Contract Publication Series 17-369

AN ARCHAEOLOGICAL SURVEY OF THE PROPOSED KY 1057 SAFETY IMPROVEMENTS IN POWELL COUNTY, KENTUCKY (ITEM NO. 10-9009.00)

by
Thomas H. McAlpine, Jr., RPA 989402,
and Alexandra D. Bybee, RPA 11813

Prepared for

KENTUCKY TRANSPORTATION CABINET

Prepared by

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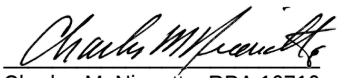

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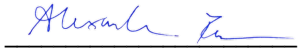

Alexandra D. Bybee, RPA 11813
Co-Principal Investigator

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Kentucky Transportation Cabinet Item No.:10-9009.00
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ABSTRACT

Between October 3 and 5, 2017, Cultural Resource Analysts, Inc., personnel conducted an archaeological survey of the proposed KY 1057 safety improvements project in Powell County, Kentucky (Item No. 10-9009.00). The survey was conducted at the request of David Waldner of the Kentucky Transportation Cabinet. The project area covers approximately 5.4 ha (13.3 acres), including 4.0 ha (9.8 acres) of new right-of-way. The project area was characterized by residential yards, driveways, pastures, an agricultural field, and a wooded area along KY 1057.

Prior to the survey, a records review was conducted at the Office of State Archaeology. The review indicated that four previous professional archaeological surveys have been conducted and five archaeological sites have been recorded within a 2.0 km (1.2 mi) radius of the project area. None of these previous survey areas or sites were within the current project area, however Site 15Po98 was reported to be adjacent to the project area. No evidence of Site 15Po98 was found within the project area.

The entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing and a bucket auger. As a result of the survey, one previously unrecorded site (15Po489) and one isolated find (IF 1) were recorded. Site 15Po489 was a multicomponent indeterminate prehistoric open habitation without mounds, and a late-nineteenth- to mid-twentieth-century historic farm/residence consisting of prehistoric and historic artifacts recovered from a few shovel tests. The site is recommended as not eligible for inclusion in the National Register of Historic Places and no further work is recommended. IF 1 consisted of two prehistoric flakes from a single shovel test. It is recommended as not eligible for inclusion in the National Register of Historic Places and no further work is recommended. No sites listed in or eligible for inclusion in the National Register of Historic Places will be affected by this project; therefore, archaeological clearance is recommended.

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I. INTRODUCTION

Between October 3 and 5, 2017, Cultural Resource Analysts, Inc. (CRA), personnel conducted an archaeological survey of the proposed KY 1057 safety improvements project in Powell County, Kentucky (Item No. 10-9009.00) (Figure 1). The survey was conducted at the request of David Waldner of the Kentucky Transportation Cabinet (KYTC). Thomas H. McAlpine, Jr., conducted the survey, which required 25 hours to complete. Office of State Archaeology (OSA) Geographic Information Systems (GIS) data was requested by CRA on September 1, 2017, and was returned on September 14, 2017. The results were researched by Heather Barras of CRA at the OSA on September 21, 2017. The OSA project registration number is FY18_9354.

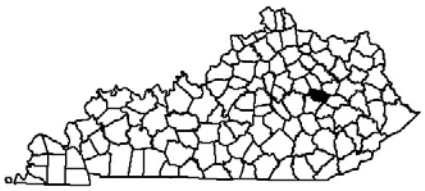

Figure 1. Map of Kentucky showing the location of Powell County.

Project Description

The project consists of low cost safety improvements on KY 1057 beginning near mile point 1.55 and extending to mile point 2.3 south of Clay City and the Mountain Parkway (Figures 2 and 3). Because of scheduling, District 10 has requested that the maximum limits of the two alternates being considered be subjected to an archaeological survey. The project area covers approximately 5.4 ha (13.3 acres), including 4.0 ha (9.8 acres) of new right-of-way. The project area consists of residential yards, driveways, pastures, an agricultural field, and a wooded area along KY 1057.

Purpose of Study

This study was conducted to comply with Section 106 of the National Historic Preservation Act. This transportation project is federally funded, and therefore considered an undertaking subject to Section 106 review. The purpose of this survey was to assess any potential effects the improvements might have on identified cultural resources. To do this, we followed these objectives:

> identify prehistoric and historic archaeological sites located within the project area;
>
> determine, to the extent possible, the age and cultural affiliation of sites;
>
> establish the vertical and horizontal boundaries of sites;
>
> establish the degree of site integrity and potential for intact cultural deposits to be present.

For the purposes of this assessment, a site was defined as "any location where human behavior has resulted in the deposition of artifacts, or other evidence of purposive behavior at least 50 years of age" (Sanders 2006:2). Cultural deposits less than 50 years of age were not considered sites.

The following is a description of the project area, previous research and cultural history of the area, field and laboratory methods, materials recovered, and results of this study. It conforms to the *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Sanders 2006). Cultural material, field notes, records, and site photographs will be curated with the William S. Webb Museum of Anthropology, University of Kentucky, in Lexington.

Summary of Findings

Prior to the survey, a records review was conducted at the Office of State Archaeology. The review indicated that four previous professional archaeological surveys have been conducted and five archaeological sites have been recorded within a 2.0 km (1.2 mi) radius of the project area. None of these previous survey areas or sites were within the current project area, however Site 15Po98 was reported to be adjacent to the project area. No evidence of Site 15Po98 was found within the project area.

The entire project area was subjected to intensive pedestrian survey supplemented with screened shovel testing and a bucket auger. As a result of the survey, one previously unrecorded site (15Po489) and one isolated find (IF 1) were recorded. Site 15Po489 was a multicomponent indeterminate prehistoric open habitation without mounds, and a late-nineteenth- to mid-twentieth-century historic farm/residence consisting of prehistoric and historic artifacts recovered from a few shovel tests. The site is recommended as not eligible for inclusion in the National Register of Historic Places (NRHP) and no further work is recommended. IF 1 consisted of two prehistoric flakes from a single shovel test. It is recommended as not eligible for inclusion in the NRHP and no further work is recommended. No sites listed in or eligible for inclusion in the NRHP will be affected by this project; therefore, archaeological clearance is recommended.

II. ENVIRONMENTAL SETTING

This section of the report provides a description of the modern and prehistoric environment and considers those aspects of the environment that may have influenced the settlement choices of past peoples. Attributes of the physical environment also often guide the methods used to discover archaeological sites. Topography, bedrock geology, vegetation, hydrology, soils, lithic resources, and climate for the project area are discussed below.

The Eastern Kentucky Coal Field region (Figure 4) is a rugged and maturely dissected area that is underlain by sandstone, shale, and coal (Bladen 1973:23, 31; Pollack 2008:16–18). There are 35 counties situated either entirely or partially within this region: Bell, Boyd, Breathitt, Carter, Clay, Elliott, Estill, Floyd, Greenup, Harlan, Jackson, Johnson, Knott, Knox, Laurel, Lawrence, Lee, Leslie, Letcher, Lewis, McCreary, Magoffin, Martin, Menifee, Morgan, Owsley, Perry, Pike, Powell, Pulaski, Rockcastle, Rowan, Wayne, Whitley, and Wolfe Counties (Bladen 1973:23). Lewis and Rowan Counties in northeastern Kentucky encompass a portion of the Knobs, a wedge of the Mississippian Plateaus, and a portion of the Eastern Kentucky Coal Field. Rockcastle County is situated partially within the Knobs subregion, partially within the Mississippian Plateaus, and partially within the Eastern Kentucky Coal Field region. Pulaski and Wayne Counties are situated partially within the Mississippian Plateaus and partially within the Eastern Kentucky Coal Field regions. Finally, Estill and Powell Counties overlap portions of the Knobs and the Eastern Kentucky Coal Field as well.

This region holds the highest elevations in Kentucky, culminating with Black Mountain in Harlan County, which has an estimated elevation of over 1,250 m (4,100 ft) above mean sea level (AMSL) (Bladen 1973:23; Schwendeman 1979:27). The region is bordered to the west and north by the Pottsville Escarpment and to the east and south by the state lines of West Virginia and Virginia, respectively. Ridge crests and valley bottoms are typically very narrow, and the majority of the terrain is steeply sloped.

The Big Sandy, Cumberland, Kentucky, Licking, Little Sandy, and Ohio Rivers and their tributaries, along with Tygarts Creek, drain the Eastern Kentucky Coal Field region (Figure 5). Locally, the major river valleys are very wide, and most of the human habitation is on the floodplains and low terraces (Newell 2001). High terraces are remnants of earlier valley bottoms.

The Eastern Kentucky Coal Field is located in the Mixed Mesophytic Forest region, which is described as the most complex and oldest association of the Deciduous Forest Formation (Braun 2001:39). Mixed mesophytic refers to a climax association in which dominance is shared by a number of species, and the dominant trees are beech, tuliptree, basswood, sugar maple, chestnut, sweet buckeye, red oak, white oak, and hemlock (Braun 2001:40).

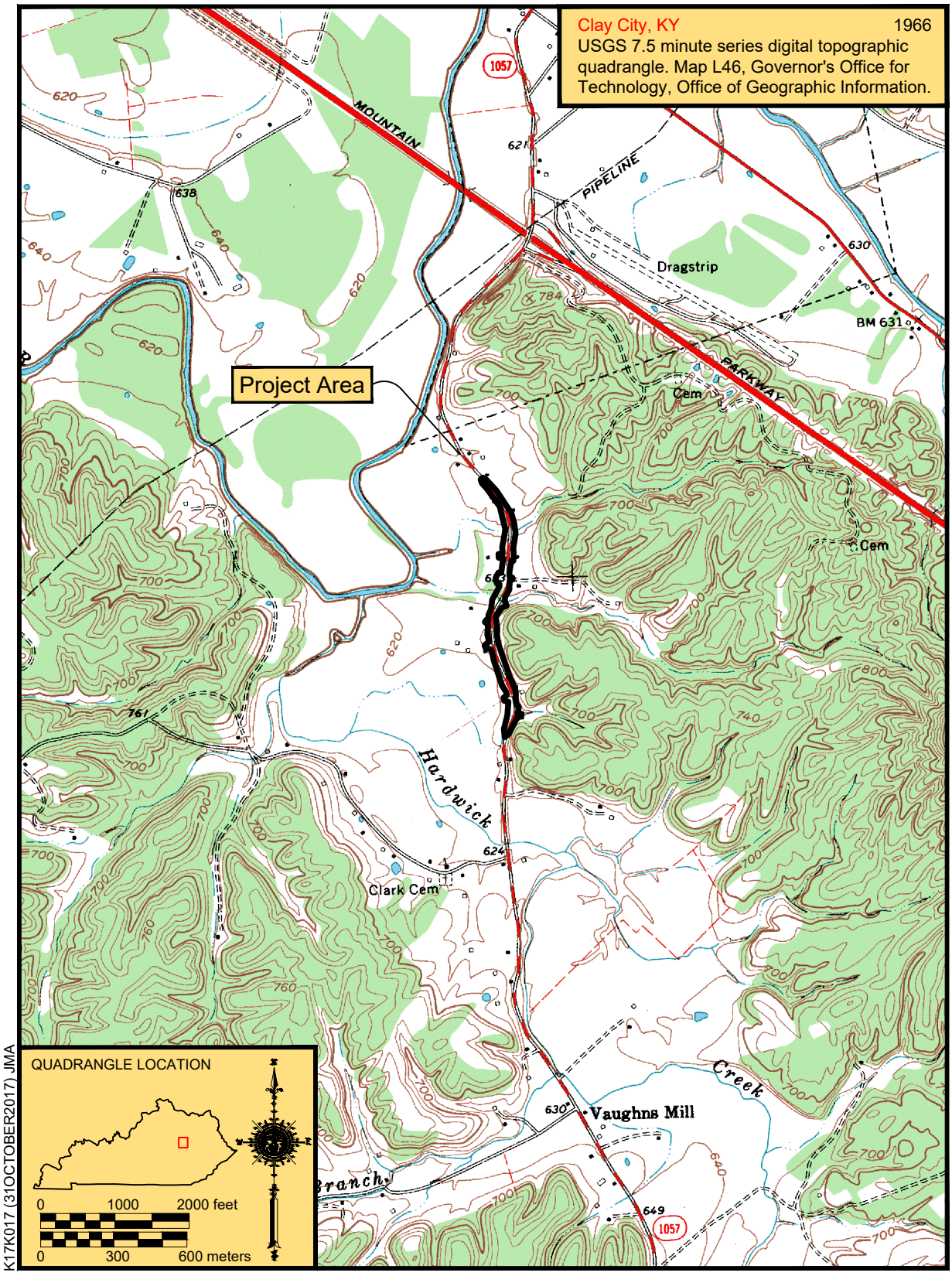

Figure 2. Location of project area on topographic quadrangle.

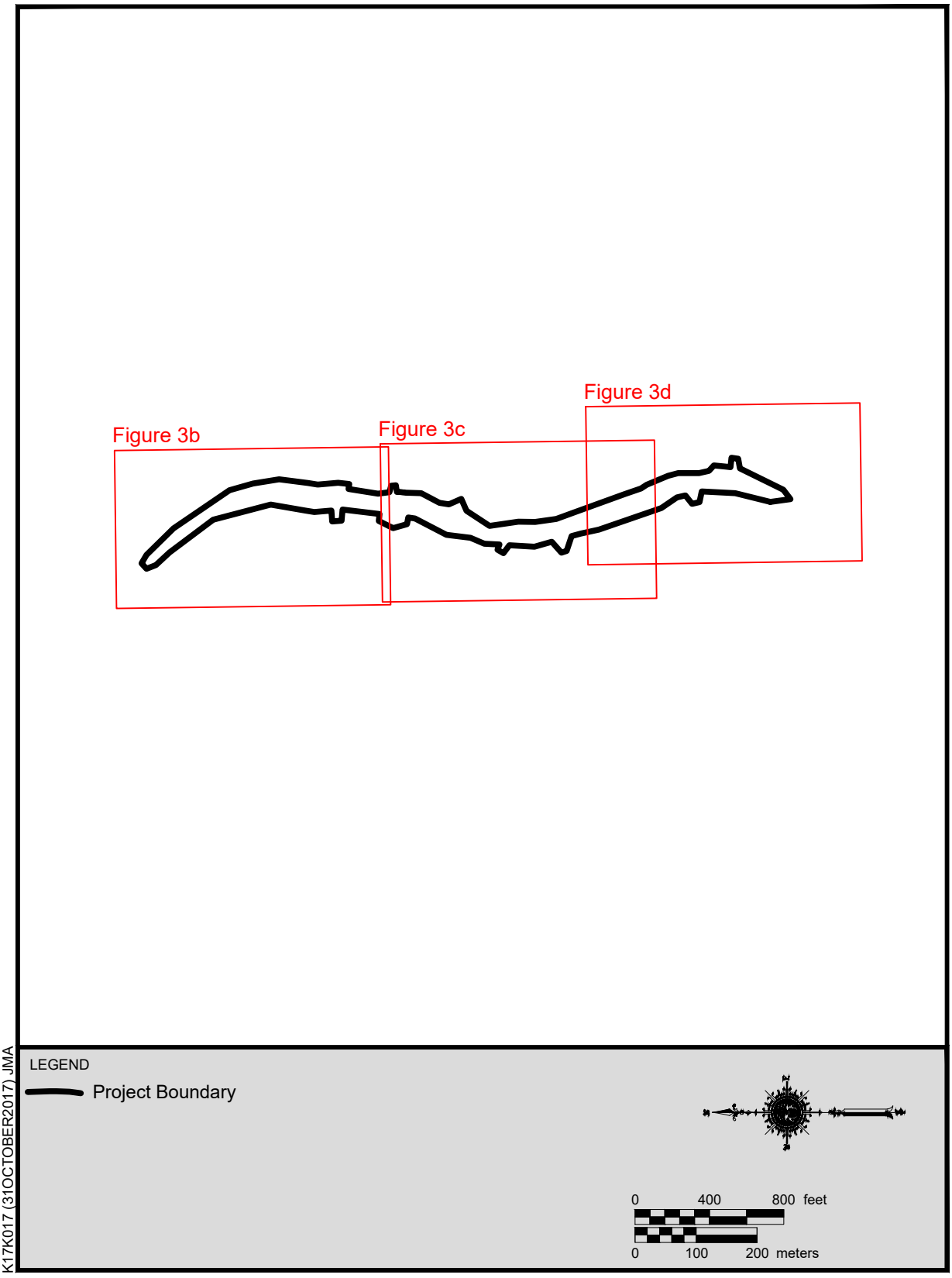

Figure 3a. Project area plan map (key).

