8500 B.C.).* The Middle Paleoindian is similar to the Early Paleoindian and is the least understood of the Paleoindian subperiods. However, it is distinguished by technological changes, greater stylistic diversity, and increased economic regionalization. During this time, marked climactic changes occurred that resulted in environmental instability and the extinction of most species of Pleistocene mega-fauna. Because of this mass extinction, there was a subsistence shift to reliance on regional plants and smaller game resources within a mixed foraging economy (Goodyear, 1999; Ray, 2003; Tankersley, 1996; Anderson et al., 1996; Delcourt and Delcourt, 1981; Walker, 2007). Toolkits during this time contained a wider range of tool types compared to the Early Paleoindian, with limaces, spurred end scrapers, and flake tools becoming more common (Ray, 2003; Tankersley, 1996). Projectile points during this time had increased stylistic diversity and included point types of Cumberland and Gainey (Maggard and Stackelbeck, 2008:122). Middle Paleoindian sites have a somewhat wider distribution than the Clovis sites and are well documented within floodplain and terrace settings. However, despite this, archaeologists know relatively little about the nature of the occupation or the activities that occurred at individual sites, and as of 2008, no radiocarbon dates have been recovered in direct association with diagnostic artifacts (Maggard and Stackelbeck, 2008:123).

*Late Paleoindian (ca. 8500-8000 B.C.).* The Late Paleoindian subperiod is recognized by unfluted projectile points. Late Paleoindian projectile points recovered from Kentucky sites can be assigned to two styles: Lanceolate Plano and Dalton, with the latter being the most common (Freeman et al., 1996; Justice, 1987; Ray, 2003). Ray (2003:46-50) suggests four major changes in lithic technology that occurred between the Late Paleoindian and earlier predecessors. These include 1) more intensive use of a wider range of locally available chert resources; 2) channel fluting replaced with basal thinning; 3) marked reduction in the size of projectile points; and 4) the extensive resharpening of projectile point blade margins. As a result, the toolkits and projectile points contained wider variety and diversity, and included bifacial and unifacial tools, unifacial and flake scrapers, adzes, retouched flakes, and drills/perforators. These changes are thought to indicate an ongoing regionalization as groups became increasingly localized in terms of settlement, subsistence practices, and resource use (Goodyear, 1999; Morse, 1997; Tankersley, 1996). In addition to these technological changes, the increased number of sites in a wider range of settings is evidence of a reduction in mobility. While open air settings remained the most common for sites, caves and rockshelters in eastern, western, and central Kentucky began to be occupied definitively for the first time (Maggard and Stackelbeck, 2008:129).

The Late Paleoindian, much like the Middle Paleoindian, was marked by variable, but accelerating, environmental change (Muller, 1986). Vegetation changed from spruce and jack pine parklands to mixed

hardwood forests and large herbivores (i.e., mammoth, horse, moose, and elk) were going or were already extinct. Open areas within Kentucky consisted of karst barrens and sandy terraces along major streams (Delcourt and Declourt, 1981; Kunen and Anderson, 1980). It is likely that these environmental changes were instrumental in the shift to a broad-spectrum foraging economy, a continuation from the previous subperiod (Hollenbach, 2007; Walker, 2007). Evidence of a broad-spectrum diet is evidenced from Dust Cave, where nuts and various animal remains (fish, birds, reptiles, etc.) were recovered.

Fewer Paleoindian sites have been documented within the Upper Kentucky/Licking Management Area than anywhere else in the state, with the majority recorded prior to 1987. However, the Enoch Fork Rockshelter, which spans a long range of time, is typical of rockshelter occupation during the Early and Middle Paleoindian subperiods (Maggard and Stackelbeck, 2008:155-156).

### 9.2.2 Archaic Period (8000-1000 B.C.)

The Archaic Period spans from 8,000 to 1,000 B.C. and is split into Early, Middle, and Late subperiods within Kentucky. Within the Upper Kentucky/Licking Management Area, less than 10% of Archaic sites within the state are located within this management area. Sites identified within this area are typically located on either slopes or ridges, reflecting the terrain (Jeffries, 2008:279). In general, little is known about the Archaic period in the Upper Kentucky/Licking management area (Jeffries, 2008:215).

*Early Archaic (8000-6000 B.C.).* The Early Archaic is defined based on technological and social changes associated with the retreat of the late Pleistocene glacier. Vegetation at this time included the replacement of circum-glacial coniferous forests with mixed deciduous forests and the replacement of Pleistocene fauna with modern species (Pollack, 2008a:5). Much like their Paleoindian predecessors, Early Archaic peoples continued to exploit relatively large territories. Evidence of this includes the distribution of corner and basal notched points (such as Kirk and LeCroy), the variety of raw materials used to make flaked stone tools, and the lack of evidence for long-term occupation. Researchers have posited that the scarcity of Early Archaic plant food procurement and processing tools indicates that the subsistence activities were of relatively minor importance compared with hunting activities (Dragoo, 1976:11; Jeffries, 2008:203).

A limited amount of material found at Early Archaic Kentucky sites, combined with a general absence of middens, features, and burials, suggests that most Early Archaic occupations were of short duration. In addition, it is likely that social units were small, consisting of bands of related individuals. Mobility throughout the region is evident from the high percentage of projectile points made from nonlocal cherts, which were reused for an extended time before being discarded far from their source (Jeffries, 2008:203). Early Archaic material recovered from two Perry County sites (15Pe10 and 15Pe23) included Kirk Serrated and LeCroy bifurcated base projectile points (Jeffries, 2008:277).

*Middle Archaic (6000-3000 B.C.).* The Middle Archaic adaptation in eastern and central Kentucky did not differ drastically from the Early Archaic (Jeffries, 2008:208). However, the subperiod did contain increased regional specialization and adaptation and was characterized by the appearance of regional projectile point styles and a variety of specialized tools. According to Jeffries (2008:208), the Middle Archaic within Kentucky



is poorly understood, with occupation within the Bluegrass, Upper Kentucky/Licking, and Big Sandy management areas recognized by projectile point types, primarily Big Sandy II, Matanzas, and Morrow Mountain (dating from 6,000 to 3,000 B.C.). The increased number and diversity of both formal and informal groundstone tools (many of which were used for plant food processing) was also notable (Pollack, 2008a:5). The variety of specialized tools may be a reflection on the exploitation of a wide array of resources, as well as new processing techniques utilized in the exploitation of plant foods (Jeffries, 2008:203).

By the beginning of the period, environmental remnants of the Pleistocene had disappeared, and the animal and plant species more closely resembled those present at European contact. Subsistence practices during the Middle Archaic included the hunting of a variety of animals and the gathering of wild plants (Breitburg, 1982; Stafford et al., 2000). White tailed deer and wild turkey were the most frequent animal resource identified at sites in Kentucky. The paleobotanical record primarily consists of hickory nutshell. Other plant resources exploited included other varieties of nuts, fruits, starchy seeds, and a wide range of plant resources not preserved at open sites (i.e., greens, syrups, etc.) (Jeffries, 2008:209). The increased prevalence of informal groundstone tools (i.e., pitted cobbles and grinding stones) may be associated with the more intensive exploitation of these plant foods, particularly nuts and seeds, with some researchers linking these tools with decreased residential mobility (Wright, 1994; Jeffries, 2008:208-209).

Like the Early Archaic, the early portion of the Middle Archaic occupations suggest high group mobility (Jeffries, 2008:205; Jeffries et al., 2005). However, conversely, the later part of this subperiod contains sites with deep middens, a high diversity of tool types, and burials, which may indicate the occupation of sites on a long-term or year-round basis (Bader and Granger, 1989; Brown and Vierra, 1983; Crothers and Bernbeck, 2004; Stafford, 1994). Information on social organization is derived from a few small sites during this later period, with analysis of burial treatment suggesting residential groups organized along egalitarian principles (Lynch, 1982; Mayes, 1997; Stafford et al., 2000).

*Late Archaic (3000-1000 B.C.).* Characteristics of the Late Archaic included greater region specialization, exploitation of locally available plant and animal resources, increased social complexity, and increased presence of long-distance exchange networks (Jeffries, 2008). Tools during the Late Archaic included a variety of flaked stone, groundstone, antler, and bone tools utilized for specialized extractive and maintenance tasks. Projectile point types included an assortment of large straight, expanding, and contracting stem points, and smaller stemmed and side notched types. According to Jeffries (2008:210), regional point styles may partially reflect the decreased mobility and more restricted social interaction of some Late Archaic groups. Late Archaic projectile points recovered from Perry County sites include Merom-Trimble, Cogswell, and other straight or expanding stem types (Gatus and Sanders, 1978).

