# *Archaeological Modeling for Segment II/III of the Eastern Corridor Multimodal Projects*

*(HAM-SR32-0.00, PID 22970; FHWA-OH-EIS-04-02)*



GRAY & PAPE, INC.

ARCHAEOLOGY • HISTORY • HISTORIC PRESERVATION

JANUARY 14, 2009

**SUBMITTED FOR:**

ENTRAN
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Cincinnati, Ohio 45237

**SUBMITTED BY:**

Gray & Pape, Inc.
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*Gray & Pape Project No. 08-11401*

GRAY & PAPE
INC.
CULTURAL RESOURCES CONSULTANTS

**Project No. 08-11401**

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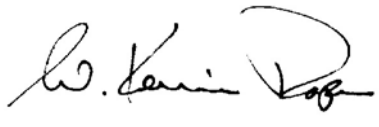

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# ABSTRACT

Under contract to ENTRAN, Gray & Pape, Inc. has prepared recommendations concerning the archaeological potential of Segment II/III of the Eastern Corridor Multimodal Projects (HAM-SR32-0.00, PID 22970; FHWA-OH-EIS-04-02), located in Hamilton and Clermont Counties, Ohio. The recommendations are based on a model developed by Gray & Pape, Inc. using the results of previous work conducted for the project (Weed 2002), documentary research, interviews with landowners and other knowledgeable parties, and an informal reconnaissance of the project area.

Gray & Pape, Inc. divided the project area into three zones: Zone 1 is the undeveloped floodplains and terraces of the Little Miami River. Zone 2 includes floodplains and terraces that have been developed in historical times, and Zone 3 includes the valley and uplands east of the Village of Newtown. The zones are defined by the varying degrees of archaeological potential and the factors affecting the possible integrity of sites therein. Zone 1 is divided into areas of high, moderate, and low sensitivity based largely of the potential complexity of sites. Zone 2 is divided into areas of high and low probability based on the potential for sites to have survived historical development. Zone 3 is modeled based on slope and level of development.

The results of this study indicate that any alternative selected for the project will likely impact archaeological sites listed on or eligible for inclusion in the National Register of Historic Places. The information presented in this modeling study will be used in the refinement of feasible alternatives to minimize impacts to sensitive resources.

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# 1.0 INTRODUCTION

Under contract to ENTRAN, Gray & Pape, Inc. (Gray & Pape) has prepared recommendations concerning the archaeological potential of Segment II/III of the Eastern Corridor Multimodal Projects (HAM-SR32-0.00, PID 22970; FHWA-OH-EIS-04-02), located in Hamilton and Clermont Counties, Ohio (Figures 1 and 2). The recommendations are based on a model developed by Gray & Pape using the results of previous work conducted for the project (Weed 2002), documentary research, interviews with landowners and other knowledgeable parties, and an informal reconnaissance of the project area. Although several potential alternative transportation corridors have been identified, Gray & Pape conducted research on the entire project area as is depicted in Figures 1 and 2.

## *1.1 Project Introduction*

The following is general project background on Segment II/III of the Eastern Corridor Multimodal Projects (Eastern Corridor). The following information is not specific to the archaeological model.

### 1.1.1 Eastern Corridor Background

Segment II/III, which involves relocation of SR 32 between US 50 in Hamilton County and I-275 in Clermont County, is one of several new highway capacity investments to be implemented as part of the Eastern Corridor Multimodal Projects. The Eastern Corridor project, which covers a 165 square mile urban/suburban sector of the greater Cincinnati metropolitan area, is following a tiered approach for compliance with requirements of the National Environmental Policy Act (NEPA) and related statutes. Tier 1, completed in 2006, evaluated transportation needs in the Eastern Corridor, identified environmental and community issues, developed preliminary multimodal alternatives, and assessed preliminary costs, benefits, and impacts. Preliminary alternatives developed in Tier 1 were based on a multimodal framework established by the Eastern Corridor Major Investment Study completed in 2000. In addition, Tier 1 established a context-sensitive framework for addressing environmental and community issues in the Eastern Corridor area by incorporating previous findings and recommendations for the project.

The Eastern Corridor Tier 1 Record of Decision (ROD) issued in June 2006 identified a set of alternatives that will be evaluated by mode and segment as independent Tier 2 NEPA analyses to determine final location and impacts. The recommended Tier 2 investments, which include Segment II/III, consist of new highway and rail transit implementation segments, expanded bus service and local network improvements, including:

New highway capacity – extending from I-71 in Hamilton County to I-275 in the Eastgate area of Clermont County, and consisting of four implementation segments:

(1) Segment I (Red Bank Corridor) – from I-71 to US 50

(2) Segment II/III (Relocated SR 32 Corridor) – from US 50 to Bells Lane, with a shared multimodal river crossing and rail transit corridor

(3) Segment IV – I-275/SR 32 interchange improvements


The Eastern Corridor Segment II/III Project Area
and Potential Alternative Transportation Corridors