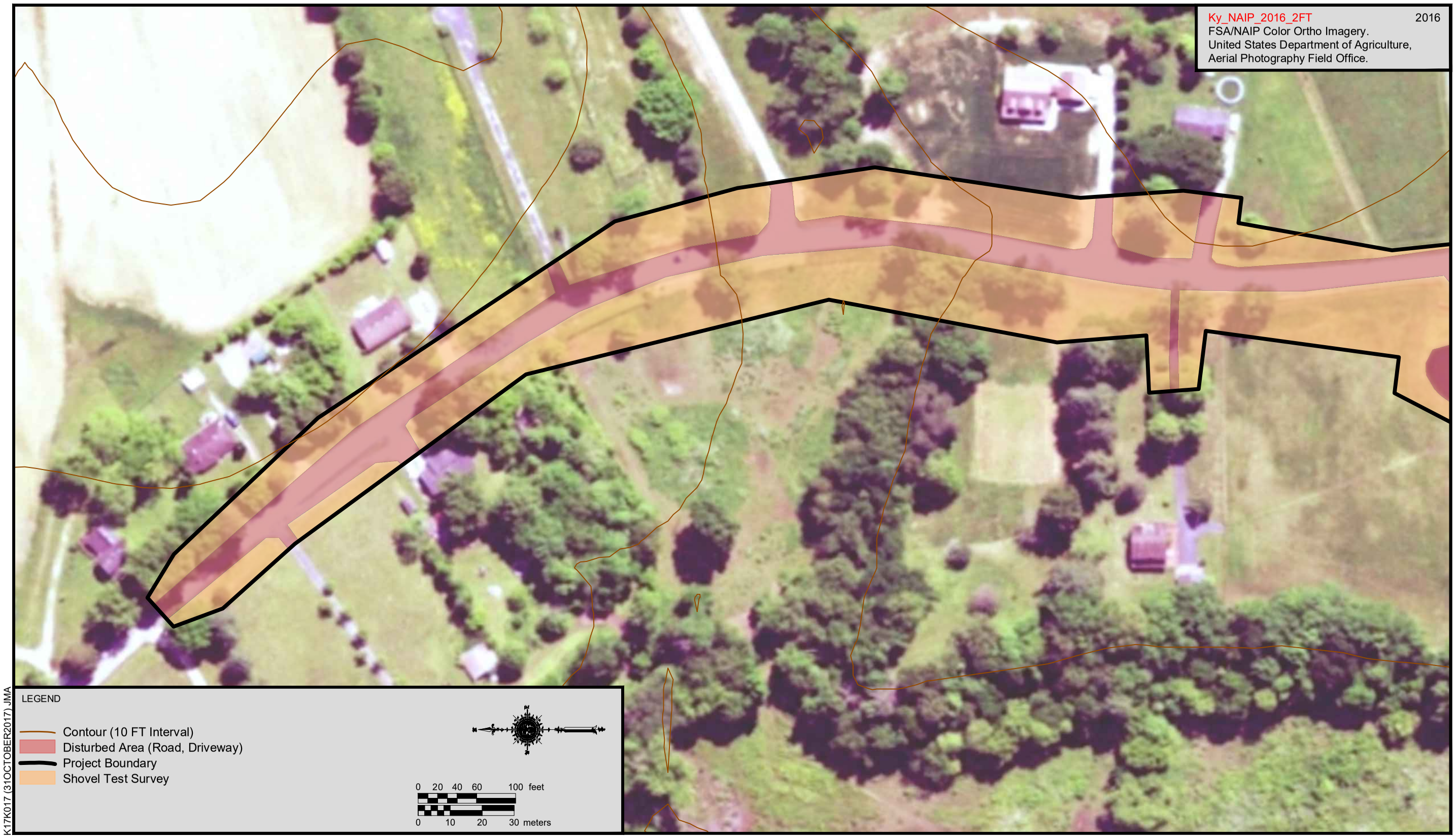

Figure 3b. Project area plan map.

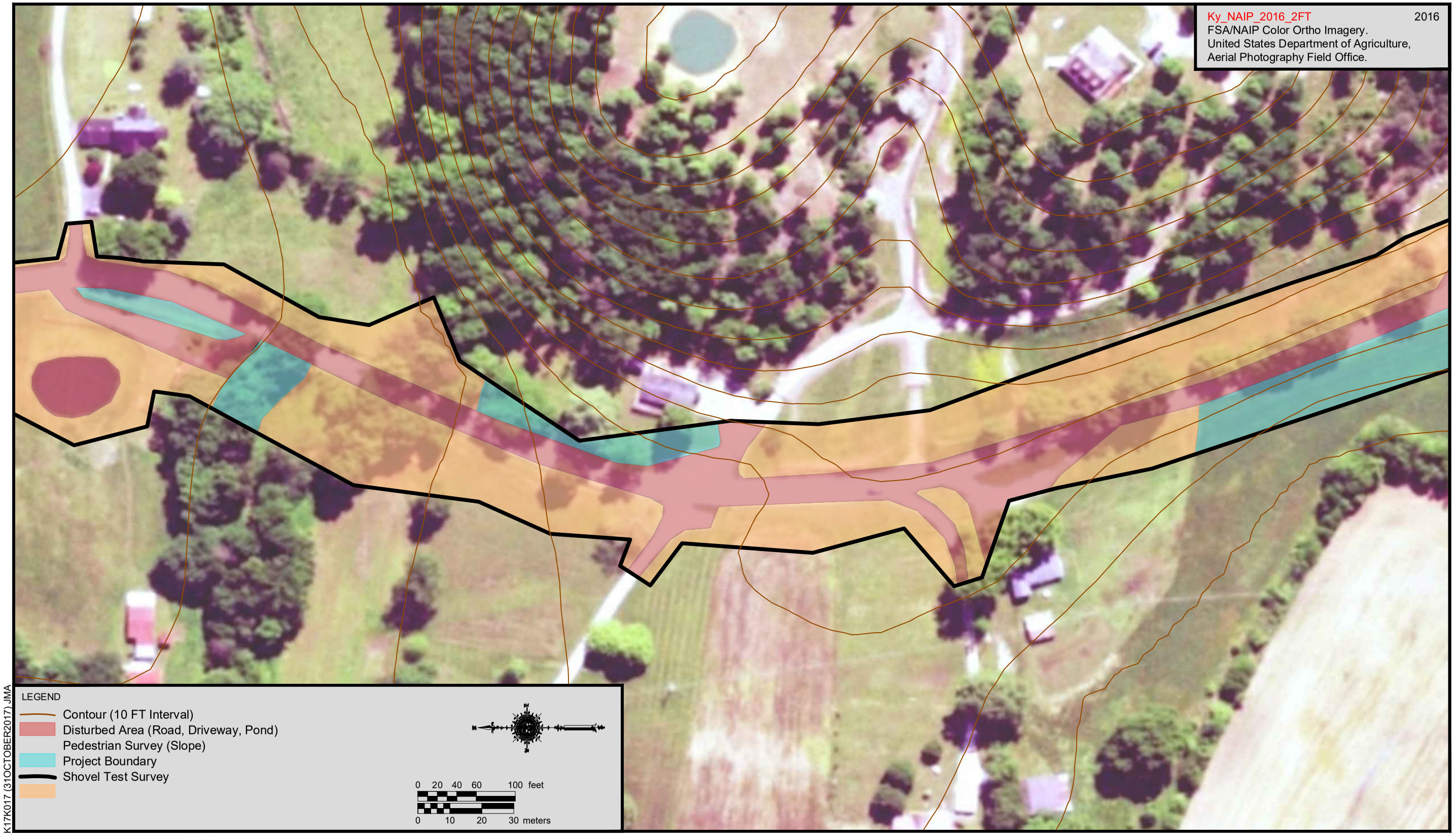

Figure 3c. Project area plan map.

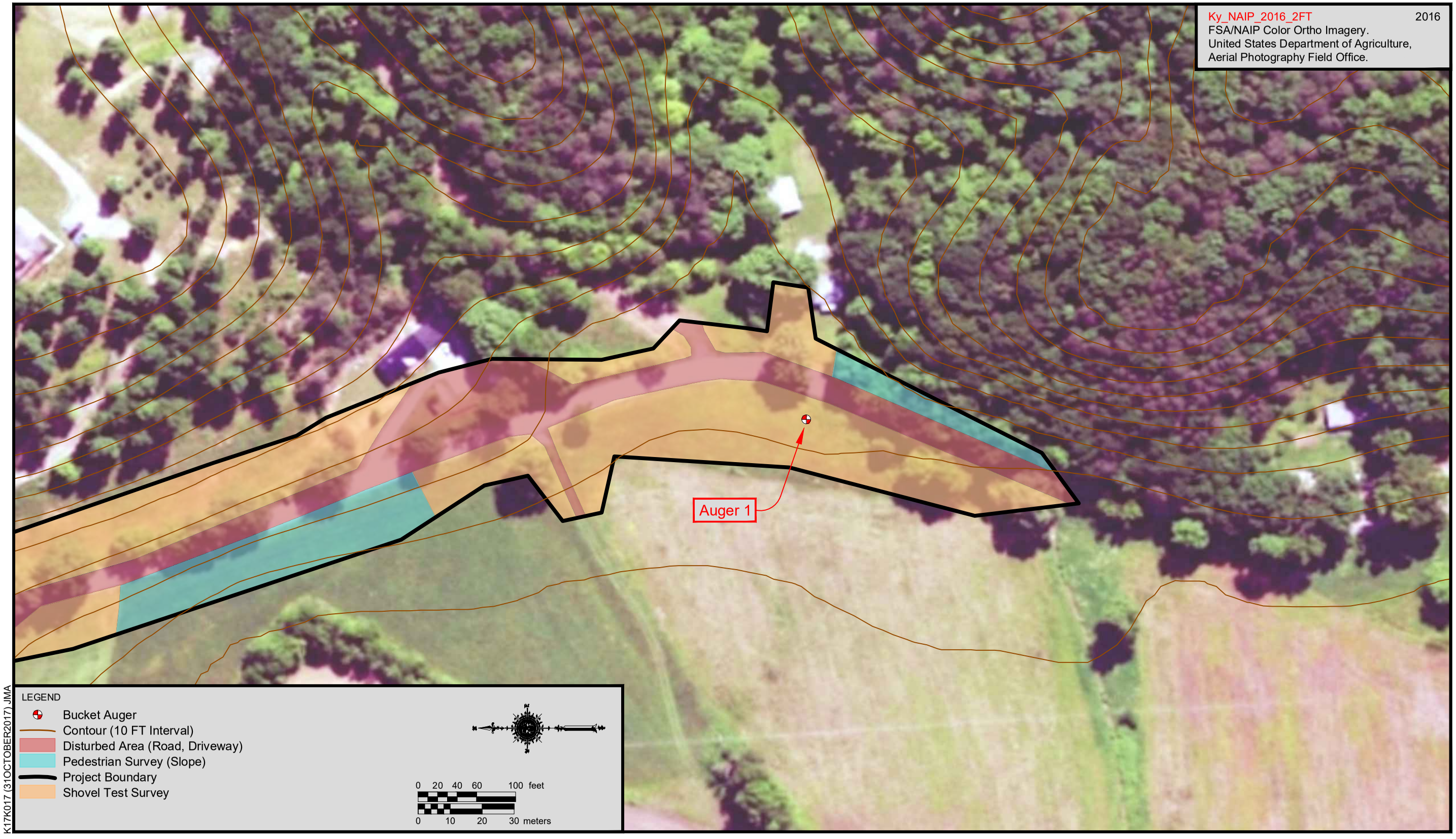

Figure 3d. Project area plan map.

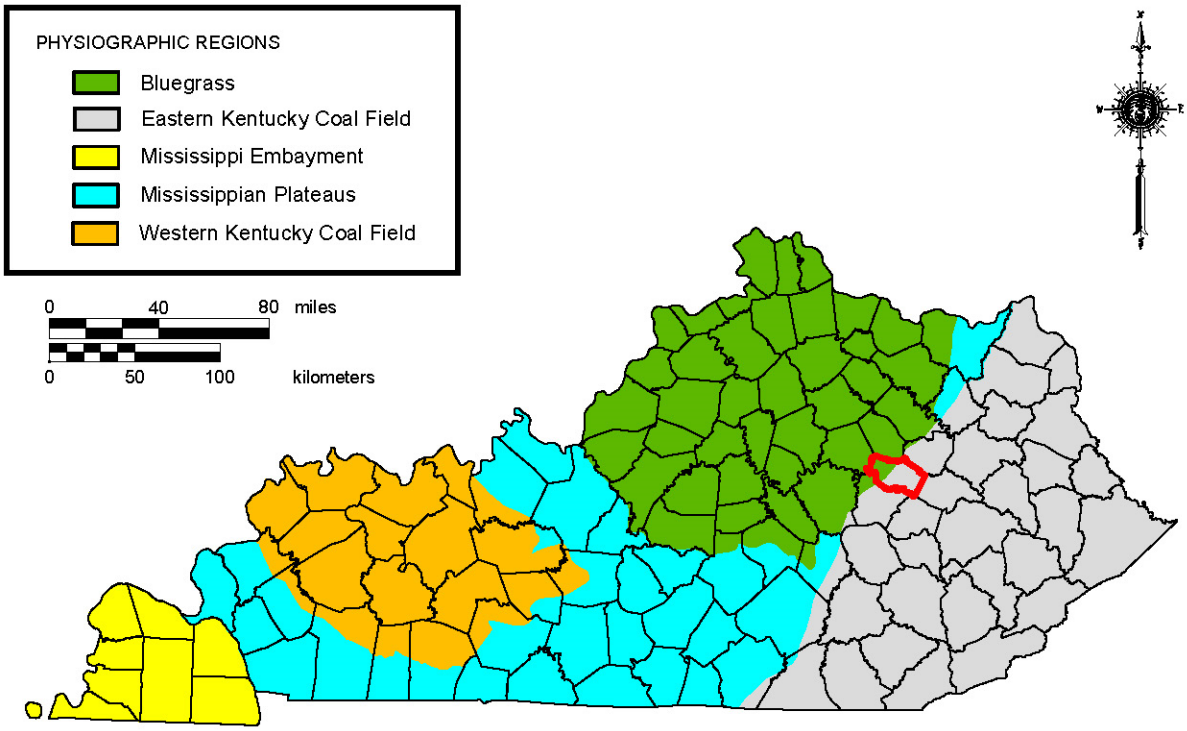

Figure 4. The Eastern Kentucky Coal Field region.

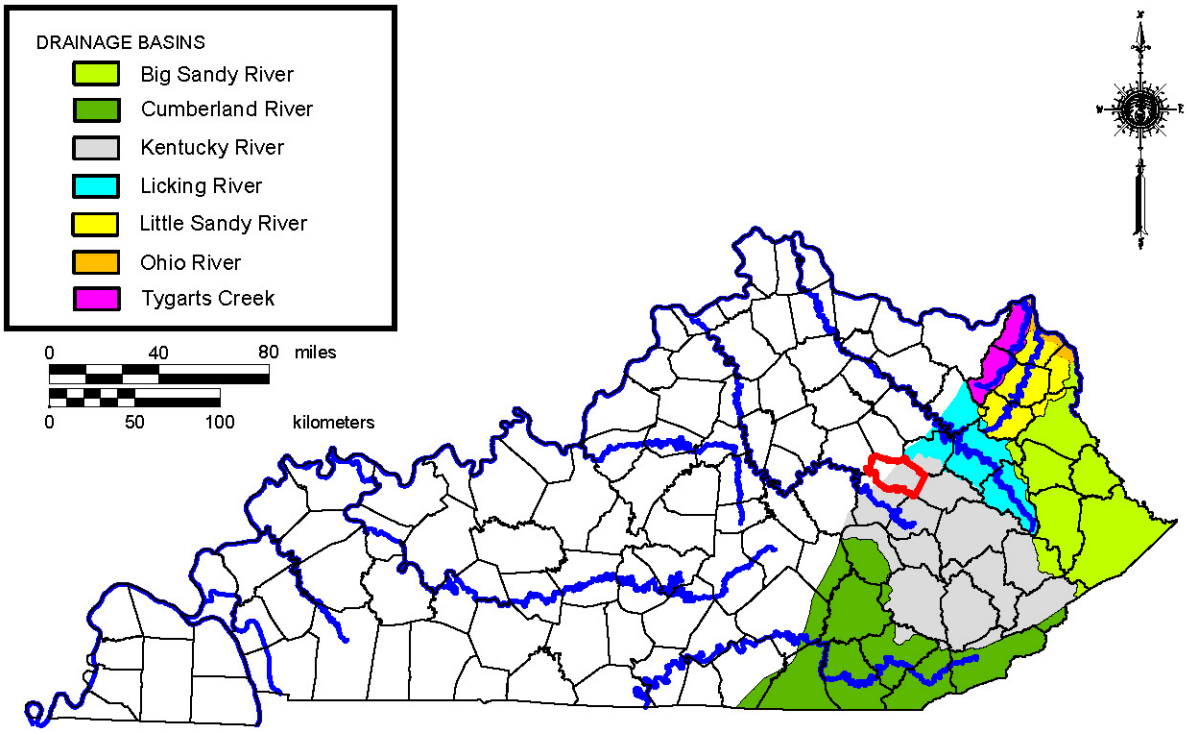

Figure 5. Rivers that drain the Eastern Kentucky Coal Field region.