Subsistence during this time focused on hunting and collecting native animals and plants, with white tail deer and hickory nuts forming the core of the diet (Scarry, 2003). A wide assortment of small mammals, birds, fish, nuts, fruits, and seeds also made up a typical Late Archaic diet. Evidence of native and tropical cultigens are present on Late Archaic sites, possibly indicating experimentation with horticulture (Chomko and Crawford, 1978; Smith and Cowan, 2003; Watson, 1985).

Social organization of the Late Archaic is primarily derived from the analysis of burials, many of which come from large shell middens located along Kentucky's Green River. Based on the grave goods associated with certain individual burials, researchers have speculated that special treatment was being afforded to certain individuals (Pollack, 2008a:5). While the differential treatment of burials suggests a greater degree of social differentiation than during earlier periods, archaeological and skeletal data suggests that Late Archaic societies were organized along egalitarian lines (Jeffries, 2008:210). Additional artifacts recovered from several Green River sites include artifacts manufactured from nonlocal raw materials, such as copper and marine shell. While Middle Archaic societies also participated in the exchange of these materials, the increased volume, particularly of marine shell, during the Late Archaic indicates an increased participation in a long-distance exchange network.

### 9.2.3 Woodland Period (1000 B.C. – A.D. 900/1000)

The Woodland Period was marked by a trend toward greater regional specialization, as well as the introduction of pottery technology. Within the Upper Kentucky/Licking Management Area and as of 2008, Woodland sites comprised 11% of archaeological sites identified. Additionally, rockshelters and open habitation sites comprised almost 98% of the Woodland sites in the management area (Applegate, 2008:364, 494).

*Early Woodland (1000-200 B.C.).* The Early Woodland is distinguished from the Late Archaic by the introduction of pottery technology into the archaeological record, which was adopted at different times throughout Kentucky (Pollack, 2008a:6; Carstens, 1996:10). However, in some areas, the impact of pottery varied, with some sites being aceramic. For example, in the Upper Green River Management Area, pottery had little impact within this rugged area, possibly because of the difficulty in carrying pottery vessels through rough terrain (Carstens, 1996:10). Within southeast Kentucky, pottery recovered from archaeological sites included quartzite tempered plain and cordmarked forms of the Pine Mountain series, which dated to cal. 1,432 to 950 B.C. However, information on the earliest Early Woodland pottery types is limited in other parts of the state (Applegate, 2008:342). In central and northeastern Kentucky, sites that pre-date 600 to 400 B.C. typically yield small assemblages of fragmentary sherds. Most are thick and grit tempered with cordmarked, plain, or fabric impressed surfaces (Applegate, 2008:343). Subsistence practices had a major impact on ceramic vessel forms during the Early Woodland. While subsistence changed little from the previous period, plant husbandry intensified and included the cultivation of weedy plants and cucurbits (Applegate, 2008:344).

Tools during the Early Woodland included projectile points, chipped stone tools (i.e., scrapers, knives, drills, and graters), groundstone tools, bone objects (such as awls, flakers, reamers, handles, and bowls), and shell objects (spoons, scrapers, beads, and gorgets). Projectile points during the Early Woodland in Kentucky include notched and stemmed forms used as spear or dart tips. Types typically recovered from archaeological sites include Merom, Late Archaic Stemmed cluster, Ledbetter, Saratoga/Cave Run, Savannah River/Swannaoa, Cotaco Creek, Motley, Cresap, Robbins, Adena Stemmed, Little Bear, and Cypress Creek (Applegate, 2008:343). While groundstone tools differed little from the Late Archaic, technological changes

occurred that shifted the grooved axe to the ungrooved celt, and the chipped stone end scrapers to bone beamers, both of which continued in use until after European contact.

Long distance trade networks continued to exist in the Early Woodland, although the appearance of exotic raw materials (i.e., copper and mica) was infrequent within archaeological sites. Evidence of these long-distance trade networks is present in Perry County at the Hall Shelter site (15Pe8), which contained steatite fragments (Gatus, 1981). Typically, these materials were most frequently recovered in mortuary contexts, which were separated from domestic habitations (Applegate, 2008:344). Domestic habitations typically consisted of dispersed un-nucleated settlements in upland, ridge top, and floodplain zones. In eastern and western Kentucky, rockshelters contain primary and secondary burials, while other areas had isolated open air mortuary sites with a limited number of interments. By 500 to 400 B.C., groups in some parts of Kentucky began to construct burial mounds and irregularly shaped enclosures, typically associated with the Adena culture (Applegate, 2008:345).

*Middle Woodland (200 B.C. – A.D. 500).* During the Middle Woodland, earthen enclosures and burial mounds reached their height of popularity by the middle of this period, with conical burial mounds and stone mounds being most frequently identified in the archaeological record. Grave goods recovered from these mounds in north-central and eastern Kentucky continued to include items made from exotic raw materials, indicative of continued interregional exchange. These items included copper bracelets and breastplates, copper and mica head ornaments, marine shell beads, and Flint Ridge chert bladelets (Applegate, 2008:346). Habitation sites ranged from large base camps in western Kentucky to smaller more dispersed settlements in north-central Kentucky (Pollack, 2008:6). Settlement strategies had an increased focus on floodplain zones, with settlements often containing midden deposits and feature clusters that suggest the presence of activity areas. Postmold patterns identified at some archaeological sites in Kentucky delineate small single and double-post structures with circular and/or square/rectangular houses (Applegate, 2008:346-347). Rockshelter occupations declined in portions of eastern Kentucky during this time.

Tools during the Middle Woodland included projectile points, chipped stone tools, and utilitarian groundstone, bone, and shell tools. The latter two groups were largely unchanged from the Early Woodland period. Projectile points included carryovers from the Early Woodland, as well as triangular/lanceolate forms and expanding stemmed and shallow sided notched types. Types recovered from archaeological sites in Kentucky include Robbins, Motley, Gary, Adena Stemmed, Copena, Copena Triangular, Snyders, Affinis Snyders, Steuben, Bakers Creek, Lowe, and Chesser (Crane and Griffin, 1966; Dowell, 1981; Mocas 1992). In addition to projectile points, chert bladelets are diagnostic of the Middle Woodland period (Applegate, 2008:346).

Ceramic vessels during this time were predominantly subconoidal or subglobular jars, with outflared, recurved, or direct rims. Most jars are cordmarked or contain plain exterior surfaces. Fabric or cord-wrapped dowel-impressed vessels with flat bases are extremely rare. At most archaeological sites, small quantities of simple stamped or check stamped sherds are often present, with complicated stamped, brushed, or rocker stamped sherds recovered (Applegate, 2008:345-346).

*Late Woodland (A.D. 500 – 900/1000).* The Late Woodland was similar to the Middle Woodland. However, notable differences included a lack of Hopewellian decorated ceramics or other items indicative of interregional exchange, the construction of some circular shaped settlements (i.e., Newtown), an increased nucleation of local populations, a shift to a more sedentary lifestyle, changes in plant subsistence practices and hunting technology, and changes in ritual expression (Pollack and Henderson, 2000:615; Pollack, 2008a:6). In addition, in the Southeast, the Late Woodland was marked by a population increase, the development of bow-and-arrow technology, changes in the amount of mound construction, shifts in social organization, and subsistence change. These changes were the case in some, but not all, of Kentucky (Applegate, 2008:347).

Subsistence practices during the Late Woodland included a hunting-gathering-gardening strategy similar to the Middle Woodland, but with increased use of cultigens. Maize became a significant component of regular diets by the end of the period. While cultivation of native plants intensified during this period, plant husbandry only contributed to a small percentage of the diet (Pollack, 2008a:6 Applegate, 2008:348). Settlement patterns had a great deal of regional variability. For example, in the Bluegrass Management Area, settlements were typically located in upland ridges while in other areas there was a marked shift to floodplain zones. Within central and northeastern Kentucky, nucleated settlements were more common during the beginning of the subperiod versus the later and consisted of circular settlements with central open areas (Applegate, 2008:349). Despite these differences, rockshelters and smaller open habitation sites may indicate that seasonal dispersal of local groups was an ongoing element of regional settlement systems. Gays Creek Shelter (15Pe186), located in Perry County, is a rockshelter site that contains evidence of short term and ephemeral use. The shelter was used repeatedly for a limited range of activities, including core reduction, tool production, expedient tool use, tool maintenance and refurbishing, and hunting (Bradbury, 2000).