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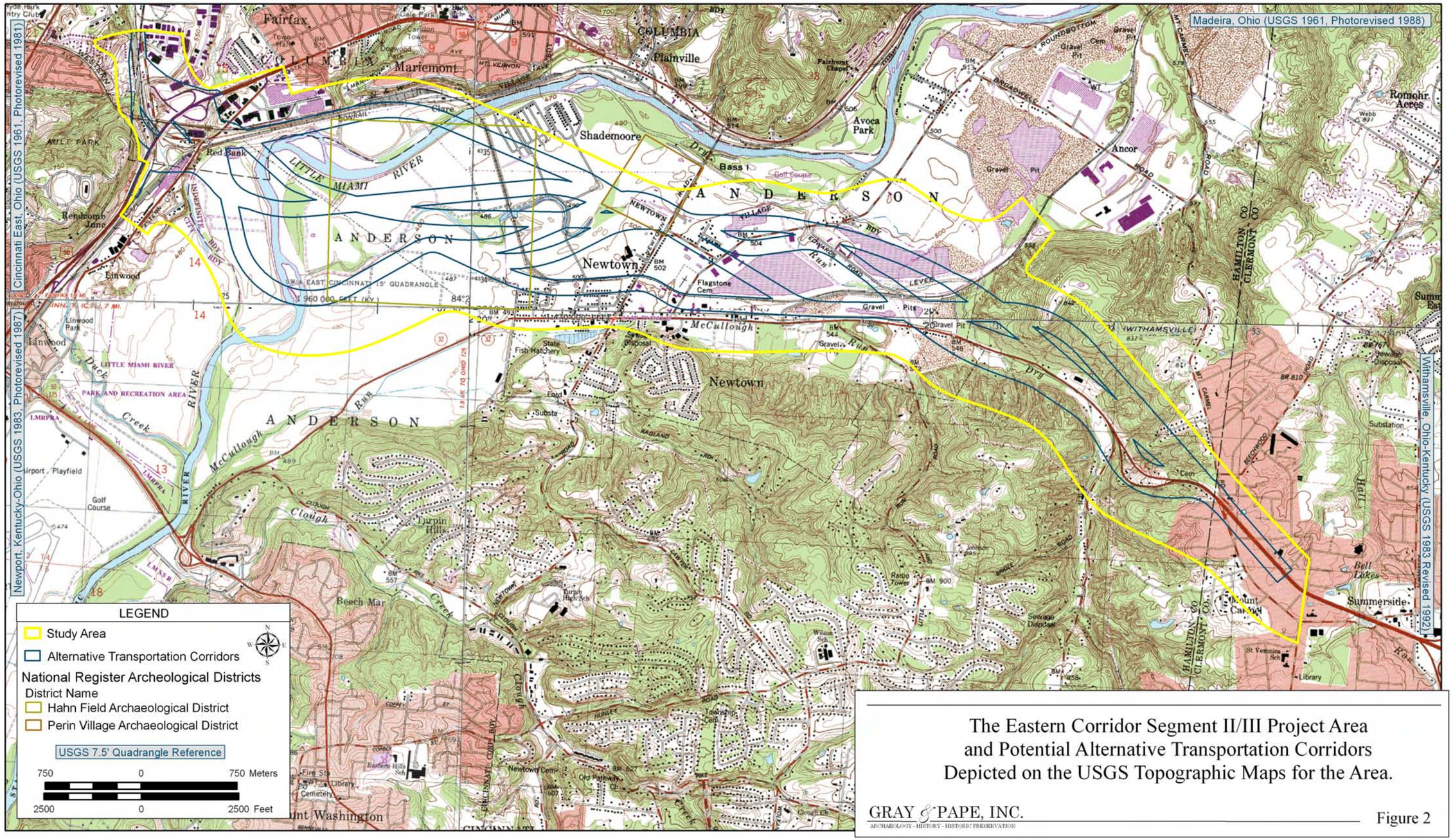
Figure 1




The Eastern Corridor Segment II/III Project Area
and Potential Alternative Transportation Corridors
Depicted on the USGS Topographic Maps for the Area.

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Figure 2

(4) Segment IVa – SR 32 from Glen Este Withamsville to Olive Branch Stonelick

New rail transit - extending from Cincinnati to Milford, and consisting of four implementation segments:

(1) Segment 1 - Riverfront Rail transit, from the existing Riverfront Transit Center to the Boathouse

(2) Segment 2 - Oasis line from the Boathouse to US 50

(3) Segment 3 - Shared highway/rail right-of-way segment from US 50 to Ancor

(4) Segment 4 - Norfolk Southern segment from Ancor to Milford

Bus transit - including expanded bus service and new bus hubs

Transportation System Management (TSM) - improvements to the local transportation network

The Tier 1 ROD established that the Tier 2 NEPA evaluation for Segment II/III (Relocated SR 32) and Rail Transit Segment 3, both located in the Little Miami River valley, must be considered in one NEPA document, anticipated to be an Environmental Impact Statement (EIS).

### 1.1.2 Status of Segment II/III Project Development

New capacity components of the Eastern Corridor, including highway and rail transit, are following the current ODOT 14-Step Project Development Process (PDP) for Major projects. The Tier 1 work for Segment II/III identified a number of preliminary alternative segments (21 overall) that could be combined into numerous full-length alternatives for a shared SR 32/rail transit corridor between US 50 in Hamilton County and the I-275/SR 32 interchange in Clermont County.