Historically, ridgetops contained various pines (black, white, and yellow) and chestnut, and slopes were typically covered in hemlock and rhododendron (Davis 1924:19). Originally, the valleys were heavily forested with oak, hickory, walnut, yellow poplar, and beech, but by the early 1920s, the forest had been almost entirely removed (Davis 1924:25). In the modern Eastern Kentucky Coal Field region, north and east slopes are dominated by white basswood, while beech and oaks are dominant on south and west slopes. Modern ravines are often dominated by hemlock and rhododendron, but magnolia is also generally abundant. The uppermost slopes and ridges contain oak-chestnut and oak-hickory communities (Braun 2001:91–92).

Soils of the Eastern Kentucky Coal Field

The Eastern Kentucky Coal Field region is predominantly mapped as the Ultisols order of soils. Ultisols formed in completely weathered colluvium or residuum of the underlying bedrock, which in eastern Kentucky is predominantly shale, siltstone, and sandstone, and they occurred on Late Pleistocene or older surfaces. They are found on nearly level to very steep landforms. These soils display a light-colored or thin or low organic-carbon content, grayish-colored surface horizon and a clay-enriched subsoil. They are relatively infertile due to being strongly leached. Ultisols are typically red to yellow in color, resulting from the accumulation of iron and aluminum oxides. They are not characterized by any specific soil temperature, and they exhibit all but aridic soil moisture regimes (Soil Survey Staff 1999:721–726). Ultisols may contain buried and intact archaeological deposits as a result of colluvium, depending upon the landform on which they formed (e.g., footslope vs. bench), but most cultural deposits contained in these soils will be on or near the surface.

The region is predominantly mapped as the Udults suborder of soils, which are the more or less freely drained and humus-poor Ultisols found in areas with well-distributed rainfall that form in humid climates. Udults are thought to have developed under forest vegetation, but some developed under a savanna associated with, or influenced by, human activity. Many are cultivated with the addition of nutrient amendments or by allowing a fallow period following very few years of use. Udults can exhibit a compacted zone, or fragipan, in or below the clay-enriched subsoil (Soil Survey Staff 1999).

Portions of the Eastern Kentucky Coal Field that are predominantly mapped as Inceptisols occur to a lesser extent. Inceptisols developed in silty, acid alluvium during the Late Pleistocene or Holocene time periods on nearly level to steep surfaces. Inceptisols may contain deeply buried and intact archaeological deposits, depending upon the landform on which they formed (e.g., sideslope vs. alluvial terrace). Inceptisols exhibit a thick, dark-colored surface horizon rich in organic matter and a weakly developed subsurface horizon with evidence of weathering and sometimes of gleying (Soil Survey Staff 1999:489–493).

When Inceptisols are the predominantly mapped soil order, they are typically mapped as the Udepts suborder of soils, which are mainly the more or less freely drained Inceptisols in areas with well-distributed to excessive rainfall. In the areas where rainfall was excessive, the soils formed in older deposits. Most of the soils are thought to have developed under forest vegetation, but some supported shrubs or grasses. Most of the soils have either a thinner or thicker but leached surface horizon and a weakly developed subsoil or B-horizon. Some also have a sulfuric acid-enhanced horizon, which commonly occurs as a result of artificial drainage, surface mining, or other earthmoving activities. Some also exhibit a cemented zone subsurface, such as a duripan, and some have a compacted zone, such as a fragipan (Soil Survey Staff 1999).

There are also smaller areas predominantly mapped as Entisols in the region. Entisols are sandy soils that formed very recently in unconsolidated parent

material and have not been in place long enough for pedogenic processes to form distinctive horizons aside from an A-horizon. They are located on steep, actively eroding slopes or on floodplains or glacial outwash plains that frequently receive new deposits of alluvium. They do not have a compacted zone, such as a fragipan, and do not have accumulated clays or aluminum or iron oxides, but they may be sodium enriched (Soil Survey Staff 1999:389–391). Because of their young age, Entisols rarely contain buried and intact prehistoric archaeological deposits.

Several suborders dominate the Entisol order. They include the Aquents, Orthents, and Psamments suborders. Aquents are found along margins of lakes or along streams where the water table is at or near the surface for much of the year. Many Aquents have bluish or grayish colors and redoximorphic features caused by alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Most Aquents support vegetation that tolerates permanent or periodic wetness. Orthents are located on recent erosional surfaces that are the result of geologic erosional processes or are caused by mining, cultivation, or other factors. The upper horizons have been either truncated or completely removed. Some are in areas of recent loamy or fine eolian deposits, in areas of glacial deposits, or in areas of debris from recent landslides and mudflows. Orthents occur in any climate and under any vegetation. Finally, Psamments are very sandy soils formed in poorly graded (well sorted) sands on shifting or stabilized sand dunes, in cover sands, in sandy parent materials that were sorted in an earlier geologic cycle, or in material weathered from sandstone or granitic bedrock. They are generally found on outwash plains, lake plains, natural levees, or beaches, and they generally exhibit a wide range of vegetation (Soil Survey Staff 1999).

Lithic Resources

Chert resources in the Eastern Kentucky Coal Field region are somewhat localized, and many portions of the region are devoid of chert resources. Chert is more common along the western border of the region. The vast majority of the area is underlain by Pennsylvanian-age sandstone, shale, and siltstone deposits (United States Geological Survey [USGS] 2017). Breathitt chert primarily outcrops in the central portion of the region in the area of Breathitt County. Breathitt chert can also be found in portions of Knott, Magoffin, Owsley, and Perry Counties. Minor sources also occur in Bell, Leslie, and Harlan Counties. Brush Creek chert can be found in the northeastern portion of the region in Boyd, Carter, and Lawrence Counties. Mississippian-age Newman limestone, containing Newman chert, is found in outcrops along the northwestern and southeastern edges of the region. Ste. Genevieve and St. Louis cherts of the same age are found along the western edge of the region, predominantly in Clinton, Estill, Menifee, Powell, and Wayne Counties. Mississippian-age Fort Payne, Monteagle, and Bangor cherts are found in sandstone or limestone outcrops, mostly in the southern counties. Finally, there are several Ordovician and Cambrian Formations along the Kentucky-Virginia-Tennessee border in Harlan and Bell Counties that contain chert. The Ordovician Formations are noted as containing olive-black to black chert, referred to as Poteet or Chickamauga chert. Lower Ordovician and upper Cambrian Formations contain Knox chert. Although often of small size, the chert is a high quality material.

Prehistoric and Historic Climate

Climatic conditions during the period of human occupation in the region (Late Pleistocene and Holocene ages) can be described as a series of transitions in temperature, rainfall, and seasonal patterns that created a wide range of ecological variation, altering the survival strategies of human populations (Anderson 2001; Niquette and Donham 1985:6–8; Shane et al. 2001). The landscape during the Pleistocene was quite different from that of today. Much of the mid-continent consisted of periglacial tundra dominated by boreal conifer and jack-pine forests. Eastern North America was populated

by a variety of faunal species, including megafaunal taxa such as mastodon, mammoth, saber-toothed tiger, and Pleistocene horse, as well as by modern taxa such as white-tailed deer, raccoon, and rabbit.

The Wisconsinan glacial maximum occurred approximately 21,400 years B.P. (Anderson 2001; Delcourt and Delcourt 1987). By 15,000 B.P., following the Wisconsinan glacial maximum, a general warming trend and concomitant glacial retreat had set in (Anderson 2001; Shane 1994). Towards the end of the Pleistocene and after 14,000 B.P., the boreal forest gave way to a mixed conifer/northern hardwoods forest complex. In the Early Holocene and by 10,000 B.P., southern Indiana was probably on the northern fringes of expanding deciduous forests (Delcourt and Delcourt 1987:92–98). Pollen records from the Gallipolis Lock and Dam on the Ohio River near Putnam County, West Virginia, reveal that all the important arboreal taxa of mixed mesophytic forest had arrived in the region by 9000–8500 B.P. (Fredlund 1989:23). Similarly, Reidhead (1984:421) indicates that the generalized hardwood forests were well established in southeastern Indiana and southwest Ohio by circa 8200 B.P.

Prior to approximately 13,450 B.P., climatic conditions were harsh but capable of supporting human populations (Adovasio et al. 1998; McAvoy and McAvoy 1997). Populations were probably small, scattered, and not reproductively viable (Anderson 2001). The Inter-Allerød Cold Period (circa 13,450–12,900 B.P.) brought about the dispersal of Native Americans across the continent. This period was followed by the rapid onset of a cooling event known as the Younger Dryas (circa 12,900–11,650 B.P.) during which megafauna species became extinct, vegetation changed dramatically, and temperature fluctuated markedly. It was also a period of noticeable settlement shift that marked the appearance of a variety of subregional cultures across eastern North America (Anderson 2001).

In a recent review, Meeks and Anderson (2012:111) described the Pleistocene/Holocene transition as "a period of tremendous environmental dynamism coincident with the Younger Dryas event." The Younger Dryas represents one of the largest abrupt climate changes that has occurred within the past 100,000 years. The onset of the Younger Dryas appears to have been a relatively rapid event that may have been driven by a freshwater influx into the North Atlantic as a result of catastrophic outbursts of glacial lakes. "The net effect of these outbursts of freshwater was a reduction in sea surface salinity, which altered the thermohaline conveyor belt; effectively slowing ocean circulation of warmer water (heat) to the north and bringing cold conditions" (Meeks and Anderson 2012:111; though see Meltzer and Bar-Yosef 2012:251–252 for a critique of this view). This resulted in significantly lower temperatures during this time. The Younger Dryas ended approximately 1,300 years later over a several decade period. The onset of the Younger Dryas coincides with the end of Clovis and the advent of more geographically circumscribed cultural traditions.

Pollen records for the Younger Dryas indicate that vegetation shifts were sometimes abrupt and characterized by oscillations. These shifts were not uniform over the entire southeast and indicate that a variety of factors were at play. At Jackson Pond in Kentucky (Wilkins et al. 1991), for example, several pronounced reciprocal oscillations occurred in a large number of spruce and oak. According to Meeks and Anderson, "these oscillations reflect shifts between boreal/deciduous forest ecotones associated with cool/wet and cool/dry conditions, respectively" (2012:113).

Meeks and Anderson (2012:126–130) define five population events for the Paleoindian–Early Holocene transition. Population Event 1 (circa 15,000–13,800 cal. B.P.) is a pre-Clovis occupation that exhibits a slow rise in population. This event may represent the initial colonization of the southeast region and may represent the basis of later Clovis occupation or a failed migration (Meeks and Anderson 2012:129). Population Event 2 represents an apparent 600 year gap

between Events 1 and 3. Population Event 3 (circa 13,200–12,800 cal. B.P.) occurred just prior to, and extended into, the Younger Dryas event. This event represents the "first unequivocal evidence for widespread human occupation across the southeastern United States" (Meeks and Anderson 2012:129). Event 3 coincided with the Clovis occupation in the region. A marked decline in the population is posited for Population Event 4 (12,800–11,900 cal. B.P.). This equates with the early to middle Younger Dryas and relates to a post-Clovis occupation of the region. Meeks and Anderson (2012:129) see a fragmentation of the regional Clovis culture at this time along with "the development of geographically circumscribed subregional, cultural traditions in the southeastern United States." A marked increase in population density is posited between 11,900 and 11,200 cal. B.P. This coincides with the late portion of the Younger Dryas and the early portion of the Holocene. Population Event 5 is represented by this time frame. Early Side Notched and Dalton are seen during this time.

During the Early Holocene, rapid increases in boreal plant species occurred on the Allegheny Plateau in response to the retreat of the Laurentide ice sheet from the continental United States (Maxwell and Davis 1972:517–519; Whitehead 1973:624). At lower elevations, deciduous species were returning after having migrated to southern Mississippi Valley refugia during the Wisconsinan advances (Delcourt and Delcourt 1981:147). The climate during the Early Holocene was still considerably cooler than the modern climate, and based on species extant at that time in upper altitude zones of the Allegheny Plateau, conditions would have been similar to the Canadian boreal forest region of today (Maxwell and Davis 1972:515–516). Conditions at lower elevations were less severe and favored the transition from boreal to mixed mesophytic species. At Cheek Bend Cave in the Nashville Basin, an assemblage of small animals from the Late Pleistocene confirms the environmental changes that took place during the Pleistocene to Holocene transition and the resulting extinction of Pleistocene megafauna and establishment of modern fauna in this area (Klippel and Parmalee 1982).

Traditionally, Middle Holocene (circa 8000–5000 B.P., also referred to as the Hypsithermal) climate conditions were thought to be consistently dryer and warmer than the present (Delcourt 1979:271; Klippel and Parmalee 1982; Wright 1968). The influx of westerly winds contributed to periods of severe moisture stress in the Prairie Peninsula and to an eastward advance of prairie vegetation (Wright 1968). More recent research (Anderson 2001; Shane et al. 2001:32–33) suggests that the Middle Holocene was marked by considerable local climatic variability. Paleoclimatic data indicate that the period was marked by more pronounced seasonality characterized by warmer summers and cooler winters.

The earliest distinguishable Late Holocene climatic episode began circa 5000 B.P. and ended around 2800 B.P. This Sub-Boreal episode is associated with the establishment of essentially modern deciduous forest communities in the southern highlands and increased precipitation across most of the mid-continental United States (Delcourt 1979:271; Maxwell and Davis 1972:517–519; Shane et al. 2001; Warren and O'Brien 1982:73). Changes in local and extra-local forests after approximately 4800 B.P. may also have been the result of anthropogenic influences. Fredlund (1989:23) reports that the Gallipolis pollen record showed increasing local disturbance of the vegetation from circa 4800 B.P. to the present, a disturbance that may have been associated with the development and expansion of horticultural activity. Based on a study of pollen and wood charcoal from the Cliff Palace Pond in Jackson County, Kentucky, Delcourt and Delcourt (1997:35–36) recorded the replacement of a red cedar–dominated forest with a forest dominated by fire-tolerant taxa (oaks and chestnuts) around 3000 B.P. The change is associated with increased local wildfires (both natural and culturally augmented) and coincided with increases in cultural utilization of upland (mountain) forests.

Beginning around 2800 B.P., generally warm conditions, probably similar to those of the twentieth century, prevailed during the Sub-Atlantic and Post–Sub-Atlantic climatic episodes, with the exception of the Neo-Boreal sub-episode, or Little Ice Age (circa 700–100 B.P.), which was coldest from circa 400 until its end. Despite the prevailing trend, brief temperature and moisture variations occurred during this period. Some of these fluctuations have been associated with adaptive shifts in Midwestern prehistoric subsistence and settlement systems (Baerreis et al. 1976; Griffin 1961; Struever and Vickery 1973; Warren and O'Brien 1982).

Studies of historic weather patterns and tree-ring data by Fritts et al. (1979) indicate that twentieth-century climatological averages were "unusually mild" when compared to seventeenth- to nineteenth-century trends (the time period used for comparison represents the coldest period of the Neo-Boreal [400–100 B.P.], or the Little Ice Age) (Fritts et al. 1979:18). The study suggested that winters were generally colder, weather anomalies were more common, and unusually severe winters were more frequent between A.D. 1602 and A.D. 1900 than after A.D. 1900. The effects of the Neo-Boreal sub-episode, which ended during the mid- to late nineteenth century, have not been studied in detail for this region. It appears that the area experienced smaller temperature decreases during the late Neo-Boreal than did the upper Midwest and northern Plains (Fritts et al. 1979), so it follows that related changes in extant vegetation would be more difficult to detect.

Modern Climate

The modern climate of Kentucky is moderate in character and temperature, and precipitation levels fluctuate widely. The prevailing winds are westerly, and most storms cross the state in a west to east pattern. Low pressure storms that originate in the Gulf of Mexico and move in a northeasterly direction across Kentucky contribute the majority of the precipitation received by the state. Warm, moist, tropical air masses from the Gulf predominate during the summer months and contribute to the high humidity levels experienced throughout the state. As storms move through the state, occasional hot and cold periods of short duration may be experienced. During the spring and fall, storm systems tend to be less severe and less frequent, resulting in less radical extremes in temperature and rainfall (Anderson 1975).

Description of the Project Area

The project area was located approximately 2.45 km (1.52 mi) south of Clay City, Kentucky, between mile point 1.55 and mile point 2.3 (see Figures 2 and 3). It measured 1.12 km (.69 mi) in length, ranged in width from 12 to 70 m (40 to 230 ft), covered 5.4 ha (13.3 acres), and was at an approximate elevation of 189 m (620 ft) AMSL. The Kentucky River and its tributaries drain the majority of the project area.

The project area consisted of residential lawns, driveways, pastures, an agricultural field, and a wooded area along KY 1057. The residential lawns were manicured, with occasional driveways running through the project area, and there was no ground surface visibility (Figure 6). Underground utilities were common sights in the lawns (Figure 7). The pastures also provided no ground surface visibility due to vegetation (Figure 8). Deciduous trees were scattered about the lawns and pastures, concentrating around the tributaries of the Red River. Most of the lawn and pasture areas were flat, though there were a few areas of steep slope. A single agricultural field containing soy beans was partially within the project area. The leaf litter was too dense to provide good ground surface visibility. The only wooded area, characterized by young deciduous trees with little undergrowth, was located at the south edge of the project area and was sloped (Figure 9).