Mortuary practices during the Late Woodland included the increased construction of stone mounds and the decreased construction of large earthen or stone enclosures. Stone box grave cemeteries became common everywhere except for eastern Kentucky (Applegate, 2008:349). The development of “true arrowheads” occurred during this time, with projectile point types consisting of Jacks Reef, Raccoon, Hamilton, and Levanna (Applegate, 2008:348). Ceramic vessels included subconoidal and subglobular cordmarked jars, unmodified rims and flattened lips, and plain decoration with occasional diagonal or perpendicular notching. A diagnostic trait of the Newtown series, widely distributed throughout Kentucky, included angular shoulders. During the latter portion of the Late Woodland, plain and cordmarked forms were common, with collared rims, carinations, and simple castellations being frequent diagnostic traits (Applegate, 2008:348).

#### 9.2.4 Fort Ancient Period (A.D. 1000-1750)

The Fort Ancient culture represents a response by populations living in north-central and eastern Kentucky to an increased reliance on corn and beans coupled with a more sedentary lifestyle which was characterized by permanent villages. According to Henderson (2008:739), “Fort Ancient” is the name used by

archaeologists to refer to the sedentary village farming peoples who lived in the middle Ohio River valley between A. D. 1000 and 1750. The Fort Ancient culture extends from above the Falls of the Ohio to east of the Muskingum River and occupies Indiana, the southern one-third Ohio, the central and eastern portions of Kentucky, and western West Virginia, although these boundaries can vary from researcher to researcher.

The most common and diagnostic artifact class from the Fort Ancient culture consists of ceramics, which distinguishes Fort Ancient sites from others. In particular, the use of shell temper typically marks the beginning of the period (Pollack, 2008a:7). Ceramics of the Fort Ancient culture primarily consisted of cordmarked conoidal jar that had straight or recurved rims (Henderson, 2008:741). Additionally, ceramics were typically manufactured from locally available clays and were grit, limestone, sandstone, and/or shell tempered. Between A.D. 1200 and 1400, the use of shell temper increased, and changes occurred in appendage styles. However, regional ceramic stylistic traditions remained, with vessels consisting almost exclusively of jars. Minor exterior surface treatments included check-stamping in the south and knot-roughened/ net-impressing in the east. After A.D. 1400, new vessel forms included bowls, pans, colanders, and globular, plain surfaced jars with flared rims. Additionally, vessels were solely tempered with shell and there was a sharp decline in regional stylistic differences (Henderson, 2008:741-742).

Fort Ancient chipped stone tools were made from locally available, high to medium quality chert recovered from quarries located at the shortest mean distance from settlements (Evans, 1996:247). Fort Ancient projectile point types generally consist of small, isosceles triangles. Railey (1990a, 1992) created a typology of Fort Ancient projectile points based on specimens recovered from a northeastern Kentucky site. While the typology does not assign type names, as he used descriptive labels, most would be considered Madison Triangulars. Other chipped stone tools included drills, knives, and scrapers, with bifacial teardrop-shaped endscrapers being particularly diagnostic of late assemblages. Groundstone tools included sandstone abraders, manos, or nutting stones. Smoking pipes were manufactured from clay, sandstone, Ohio pipestone, limestone, and catlinite, with the latter being restricted to the Late Fort Ancient subperiod and chipped limestone being diagnostic of the Middle Fort Ancient subperiod (Henderson, 2008:743).

Tools during the Fort Ancient period were also manufactured from shell and bone and included spoons, hoes, awls, needles, di=ripts, and beamers. Ornaments, such as beads, gorgets, earrings, and bracelets were made from animal teeth, bone, shell, and cannel coal. The latter material was recovered from nearby streams and rivers along with freshwater mussel shells, while marine shell was obtained through long-distance exchange networks. The use of ornaments composed of marine shell increased during the latter portion of the Fort Ancient period, providing evidence for participation in interregional exchange networks (Pollack et al., 2002a).

Subsistence practices changed little during the Fort Ancient period. Maize was the most consumed food, with beans, squash, and sunflower being staples in the diet, as well. Additional crops grown included gourd, tobacco, and sumac. However, much less emphasis was placed on starchy-oil seeded crops, such as maygrass, compared to the Late Woodland peoples (Rossen, 1992a; Rossen and Edging, 1987). In addition to horticultural practices, local nuts and wild fruits were also collected, although there was a decreased

emphasis on nuts compared to the Late Woodland. Animal exploitation strategies focused on deer, bear, elk, and wild turkey for subsistence (Henderson, 2008:744).

Fort Ancient settlements within Kentucky consisted of autonomous villages and small camps which were typically located along floodplains or terraces of major streams and the Ohio River (Henderson, 2008:745). Environmental factors that may have influenced village location included topography, soil type, proximity to an environmental boundary, and proximity to water, while cultural factors may have been group territorial boundary and a concern for defense. The earliest settlements during this period consisted of small, dispersed farming communities consisting of scattered households with an associated activity area. Much like the Woodland period, stone mounds or ritual areas were located away from habitations (Henderson, 2008:745). Settlements after A.D. 1200 were more compact and varied in shape and size. Many were circular. Others were arc-shaped or consisted of a linear arrangement of structures along a ridge or terrace. The circular villages exhibited distinct activity areas that encircled a central plaza, which could serve purposes such as domestic, storage, or mortuary, although this differed from village to village. Burial mounds located at the edges of these plazas could also be present (Henderson, 1998; Pollack and Henderson, 1992b). Some, but not all, circular villages were encircled by a palisade (Henderson, 2008:745).

Villages during the Late Fort Ancient were larger, lacked mounds, and had more intensive occupations. In the culture's western boundary in Kentucky, these villages consisted of clustered households with associated cemeteries, while in the east villages remained circular and palisaded. Fort Ancient peoples lived in the villages for most of the year, with evidence for winter hunting camps present after A.D. 1400 (Fitting and Cleland, 1969). These small hunting camps are typically represented as open sites or rockshelter occupations and located at the headwater of smaller streams (Henderson, 2008:746). Over time, village population size increased from 40 to 50 people during the Early Fort Ancient, to 250 to 500 people during the Late Fort Ancient. The average house size also increased from 10.5 to 133 square meters (Henderson and Pollack, 2001). This increase in house size may be indicative of housing nuclear families prior to A.D. 1400, and housing extended or multiple families after A.D. 1400. Houses within villages tended to be square with rounded corners, with walls composed of single-set hardwood posts covered with bark, thatch, or mats (Henderson, 2008:746). In addition to increased housing and village size, there was also restricted spatial distribution of villages now along major waterways. The change in spatial distribution may be a response to the "Little Ice Age" (ca. A.D. 1450 to 1900), which may have caused Fort Ancient peoples to abandon certain areas and focus on areas with higher soil fertility and a longer growing season (Kennedy, 2000). Additional theories include the need for access to intervillage exchange routes (Henderson, 2008:747).

Interregional exchange continued during the Fort Ancient period. Prior to A.D. 1400, there was limited interaction with the Mississippian peoples. However, after A.D. 1400, interactions significantly increased and coincided with the appearance of a regional prestige good economy (i.e., trade of marine shell) (Henderson, 2008:747). Mississippian prestige goods (i.e., 'weeping eye' and rattlesnake motifs) in Fort Ancient graves after A.D. 1400 may also point to a greater participation by Fort Ancient peoples in the broader Mississippian religious system. The development of a regional Fort Ancient style of shell engraving may also be evidence of this as it is similar to Mississippian iconography (Henderson and Pollack, 2001).

The increased size of Fort Ancient villages and the participation of a long-distance exchange network may indicate a more complex political organization than earlier periods (Henderson, 2008:748). A formalized expression of social inequality began during the Middle Fort Ancient, as evidenced by mortuary contexts. According to Henderson (2008:748), during this time, social standing was expressed via burial placement (e.g., mound, mortuary zone, or trash pit). However, during the Late Fort Ancient, social inequality was expressed by grave goods (e.g., shell gorgets, pipes, and marine shell bead bracelets). Evidence of other mortuary practices include evidence of *in situ* defleshing, curation of selected bones before burial, and the reuse of graves (Henderson, 2008:750). After A.D. 1400, there is evidence for graveside ritual feasting and the use of offerings, such as maize and beans (Pollack et al., 1987). Burial practices included stone lined or stone covered pits, as well as mounds. The Lead Branch Crematory (15Pe126) located in Perry County represents a Fort Ancient mortuary site. The site, overlooking Lead Branch, consists of a four by six-meter rectangular enclosure formed by a low rock wall that was built directly on top of bedrock (Hand and Niquette, 1993). The burial dates to A.D. 1440 to 1532, with evidence of bones burned after decomposition. Other materials included charcoal, oxidized sandstone, chert flakes, mammal bones, and a Chesser Notched-like projectile point. The treatment of the remains and presence of grave goods may indicate the importance of the individual (Niquette et al., 1995).