Tier 2 for Segment II/III will continue project development consistent with the ODOT PDP and federal NEPA requirements to identify a preferred alternative, corresponding to Major PDP Step 6 (refining feasible alternatives and identifying a preferred alternative), Step 7 (developing the preferred alternative), and Step 8 (environmental clearance). Because of the numerous preliminary alternative segments carried over from the initial Eastern Corridor work, the transition from Tier 1 to Tier 2 through ODOT guidance includes a conceptual alternatives study (completion of PDP Step 5) to identify a manageable number of full-length alternatives to be carried forward into Step 6 evaluation. The Segment II/III Conceptual Alternatives Study (CAS) currently underway will be based on information provided in the Eastern Corridor Tier 1 EIS, as well as recent studies completed since Tier 1 for key sensitive resources. Information from this archaeology model will be considered in the evaluation of potential alternatives.

### 1.1.3 Proposed Transportation Improvements

Segment II/III involves consolidating and managing access points to establish relocated SR 32 as a controlled access arterial roadway west of I-275. Segment II/III extends from US 50 near Fairfax in Hamilton County, where it ties into planned improvements in Segment I at Fair Lane (the Red Bank corridor), to the Eastgate area of Clermont County, where it ties into

planned improvements in Segment IV at Bells Lane (the I-275/SR 32 interchange project). Proposed improvements in Segment II/III consist of a new interchange at US 50/Red Bank Road, relocated SR 32 with new parallel rail transit, a multimodal clear span crossing of the Little Miami River, multimodal transit stations at US 50 and Newtown Road, preservation of a future rail transit corridor for the proposed Eastern Corridor Wasson line, and coordination with other modal improvements in the area.

Three interchange configurations for US 50/Red Bank Road and 18 alternative segments for relocated SR 32/parallel rail transit have been carried over from Tier 1 for further evaluation.

### 1.1.4 River Crossing Alternatives

Four multimodal mainline alternatives for approaches to the Little Miami River and a clear span crossing are under consideration, including:

- Alternative C - from Red Bank/US 50 interchange, extends east, crossing the Little Miami River upstream of Horseshoe Bend
- Alternative D - from Red Bank/US 50 interchange, extends east, crossing the Little Miami River at Horseshoe Bend
- Alternative E - from Red Bank/US 50 interchange, extends east, crossing the Little Miami River downstream of Horseshoe Bend
- Alternative F - from Red Bank/US 50 interchange, extends east, crossing the Little Miami River furthest downstream of Horseshoe Bend

### 1.1.5 Study Area Setting

The Segment II/III study area includes the communities of Newtown and Shademore, a portion of Anderson Township, and the south edges of the communities of Fairfax and Mariemont. The area is a mix of land use and disturbances, including residential, commercial and extensive industrial development in Newtown; wooded stream corridor and agricultural land along the Little Miami River to the west and north of Newtown; and wooded uplands with developing residential areas to the south of Newtown and along existing SR 32 to Eastgate. Segment II/III contains a number of recreational and natural areas, including a public golf course, ball/soccer fields and other parkland/greenspace, and the privately owned Horseshoe Bend preserve. Also occurring in the area is extensive gravel mining and industrial development in the Ancor area to the east of Newtown, and active landfills along US 50 to the west of the Little Miami River and along existing SR 32 just east of Newtown. The Segment II/III area also is sensitive for cultural historic and archaeological resources, especially along the Little Miami River floodplain, and in and around Newtown.

### 1.1.6 Draft Purpose and Need

Transportation needs in the Eastern Corridor, including the Segment II/III area, were documented in the Tier 1 work. Key transportation needs identified for the Eastern Corridor included: (1) existing network deficiencies affecting capacity, safety and accessibility; (2) limited available transportation options; (3) inadequate regional linkage and mobility between social and economic destinations; and (4) anticipated continued inadequacies in the

existing network due to future economic expansion and population growth. These corridor-level needs apply to all areas of the Eastern Corridor, including Segment II/III.

The purpose of the Eastern Corridor investments as documented in the Tier 1 ROD is to implement a multimodal transportation program that increases capacity, reduces congestion and delay, improves safety, provides transportation options and connects the region's key transportation corridors and social and economic centers by the efficient movements of people, goods and services.

The specific goal for Segment II/III, in support of the overall purpose and need for the Eastern Corridor Multimodal program, is to establish relocated SR 32 as a controlled access arterial roadway west of I-275, with parallel rail transit that provides a new transportation alternative to driving. SR 32 in the Segment II/III area is a mostly developed commercial/industrial and residential corridor that experiences high volumes of commuter, freight and residential traffic. The need for transportation improvements results from insufficient levels of service and high crash rates that currently are being experienced along existing SR 32 and are expected to worsen by 2030 (the project design year).

## *1.2 The Archaeological Study*

The current archaeological study was prompted by the existence of the Hahn Field Archaeological District, located north of SR 32 west of Newtown. The district was listed in the National Register in 1974 as a rectangular-shaped district covering about 690 acres (about 280 hectares). Past excavations and information from landowners have indicated possible burial sites and a range of features within the district boundaries; however, the extent and significance of the resources is not known. Most of the area is currently in agricultural and park use, and these activities and past excavations have resulted in disturbance over the years.