Portions of the project area had been previously disturbed through the placement of underground utilities, landscaping, residential construction, and erosion.

Figure 6. Lawn with driveway, facing south.

Figure 7. Underground utility, facing east.

Figure 8. Pasture, facing north.

Figure 9. Sloped wooded area, facing north.

Chert resources for the region have been previously discussed. For a more detailed analysis of chert resources, see the Lithic Analysis section of this report.

Five soil series (Allegheny, Cotaco, Grigsby, Newark, and Rowdy) and one soil complex (Jessietown-Muse-Rohan) have been mapped in the project area. The soil series are classified by the amount of time it has taken them to form and the landscape position they are found on (Birkeland 1984; Soil Survey Staff 1999). This information can provide a relative age of the soils and can express the potential for buried archaeological deposits within them (Stafford 2004). The soil order and group classifications for each soil series are used to assist with determining this potential.

The Allegheny series consists of very deep, well drained soils found on stream terraces and alluvial fans. A typical Allegheny profile shows an Ap horizon of dark yellowish brown (10YR 4/4) moist, light yellowish brown (10YR 6/4) dry, loam extending 20 cm (8 in) below ground surface (bgs). Below that is a Bt1 horizon of yellowish brown (10YR 5/6) loam extending 38 cm (15 in) bgs. Below that is a Bt2 horizon of yellowish brown (10YR 5/6) loam with few medium distinct brown (10YR 5/3) and strong brown (7.5YR 5/8) mottles extending to 71 cm (28 in) bgs (Soil Survey Staff 2017). Because the Allegheny series is classified as an Ultisol, archaeological deposits will only be found on or near the ground surface (Soils Survey Staff 1999).

The Cotaco series consists of very deep, moderately well or somewhat poorly drained soils that formed in loamy sediments of acid sandstone, siltstone, and shale origin. They are found on footslopes, colluvial fans, and low stream terraces. A typical Cotaco profile shows an Ap horizon of dark grayish brown (10YR 4/2) loam extending 25 cm (10 in) bgs. Below that is a BA horizon of yellowish brown (10YR 5/4) sandy clay loam with many faint brown (10YR 5/3) iron depletions on ped faces, common medium prominent strong brown (7.5YR 5/6) iron concentrations, and about 5 percent pebbles extending to 41 cm (16 in) bgs. Below that is a Bt1 horizon of yellowish brown (10YR 5/4) gravelly sandy clay loam with common medium prominent light brownish gray (2.5Y 6/2) iron depletions, common medium distinct brown (7.5YR 4/4) and yellowish brown (10YR 5/8) iron concentrations, and 15 percent sandstone and shale pebbles and thin flat channers extending to 58 cm (23 in) bgs (Soil Survey Staff 2017). Because the Cotaco series is classified as an Ultisol, archaeological deposits will only be found on or near the ground surface (Soils Survey Staff 1999).

The Grigsby series consists of very deep, well drained soils that formed from mixed alluvium washed from mostly Pennsylvanian aged sandstone, shale, siltstone, and limestone. They are found on low stream terraces, floodplains, and natural levees. A typical Grigsby profile shows an Ap horizon of brown (10YR 4/3) loam extending to 18 cm (7 in) bgs. Below that is a Bw horizon of dark yellowish brown (10YR 4/4) loam extending to 122 cm (48 in) bgs (Soil Survey Staff 2017). Because the Grigsby series is classified as an Inceptisol, there may be deeply buried/intact archaeological deposits depending on the landform on which they formed (Soil Survey Staff 1999).

The Newark series consists of very deep, somewhat poorly drained soils that formed in mixed alluvium from limestone, shale, siltstone, sandstone, and loess. They are found on nearly level floodplains and in upland depressions. A typical Newark profile shows an Ap horizon of brown (10YR 4/3) silt loam extending to 23 cm (9 in) bgs. Below that is a Bw horizon of brown (10YR 5/3) silt loam with many fine and medium faint light brownish gray (10YR 6/2) iron depletions and a few small flakes of mica extending to 38 cm (15 in) bgs. Below that is a Bg horizon of light brownish gray (2.5Y 6/2) silt loam with many medium distinct brown (10YR 4/3) masses of iron accumulations and a few small flakes of mica extending to 81 cm (32 in) bgs (Soil Survey Staff 2017). Because the Newark series is classified as an Inceptisol, there may be deeply buried/intact archaeological deposits

depending on the landform on which they formed (Soil Survey Staff 1999).

The Rowdy series consists of very deep, well drained soils that formed from loamy alluvium weathered mainly from Pennsylvanian aged sandstone, siltstone, and shale. They are found on low stream terraces, footslopes, and alluvial fans. A typical Rowdy profile shows an Ap horizon of brown (10YR 4/3) loam extending to 18 cm (7 in) bgs. Below that is a BA horizon of dark yellowish brown (10YR 4/4) loam extending to 48 cm (19 in) bgs. Below that is a Bw1 horizon of yellowish brown (10YR 5/6) loam with few distinct brown (7.5YR 5/4) clay films and dark yellowish brown (10YR 4/4) organic stains on all surfaces of peds extending to 76 cm (30 in) bgs (Soil Survey Staff 2017). Because the Rowdy series is classified as an Inceptisol, there may be deeply buried/intact archaeological deposits depending on the landform on which they formed (Soil Survey Staff 1999).

The Jessietown-Muse-Rohan soil complex consists of an indistinguishable mix of the Jessietown, Muse, and Rohan soil series. The Jessietown series consists of moderately deep, well drained soils that formed in a thin mantle of silty material and residuum weathered from black fissile shale. They are found on gently sloping to steep upland ridges, sideslopes, and toeslopes. A typical Jessietown profile shows an Ap horizon of brown (10YR 4/3) silt loam extending to 20 cm (8 in) bgs. Below that is a Bt1 horizon of brown (7.5YR 5/4) silty clay loam extending to 56 cm (22 in) bgs. Because the Jessietown series is classified as an Ultisol, archaeological deposits will only be found on or near the ground surface (Soil Survey Staff 1999). The Muse series consists of deep and very deep, well drained soils that formed in residuum or colluvium weathered from acid shale or siltstone. They are found on sideslopes, footslopes, and benches on uplands. A typical Muse profile shows an Oe horizon of moderately decomposed organic duff extending to 3 cm (1 in) bgs. Below that is an A horizon of very dark grayish brown (10YR 3/2) silt loam extending to 8 cm (3 in) bgs. Below that is an AB horizon of dark brown (10YR 3/3) silt loam with 2 percent shale channers extending to 15 cm (6 in) bgs. Below that is an E horizon of brown (10YR 4/3) silt loam extending to 36 cm (14 in) bgs. Below that is a Bt1 horizon of strong brown (7.5YR 4/6) silty clay loam extending to 53 cm (21 in) bgs. Because the Muse series is classified as an Ultisol, archaeological deposits will only be found on or near the ground surface (Soil Survey Staff 1999). The Rohan series consists of shallow, well drained soils that formed in loamy residuum or colluvium from weathered black fissile shale. They are found on gently sloping to very steep uplands. A typical Rohan profile shows an A horizon of dark brown (10YR 3/3) channery silt loam with 30 percent shale fragments extending to 10 cm (4 in) bgs. Below that is a BA horizon of dark yellowish brown (10YR 4/4) very channery silt loam with 35 percent shale fragments extending to 20 cm (8 in) bgs. Below that is a Bw horizon of yellowish brown (10YR 5/4) extremely channery silty clay loam with 65 percent shale fragments extending to 36 cm (14 in) bgs. Below that is a Cr horizon of strong brown (7.5YR 4/6) weathered shale with black (10YR 2/1) interior that ends at the hard black (10YR 2/1) fissile shale bedrock at 46 cm (18 in) bgs. Because the Rohan series is classified as an Inceptisol, there may be deeply buried/intact archaeological deposits depending on the landform on which they formed (Soil Survey Staff 1999).

While shovel tests did reveal profiles similar to the Allegheny, Grigsby, Rowdy, and Rohan soil series, most of the profiles observed did not match any of the recorded soil series and showed how the project area had been disturbed through the placement of underground utilities, landscaping, residential construction, and erosion. Examples of this are an olive brown (2.5Y 4/3) loam extending to 22 cm (9 in) bgs above a grayish brown (2.5Y 5/2) clay with strong brown (7.5YR 4/6) mottles, and a light olive brown (2.5Y 5/3) silt loam extending to 5 cm (2 in) bgs above a light yellowish brown (2.5Y 6/4) silt loam.

A single bucket auger was placed in a pasture at the south end of the project area (see

Figure 3). This was the area that had the greatest potential to have deeply buried cultural deposits. The bucket auger revealed a profile with four zones. Zone I was a dark grayish brown (10YR 4/2) compact silt loam extending to 28 cm (11 in) bgs. Zone II was a brown (10YR 4/3) silt loam with a higher clay content extending to 44 cm (17 in) bgs. Zone III was a dark yellowish brown (10YR 4/4) silty clay loam with common fine shale fragments extending to 100 cm (39 in) bgs. Zone IV was a dark yellowish brown (10YR 4/4) silty clay loam with many fine-large shale fragments that was terminated at 110 cm (43 in) bgs due to bedrock. This profile does not match the Newark soil series which is mapped in that area. The pasture is near an agricultural field and may have been impacted by agricultural activity, along with landscaping and erosion. No artifacts were found in the bucket auger.

Site 15Po489 was located on soils mapped as Jessietown-Muse-Rohan soil complex. Specific soil detail for Site 15Po489 is provided in Section 6.

III. PREVIOUS RESEARCH AND CULTURAL OVERVIEW

Prior to initiating fieldwork, a search of records maintained by the NRHP (available online at: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome) and the OSA (FY18_9354) was conducted to: 1) determine if the project area had been previously surveyed for archaeological resources; 2) identify any previously recorded archaeological sites that were situated within the project area; 3) provide information concerning what archaeological resources could be expected within the project area; and 4) provide a context for any archaeological resources recovered within the project area. A search of the NRHP records indicated that no archaeological sites listed in the NRHP were situated within the current project area or within a 2.0 km (1.2 mi) radius of the project area. The OSA file search was conducted between September 1 and 21, 2017. The work at OSA consisted of a review of professional survey reports and records of archaeological sites for an area encompassing a 2 km radius of the project footprint. To further characterize the archaeological resources in the general area, the OSA archaeological site database for the county was reviewed and synthesized. The review of professional survey reports and archaeological site data in the county provided basic information on the types of archaeological resources that were likely to occur within the project area and the landforms that were most likely to contain these resources. The results are discussed below.

Previous Archaeological Surveys

Heather D. Barras

OSA records revealed that four previous professional archaeological surveys have been conducted within a 2 km radius of the project area. Five archaeological sites have been recorded in this area also. One of these sites (15Po98) falls adjacent to the project area for the KY 1057 safety improvements. Two additional surveys completed within the 2 km area have not yet been entered in the OSA GIS (Webb and Funkhouser 1932; Weinland and Sanders 1977).

The records search revealed that one of the five sites in the file search area (15Po3) is a series of prehistoric mounds. The remaining four sites (15Po76, 15Po77, 15Po97, and 15Po98) are prehistoric open habitations without mounds. The 2 km radius included areas within the Clay City quadrangle (USGS 1966).

In 1931, archaeologists from the University of Kentucky (UK) compiled a list of known archaeological sites in 68 Kentucky counties (Webb and Funkhouser 1932). During this documentation, Site 15Po3 was recorded as a series of 15 to 20 low mounds on the top of a ridge. NRHP status was not assessed for these sites.

Between August and September 1976, the Kentucky Heritage Council (KHC) conducted an archaeological survey in Powell County, Kentucky, as part of an effort to sample diverse areas of the state; to update and increase the archaeological site inventory; to create a data base for use in planning, academic research, and public education; and to nominate selected sites to the NRHP (Weinland and Sanders 1977). Field methods consisted of informant interviews and surface investigation. Thirty-eight sites were documented during the survey (15Po25, 15Po50, 15Po51, 15Po55, 15Po69, 15Po75–15Po89, and 15Po91–15Po108).

Four of these sites were located within a 2 km radius of the current project area (15Po76, 15Po77, 15Po97, and 15Po98). All were prehistoric open habitations without mounds of indeterminate temporal affiliations. Site 15Po98, however, was a large site with a greater density of artifacts. The only potential impacts to the site appeared to be from agricultural practices or erosion. The NRHP eligibility for Sites 15Po76, 15Po77, and 15Po97 was not assessed. Site 15Po98 was recommended for nomination to the NRHP. No recommendations for further work were made, except to state that an intensive survey and testing program should be implemented before any state or federal project was to be initiated at the site location (Weinland and Sanders 1977). Site 15Po98 was adjacent to the current project area, although no evidence of it was found within the current project area during the survey.

On January 10, 1983, personnel from UK's Program for Cultural Resource Assessment completed an archaeological survey for a proposed industrial park near Clay City in Powell County, Kentucky (Ison 1983). At the request of the Bluegrass Area Development District, approximately 2.8 ha (7.0 acres) were investigated by pedestrian survey supplemented with shovel testing. No archaeological sites were encountered and project clearance was recommended.

In July of 1983, Environmental Consultants, Inc., personnel conducted an archaeological survey of a proposed water supply reservoir for the towns of Stanton and Clay City in Powell County, Kentucky (Niquette 1983). The survey was conducted at the request of the Blue Grass Area Development District, on behalf of the City of Stanton. The survey area consisted of 23.9 ha (59.0 acres) and was investigated by pedestrian survey supplemented with shovel testing. No archaeological sites were identified and no further work was recommended.

On June 8, 2004, AMEC Earth & Environmental, Inc., personnel conducted an archaeological survey of the proposed Hardwick's Creek substation and tap in Powell County, Kentucky (Miner 2004). At the request of Joe Settles of East Kentucky Power Cooperative, .53 ha (1.3 acres) were investigated by pedestrian survey supplemented with screened shovel testing. No archaeological sites were documented and project clearance was recommended.

On August 10, 2009, AMEC Earth & Environmental, Inc., personnel conducted an archaeological survey of 2.33 ha (5.75 acres) for the proposed Red River Wastewater Conveyance and Treatment Facilities in Powell County, Kentucky (Knopf 2009). The project area was investigated by pedestrian survey and screened shovel testing at the request of Bell Engineering. One isolated find was identified, but no archaeological sites were encountered. Project clearance was recommended.

Archaeological Site Data

According to available data, 453 archaeological sites have been recorded in Powell County (Table 1). The site data indicate that the majority of archaeological sites recorded in Powell County consist of prehistoric rockshelters (n = 194; 42.83 percent) or open habitations without mounds (n = 166; 36.64 percent). Other site types in the county include historic farms/residences (n = 25; 5.52 percent), petroglyphs/pictographs (n = 12; 2.65 percent), industrial (n = 11; 2.43

Table 1. Summary of Selected Information for Previously Recorded Archaeological Sites in Powell County, Kentucky. Data Obtained from OSA and May Contain Coding Errors.

Site Type:	N	%
Cave	2	0.44
Cemetery	3	0.66
Earth Mound	2	0.44
Historic Farm/Residence	25	5.52
Industrial	11	2.43
Isolated Burials	1	0.22
Isolated Find	2	0.44
Mound Complex	2	0.44
Open Habitation with Mounds	2	0.44
Open Habitation without Mounds	166	36.64
Other	2	0.44
Other Special Activity Area	8	1.77
Petroglyph/Pictograph	12	2.65
Quarry	8	1.77
Rockshelter	194	42.83
Stone Mound	2	0.44
Undetermined	11	2.43
Total	453	100
Time Periods Represented	**N**	**%**
Paleoindian	3	0.53
Archaic	36	6.3
Woodland	62	10.86
Late Prehistoric	30	5.25
Indeterminate Prehistoric	331	57.97
Historic	121	21.19
Total	571*	100
Landform	**N**	**%**
Dissected Uplands	214	47.24
Floodplain	83	18.32
Hillside	98	21.63
Terrace	9	1.99
Undissected Uplands	39	8.61
Unspecified	10	2.21
Total	453	100

**One site may represent more than one time period.*

percent), undetermined (n = 11; 2.43 percent), other special activity areas (n = 8; 1.77 percent), quarries (n = 8; 1.77 percent), cemeteries (n = 3; .66 percent), caves (n = 2; .44 percent), earth mounds (n = 2; .44 percent), isolated finds (n = 2; .44 percent), mound complexes (n = 2; .44 percent), open habitations with mounds (n = 2; .44 percent), other (n = 2; .44 percent), stone mounds (n = 2; .44 percent), and an isolated burial (n = 1; .22 percent).

Most of these sites are found on dissected uplands (n = 214; 47.24 percent), but are also found on hillsides (n = 98; 21.63 percent), floodplains (n = 83; 18.32 percent), undissected uplands (n = 39; 8.61 percent), unspecified (n = 10; 2.21 percent), and terraces (n = 9; 1.99 percent). These sites covered a variety of time periods, including Paleoindian (n = 3; .53 percent), Archaic (n = 36; 6.3 percent), Woodland (n = 62; 10.86 percent), Late Prehistoric (n = 30; 5.25 percent), Indeterminate Prehistoric (n = 331; 57.97 percent), and Historic (n = 121; 21.19 percent).