Because of the location and mountainous terrain of the Upper Kentucky/Licking management area, some investigators (Sharp, 1990) have questioned whether post-A.D. 1000 sites in this management area should be considered Fort Ancient based on the mountainous terrain. According to Henderson (2008:810), while there is evidence of interaction/affiliation with groups located to the south and east (i.e., net impressed sherds), there is not enough evidence to assign sites to another cultural manifestation, although some sites located within the southern periphery of this management area could be assigned to either Fort Ancient or Mississippian. As of 2008, 222 Fort Ancient sites have been documented within the Upper Kentucky/Licking Management Area (Henderson, 2008:823). Fort Ancient site types in this area typically consist of open habitation or rockshelters (Henderson, 2008:819). The open habitation sites are typically located on benches overlooking waterways (15Br141), terraces overlooking floodplains (15Cy204 and 15Br9), and floodplains (15Lr13) (Henderson, 2008:819-821). Rockshelter sites were utilized mainly during the Late Fort Ancient subperiod. According to Henderson (2008:852), the Fort Ancient culture appears to have developed somewhat differently in this management area. Early and Middle Fort Ancient occupations tend to be open habitation sites, while Late Fort Ancient occupations, interpreted as temporary or seasonal camps, tend to occur more commonly in rockshelters (Henderson, 2008:853). Additionally, Fort Ancient potters continued the tradition of using locally available sandstone in the manufacture of ceramics. However, more research needs conducted in this management area to identify the characteristics of the ceramic assemblages.

### 9.3 Kentucky Cultural Landscapes

In addition to management areas, Kentucky is divided into five cultural landscapes based on regional environmental and/or cultural factors (Pollack, 2008a:19). These cultural landscapes also assist with organizing historic properties within geographic areas in Kentucky. The cultural landscapes consist of the Purchase, Pennyrile, Ohio Valley Urban Centers, Bluegrass, and Appalachian Mountains Cultural Landscapes.

Table 4 details the cultural landscapes within Kentucky, including the designated counties and subsections within each area.

**Table 6. Cultural Landscapes and Sections within Kentucky.**

<b>Cultural Landscape</b>	<b>Section</b>	<b>Counties</b>
<b>Purchase</b>	-	Ballard, Carlisle, Calloway, Fulton, Graves, Hickman, McCracken, Marshall
<b>Pennyrile</b>	Western Coalfield	Butler, Breckenridge, Daviess, Edmonson, Grayson, Hancock, Henderson, Hopkins, Livingston, Lyon, McLean, Muhlenberg, Ohio, Triggs, Union, Webster
	Plain	Allen, Barren, Caldwell, Christian, Crittenden, Hardin, Hart, Larue, Logan, Meade, Simpson, Todd, Warren
	Eastern	Adair, Casey, Clinton, Cumberland, Green, Metcalfe, Monroe, Pulaski, Russel, Taylor, Wayne
<b>Ohio Valley Urban Centers</b>	Louisville	Jefferson
	Northern Kentucky	Boone, Campbell, Kenton
<b>Bluegrass</b>	Inner	Anderson, Boyle, Bourbon, Clark, Fayette, Franklin, Garrard, Harrison, Jessamine, Lincoln, Madison, Mercer, Scott, Woodford
	Outer	Bath, Bracken, Bullitt, Carroll, Fleming, Gallatin, Grant, Henry, Marion, Mason, Montgomery, Nelson, Nicholas, Oldham, Owen, Pendleton, Robertson, Shelby, Spencer, Trimble, Washington
<b>Appalachian Mountains</b>	Coalfields	Bell, Floyd, Harlan, Johnson, Knott, Knox, Lawrence, Leslie, Letcher, McCreary, Martin, Perry, Pike, Whitley
	Foothills	Boyd, Breathitt, Carter, Clay, Elliott, Estill, Greenup, Jackson, Laurel, Lee, Lewis, Magoffin, Menifee, Morgan, Owsley, Powell, Rockcastle, Rowan, Wolfe

The Project is located within the Appalachian Mountains Cultural Landscape, which comprises one third of the state of Kentucky. This cultural landscape was initially sparsely settled by Euro-Americans due to the rugged area's lack of suitability for agriculture. According to Pollack (2008a:23), this area was nicknamed "Kentucky's Last Frontier," with many counties formed after 1850. The Appalachian Mountains Cultural Landscape is subdivided into two Sections: Highlands and Foothills, with the Project located in the



Highlands. The Highlands Section was sparsely settled by Euro-Americans prior to the construction of the railroads at the turn of the twentieth century and the growth of the coal mining industry. In addition, the topography of the section prevented wide-spread growth, as Euro-American settlement was limited to flat areas suitable for roads, housing, and coal processing facilities. Properties within this Section have also undergone extensive alteration, with few nineteenth century structures present. A history of Perry County and the Appalachian Mountains Cultural Landscape post-contact is detailed in Section 9.4, below.

#### 9.4 Historic Context

While the identity of the first European to explore Kentucky is unknown, it is generally accepted that European exploration within the state occurred by at least the late seventeenth century. Early known European explorers include Father Jacques Marquette and fur trader Louis Joliet on their 1673 trip down the Mississippi River, La Salle on his 1682 trip on the Mississippi River, and British exploration of westward-flowing rivers (McBride, 2008:906; Alvord, 1920). These explorations by the French and British initiated conflict between each sovereign nation and Native Americans, in a struggle that would continue through the next century.

By the late seventeenth century, many of the Ohio Valley tribes had become dependent on the Iroquois and the fur trade and were living in the northeastern United States. Exploration within Kentucky and neighboring regions was spurred by the fur trade, with numerous evidence of French fort construction within Illinois. The Ohio Valley fur trade was controlled by the Iroquois, while the Cumberland and Tennessee Valleys were controlled by the Chickasaw and Cherokee (Alvord, 1920).

While Illinois has numerous evidence of fort construction during the late seventeenth century, no evidence of fort or post construction is present within Kentucky until the first half of the eighteenth century. However, it is possible that small private posts were established in western Kentucky (McBride, 2008:906-907). By the 1720s, Native American groups, such as the Shawnee and Delaware, were returning or moving into the Ohio Valley, and by the 1740s, Pennsylvanian traders had begun moving into the Ohio Valley and establishing trading houses in Native American villages (Hunter, 1978:591; Alvord, 1920). At least one trading house was established in Kentucky along the Ohio River by 1752 to 1754.

Throughout the eighteenth century, land cessions of Native American lands were a continual occurrence. In 1744, the Treaty of Lancaster was negotiated and signed, and entailed that the Iroquois cede their lands south of the Ohio River to Europeans. As a direct result of this treaty, two land companies received land grants, which included the Loyal Company and the Ohio Company. Agents from these companies who traveled into Kentucky included Dr. Thomas Walker in 1749 via Appalachia and Christopher Walker via the Kentucky and Licking Rivers (McBride, 2008:908).

During the French and Indian War, the French controlled trade between 1754 and 1758 in the Ohio Valley. After 1758, French settlements were contained to western Kentucky, as the Treaty of Paris granted lands east of the Mississippi River to Great Britain; however, no definitive evidence exists of their occupation (McBride, 2008:908-909). During this time, trade and settlement along Kentucky's borders increased. By the

end of the French and Indian War, land speculators and settlers began moving into the Trans-Appalachian lands. While European settlement was temporarily stopped by the Proclamation of 1763 and Pontiac's Uprising from 1763 to 1765, afterwards speculators pressured British and colonial officials to shift the ceded lands line westward. Additional treaties during this time that removed Native American claims to their lands, included the Treaty of Hard Labor (1768), the Treaty of Fort Stanwix (1768), and the Treaty of Lochaber (1771), which relinquished Cherokee lands east of the Kanawha-New River, ceded Iroquois lands south of the Ohio River, and established the western boundary of Kentucky, respectively. Soon after the latter of these treaties was signed into effect, surveyors from various land companies and the Colony of Virginia began entering Kentucky, which rapidly spurred Euro-American exploration and settlement (Hammon and Taylor, 2002). In addition, during the late 1760s, hunters from Pennsylvania, Virginia, and North Carolina (also called "Long Hunters") entered Kentucky, staying in the state for months or years and moving from camp to camp. Their exploration was important to later settlement in Kentucky, as the information they reported back was utilized by land companies and speculators to encourage settlers to move to the state (McBride, 2008:910).