The current archaeological investigations focus on identifying the potential for discrete archaeological sites within the established Hahn District boundaries through secondary source review, field reconnaissance, and limited ground truthing in identified sensitive areas. Because of the high archaeological potential of the entire area, Gray & Pape did not limit itself to the Hahn District, but extended its investigations to the entire project area. A more detailed discussion of the methods and recommendations can be found in Section 2.

In addition to this report, Gray & Pape's submittal includes a GeoPDF file containing the information used in our model. The GeoPDF file includes various layers of data that support our recommendations as related to various factors such as soils, slopes and elevation, stream meanders, known sites, etc.

# 2.0 RESEARCH DESIGN

The goal of this project is to provide an archaeological sensitivity framework (without engaging in extensive fieldwork) that will be used to assist in the selection of possible transportation corridors through the study area. The most important consideration from the standpoint of archaeological resources is the presence of two NRHP-listed archaeological districts, the Hahn Field and Perrin Village districts, within the project area. The current study was designed to provide information that could aid in the refinement of feasible alternatives to avoid or minimize impacts to resources within these districts. It also was acknowledged, however, that sites that are not listed, but are eligible for the NRHP merit the same consideration, and so the archaeological study was conducted to encompass the Segment II/III area.

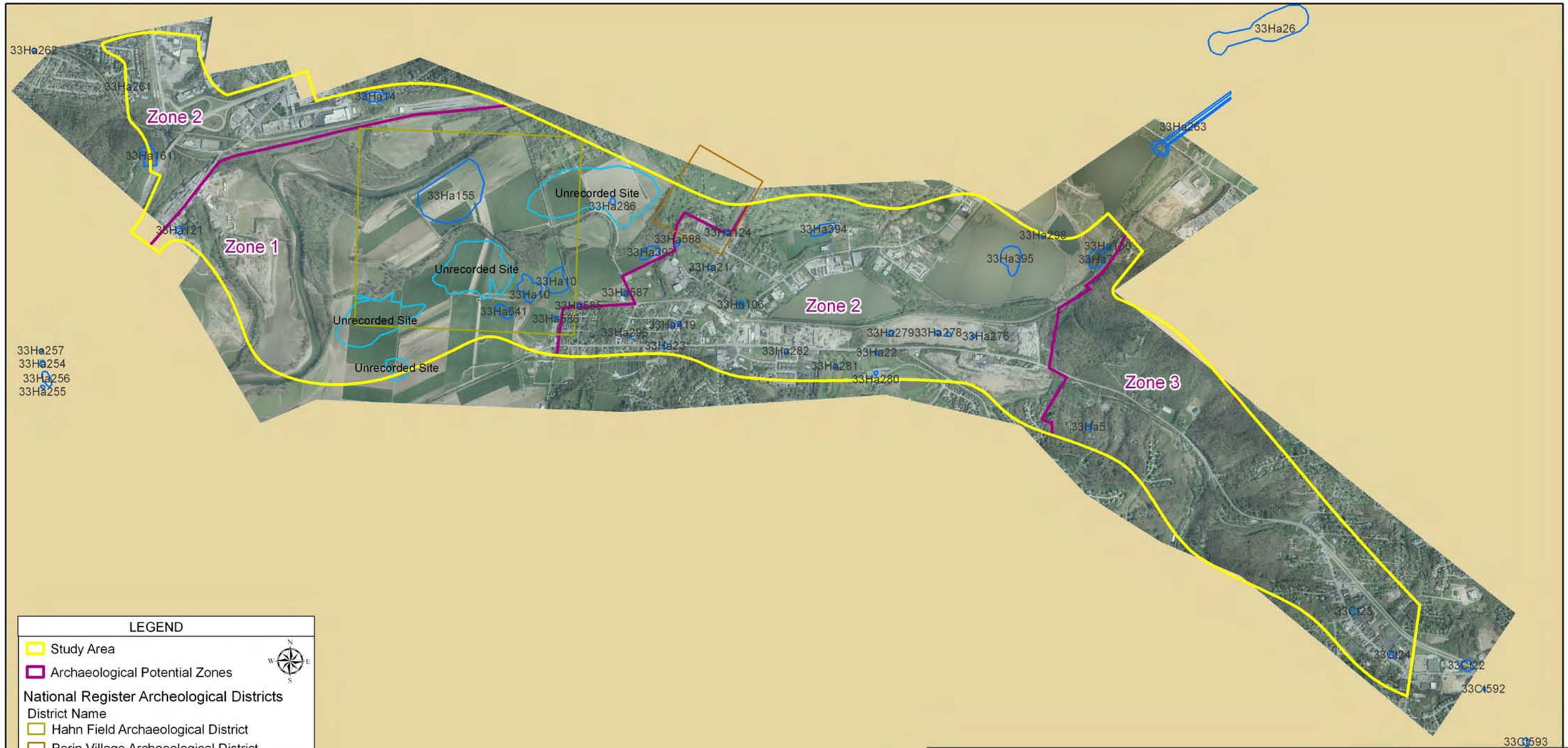
The project area was divided into three zones based on geographical setting and the potential for development to have affected the presence and integrity of archaeological deposits (Figure 3). The zones are as follows:

**Zone 1 – Undeveloped floodplains and terraces.** This zone includes relatively undeveloped agricultural and recreational land located on the floodplains and terraces of the Little Miami River west of the Village of Newtown and the Little Miami Golf Center on the east. The area consists predominately of the Fischer and Motz properties, but also includes property owned by the Anderson Township Parks District (Clear Creek Park and several small holdings in the vicinity of Shademore). This zone includes the potential crossing of the Little Miami River, and is distinguished by the very low amount of historical construction and disturbance. The majority of the Hahn Field Archaeological District is located in this zone. The archaeological potential of Zone 1 is high, and in places is limited only by degrees of potential archaeological complexity.