Map Data

In addition to the file search, a review of available maps was initiated to help identify potential historic properties (structures) or historic archaeological site locations within the proposed project area. The following maps were reviewed:

1892 (revised 1912) Beattyville, Kentucky, 30-minute series topographic quadrangle (USGS);

1948 General Highway Map of Powell County, Kentucky (Kentucky State Highway Department [KSHD]);

1952 Clay City, Kentucky, 7.5-minute series topographic quadrangle (USGS); and

1958 Highway and Transportation Map of Powell County, Kentucky (Kentucky Department of Highways).

The historic maps indicated that seven structures were located either in or just outside the project area. The 1948 map (KSHD 1948) shows four structures along the east side of KY 1057 (Figure 10). Map structure (MS) 1 is located at the north edge of the project area. During the survey a barn was located outside the project area at this location (Figure 11). Shovel tests excavated within the project area near it were negative. MS 2 is located to the south of MS 1. During the survey, Site 15Po489 was recorded in this area, though no signs of structural remains were identified. Site 15Po489 will be discussed further in Section 6. MS 3 and MS 4 are located at the south end of the project area. During the survey, a mobile home was located outside the project area near MS 3 (Figure 12). Shovel tests excavated within the project area at this location were negative. During the survey, a two-story residence was found just outside the project area near MS 4 (Figure 13). Shovel tests excavated within the project area at this location were negative.

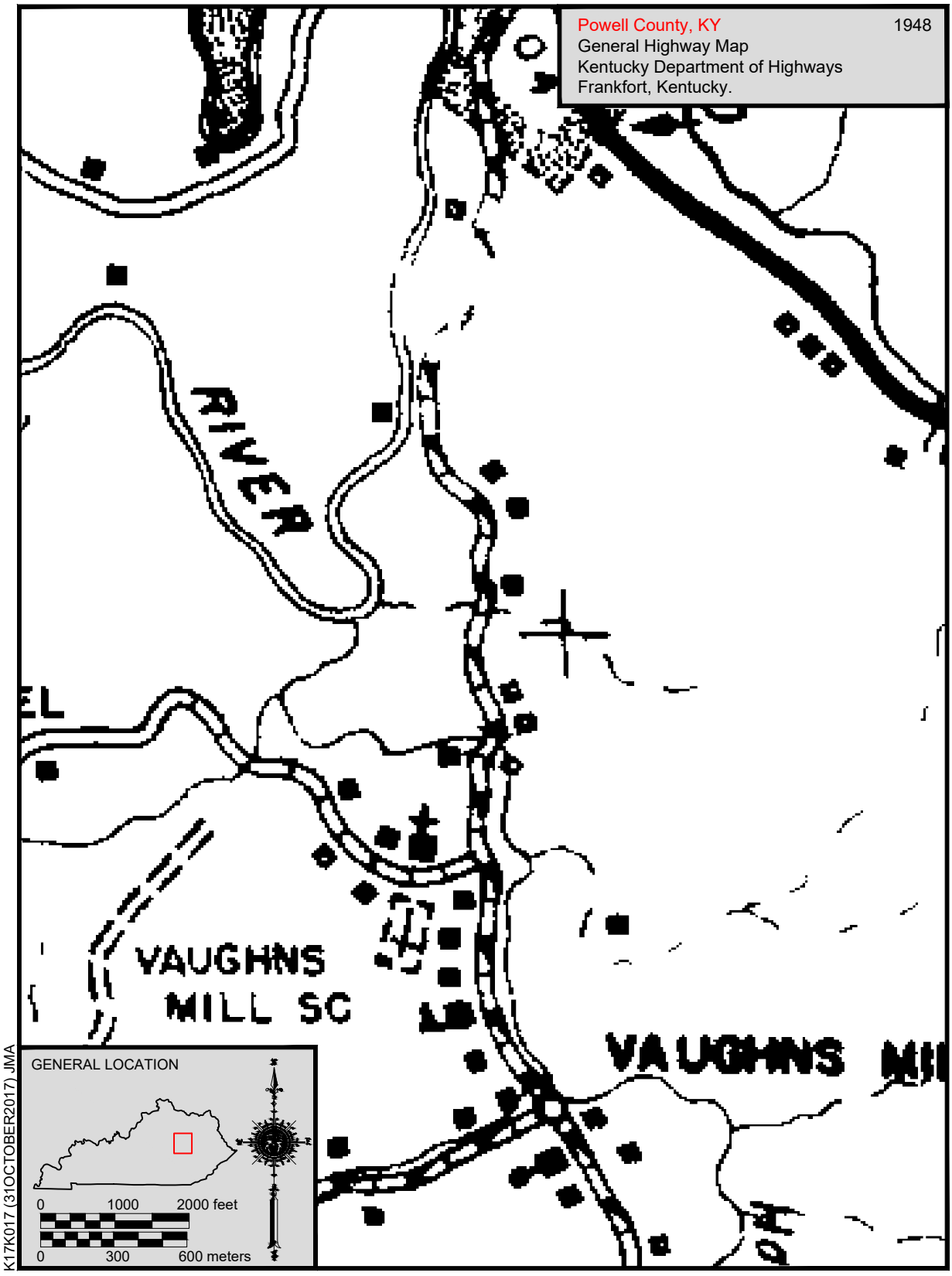

Figure 10. 1948 map (KSHD 1948) showing MS 1-4.

Figure 11. Barn at MS 1 area, facing northeast.

Figure 12. Mobile home at MS 3 area, facing north.

Figure 13. Residence at MS 4 area, facing east.

The 1952 map (USGS 1952) shows an additional three map structures, along with MS 1−4 (Figure 14). MS 5 is located on the west side of KY 1057, across from MS 2. During the survey, this area was a pasture, with no structural remains located aboveground and no artifacts found within the shovel tests excavated in this location (Figure 15). MS 6 is located on the west side of KY 1057, between Meadows Creek Road and MS 3. During the survey, a one-story residence was located outside the project area near MS 6 (Figure 16). Shovel tests excavated within the project area near it were negative. MS 7 is located next to MS 3. During the survey, a barn was found among some trees well outside the project area in the vicinity of MS 7 (Figure 17). Shovel tests excavated within the project area near it were negative.

Cultural Overview

Early Human Occupation (before 11,500 B.C.)

There is an increasing amount of evidence documented over the last two decades suggesting that humans arrived in North America before what has traditionally been thought of as the first migration of peoples into the Americas. Archaeologists thought that humans first entered the Americas while following Pleistocene megafauna or other animal species over the Bering Land Bridge that once joined Siberia and Alaska no earlier than about 11,500 years ago. It was thought that after arrival, these migrants—referred to as the Clovis people—quickly spread across North and South America.

Evidence for a pre-Clovis migration is becoming stronger as additional data are collected. Furthermore, multiple entry points or routes have been suggested. Not only did entry into North America occur across a land bridge, but it may also have happened via northern coastal waterways leading to the western (Waguespack 2007), and possibly the eastern (Lowery et al. 2010), seaboards. According to Maggard and Stackelbeck (2008:110) “these discoveries have seriously challenged the Clovis-first model and force us to reconsider the timing of colonization and the processes that were involved in the initial settlement of the New World.”

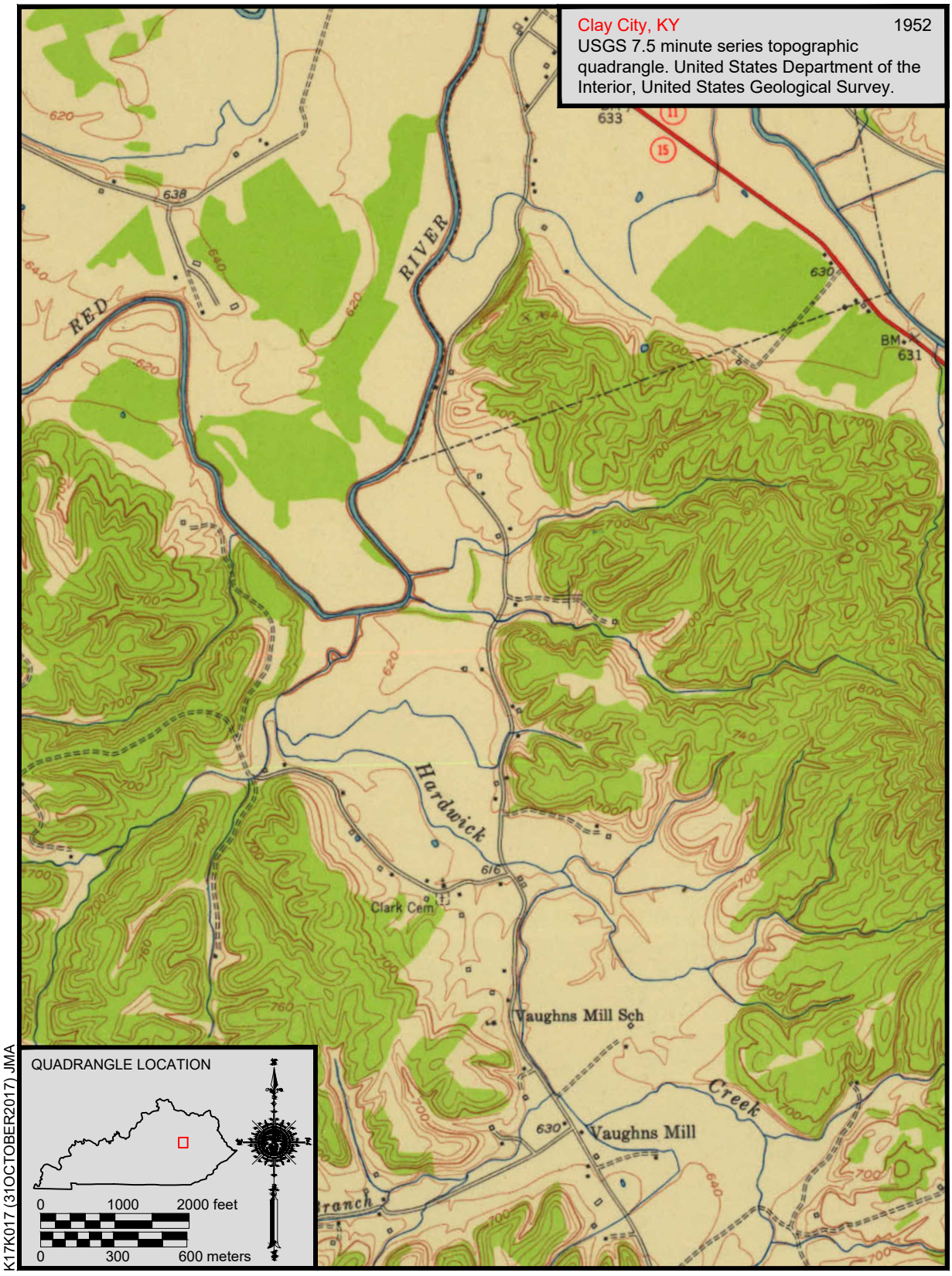

Figure 14. 1952 map (USGS 1952) showing MS 1-7.

Figure 15. Pasture at MS 5 area, facing south.

Figure 16. Residence at MS 6 area, facing northwest.

Figure 17. Barn at MS 7 area, facing east.

Paleoindian Period (11,500–8000 B.C.)

The Paleoindian cultural tradition in the northeastern United States has been recognized as part of the Clovis culture, a widespread, homogeneous New World culture typified by a distinctive lithic assemblage. The most distinctive members of this assemblage are lanceolate shaped, often fluted, hafted bifaces (Maggard and Stackelbeck 2008). The presence of other artifact types in these Paleoindian assemblages, such as chert knives, scrapers, unifacial tools, and blades, is consistent across the eastern United States. These types of artifacts have been recovered from Clovis sites such as Holcombe Beach in Michigan (Fitting et al. 1966), Debert in Nova Scotia (MacDonald 1968), Martens in Missouri (Martens et al. 2004; Morrow 1998, 2000), and Topper in South Carolina (Goodyear and Steffy 2003).

Clovis components are not well represented in Kentucky, but they have been identified at sites such as Adams, Adams Mastodon, Big Bone Lick, Clay's Ferry Crevice, and Parrish (Tankersley 1996). The artifacts in the Clovis toolkit represent predominantly hunting, butchering, and hide-working activities. Bone tools (e.g., awls, needles, flakers, and possibly shaft straighteners) and ornaments are assumed to have been used, but have not been recovered because of unfavorable environmental conditions (Griffin 1978:226).

Post-Pleistocene adaptive strategies were geared for coping with a harsh, but rapidly changing, environment. In general, Paleoindian sites are reflective of areas where small groups of people, perhaps no more than 50 individuals (Tankersley 1996:21), would perform specific tasks of short duration. This type of site casts a very low archaeological profile across the landscape. It has been argued that the earliest subsistence strategies in the eastern United States were not typified by a focus on the harvest of megafauna, but rather by a balanced hunting economy based

on the exploitation of migratory game—especially caribou—and supplemented by foraged food (Fitting et al. 1966:103–104; Gingerich 2011; Ritchie and Funk 1973:336; Tankersley 1996:22; Walker et al. 2001).

Archaic Period (8000–1000 B.C.)

As Griffin (1978:226) states, "a purely arbitrary division is made between the earlier fluted point hunter and their direct descendants," yet typological comparisons of artifact assemblages begin to take on distinctly regional characteristics with time. The Archaic period is customarily divided into three subperiods: Early (8000–6000 B.C.), Middle (6000–3500 B.C.), and Late (3500–1000 B.C.) (Jefferies 2008). By the Early Archaic, the last glaciers had retreated and the arctic-like boreal forest was developing into the eastern deciduous forest. By the Middle Archaic subperiod, the environment was much as it is today. This subperiod is marked by the introduction of groundstone tools, some of which have been interpreted as plant processing implements. At the beginning of the Late Archaic subperiod, the modern deciduous climax forest covered the entire eastern United States. In response to the changing environment and concurrent changes in plant and animal communities, Archaic period peoples developed a more diversified subsistence strategy that included a shift to exploitation of riverine ecosystems and, perhaps, the beginnings of a planned seasonal round exploitation strategy (Winters 1967:32, 1969).

The typical artifact assemblage representative of the Archaic period is composed of corner- and side-notched, or stemmed, hafted bifaces, increasing in both quantity and stylistic variation through time but accompanied by a decrease in quality of individual workmanship. Corner- and side-notched forms appear earlier in the sequence, whereas stemmed bifaces appear later (Jefferies 2008).

Judging from the greater frequency with which Late Archaic sites appear among sites that are recognized in the prehistoric record, a population increase may be postulated. Moreover, evidence of longer, more intensive site occupation suggests, in some cases, the possibility of extended habitation in parts of the state (Jefferies 2008).

Woodland Period (1000 B.C.–A.D. 900)

Griffin (1978:231) notes that during the Late Archaic subperiod there was "considerable evidence for the long distance movement of goods." The interregional movement of goods provided a structure for the transmission of information as well. During this period of interregional dynamism, there was a trend towards a more sedentary lifestyle with increasingly elaborate burial ceremonialism and, possibly, stratified social organization. These trends, along with the appearance of fired ceramic vessels, mark the transition between Archaic and Woodland peoples (Griffin 1978).

The Woodland period, like the preceding Archaic period, is divided into three subperiods: Early Woodland (1000–200 B.C.), Middle Woodland (200 B.C.–A.D. 400), and Late Woodland (A.D. 400–900) (Applegate 2008). Overall, the Woodland period witnessed a continuation and elaboration of cultural practices that began during the Late Archaic subperiod. Woodland peoples became increasingly dependent on the cultivation of plant foods, which allowed for a more sedentary lifestyle. Except for the latter part of the Late Woodland subperiod, subsistence practices remained similar to the Archaic subsistence patterns, which is to say a combination of hunting, plant food gathering, and fishing in a seasonal round exploitation pattern. It is within the Woodland period that highly visible site types, such as mounds and enclosures, were constructed (Applegate 2008).

Late Prehistoric Period (A.D. 900–1650)

In addition to an increase in cultural integration and cultural complexity, the Late Prehistoric period witnessed a rapidly growing

dependence upon horticulture in the subsistence activities of native populations. Cultural materials are assigned to the Late Prehistoric period by the presence of seemingly diagnostic artifacts, such as mixed limestone and shell or purely shell tempered pottery and triangular projectile points. Temporal assignment based on the presence of triangular points can be misleading since they first appeared during the Late Woodland period. The Late Prehistoric period in this region of Kentucky is referred to as Fort Ancient (Henderson 2008).

During the Fort Ancient period, there was an increased reliance on agriculture, an increase in sedentism, and an increase in the complexity of sociopolitical organization. Subsistence practices focused on the cultivation of corn and beans. This was supplemented with hunting, fishing, and wild plant collecting. Many Fort Ancient villages were circular or elliptical and "exhibit distinct activity areas that encircle a central plaza: domestic/habitation, storage/trash disposal, and mortuary" (Henderson 2008:745). Some, but not all, of these circular villages were surrounded by a palisade.