During the late eighteenth century and early nineteenth century, most of the land in Kentucky was claimed by Europeans, road infrastructure was established, towns were created, and counties were formed (Pollack, 2008a:7; McBride, 2008:911). While the previously mentioned treaties spurred European settlement, settlement remained relatively slow until after the Revolutionary War and due to continued conflict between Europeans and Native Americans. By 1784, Euro-American settlers numbered 30,000, and by 1790 Euro-Americans numbered 61,133, enslaved Africans numbered 12,430, and free African Americans numbered 114 (McBride, 2008:913). Statehood was granted to Kentucky in 1792, with the Treaty of Greenville (1795), which ceded all Native American claims to Kentucky, leading to a dramatic increase of settlers in the state. By 1800, 41 counties were formed, and the population of the state rose to 220,955 Euro-Americans and 40,433 enslaved Africans. Settlement within the Project's region was relatively slower than the rest of the state. However, the population of the region did increase from 20,297 to 34,602 between 1810 and 1820, with iron furnaces being centered in the region (McBride, 2008:914-919). By 1820, Perry County, where the Project is located, was formed (Pilcher, 1913).

During the early nineteenth century, growth in Kentucky resulted from a highly productive agricultural economy (Pollack, 2008a:7). The state continued to be predominantly agricultural throughout the nineteenth century, with agriculture recovering rapidly after the Civil War. By 1870, Kentucky was first in hemp production, third in the production of mules, fifth in swine, and eighth in the production of corn, wheat, and flax. By 1900, the value of farm products was the highest in the South except for Texas (Axton, 1975; Tapp and Klotter, 1977).

By the mid-nineteenth century, farm tenancy and farm mortgages increased throughout Kentucky, with tenancy increasing from 26.5% of farm operators in 1880 to 33.9% in 1900. Share-renting and sharecropping increased, as well, all of which may be tied to freed slaves who had a great knowledge of agriculture but no means of acquiring land (McBride, 2008:944). The increase has also been attributed to the economics of tobacco production, in which high prices coupled with high labor demands and high land prices often made

renting and working small acreage a more profitable way to farm (McBride, 2008:944). However, within the Project's region, and much like other less fertile portions of the state, focus remained more oriented toward subsistence crops, such as corn and livestock, rather than tobacco (Burrough, 1924). In Perry County, crops grown included corn, potatoes, and hay, as well as apples and berries. Livestock included swine, cattle, mules, sheep, and horses (Randolph, 1936:3-4).

During the late nineteenth century and early twentieth century, agricultural deterioration within the region of the Project was evident. This was in part due to the extractive industries of lumber and coal. The timber industry caused erosion and loss of fertility, while coal towns often occupied the flatter, more valuable farmland. Additional factors that effected soil fertility and agricultural production within or near the Project included the loss of labor to the timber and coal industries, the demand of food from miners, and the demand for livestock feed for oxen (Caudill, 1963; Jones, 1985). As a result, many farmers began cultivating the less fertile lands (i.e., slopes), and livestock declined to only 39% of its 1880 level by 1930 (Kirby, 1987). Within the region, lumber and mining began to create a dependence on wage labor and/or sharecroppers (i.e., landless farmers).

From the mid-nineteenth century to the early twentieth century, over 600 coal towns were formed within the Appalachian Mountain region, with many people arriving from northern cities or western Kentucky (McBride, 2008:957, 962). Much of the state's best timber and coal was located within the Appalachian Mountain region in areas without established towns. Therefore, a number of entire communities were constructed due to the timber and coal industries. Essential components of a coal town included a railroad line, mine entrance, dump areas, sorting sheds, mine office, small frame houses for the miners, larger frame houses for the mine managers and other officials, at least one store, and a blacksmith shop. Other components could include a bank, service shops for the railroad, doctor's office, boarding house or hotel, wash houses, community buildings, schools, or churches. However, one definitive feature of mining towns was the lack of a municipal government, city council, and a low number of retail outlets per capita, otherwise called a "company town" (McBride, 2008:963; Pickard, 1969). Terraces and floodplains were common locations for these company towns, as the necessity for flat land for a railroad heavily influenced the location (McBride, 2008:965). Hazard, the county seat of Perry County, was a company town owned and controlled by mining companies. In 1920 the population was 537, and by 1936 the population was approximately 10,000 (Randolph, 1936:19).

By the second half of the nineteenth century, there was an increase in road and railroad chartering and construction. Other than the Louisville and Nashville feeders from the Ohio River to Lexington, few rail lines and formalized roads had been constructed before interruption by the Civil War. Most major roads and railroads were built during the Antebellum period (1865-1915), with the majority of roads consisting of private toll roads. Within Kentucky, violence against toll gates and houses, which protested rising tolls amidst falling agricultural prices, peaked in 1896 (Hepner and Whyne, 1992). In addition, roads during this time primarily consisted of a dirt surface or, at best, crushed rock that consisted of limestone or chert (McBride, 2008:955).

After World War I, the rural population of Kentucky increased more slowly than the urban population, as people moved to cities for work. For example, from 1910 to 1920, the rural population increased by only 2.8% while the urban population increased by 14.1%. This trend reversed in the 1930s due to the Great Depression and mass layoffs, with the rural population increasing by 10% and the urban population increasing only by 6.3% (U. S. Census, 1943). Within Perry County, the population somewhat differed from the state-wide trend between 1910 and 1920, with Pilcher (1913) stating that the “population is now over double what it was a year ago when the railroad arrived.” Between 1910 and 1920, spurred by the mining industry, the population of Perry County increased from 11,255 to 26,042, and by 1930 the population was 42,186.

Throughout the twentieth century, there was a continuation of the previous trends from the nineteenth century, with a general decline of farming as a way of living, the increased prevalence of wage labor, continued urbanization, major improvements in roads, decline in river traffic, increase in stores and access to consumer goods, and the continued extraction of natural resources such as timber and coal (McBride, 2008:967). The 1920s was a period of agricultural stagnation in Kentucky, as well as much of the South. While 26.6% of farms were classified as tobacco farms and 19.1% were classified as commercial orientation, almost 29% were classified as self-subsistence (Odum, 1936:170). As discussed above, lands within the Project’s region contained poor agricultural soils that produced low yields. As a result, many farmers were pushed to marginal lands, such as steep slopes. By the mid-1920s, many fields were abandoned and were marked by secondary growth of sassafras, persimmon, and other small shrubs (Davis, 1927). In addition, outbuildings associated with farms were relatively rare compared to farms in the North.

While the agricultural industry made modest gains during World War II as farm income rose, the resurgence of the mining industry, particularly within the Appalachian Mountain region, interrupted these agricultural improvements (Caudill, 1963). Between 1920 and 1940, the number of persons engaged in farming declined from 70% of the Kentucky population to 55% (Kirby, 1987). According to Randolph (1936:4), 23.8% of Perry County was employed in agriculture in 1936, with most production little more than what the farmer’s family could consume. In addition, over 132,000 acres of the county were farmsteads. Tenancy continued to increase during the twentieth century possibly associated with the increase of farmers becoming part-time wage laborers. Tenancy increased from 33% in 1920 to 38% of all farms by 1940 (U. S. Census, 1943). Between 1929 and 1934, the number of tenant farmers within Perry County more than doubled, with corn, potatoes, and hay being the leading farm crops (Randolph, 1936:4-5).

One of the most dramatic changes during the early to mid-twentieth century was the improvements of roads and the increased prevalence of automobiles. In 1918, Kentucky roads totaled almost 58,000 miles, only 13,900 miles of which had any surface (Clark, 1960). Because road traffic continued to increase and caused a faster rate of wear, the need for road surfaces increased significantly. However, efforts in the Appalachian Mountain region were drastically reduced, with only one in 20.4 persons owning a vehicle by the early 1930s as compared to one in 6.9 within the Lexington and Frankfort region (Odum, 1936:366). In rural Kentucky, small farms and rural residences began to be established along roads, with many people migrating from farms to the “pike.” As a result, they could continue to have a garden and some animals on

several acres, but also take advantage of the improved roads to commute to outside jobs or nearby towns and cities (Sauer, 1927:145). By 1936, Perry County contained 70.9 miles of state-maintained highways, with 222 miles of improved and unimproved county roads (Randolph, 1936:2).