**Zone 2 – Village of Newtown and other developed areas on the floodplains and terraces.** This zone includes the Village of Newtown, and the unincorporated areas north and east of Newtown. A small portion of developed land north and west of the Little Miami River also is included in this zone, including part of the Village of Fairfax and the Village of Mariemont. Zone 2 is located on floodplains and terraces of the Little Miami River that are known to contain significant archaeological sites, but which have been compromised by various levels of development. The archaeological potential of Zone 2 is defined by the likelihood that archaeological sites in the zone retain the integrity necessary to communicate important information.

**Zone 3 – East of Newtown.** This zone includes all areas east of Zone 2. It is characterized by undeveloped lands on moderate to steep slopes, and residential development. The archaeological potential of this zone is determined by conventional archaeological modeling.

Because each zone is unique in terms of the potential for archaeological resources, the recommendations differ for each. Zone 3 contains relatively few identified sites, and is divided into areas of high and low probability. These areas were determined based on the degree of slope present, proximity to water sources, and amount of development that has occurred.




LEGEND

- Study Area
- Archaeological Potential Zones

National Register Archeological Districts

District Name

- Hahn Field Archaeological District
- Perin Village Archaeological District
- Known Archaeological Sites from the Ohio Archaeological Inventory
- Unrecorded Archeological Sites

700 0 700 Meters

2500 0 2500 Feet

Overview of the Project Area
Showing Zones 1, 2, and 3

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Figure 3

Zones 1 and 2 are entirely in areas of high probability in term of archaeological sites. In fact, archaeological sites appear to be, now or in the past, ubiquitous. However, the complexity of the sites, and their potential to be costly to evaluate and mitigate vary. Therefore, we have defined areas within Zones 1 and 2 as having high sensitivity, moderate sensitivity, and low sensitivity. In areas of low sensitivity, the integrity of archaeological sites is likely to have been impacted by erosion or development, and we believe that it is unlikely that NRHP-eligible archaeological sites will be located in these areas. Areas that are moderately sensitive are likely to contain archaeological sites, but these sites are not expected to be archaeologically complex or contain burials. Areas of moderate sensitivity include areas that are expected to contain historical archaeological sites. Areas of high archaeological complexity include village sites and mounds. These site types are extremely complex in terms of archaeology, and are likely to contain burials. Although all sites that are eligible for or listed on the NRHP are equally significant, the sites in the areas of high sensitivity either have the potential to yield large amounts of data, in which case they would be extremely costly to evaluate or mitigate, or are likely to contain burials. A more detailed discussion of how these determinations were made can be found by reading the background information provided in Sections 2.1 through 2.4.

## *2.1 Geomorphological Background*

The Little Miami River valley lies within the larger Little Miami River basin, which, in turn, is within the Till Plains section of the Central Lowlands Physiographic Province (USACOE 1966, 1973; Forsyth 1961). In recent geological history, nine glacial and interstadial events have shaped the immediate valley (Forsyth 1961; Genheimer and Scheurer 1978). The first of these occurred during the Nebraskan glacial advance. The ancestral Teays River drainage was impeded by the glacial ice sheet resulting in ponding of the Ohio River and overflow of waters into the basin, filling it with alluvial overburden (Callum 1993).

The subsequent Aftonian and Yarmouth interstadials significantly altered the basal level of the valley, taking the valley floor to about 380 feet above mean sea level (AMSL) (Forsyth 1961). In effect, the basal deposits that had accumulated during the Nebraskan and preceding geological episodes were removed. The subsequent Illinoian and Clermont Lobe advances laid down three significant till strata: the early Illinoian between 380 and 420 feet AMSL, the Clermont deposit from 420 to 450 feet AMSL, and the later Illinoian from 450 to 550 feet AMSL (Genheimer and Scheurer 1978). These thick gravel and detritus strata lined the Little Miami River valley and, although now weathered, the two older, and lower, strata are in place as the basal deposits to the existing valley edge terraces. The youngest deposits, those between 450 and 550 AMSL, were removed during the Sangamon interstade although loess deposition during the Sangamon provided some replacement material (Callum 1993; Genheimer and Scheurer 1978; USACOE 1966).

Throughout these cycles of deposition and removal, the Little Miami River moved within changing valley courses. The sometimes braided river courses were restricted by the valley edge terrace deposits and thus, most of the erratic behavior attributable to the river occurred in the valley's mid-section and toward its northern lateral edge. This pattern was reinforced by events during the various stages of the Wisconsin glacial period (Forsyth 1961; USACOE

1966, 1973). By about 24,000 years ago, the glaciofluvial outwash from the Miami and Scioto lobes of the Wisconsin glacier flowed into the only available drain, the Little Miami River valley. The deposits accumulated rapidly and dramatically, returning the valley floor elevation to about 540 feet AMSL (Genheimer and Scheurer 1978).