Cultures with a somewhat similar level of development included Pisgah in the Appalachian Summit, Mississippian in the middle Mississippi River area, and the Plaquemine culture of the lower Mississippi River area. A Late Woodland level of society continued in the Midwest, the Great Lakes, the Northeast, and the piedmont and coastal areas of the Middle Atlantic until European contact (Geier 1992:279–280). The Fort Ancient period is dated between approximately A.D. 900 and 1650.

Historic Period

The first Europeans to visit Kentucky included explorers, trappers, traders, and surveyors. It was in the 1750s, when the English Crown attempted to colonize the Ohio Valley, that the first organized attempt to settle Kentucky occurred. This attempt stimulated the formation of land companies that sent surveyors into the area (McBride and McBride 2008:909). One of these, the Ohio Land Company, sent Christopher Gist into Kentucky in 1751. The French and Indian War that erupted in 1754 disrupted this early exploration (Talbert 1992:689).

In 1763, England's King George III set aside the land west of the Appalachians for native populations and English fur traders and closed the area to permanent settlement. His decree was ignored, and further colonial exploration and development could not be stopped. One man who took advantage of the commercial expansion westward was Daniel Boone. Boone first explored Kentucky in 1767, and by 1769, he had explored much of the Red and Kentucky River valleys. Harrodsburg was established soon after in 1774 followed by Boonesboro in 1775. The western movement of the American frontier pushed the Native Americans further and further west, and Kentucky was one of the places where they decided to take a stand. In response, Governor Dunmore (of Virginia) waged two large campaigns in the Ohio Valley (later known as Dunmore's War), and the Native Americans were defeated. Dunmore's War opened Kentucky for settlement, although some hostilities continued after this time (Nickell 1992:96–98; Stone 1992:571).

History of Powell County

In 1776, the Virginia General Assembly had created Kentucky County from its western lands. The newly created Kentucky County had approximately the same boundaries as the state of Kentucky does today. This county in 1780 was divided into three separate counties (Fayette, Lincoln, and Jefferson), which would collectively become the District of Kentucky in 1783 (Hammon 1992:495; Kleber 1992:267). Then, in 1792, the Kentucky District would dissipate in favor of the Commonwealth of Kentucky, and the counties that comprised the district would eventually be divided and subdivided into the 120 counties that presently make up Kentucky. Powell County was 101st in order of formation, and it was created in 1852 with land appropriated from portions of Clark, Estill, and Montgomery Counties (Bryant 1992a:732).

Located in the east-central portion of the state, Powell County is bordered by Clark, Estill, Lee, Menifee, Montgomery, and Wolfe Counties. The county presently encompasses 466 sq km (180 sq mi) and is part of the Foothills section of the Appalachian Mountains cultural landscape. The county is named for Lazarus Whitehead Powell who served as governor of Kentucky from 1851 to 1855, and as U.S. Senator from 1859 to 1865 (Bryant 1992a:732). Stanton was designated the county seat when the county was formed, but it was not incorporated until 1854. Originally it was named Beaver Pond, and had a post office established in 1848 (Rennick 1994:135, 137). When Powell County was formed and the location of Beaver Pond selected for the county seat, the town was renamed Stanton for Richard M. Stanton of Maysville, who served in the U.S. House of Representatives from 1849 to 1855 (Bryant 1992b:848).

Powell County is drained by the Red River and its branches. The eastern and southern portions of the county are defined by rugged and mountainous terrain, and the western portion of Powell County contains most of the county's agricultural lands (Bryant 1992a:732; Rennick 1984:242).

Some of the earliest known pioneers to the county included Daniel Boone and John F. Finley. According to local lore, Daniel Boone climbed Pilot Knob, the highest point in the county, for an overview of the vicinity (Bryant 1992a:732).

After the county's initial settlement, it became known for its iron works. Iron pyrite was discovered near present-day Clay City in 1786 by a man named Stephen Collins and his brother. The first commercial iron furnace west of the Allegany Mountains was constructed near the site, which was known as Collins Forge. Robert Clark, Jr., and William Smith purchased the Collins' brothers' interest in the property and constructed another iron furnace near the site by 1805. This furnace later became known as the Red River Iron Works, manufacturing products such as pots and nails. During the War of 1812, the iron works produced cannonballs. The timber industry also was an important economic force for the area in the first half of the nineteenth century, with numerous lumber mills found along the Red River (Bryant 1992a:732; Rennick 1984:59).

Since Powell County was not officially created until 1852, population statistics for the county are not available before 1860. That year, the population of Powell County was 2,257 with 125 enslaved African Americans (United States Bureau of the Census [USBC], 1860, Washington D.C.). During the Civil War, Powell County suffered hardships from two guerrilla raids by Confederate forces. In 1863, Stanton was raided and the courthouse was burned. One year later, Stanton was again the target of a guerrilla attack, and the jail was destroyed (Bryant 1992a:732, 1992b:848).

While the Civil War presented challenges to the residents of Powell County, the county's economy rebounded quickly at the war's end. The lumber industry operated at a large scale, and by 1870, the number of residents had increased to 2,599. The population of the county continued to grow by 40 percent over the next 10 years, reaching 3,639 in 1880 (Bryant 1992a:732; USBC 1870, 1880). The Kentucky Union Railroad entered the county in 1886, and it presented even greater opportunities for the lumber industry. With the presence of the railroad, Clay City became the location of one of the largest sawmills in the United States by 1889. The Lexington and Eastern (L & E) Railway purchased the Kentucky Union Railway in 1894 (Bryant 1992a:732).

With the arrival of the railroad and continued strength of the lumber industry, Powell County's population continued to increase. The total number of residents stood at 4,698 in 1890, and it was 6,443 by 1900. This number fell slightly by 1910, to 6,268, before rebounding to 6,745 in 1920 (USBC 1890–1920).

In 1909, the Louisville and Nashville Railroad (L & N) purchased the land which presently contains Natural Bridge State Park, the same year it purchased the Kentucky

Union Railway. The L & N constructed a hotel near the natural bridge in hopes of creating a tourism boom for the company (Bryant 1992a:732). Stanton as the county seat also grew with the land purchase by the L & N as well as its purchase of the L & E, and the town reaped the benefits of being an important stop on a route bringing lumber and coal out of the Appalachian Mountains (Bryant 1992b:848).

The lumber industry in Powell County declined greatly during the Great Depression. With new residential construction practically non-existent nationwide, there was very little demand for the county's lumber. The L & N took up its tracks in the county in 1941, thereby ending the boom period brought by the railroad (Bryant 1992a:732). The county's total population dropped to 5,800 in 1930, due in large part to the effects of the Great Depression on the local economy (USBC 1930). Within 10 years, however, the population of the county rebounded strongly, reaching 7,671 in 1940 (USBC 1940). The population growth trend then stalled, and over the next three decades, Powell County's population fluctuated little, reaching only 7,704 residents by 1970 (USBC 1950–1970).

The 1960s saw the beginnings of an economic rebound for Powell County. The Mountain Parkway, a four-lane highway, was constructed through the county. This parkway reopened the county's rich natural resources to larger markets. Timber once again was able to play an important role in the local economy. The county's tourism industry rebounded with the opening of the Natural Bridge State Park (Bryant 1992a:732).

Powell County's population increased to 11,101 by 1980. The 1990 census showed continued growth, with 11,686 total residents. In 1990, Stanton had approximately 2,800 residents, and Clay City had a population of approximately 1,260 (Rennick 1994:137; USBC 1980, 1990). The next 10 years brought a 13 percent increase in the county population, with 13,237 total residents (USBC 2000).

In the late twentieth century, Powell County developed some industry, mainly in Stanton and Clay City, but agriculture still remained important to the county's economy, especially in the western portion of the county (Bryant 1992a:733). The population of Powell County was 12,613 people in 2010, and 67 percent of the population resides in rural areas. The majority of the population is European American, with 1 percent being Hispanic or Latino and .6 percent being African American (USBC 2010). Schools in Powell County include three elementary schools, a middle school, and a high school (Powell County School District 2015). Tourism and recreation opportunities include the Red River Gorge, Natural Bridge State Park, and Pilot Knob Nature Preserve, as well as several museums, learning centers, and a reptile zoo (Powell County Tourism Commission 2015).

IV. METHODS

This section describes the methods used during the survey. Site-specific field methods are discussed in further detail in the Site Description section of this report. Laboratory methods specific to the individual analyses are discussed in the specific analysis sections of this report.

Field Methods

The project area consisted of residential lawns, driveways, pastures, an agricultural field, and a wooded area that stretched for 1.12 km (.69 mi) along KY 1057, ranging in width from 12 to 70 m (40 to 230 ft) (see Figures 2 and 3). The project boundaries were determined using maps provided by the client and an iPad Mini tablet coupled with a Garmin GLO Bluetooth global positioning system (GPS) receiver capable of real-time 2−3 m (7−10 ft) horizontal accuracy. Survey was conducted on private property only after a reasonable attempt had been made to obtain permission from the landowners.

The entire project area was subject to intensive pedestrian survey; in addition, screened shovel testing was conducted on all flat areas that had no ground surface visibility. Limited bucket auguring was also conducted.

A transect of shovel tests at 20 m (66 ft) intervals was excavated on each side of KY 1057. Additional shovel tests were excavated in areas where the project boundary extended far enough from KY 1057 that more than one transect could be placed. When excavating near a map structure or previously recorded site (15Po98), the shovel test interval was reduced to 10 m (33 ft). Each shovel test measured no less than 35 cm (14 in) in diameter and was excavated well into the subsoil. The contents of each shovel test were screened through .64 cm (.25 in) mesh hardware cloth, and the sides and bottoms of each shovel test were examined for cultural material and features. When a positive shovel test was identified, radials were excavated at 10 m intervals in cardinal directions, within the project area, until two consecutive negative shovel tests were excavated in a row or the project boundary was reached. The few areas of steep sideslope were walked and inspected for natural rock benches and overhangs. None were observed. Gravel and dirt roads were walked and visually examined for indications of cultural material and features.

A single bucket auger was excavated in the area with the greatest potential for deeply buried cultural remains. The bucket auger was 8 cm (3 in) in diameter and excavated down to bedrock. The contents of each bucket auger were screened through .64 cm mesh hardware cloth. All zones were recorded and no artifacts were recovered from the bucket auger.

Laboratory Methods

All cultural material recovered from the project was transported to CRA for processing and analysis. Initial processing of the recovered artifacts involved washing all artifacts, sorting the artifacts into the major material classes (i.e., historic and lithic) for further analysis, and assigning catalog numbers. Catalog numbers consisted of the site number and a unique number for each provenience lot or diagnostic specimen. Historic artifacts received a unique catalog number for each material group and class by provenience. Non-diagnostic material, such as flake debris, was cataloged by provenience lot where all flakes in the same provenience received the same number.

The methods, specifics, and results of subsequent analyses are discussed in each of the specific analysis sections of this report. All cultural materials, field notes, records, and site photographs will be curated at the University of Kentucky's William S. Webb Museum of Anthropology.

V. MATERIALS RECOVERED

Prehistoric materials were recovered from Site 15Po489 and IF 1, and historic materials were recovered from Site 15Po489. The assemblages from each are described below. In addition, an inventory of materials recovered from the site, listed by provenience, is presented in the site description section of this report.

Prehistoric Materials Recovered

D. Randall Cooper

Lithic remains recovered during this investigation consist of 12 pieces (5.2 g) of flake debris (Table 2). These came from one multicomponent site (15Po489) and one isolated find (IF 1). No temporally diagnostic lithic material was recovered.

The analysis of flake debris involved the recording of several attributes, including flake size, weight, raw material type, presence of cortex, and probable stage of lithic reduction during which the flake was produced. Reduction stage follows Magne's (1985) definitions and was determined by the number of facets on the platform or the number of flake scars on the dorsal surface. Early stage reduction is defined as core reduction, middle stage as the first half of tool production, and late stage as the second half of tool production and subsequent maintenance. For flakes that retain platforms, zero to one facet on the platform indicates early stage, two facets

Table 2. Prehistoric Materials Recovered.

Site	Unit	Count	Wt(g)	Stage or Class	Material	Comments
15Po489	STP 1	1	0.9	Late Stage	Boyle Chert	
15Po489	STP 2	2	0.2	--	Indeterminate (<1/4 inch)	Possible pressure flakes
15Po489	STP 2	1	0.7	Blocky Debris	Boyle Chert	Weathered, possibly natural
15Po489	STP 2	1	0.3	Biface Thinning	Boyle Chert	
15Po489	STP 2	1	0.5	Biface Thinning	Newman Chert	
15Po489	STP 3	2	0.4	--	Indeterminate (<1/4 inch)	
15Po489	STP 3	1	0.9	Early Stage	Boyle Chert	Mature alluvial cortex
15Po489	STP 4	1	0.6	Early Stage	Boyle Chert	Mature alluvial cortex; burned
IF 1	STP 1	1	0.3	--	Indeterminate (<1/4 inch)	Mature alluvial cortex
IF 1	STP 1	1	0.4	Biface Thinning	Boyle Chert	
		12	5.2			

indicate middle stage, and three or more facets indicate late stage. Biface thinning is a specialized form of late stage reduction. A biface thinning flake is defined as a flake with a lipped platform having three or more facets. For non-platform bearing flakes, dorsal flake scars were counted instead of platform facets; zero to one dorsal flake scars indicate early stage, two scars middle stage, and three or more flake scars late stage. Stage of reduction was not determined for blocky debris or flakes smaller than .25 inch.

The flakes recovered in this investigation are from a mix of early and late stage reduction. Flake debris larger than .25 inch from Site 15Po489 was classified as blocky debris (n = 1, 16.7 percent), early stage flakes (n = 2, 33.3 percent), a late stage flake (n = 1, 16.7 percent), and biface thinning flakes (n = 2, 33.3 percent). One of the two flakes from IF 1 is a biface thinning flake. The other flake from IF 1 is smaller than .25 inch, therefore reduction stage was not identified.

Material type for the recovered artifacts was determined by comparison with a sample collection housed at CRA. Material was not determined for flake debris smaller than .25 inch. Boyle chert was the material for six of the seven pieces larger than .25 inch. A single flake was made of Newman chert. Three of the Boyle chert flakes had waterworn cobble cortex, indicating that at least some of the raw material was obtained from stream beds or terraces.

Gatus (1980) describes Boyle chert as having a moderate to semi-vitreous luster. It is fine-grained to medium fine-grained and is variable tan, brown, pink, red, blue, white, and gray in color, with tans and grays dominating. It often has inclusions of fossilized crinoids and bryozoan fragments. It occurs as nodules and tabular blocks (Gatus 1980).

Newman chert is highly variable, and exposures of Newman Limestone are scattered over a wide area of Eastern Kentucky, especially along the western edge of the Cumberland Plateau. Two varieties of Newman that have been described as different chert types are Paoli and Haney. The single flake of Newman from Site 15Po489 is closer to the Paoli variety. Paoli typically exhibits a semi-vitreous to vitreous luster and is generally medium to fine-grained. It is brownish red to medium red, light tan, and/or bluish white. It typically occurs as cannonball nodules and occasionally has concentric banding (Gatus 1985).

Most of the lithic material used for stone tools in the project area could have been obtained from local sources. Creeks and hills nearby are rich in lithic resources, especially on the west side. Extensive outcrops of chert-bearing Boyle dolomite are present along the edge of the Red River channel and its tributaries, beginning approximately 3 km downstream from Site 15Po489. Stream cobbles along this stretch of river would also include chert derived from the Boyle dolomite.

The lithic sample recovered during this investigation is small and includes nothing to suggest an age for the prehistoric occupation(s) of this area. At Site 15Po489, the two different chert types indicate that more than one episode of lithic reduction occurred,

and the presence of both early and late stage reduction debris suggests this area was more than just a chert procurement locality. The initial processing of raw material took place, as well as tool production or maintenance. This suggests there was at least a short term occupation, or possibly multiple occupations. Although the lithic scatter was moderately dense in two small areas (Shovel Tests 2 and 3), no dateable lithic material was recovered, and all remains were found in topsoil context, so it is not clear when the site was occupied or if all the flakes were deposited during the same occupation. It is not likely that further investigation of this area would yield important information about prehistoric activity. It is likely, however, that the site extends beyond the current project boundary to the east, and additional remains could be present there, outside of the area to be impacted by the current project.

Historic Materials Recovered

Tanya A. Faberson

Methods

The historic assemblage includes artifacts classified and grouped according to a scheme originally developed by Stanley South (1977). South believed that his classification scheme would present patterns in historic site artifact assemblages that would provide cultural insights. Questions of historic site function, the cultural background of a site's occupants, and regional behavior patterns were topics to be addressed using this system.