The lumber industry began to decline in Kentucky as compared to the nineteenth century. Many lumber camps were abandoned with few new lumbering sites established (McBride, 2008:983). However, within Perry County, particularly near the county seat of Hazard, the timber industry was within its initiative stage (Pilcher, 1913). According to Pilcher (1913), "Timbermen and lumber dealers and sawmills the country over have made Hazard the headquarters and the hotels are crowded with agents buying lands and logs and walnut stumps... the registers of the Combs Hotel and the Hotel Beaumont have names daily from Virginia, Tennessee, and other states." It was also during this time, in the twentieth century, that public dismay over deforestation began to grow. As a result, several National Forests were established in eastern Kentucky during the 1910s and 1920s (Eller, 1982:119). In 1923, approximately 15,000 acres in Breathitt, Knott, and Perry Counties were conveyed by the E. O. Robinson Mountain Fund to the University of Kentucky for agricultural experiment work, teaching, and practical demonstration of reforestation (Overstreet, 1984).

The coal mining industry in Kentucky was significantly prosperous from the mid-1910s to the mid-1920s, for both the coal companies and miners. It is estimated that by 1925, there were over 500 coal towns in Appalachia (Shifflet, 1991), with 37 coal camps or towns in Perry County, Kentucky. According to Pilcher (1913), coal mining was in its infancy within Perry County in 1917, with only three mines opened: Raccoon Coal Company, Jewel Coal Company, and D. Y. Combs mines. By 1926, however, the County was producing over 6.5 million tons of bituminous coal, making the county the third highest producer in Kentucky. However, this prosperity ended between 1927 and 1929 with a sharp decline in coal and the closing of small mines due to the Great Depression. Coal mines declined from 742 in 1919 to 479 by 1939, while people employed in the mining industry declined from almost 58,000 in 1929 to approximately 49,000 in 1939 (U. S. Census, 1943). By the end of the 1930s, mining in the Appalachian Mountain region resumed due to World War II. However, improvements in transportation and the lower labor demands introduced by mechanization resulted in more dispersed and scattered housing throughout rural Kentucky (Caudill, 1963; Pickard, 1969). By 1936, coal mining employed 44.4% of Perry County's employed population. In addition, there were 46 active coal mines and 129 abandoned coal mines (Randolph, 1936:3).

In addition to coal mining in the Appalachian Mountain region of Kentucky, large-scale strip mining was introduced beginning in 1928. The largest of these strip-mining industries were in Pike, Perry, and Breathitt counties (Currens and Smith, 1977:8-10). The industry continued to grow in popularity, although the tonnage never outnumbered the tonnage recovered from underground mining from the 1920s to the 1970s. In addition, due to strip mining operations being more dispersed than underground mines, as well as the growth of the automobile, many nucleated company towns began to decline (McBride, 2008:984).

In addition to agriculture, timber, and coal, additional Perry County industries included retail establishments, transportation (i.e., the Eastern Kentucky Division of the Louisville and Nashville Railroad and the Southeastern Greyhound Bus line between Hazard and Lexington), hospitals, the Perry County Health

Department (established 1927), public works, newspapers (*The Hazard Herald*, *the Hazard Plain Dealer*, and the *Union Advocate*), an electric power plant maintained by the Kentucky and West Virginia Power Company, fire department, banks, churches, hotels, a YMCA, and wholesale establishments (Randolph, 1936:4-5, 20). A steel plant was also erected in Hazard in order to take advantage of the coal industry.

## 9.5 Historic Maps Review

Historic maps and aerial photographs depict nineteenth- and twentieth-century settlement and development within the Project and surrounding vicinity. Maps and historical aerial photographs reviewed include:

- The 1891 *Hazard, Kentucky* USGS topographic quadrangle (Figure 5)
- The 1913 *Buckhorn, Kentucky* and 1914 *Troublesome, Kentucky* USGS topographic quadrangles (Figure 6)
- The 1937 Highway and Transportation Map Perry County Kentucky (Figure 7)
- The 1972 *Krypton, Kentucky* and 1972 *Hazard North, Kentucky* USGS topographic quadrangles (Figure 8)
- 1995, 2004, 2008, 2014, and 2022 Aerial Photographs (Google Earth, 2022)

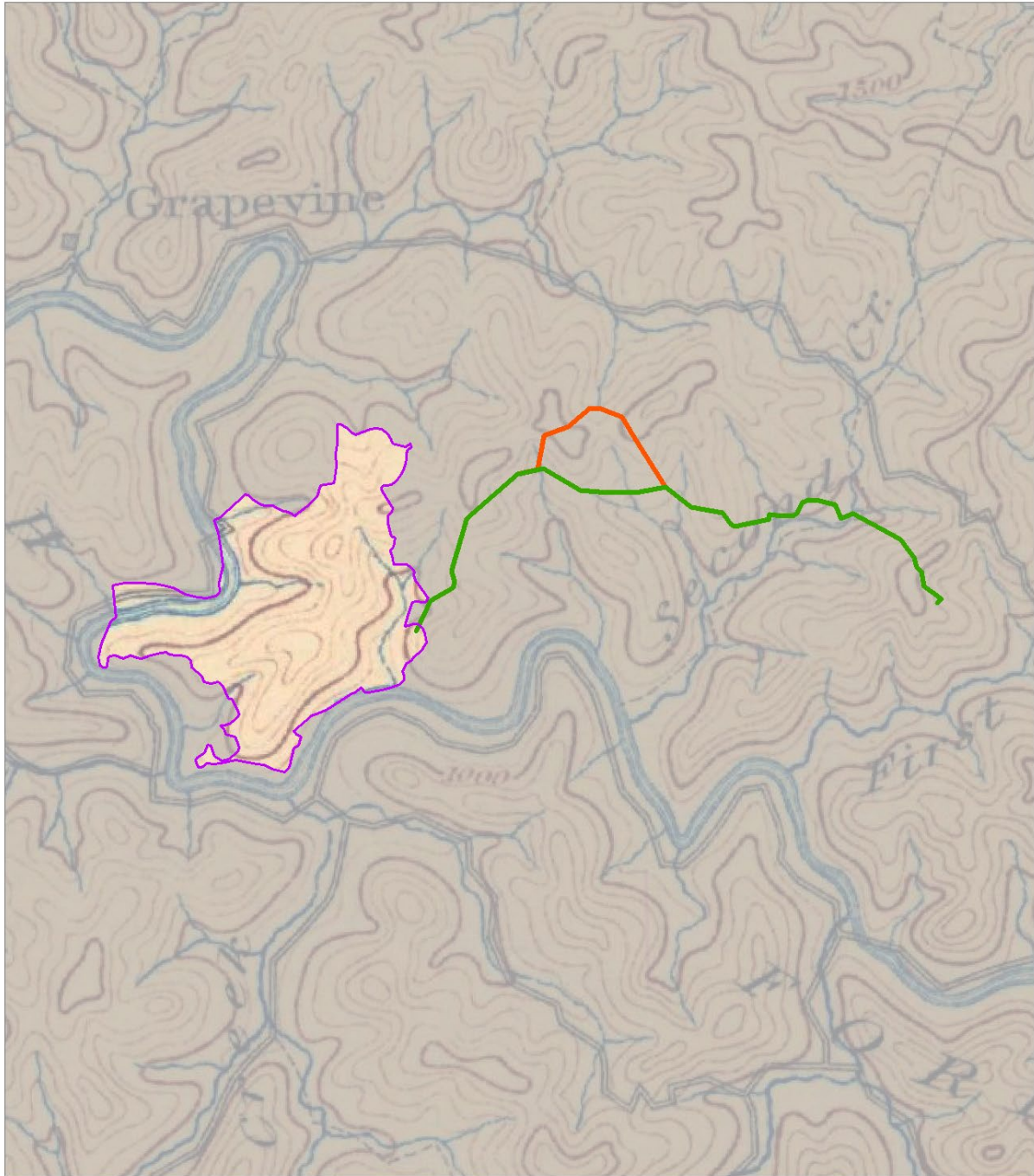
Each map and aerial photograph are discussed in detail below.