These so-called Tazewell outwash deposits were partially removed, but the subsequent Middle Woodfordian advance of the Wisconsin resulted in additional deposition. The resultant terraces are at about 500 feet AMSL. The last glacial retreat occurred about 13,000 years ago and since that period, the Little Miami River has effectively been downcutting and meandering across the middle and northern segments of the valley. Today, the river has cut well into the Middle Woodfordian deposits and the river valley channel floor is at about 460 feet AMSL (USACOE 1966; USDA-SCS 1975).

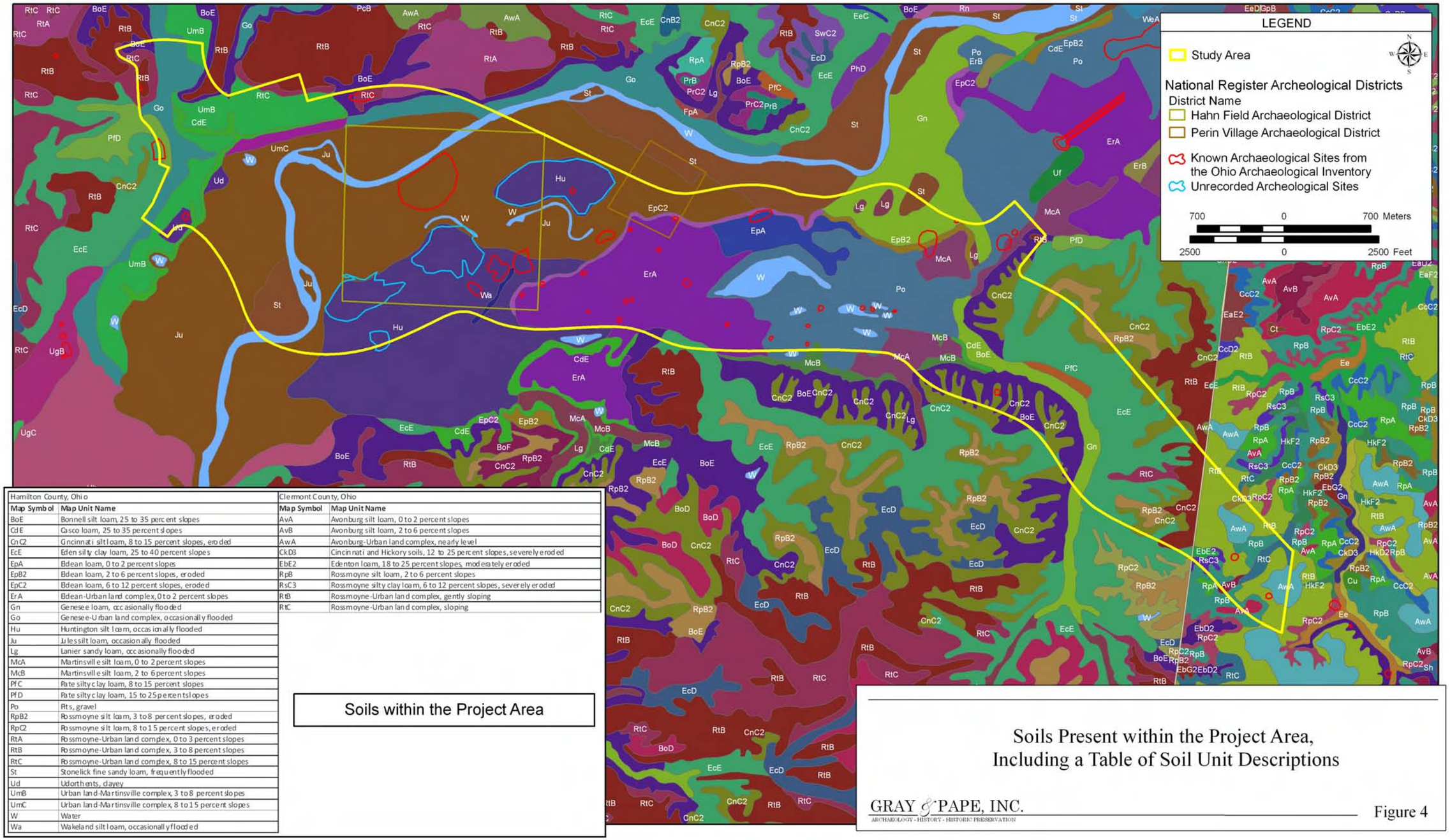
## *2.2 Soil Depth and Characteristics*

The valley is lined with outwash, till, alluvial and aeolian deposits that offer variable resistance to water flow. For this reason, the river channel continues to seek a path of least resistance and this path varies from time to time because of factors related to water flow and strata characteristics. The soil mantle is variable in depth and, not unexpectedly, is thickest south and east of the active river channel and outside of the active meander zone. The soils thin dramatically on the valley terraces and except in areas of colluvial deposition never seem to reach thicknesses in excess of 5 feet (1.5 meters).

In contrast, the mid-valley soil deposits can reach 25 feet (7.6 meters) in thickness (Genheimer and Scheurer 1978, based on H.C. Nutting Order No. 95.88, 6/18/76, Hole #15). Typical depths on the T-0 and T-1 terraces, however, seem to range between 5 and 10 feet (1.5 to 3 meters) (Weed 2002). Mr. Daniel Motz (personal communication 2002) indicated that soil depth on the Motz property ranged from about 7.5 to 24 feet (2.3 to 7.3 meters) depending on the landform proximity to the active meander channel at the western end of his property.