South's system was widely accepted and adopted by historical archaeologists. However, some have criticized South's model on theoretical and organizational grounds (Orser 1988; Wesler 1984). One criticism is that the organization of artifacts is too simplistic. Swann (2002) observed that South's groups have the potential to be insufficiently detailed. She suggested the use of sub-groups to distinguish between, for example, candleholders used for religious purposes and those used for general lighting. Others, such as Sprague (1981), have criticized South's classification scheme for its limited usefulness on late-nineteenth- and early-twentieth-century sites, which include an array of material culture—such as automobile parts—not considered by South. Despite its shortcomings, most archaeologists recognize the usefulness of South's classification system to present data.

Stewart-Abernathy (1986), Orser (1988), and Wagner and McCorvie (1992) have subsequently revised this classification scheme. For the purposes of this assessment, artifacts are grouped into the following categories: domestic, architecture, arms, furnishings, clothing, personal, communication and education, maintenance and subsistence, biological, and unidentified. The artifacts recovered during this project are summarized in Table 3.

Table 3. Historic Artifacts Recovered According to Functional Group.

Group	15Po489	Percent
Architecture	5	50
Domestic	2	20
Maintenance/Subsistence	2	20
Unidentified	1	10
Totals	10	100

Grouping artifacts into these specific categories makes it more efficient to associate artifact assemblages with historic activities or site types. One primary change associated with the refinement of these categories is reassigning artifacts associated with the "Miscellaneous and Activities" under South's (1977) original system. Considering the potential variety of historic dwellings and outbuildings within the project area, a refinement of the artifact groupings was considered important to perhaps observe whether the distribution of specific artifact groups would produce interpretable patterns related to activity areas or structure types. Each one of these groups and associated artifacts is discussed in turn.

Information on the age of artifacts as described in the artifact tables is derived from a variety of sources cited in the discussion of the materials recovered. The beginning and

ending dates cited need some clarification. Usually, an artifact has specific attributes that represent a technological change, an invention in the manufacturing process, or simple stylistic changes in decoration. These attribute changes usually have associated dates derived from historical and archaeological research. For example, bottles may have seams that indicate a specific manufacturing process patented in a certain year. The bottle then can be assigned a "beginning," or incept, date for the same year of the patent. New technology may eliminate the need for the same patent and the bottle would no longer be produced. The "ending," or terminal, date will be the approximate time when the new technology took hold and the older manufacturing processes are no longer in use.

Specific styles in ceramic decorations are also known to have changed. Archaeological and archival researchers have defined time periods when specific ceramic decorations were manufactured and subsequently went out of favor (e.g., Lofstrom et al. 1982; Majewski and O'Brien 1987). South's (1977) mean ceramic dating technique uses this information. The dates presented here should not be considered absolute; but rather the best estimates of an artifact's age available at this time. A blank space indicates that the artifact could not be dated or, alternately, that the period of manufacture was so prolonged that the artifact was being manufactured before North America was colonized. An open-ended terminal date was assigned for artifacts that may be acquired today. The rationale for presenting dates for the artifacts recovered is to allow a more precise estimate of the time span the site was occupied, rather than the mean occupation date of a site.

A summary of the artifacts recovered follows. A complete inventory of the historic artifacts can be found in Appendix A.

Materials Recovered by Functional Group

There were 10 historic artifacts recovered during the current survey. The following provides a descriptive discussion of the types and age of artifacts recovered from Site 15Po489.

Architecture Group (N = 5)

The architecture group is comprised of artifacts directly related to buildings, as well as those artifacts used to enhance the interior or exterior of buildings. These artifacts typically consist of window glass, plate glass, nails, and construction materials, such as brick and mortar. The architecture group items are discussed below.

Construction Materials (n = 1)

Construction materials refer to all elements of building construction. For this project, the building materials consisted of a single hand-made brick fragment (Table 4). The brickmaking industry was one of the most localized of all nineteenth-century industries (Walters 1982:125). It was far less expensive to produce bricks on site than to pay to ship the bricks from another location. In fact, a brickmaker could transport everything needed to produce enough bricks for a large building in two wagons. Although brickmaking was present in the United States by the late eighteenth century, this industry did not become popular until circa 1800. Hand-made bricks manufactured at the construction site continued to be popular as late as the 1880s (Walters 1982:126–128).

Table 4. Summary of Historic Materials Recovered.

Class	Type	15Po489
Construction material		
	Brick	1
Flat glass		
	Window glass	1
	Plate glass	1
Nails		
	Indeterminate cut/wrought	1
	Unspecified cut	1
Ceramics		
	Whiteware	1
Container glass		
	BIM	1
General hardware		
	Fencing	1
Stable & barn		
	Horseshoe	1
Unidentified		
	Glass	1
	Totals	10

Hand-made bricks were typically 5:1 bricks because five sides were identical and the sixth side exhibited distinctly different markings. Linear marks were usually found on the sixth side and were caused by the brickmaker when excessive clay was removed from the top of the mold. The remaining five sides of hand-made bricks usually exhibit a gritty/sandy texture from the sand-coated mold (Walters 1982:128). The paste of hand-made bricks is usually more porous than machine-made bricks. Most hand-made bricks manufactured in the nineteenth century were close in size to the standard adopted by the National Brickmakers Association. However, some irregularity did occur accidentally (Walters 1982:130).

The shift from hand-made bricks to machine-made bricks occurred circa 1880. Although machine-made bricks were produced in factories in most major cities in the United States by the mid-nineteenth century, this process was not standardized or popularized until the last two decades of the nineteenth century (Holley 2009:97). The creation of the National Brick Manufacturers Association in 1886 allowed for an industry-wide discussion of standardization. This push came mostly from architects and building contractors who needed a better standard for quantity and project cost estimations (Holley 2009:97). Machine-made bricks will often have marks in the clay related to the machine manufacturing process (Greene 1992; Gurcke 1987). This brick type is typically more uniform in shape, and the paste is more consistent throughout.

It should also be noted that firebricks and molded ornamental bricks became largely popular in the late nineteenth century. Large fires destroyed huge portions of major American cities throughout the latter half of the nineteenth century. This prompted many cities to develop building ordinances that required fireproof brick construction. Ornamental bricks became largely popular between the 1893 and 1904 world's fairs. Unfortunately, the production of these types of bricks declined after 1904 when the extruded method of brick production became more popular than the dry-press method (Broeksmit and Sullivan 2006). Paving bricks typically are heavier and larger than the other bricks described above, and they were manufactured to construct roadways. Hence, they needed to be manufactured to withstand the weight and wear of daily traffic. Brick paving became popular in the 1890s (Hockensmith 1997:158).

Flat Glass (n = 2)

Cylinder glass was developed in the late eighteenth century to enable the inexpensive production of window glass. With this method, glass was blown into a cylinder and then cut flat (Roenke 1978:7). This method of producing window glass replaced that of crown glass production, which dates back to the Medieval period and was capable of fabricating only very small, usually diamond-shaped, panes (Roenke 1978:5). Cylinder glass was the primary method of window glass production from the late eighteenth century through the early twentieth century, at which time cylinder glass windows were slowly replaced by plate glass windows. Plate glass window production became mechanized after 1900, but did not become a commercial success in the United States until around 1917 (Roenke 1978:11).

Cylinder window glass has been shown to gradually increase in thickness through time and can be a useful tool for dating historic sites. Several dating schemes and formulas have been devised that use average glass thickness to calculate building construction or modification dates. These include Ball (1984), Roenke (1978), and Chance and Chance (1976) to name a few. Like previously derived formulas, Moir (1987) developed a window glass dating formula to estimate the initial construction dates for structures built primarily during the nineteenth century. Although Moir (1987:80) warns that analysis on structures built prior to 1810 or later than 1915 have shown poor results, most research in this area shows the regression line extending back beyond 1810 (Moir 1977; Roenke 1978). Hence, dates calculated back to 1785 were considered plausible. Sample size is also a consideration when using the Moir window glass regression formula. According

to Moir (1987:78), sample sizes also need to be "reasonable and not collected from a point or two" in order to accurately date the construction of a building. Moir (1987:80) indicates sample sizes as small as 15 sherds are acceptable, but recommends larger sample sizes for better accuracy, and we agree with his assessment. For the purposes of this assessment, a "reasonable" sample size is considered 25 window glass sherds. It should be noted that for window glass assemblages with less than 25 sherds, however, "tentative" dates based on measurements are still presented for the purpose of reporting and providing additional information regarding the material collected. Individual sherd/small assemblage measurements/dates are not presented as "absolute" dates for sites, and as a general principle, any window glass dates derived using the Moir (1987) method should be contextualized utilizing other artifact dating methods whenever possible.

Although Moir (1987:80) states that dating window glass after 1915 is not as reliable for dating sites, for our purposes, window glass that measures 2.41 mm (dating to 1916) is included in our calculations because according to Roenke (1978:11), plate glass does not become widely or successfully produced in the United States until 1917. Two pieces of flat glass were recovered during the current project. One of these was a piece of window glass with a thickness suggesting a date around the turn of the twentieth century. The other piece of flat glass was a piece of plate glass dating after 1917.

Nails (n = 2)

There are three stages recognized in the technological chronology of nails: wrought nails, cut nails, and wire-drawn nails.

Wrought nails were handmade and were the primary type of construction fastener in the eighteenth and early nineteenth centuries. Their use ended around 1810 with the widespread use of square cut or machine cut nails (Nelson 1968:8).

The cut nail, introduced in approximately 1800, originally had a machine-cut body with a hand-made head. Around 1815, crude machine-made heads replaced hand-made heads on cut nails, and overall, cut nails replaced wrought nails in the construction industry. Early fully machine-cut nails exhibit a "rounded shank under the head," and therefore, often appear pinched below the head of the nail (Nelson 1968:8). By the late 1830s, these "early" fully machine-cut nails were replaced with "late" fully, or modern, machine-cut nails.

The first wire-drawn nails were introduced into the United States from Europe by the mid-nineteenth century. These early wire nails were primarily used for box construction and were not well adapted for the building industry until the 1870s. Although the cut nail can still be purchased today, the wire nail nearly universally replaced it by the turn of the twentieth century (Nelson 1968:8).

Two nail fragments were recovered from the project area (see Table 4). One was indeterminate cut/wrought, and the other was unspecified cut (Figure 18a). The pennyweights are unknown since the nails were fragmentary.

Domestic Group (N = 2)

Artifacts included in the domestic group consisted of a ceramic sherd (n = 1) and a piece of container glass (n = 1) (see Table 4).

Ceramics (n = 1)

One ceramic sherd was recovered, and it consisted of an undecorated whiteware body sherd of unknown vessel form (Figure 18b). As a ware type, whiteware includes all refined earthenware that possesses a relatively non-vitreous, white to grayish-white clay body. Undecorated areas on dishes exhibit a white finish under clear glaze. This glaze is usually a variant combination of feldspar, borax, sand, nitre, soda, and china clay (Wetherbee 1980:32). Small amounts of cobalt were added to some glazes, particularly during the period of transition from pearlware to whiteware and during early ironstone manufacture. Some areas of thick glaze on whiteware may, therefore, exhibit bluish or greenish-blue tinting.

Figure 18. Historic materials recovered from Site 15Po489 STP 3, Zone I: (a) unspecified cut nail fragment; (b) undecorated whiteware body sherd; (c) amethyst glass BIM body sherd; and (d) cast-iron (cast) horseshoe with horseshoe nails.

Weathered paste surfaces are often buff or off-white and vary considerably in color from freshly exposed paste (Majewski and O'Brien 1987).

Most whiteware produced before 1840 had some type of colored decoration. These decorations are often used to designate ware groups (i.e., edgeware, polychrome, and colored transfer print). Most of the decorative types are not, however, confined to whiteware. Therefore, decoration alone is not a particularly accurate temporal indicator or actual ware group designator (Price 1981).

The most frequently used name for undecorated whiteware is the generic "ironstone," which derives from "Ironstone China" patented by Charles Mason in 1813 (Mankowitz and Haggar 1957). For purposes of clarification, ironstone will not be used when referring to whiteware. Ironstone is theoretically harder and denser than whiteware produced prior to circa 1840. Manufacturer variability is, however, considerable and precludes using paste as a definite ironstone identifier or as a temporal indicator. Consequently, without independent temporal control, whiteware that is not ironstone is difficult to identify, as is early vs. later ironstone.

Whiteware was manufactured with decoration and without decoration, and the sherd recovered was undecorated. It was assigned a date range of 1830 to the present.

Container Glass (n = 1)

Research by Baugher-Perlin (1982), Jones and Sullivan (1985), Lindsey (2017), and Toulouse (1971) was used to analyze and date the container glass sherd recovered. The single sherd was identified as Blown-in-Mold (BIM). No other characteristics, such as mold seams or finish type, were identified on the sherd. Hence, it could only be dated according to color, and it was solarized amethyst glass (Figure 18c). According to Lockhart (2006), amethyst glass began to be manufactured around 1870, when manganese was being added to the glass recipe. Although initially colorless, the glass will turn a distinctive purplish color when exposed to sunlight over time. It was previously thought that amethyst

glass production ceased by 1914 due to a shortage of manganese from Germany during World War I; however, the change was actually a result of technological advancements in the glass industry, mainly the conversion to automatic bottle machines (Lockhart 2006:53). Although manganese was more difficult to obtain after World War I, and selenium was often less expensive, the improvement in technology was the major reason for the change. The use of selenium proved to be an inexpensive decolorant in glass production and ultimately displaced manganese as a decolorizer by 1920 (Lockhart 2006:53). The amethyst BIM glass body sherd was assigned a date range of 1870–1920.

Maintenance and Subsistence Group (N = 2)

The maintenance and subsistence group contains artifacts grouped into classes containing non-food containers, electrical, farming and gardening, hunting and fishing, stable and barn activities, general hardware, general tools, transportation, and fuel-related items such as coal. One stable and barn item was recovered, and it was a cast iron (cast) horseshoe (see Table 4) (Figure 18d). It was not assigned a specific date. The other maintenance and subsistence artifact was a piece of barbed wire fencing. It dates after 1874 (Turner 1971).

Unidentified (N = 1)

This category contains artifacts that cannot be identified beyond the material from which they are made. This item was a small piece of milk glass that appears to be a piece of "shatter" from some sort of broken item/part, such as container glass, a container closure, lighting item, or electrical item (see Table 4). It was not assigned a specific date.

Discussion

There were 10 historic artifacts recovered during the current survey from Site 15Po489. Five architectural items were recovered, including a hand-made brick fragment dating from 1800 to 1880; a piece of window glass with a thickness suggesting a turn of the twentieth-century manufacture date; a piece of plate glass dating after 1917; an indeterminate cut/wrought nail fragment; and an unspecified cut nail dating between 1800 and 1890. The domestic items included an undecorated whiteware body sherd dating after 1830 and an amethyst BIM body sherd dating between 1870 and 1920. The maintenance and subsistence artifacts included a cast iron (cast) horseshoe and a piece of barbed wire fencing. The unidentified artifact was a piece of milk glass.

The historic artifacts recovered from 15Po489 had an average date range of 1834–1919, and a mean of 1878. The dominance of the architectural and domestic group artifacts supports the known use of the site as a domestic farmstead/residence. The first map showing a residence in the location of the site dates to 1948. It is unknown when the structure was demolished, but it is no longer extant and likely has not been for a number of years. The artifacts recovered from the site strongly suggest that the site was occupied by at least the late nineteenth century. Since so few items were recovered from the site, it is difficult to make any specific interpretations regarding the site occupants' former lifeways except that they utilized refined ceramics, purchased glass containers, and likely had one or more horses.

VI. RESULTS

During the course of the current survey, one previously unrecorded archaeological site (15Po489) and one isolated find (IF 1) were documented. A description of each is presented below, and the location of each is depicted on Figure 3.

During the survey, special attention was paid to the portion of the project area near Site 15Po98, a previously recorded prehistoric open habitation without mounds of indeterminate temporal period. The site had previously been recommended for nomination to the NRHP (Weinland and Sanders 1977). The project area adjacent to this site consisted of residential lawn and a soy bean field (Figure 19).