## 9.6 1891 Hazard, Kentucky USGS topographic quadrangles

The area within the Project and the surrounding vicinity was primarily rural throughout the nineteenth century, with little development or occupation by Euro-Americans until the twentieth century (USGS, 1891; see Figure 5). Few structures or towns are mapped within Figure 5. Notable mapped waterbodies in 1891 that continue to be present near or within the Project today include the North Fork of the Kentucky River, First Creek, and Second Creek (presently an unnamed stream). Hazard, the county seat, is located southeast of the Project, with few mapped structures present. Mapped roads near or within the Project include Couchtown Road, portions of Sam Campbell Branch Road, portions of State Route 451, and an unnamed road that would eventually become the Lexington and Eastern Railroad.

## 9.7 1913 Buckhorn, Kentucky and 1914 Troublesome, Kentucky USGS topographic quadrangles

Development within the Project and surrounding vicinity increased exponentially between 1891 and 1913/1914 (USGS, 1891, 1913, and 1914; see Figures 5 and 6). One of the most notable changes included the construction of the Lexington and Eastern Railroad, which paralleled the North Fork of the Kentucky River and connected Perry County to major cities within and outside of Kentucky. Mapped structures and schoolhouses significantly increased throughout the vicinity of the Project between 1891 and 1913/1914, particularly around waterbodies such as the North Fork of the Kentucky River, First Creek, Pigeonroost Branch, and Lower Second Creek (presently an unnamed stream). Mapped roads near or within the Project

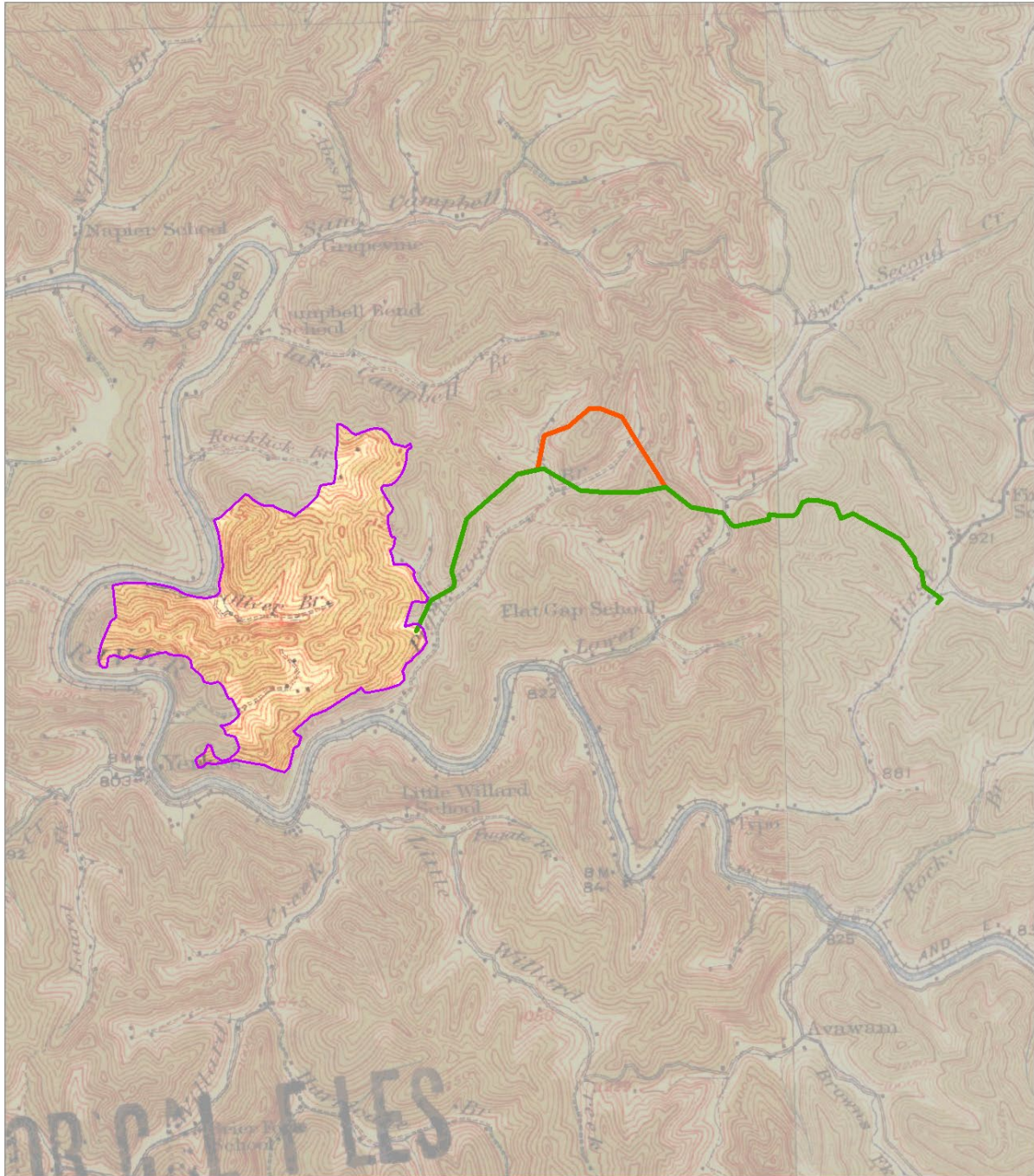


- T-Line Area
- Transmission Line
- Alternate Transmission Line
- Facility Area



Basemap: 1891 USGS Hazard, Kentucky 1:125,000 Topographic Quadrangle

**Figure 5. 1891 Hazard, Kentucky USGS topographic quadrangle**



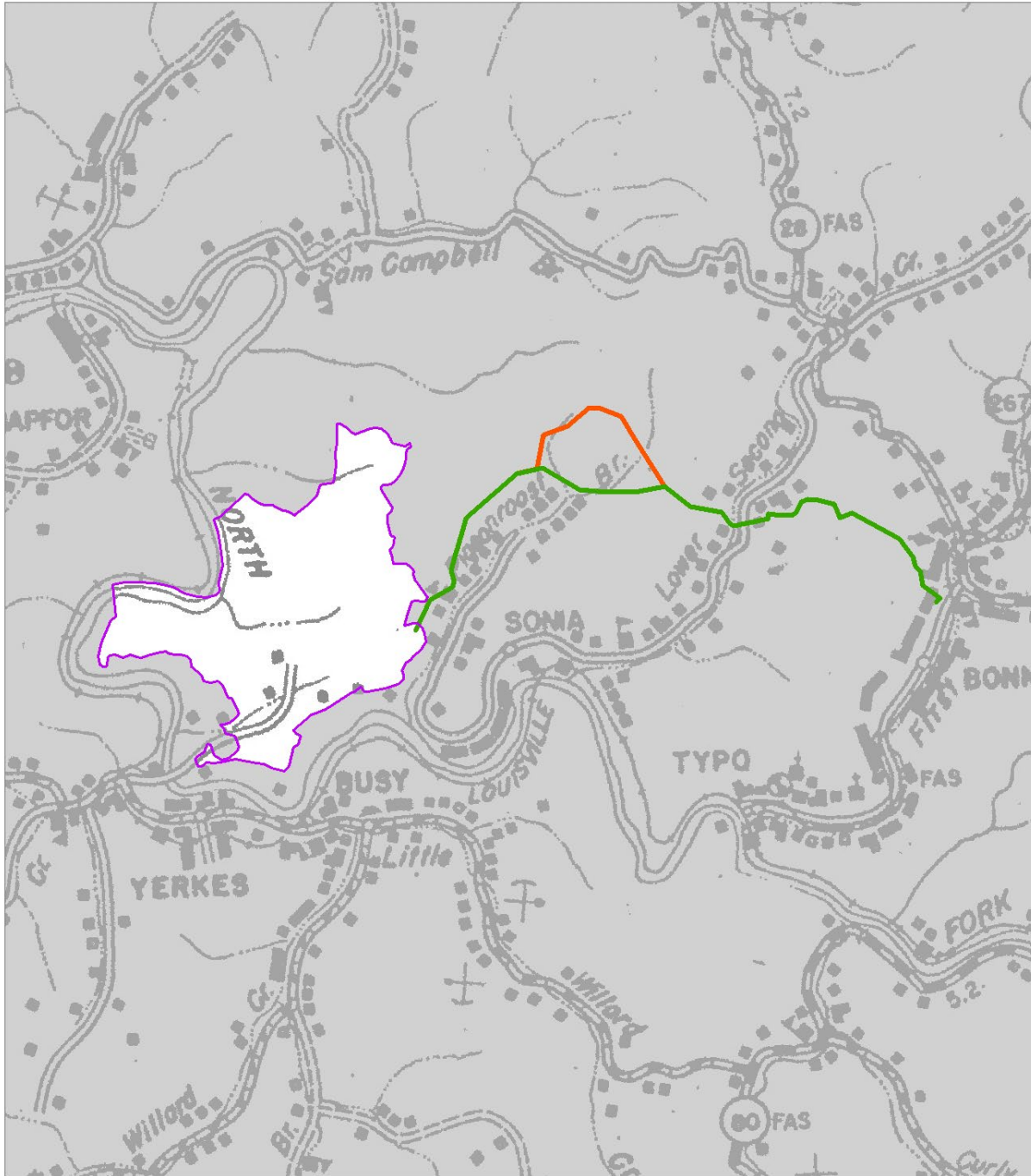
- T-Line Area
- Transmission Line
- Alternate Transmission Line
- Facility Area