The depositional regime in the recent Holocene in the valley is alluvial. Major flood events have occurred at least four times in the last century and these floods have inundated the T-0, T-1, and parts of the T-2 terraces with water to depths in excess of 6 feet (1.8 meters). Residual deposition following the floods has been as great as 10 inches (25.4 centimeters) according to Motz (personal communication 2002; Callum 1983). Seasonal, low-grade flooding occurs with regularity and these less-dramatic flood episodes also lay down a thin veneer of new soil. This veneer, however, apparently rarely exceeds 1 inch (2.54 centimeters) in thickness and usually is restricted to the near channel edges.

Within Zone 1 and Zone 2 of the study area, the dominant soils on the T-0 and T-1 terraces are Jules silt loam (occasionally flooded) and Huntington silt loam (occasionally flooded). These soils are both grouped in early archaeological literature as the Genesee soils. Jules and Huntington silt loams extend east and south to Route 32, and the Newtown T-1/T-2 terrace combination. Along the Newtown terrace edge, Eldean loam (6 to 12% slopes, eroded) forms a narrow strip separating the Jules/Huntington soils from the T-2 terrace Eldean-Urban land complex (0-2% slopes) soils. All three of these soils (Huntington, Jules, the Eldean/Eldean-Urban) host archaeological sites (Figure 3).




| Hamilton County, Ohio | | Clermont County, Ohio | |
|---|---|---|---|
| **Map Symbol** | **Map Unit Name** | **Map Symbol** | **Map Unit Name** |
| BoE | Bonnell silt loam, 25 to 35 percent slopes | AvA | Avonburg silt loam, 0 to 2 percent slopes |
| CdE | Casco loam, 25 to 35 percent slopes | AvB | Avonburg silt loam, 2 to 6 percent slopes |
| CnC2 | Cincinnati silt loam, 8 to 15 percent slopes, eroded | AwA | Avonburg-Urban land complex, nearly level |
| EcE | Eden silty clay loam, 25 to 40 percent slopes | CkD3 | Cincinnati and Hickory soils, 12 to 25 percent slopes, severely eroded |
| EpA | Elkean loam, 0 to 2 percent slopes | EbE2 | Edenton loam, 18 to 25 percent slopes, moderately eroded |
| EpB2 | Elkean loam, 2 to 6 percent slopes, eroded | RpB | Rossmoyne silt loam, 2 to 6 percent slopes |
| EpC2 | Elkean loam, 6 to 12 percent slopes, eroded | RsC3 | Rossmoyne silty clay loam, 6 to 12 percent slopes, severely eroded |
| ErA | Elkean-Urban land complex, 0 to 2 percent slopes | RtB | Rossmoyne-Urban land complex, gently sloping |
| Gn | Genesee loam, occasionally flooded | RtC | Rossmoyne-Urban land complex, sloping |
| Go | Genesee-Urban land complex, occasionally flooded | | |
| Hu | Huntington silt loam, occasionally flooded | | |
| Ju | Jules silt loam, occasionally flooded | | |
| Lg | Lanier sandy loam, occasionally flooded | | |
| McA | Martinsville silt loam, 0 to 2 percent slopes | | |
| McB | Martinsville silt loam, 2 to 6 percent slopes | | |
| PfC | Pate silty clay loam, 8 to 15 percent slopes | | |
| PfD | Pate silty clay loam, 15 to 25 percent slopes | | |
| Po | Pits, gravel | | |
| RpB2 | Rossmoyne silt loam, 3 to 8 percent slopes, eroded | | |
| RpC2 | Rossmoyne silt loam, 8 to 15 percent slopes, eroded | | |
| RtA | Rossmoyne-Urban land complex, 0 to 3 percent slopes | | |
| RtB | Rossmoyne-Urban land complex, 3 to 8 percent slopes | | |
| RtC | Rossmoyne-Urban land complex, 8 to 15 percent slopes | | |
| St | Stonelick fine sandy loam, frequently flooded | | |
| Ud | Udorthents, clayey | | |
| UmB | Urban land-Martinsville complex, 3 to 8 percent slopes | | |
| UmC | Urban land-Martinsville complex, 8 to 15 percent slopes | | |
| W | Water | | |
| Wa | Wakeland silt loam, occasionally flooded | | |

Soils within the Project Area

Soils Present within the Project Area,
Including a Table of Soil Unit Descriptions

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Figure 4

Figure Created in ArcGIS 9.3 for Gray & Pape Project No 08-11401, Version of 24 December 2008

However, the distribution of the sites is not uniform across the Jules and Huntington landscapes. Rather, the archaeological sites are restricted to contour highs (almost exclusively, the 486- and 484-foot [148- and 147-meter contours) on the T-0 and T-1 terrace landscape. In turn, the contour highs appear to represent remnant meander levees or terraces (Figure 3).