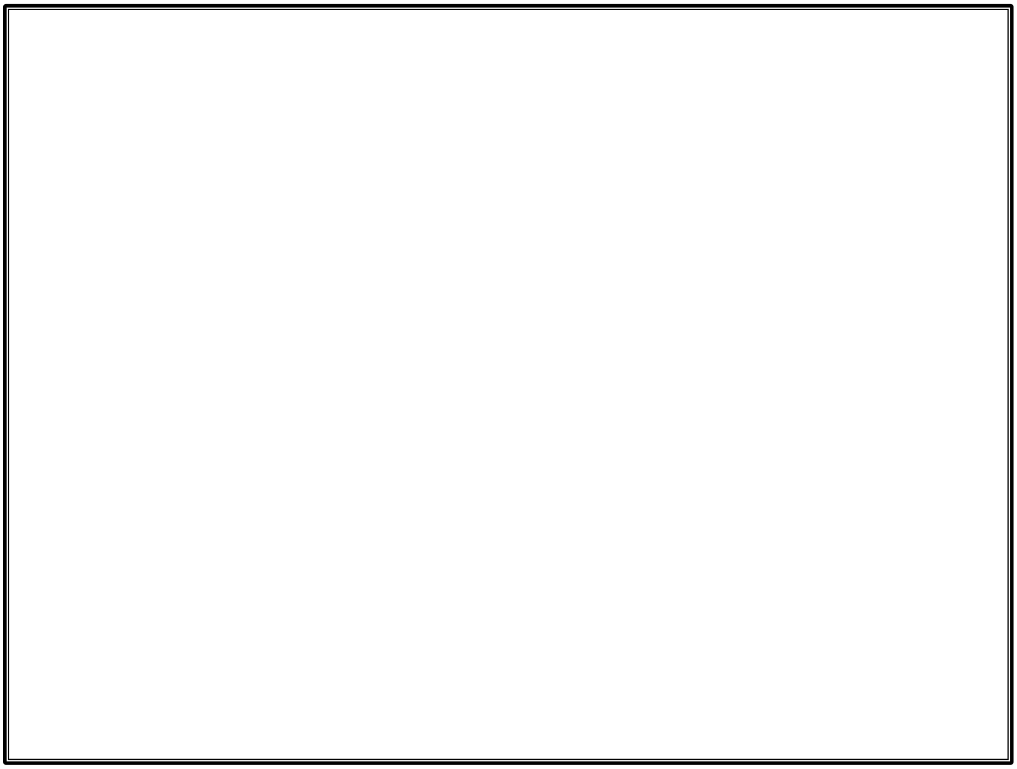

Figure 19. Overview of Site 15Po98 area, facing west.

Shovel tests were excavated at 10 m (33 ft) intervals in the lawn. The portion of the soy beans within the project area was within 10 m of the shovel tests, therefore no shovel tests were placed within the soy beans. A surface survey could also not be conducted in the soy beans as there was no ground surface visibility due to leaf litter. The only cultural material found near Site 15Po98 was IF 1, approximately 80 m (262 ft) from the site boundary (see Figure 3). The site itself is likely located closer to the Red River and well outside the current project area.

15Po489

Elevation: 189 m (620 ft) AMSL
Component(s): historic and prehistoric
Site type(s): farmstead, open habitation without mounds
Size: 500 sq m (5,382 sq ft)
Distance to nearest water: 60 m (197 ft)
Direction to nearest water: south
Type and extent of previous disturbance: structure removal and landscaping, 75−100 percent disturbed
Topography: terrace
Vegetation: various grasses
Ground surface visibility: zero percent
Aspect: flat
Recommended NRHP status: not eligible

Site Description

Site 15Po489 is a multicomponent indeterminate prehistoric open habitation without mounds, and a late-nineteenth- to mid-twentieth-century historic farm/residence in Powell County, Kentucky. The site consisted of prehistoric and historic artifacts found in shovel tests in a residential lawn and grass field between two driveways along KY 1057, approximately 271 m (889 ft) north of Meadows Cemetery Road (see Figures 2 and 3). The site is located on a level terrace above a tributary of the Red River, at an elevation of 189 m (620 ft) AMSL. The site area consisted of a manicured lawn (Figure 20) and a tall grass field (Figure 21) separated by a wooden fence. The various grasses in both areas provided no ground surface visibility. Occasional deciduous trees were in the area.

Figure 20. Site 15Po489 manicured lawn area, facing south.

Figure 21. Site 15Po489 tall grass field, facing south.

The site extends 10 m (33 ft) east-west and 50 m (164 ft) north-south, covering 500 sq m (5,382 sq ft).

Site 15Po489 is located in the same area as MS 2, which was depicted on the mid-twentieth century highway and topographic maps (KSHD 1948; USGS 1952). It was not depicted on the 1892 topographic quadrangle (USGS 1892). A further review of aerial photos and topographic maps (Nationwide Environmental Title Research 2017) reveals that the structure was extant until sometime between 1977 and 1995.

Archival Research

Julia K. Gruhot

The earliest confirmed known landowner associated with Site 15Po489 is Charles Welch. In 1880, Charles, age 5, lived on Hardwick Creek with his mother's family while his father, James, age 39; and uncle, Robert "Kidd" Welch, age 30, worked the family farm on Hardwick Creek. Robert "Kidd" Welch's family lived with the brothers on the farm, including the brothers' widowed mother, Cynthia, age 76; Robert's wife, Mary, age 27; and their two children, Marion, age 3, and Laura, age 3 months (USBC 1880). The family farm was jointly owned by brothers, James, Robert "Kidd", and Thomas, and when Robert "Kidd" Welch died in 1900, a special commissioner, C.F. Spencer, was appointed to decide ownership of the land. C.F. Spencer granted James Welch, father of Charles, ownership of the family farm, comprised of two parcels of land, totaling to 61 ha (150 acres); a 36 ha (90 acre) tract and a 24 ha (60 acre) tract along Hardwick Creek and the Red River (Powell County Clerk's Office [PCCO], Deed Book [DB] 9:539, Stanton, Kentucky).

Charles and Nettie Welch married in 1896 and were living on the family farm in 1900 (USBC 1900). However, by 1910 Charles was working as a general store manager in North Middletown, Bourbon County, Kentucky, with Nettie and his three children: Sylvia, Mildred, and Clifton. It is unknown when the young Welch family moved from the family farm to Bourbon County, but in that decade Charles saved money and purchased several properties surrounding the family farm on Hardwick Creek. Charles purchased 16 ha (40 acres) from Mary C. McKinney for $500.00 on September 29, 1904 (PCCO DB 11:402). He purchased an additional 1 ha (2 acres) from John M. Kennon for $6.00 cash on February 12, 1907 (PCCO DB 21:363). By early 1911, the Clay City Times reported that Charles had made arrangements to move back to the now expanding family farm (Ancestry.com 2016).

Charles's father, James, had moved away from the family farm by 1900 and was living in Stanton with his second wife, Provie, age 35, and their three children (USBC 1900). On March 29, 1919, James divided his property between his two families. Half of the property went to Charles, approximately 30 ha (75 acres), for a sum of $500.00, and the remaining 30 ha went to his second wife's children (PCCO DB 20:438). Charles Welch completed his estate on June 24, 1919, when he purchased 17 ha (43 acres) abutting his property from Alex and Sidney Fox for $800.00 (PCCO DB 21:362). Charles owned 65 ha (160 acres) on Hardwick Creek and it is on this combined property that Site 15Po489 is located (Table 5). He lived and farmed the property with his family; however, the farm struggled and by 1920, he had mortgaged the property (USBC 1920).

Table 5. Historic Ownership and Occupation Data for Site 15Po489.

Year	Owner	Acreage	Price/Value	Occupant
1919-1924	Charles and Nettie Welch	160	$ 1,806.00	Charles and Nettie Welch, children: Sylvia, Mildred, and Clifton
	James Tipton			James and Clara Tipton, Children: Arnold, Floyd, Roy, Stella
				Robert T. and Minnie McKinney

Investigation Methods

Because of the known map structure in the area, a transect of shovel tests was excavated in this area at 10 m (33 ft) intervals (Figure 22). Each shovel test measured no less than 35 cm (14 in) in diameter and was excavated well into subsoil. The walls and bottoms of each shovel test were examined for cultural material and features. The site was bounded to the west by KY 1057 and to the east by the project boundary, and both were less than 10 m from the transect, therefore no radials could be excavated in those directions. The site likely extends beyond the project boundary to the east. No sign of any structural remains was found.

Depositional Context

The shovel tests showed a consistent profile with two zones. Zone I was a light olive brown (2.5Y 5/4) silt loam extending to 32 cm (13 in) bgs. Zone II was a brownish yellow (10YR 6/6) silty clay loam (Figure 23).

Figure 22. Schematic plan map of Site 15Po489.

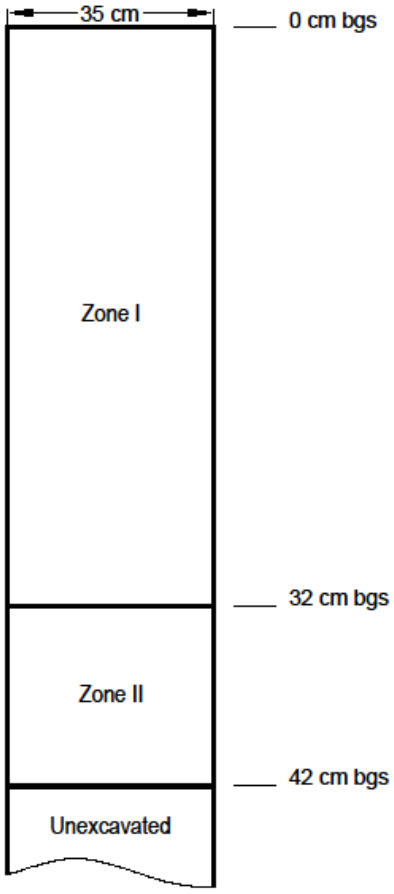

Figure 23. Representative soil profile from Site 15Po489.

This profile is not consistent with what is expected from the Jessietown-Muse-Rohan soil complex mapped in the area. The site has likely been disturbed by the construction and removal of the structure that once stood here and landscaping.

Artifacts

Prehistoric (n = 10) and historic (n = 10) artifacts were recovered from four shovel tests (Table 6). All artifacts were found in Zone I.

The prehistoric artifacts consisted entirely of chert flakes. Two were from early stage manufacture, one was from late stage manufacture, two were from bifacial thinning, one was a piece of blocky debris, and four were indeterminate (greater than .25 inch). The flakes were made from Boyle and Newman chert, both locally found. The presence of early and late stage reduction flakes suggests that the site was used for the initial processing of the raw material, as well as tool production or maintenance during the occupation(s). None of the flakes are temporally diagnostic.

The historic artifacts consisted of a piece of hand-made brick, a piece of window glass, a piece of plate glass, an indeterminate cut/wrought nail fragment, an unspecified cut nail, an undecorated whiteware body sherd, an amethyst BIM body sherd, a cast iron horseshoe, a piece of barbed wire fencing, and a piece of milk glass. The average date range of these artifacts was 1834–1919, with a mean date of 1878. The artifacts recovered from the site strongly suggest that the site was occupied by at least the late nineteenth century. The dominance of the architectural and domestic group artifacts supports the known use of the site as a domestic farmstead/residence.

Features

No features were observed during the investigation of the site, and no fire-cracked rock (FCR), charcoal, or burned soil was observed in the shovel tests. No evidence of intact structural remains was identified.

Summary and National Register Evaluation

Site 15Po489 is a multicomponent indeterminate prehistoric open habitation without mounds and a late-nineteenth- to mid-twentieth-century historic farm/residence in Powell County, Kentucky. The site consisted of prehistoric and historic artifacts found in shovel tests in a residential lawn and grass field between two driveways along KY 1057. The site area consisted of a manicured lawn and a tall grass field separated by a wooden fence. The site was shovel tested on a 10 m interval transect; 20 artifacts were recovered from 4 shovel tests.

While the historic maps depict a structure in the area between 1948 and 1977, the historic artifacts and the archival data suggest that the site was occupied by at least the late nineteenth century. The prehistoric artifacts could provide no temporal information.

Table 6. Artifacts Recovered from Site 15Po489.

Unit	Zone	Depth	Group	Class/Type	N =
STP 1	I	0–16 cm bgs	Architecture	Construction Material	1
STP 1	I	0–16 cm bgs	Flake	Late Stage Boyle	1
STP 2	I	0−25 cm bgs	Flake	Indeterminate	2
STP 2	I	0−25 cm bgs	Flake	Blocky Debris Boyle	1
STP 2	I	0−25 cm bgs	Flake	Biface Thinning Boyle	1
STP 2	I	0−25 cm bgs	Flake	Biface Thinning Newman	1
STP 3	I	0–32 cm bgs	Architecture	Nails, window glass	3
STP 3	I	0–32 cm bgs	Domestic	Ceramic, BIM	2
STP 3	I	0–32 cm bgs	Unidentified	Glass	1
STP 3	I	0–32 cm bgs	Maint/sub	Horse shoe	1
STP 3	I	0–32 cm bgs	Flake	Indeterminate	2
STP 3	I	0–32 cm bgs	Flake	Early Stage Boyle	1
STP 4	I	0–29 cm bgs	Architecture	Plate glass	1
STP 4	I	0–29 cm bgs	Maint/sub	Fencing	1
STP 4	I	0–29 cm bgs	Flake	Early Stage Boyle	1
				Total	20

Due to the absence of features, structural remains, and any intact deposits, the portion of the site within the project area is not considered to have the potential to provide important information about local or regional history or prehistory and is recommended as not eligible for inclusion in the NRHP. No further work is recommended for the portion of the site within the project boundaries. If the project boundaries are amended, additional archaeological survey may be necessary.

Isolated Find Artifacts

This class of cultural resource consists of isolated artifacts that are identified with no other evidence of prehistoric or historic activity associated with the materials (e.g., FCR or charcoal).

Isolated Find 1 UTM:

17

Elevation: 189 m (620 ft) AMSL

Distance to nearest water: 10 m (333 ft)

Direction to nearest water: north

Type and extent of previous disturbance: erosion, agricultural use; extent unknown

Topography: terrace

Vegetation: manicured lawn, deciduous and coniferous trees.

Ground Surface Visibility: 5 percent

Aspect: flat

Description. IF 1 consisted of two flakes recovered from a single shovel test in a topsoil context (Zone I). The isolated find was identified during shovel testing along a terrace in a manicured lawn (Figure 24) approximately 117 m (383 ft) southwest of the intersection of KY 1057 and Meadows Cemetery Road (see Figure 3). One flake was smaller than .25 inch and made of indeterminate chert (.3 g) and the other was a bifacial thinning flake made of Boyle chert (.4 g). Radial shovel tests were excavated at 10 m intervals in the immediate vicinity of the find, but no additional cultural material was encountered. IF 1 was located approximately 80 m (262 ft) from previously recorded Site 15Po98. IF 1 is recommended as not eligible for the NRHP.

VII. CONCLUSIONS, RECOMMENDATIONS, AND TREATMENT

Note that a principal investigator or field investigator cannot grant clearance to a project. Although the decision to grant or withhold clearance is based, at least in part, on the recommendations made by the field investigator, clearance may be obtained only through an administrative decision made by the lead agency in consultation with the State Historic Preservation Office (KHC).

Figure 24. IF 1 overview, facing south.

As a result of the survey one previously unrecorded site (15Po489) and one isolated find (IF 1) were recorded. Site 15Po489 was a multicomponent indeterminate prehistoric open habitation without mounds, and a late-nineteenth- to mid-twentieth-century historic farm/residence consisting of prehistoric and historic artifacts recovered from a few shovel tests. The site is recommended as not eligible for inclusion in the NRHP and no further work is recommended. IF 1 consisted of two prehistoric flakes from a single shovel test. It is recommended as not eligible for inclusion in the NRHP and no further work is recommended. Finally, no evidence of Site 15Po98 was found within the project area. No sites listed in or eligible for inclusion in the NRHP will be affected by this project; therefore, archaeological clearance is recommended.

If any previously unrecorded archaeological materials are encountered during construction activities, the KHC should be notified immediately at (502) 564-6662. If human skeletal material is discovered, construction activities should cease, and the KHC, the local coroner, and the local law enforcement agency must be notified, as described in KRS 72.020.

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APPENDIX A. HISTORIC ARTIFACT INVENTORY

Table A-1. Historic Artifact Inventory.

Bag	Site	Unit #	Zone	Depth	Cat #	Group	Class	Type	Attr 1a Def	Attr 1b Def	Burned	Count	Wt (g)	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
001	15Po489	STP 1	I	0–16 cm bgs	1	A	Construction Material	Brick	Handmade brick:non–vitrified		FALSE	1	11.6			1800	1880	Walters 1982:128–130	
003	15Po489	STP 3	I	0–32 cm bgs	2	A	Nails	Indeterminate Cut / Wrought Nail	Fragment		FALSE	1				1700	1890	Nelson 1968	
003	15Po489	STP 3	I	0–32 cm bgs	3	A	Nails	Cut Nail: unspecified	Fragment		FALSE	1				1800	1890	Nelson 1968	
003	15Po489	STP 3	I	0–32 cm bgs	4	D	Ceramics	Whiteware	Undecorated		FALSE	1		Body		1830		Majewski and O'Brien 1987:119	
003	15Po489	STP 3	I	0–32 cm bgs	5	D	Container Glass	Blown in Mold		Amethyst glass	FALSE	1		Body		1870	1920	Lockhart 2006	
003	15Po489	STP 3	I	0–32 cm bgs	6	U	Glass	Item / part			FALSE	1							milk glass shatter
003	15Po489	STP 3	I	0–32 cm bgs	7	A	Flat Glass	Window Glass			FALSE	1				1895	1895	Moir 1987	
003	15Po489	STP 3	I	0–32 cm bgs	8	M	Stable and Barn	Horse / Mule Shoe	Iron / Steel, Cast		FALSE	1							two horse shoe nails present
004	15Po489	STP 4	I	0–29 cm bgs	9	A	Flat Glass	Plate Glass			FALSE	1				1917		Roenke 1978	
004	15Po489	STP 4	I	0–29 cm bgs	10	M	General Hardware	Fencing	Barbed		FALSE	1				1874		Turner 1971	