Basemap: 1913 USGS *Buckhorn, Kentucky* and 1914 *Troublesome, Kentucky* 1:62,500 Topographic Quadrangles

Figure 6. 1913 Buckhorn, Kentucky and 1914 Troublesome, Kentucky USGS topographic quadrangles



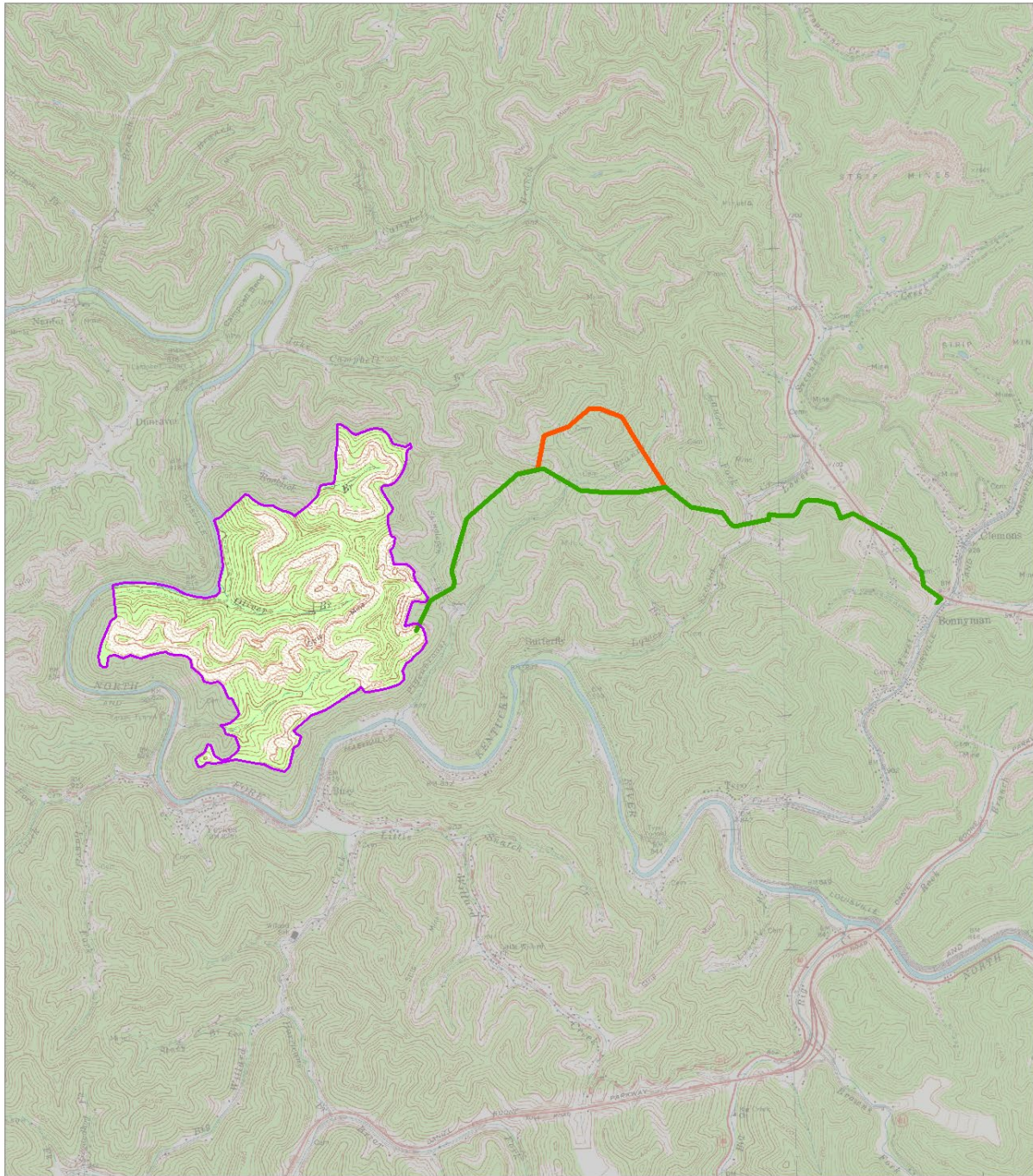


- T-Line Area
- Transmission Line
- Alternate Transmission Line
- Facility Area



Basemap: 1937 High and Transportation Map, Perry County, Kentucky

Figure 7. 1937 Highway and Transportation Map Perry County Kentucky



- T-Line Area
- Transmission Line
- Alternate Transmission Line
- Facility Area



Basemap: 1972 USGS Hazard, Kentucky and Krypton, Kentucky 1:24,000 Topographic Quadrangles

**Figure 8. 1972 Krypton, Kentucky and 1914 Hazard North, Kentucky USGS topographic quadrangles**

included portions of Highway 15, Lower Pigeonroost Road, portions of Couchtown Road, portions of State Route 451, Flatgap Road, Rocklick, and Rocklick Branch Road. Mapped towns near the Project included Yerkes and Krypton.

### **9.8 1937 Highway and Transportation Map Perry County Kentucky**

Development within or near the Project continued to increase between 1913/1914 and 1937, most likely spurred by the mining and lumber industries (see Section 9.4). Mapped mines are significantly prevalent to the east of the Project, and to the southeast near the county seat of Hazard and along Highway 15. Numerous mapped structures are centralized along major roads and waterbodies, most likely due to the steep topography of the county and in keeping with state-wide trends (see Section 9.4). Mapped towns near the Project that were not present on the 1913/14 USGS topographic maps include Bonnyman, Typo, Busy, and Napfor.

### **9.9 1972 Krypton, Kentucky and 1972 Hazard North, Kentucky USGS topographic quadrangles**

Between 1937 and 1972, surface mining activities began within the Facility Area and T-Line Area, which paralleled state-wide trends (see Section 9.4). Additionally, mapped structures from 1913/1914 and 1937 within or near the Project somewhat decreased, possibly from demolition tied to the surface mining activities. Mapped cemeteries near the Project also appeared on the USGS topographic quadrangles, which were not mapped in 1937. In general, however, the Project and nearby vicinity appeared relatively similar to their present-day conditions.

### **9.10 1995, 2004, 2008, 2014, 2018, and 2022 Aerial Photographs**

While surface mining activities have been prevalent near the Project since the mid-twentieth century, significant changes did not occur within the Facility Area until the late twentieth century. According to aerial photographs from 1995 and 2004 (Google Earth, 2022), strip mining activity exponentially increased between 1995 and 2004, transforming the ground surface of the Facility Area to its present-day condition. This activity continued to increase between a 2008 and 2014 aerial photograph. Between 2014 and 2018, however, the surface mining activity appeared to cease, with the Facility Area appearing overgrown by vegetation in a 2018 and 2022 aerial photograph (Google Earth, 2022).

## SUMMARY

The Phase IA Archaeology Report presented herein was conducted on behalf of Bright Mountain, LLC as part of their due diligence for their application to the Kentucky State Board on Electric Generation and Transmission Siting.

The proposed Project is not currently anticipated to directly (physically) impact any known cultural resources eligible for or listed on the NRHP. No previously recorded archaeological sites within the Project are considered eligible for or listed on the NRHP.

Additionally, the Project is primarily located within a highly disturbed landscape with steep topography. Intensive past surface mining activities during the twentieth and early twenty-first century dramatically altered the ground surface within the Buildable Area of the Facility Area. Therefore, due to the intensive ground disturbance within the Buildable Area of the Facility Area as well as the extremely steep topography within the T-Line Area, EDR recommends that the Project has a low probability of impacting cultural resources.

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