## 2.3 Hydrology and Stream Meandering

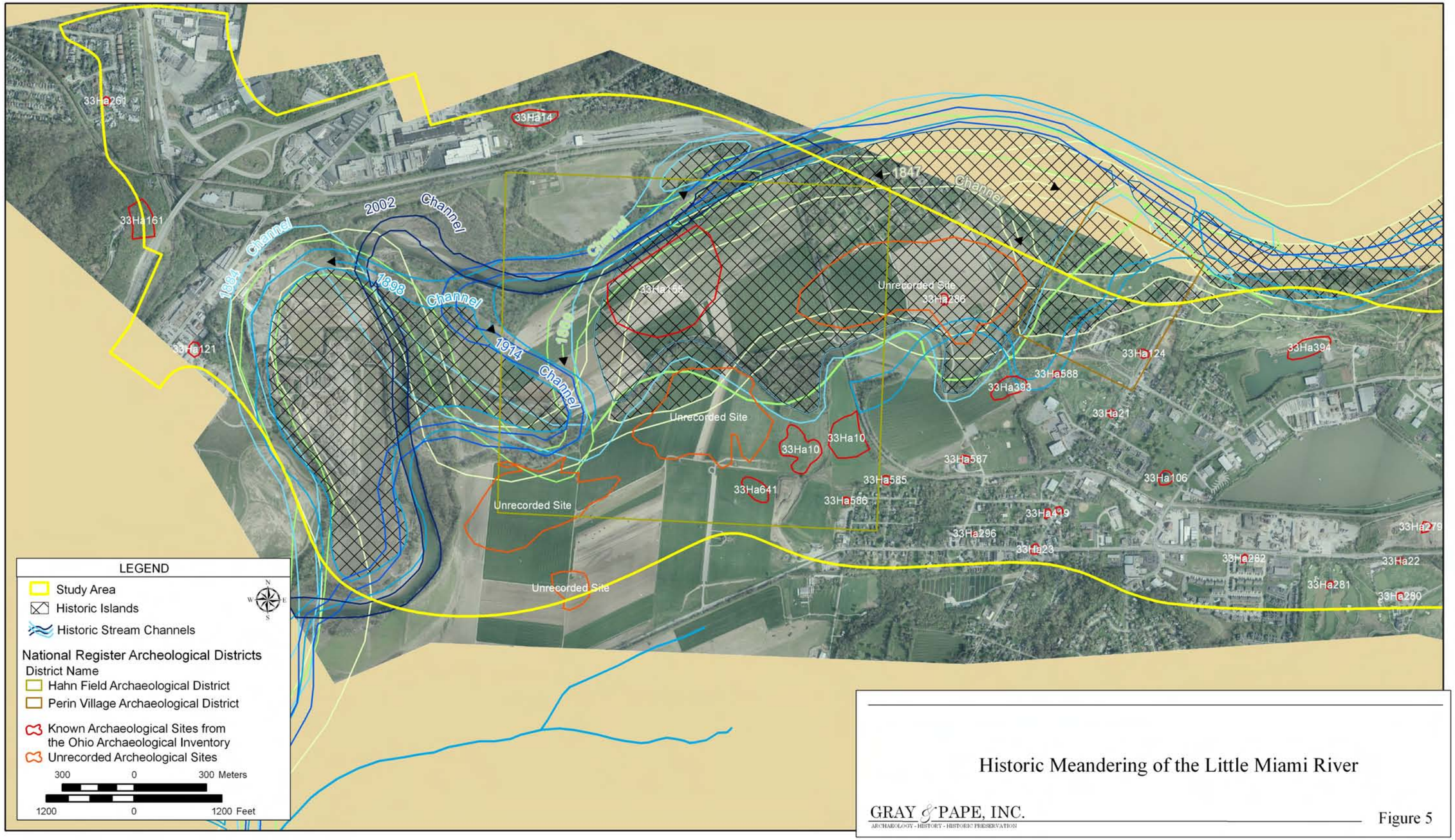
Historic maps (Titus 1869; Moessinger and Bertch1884) and meander coverage provided for the project by H.C. Nutting (from 1912, 1950s, 1960s) form the current basis for isolation of the Little Miami River channel changes in the area. The western end of the study corridor has been repeatedly altered by channel meander (Figure 4). Further, the existing backchannel (also referenced as Clear Creek on some maps) has effectively isolated the area north of it from the remainder of the T-0 and T-1 terraces south of it and in the Newtown vicinity.

At least in the historic period represented by the map coverage, the Little Miami River and Clear Creek channel meanders show channel persistence. The horizontal distribution of known archaeological sites in the study corridor and vicinity suggest that the channels have not strayed far from the illustrated locations. Further, the landform on the north side of Clear Creek has been stable long enough to host prehistoric occupations contemporaneous with those south and east of the backchannel. One important effect of the meandering of the river is that a portion of Zone 1 is composed of alluvium that is likely to have been deposited entirely during the historical period, and is therefore expected to contain no prehistoric archaeological sites.

## 2.4 Archaeological Background

The lower Little Miami River valley, particularly the area around Newtown, has long been known as one of the most archaeologically significant areas in southern Ohio. Sites are known or have been reported to be located throughout the area, and an argument could be made in favor of NRHP eligibility for any site in the area. As a result, the recommendations that Gray & Pape presents in this document are based more on the relative complexity of the sites that are likely to be present rather than on their likely presence or absence. Because of this, a detailed discussion of the culture history developed for the area by archaeologists is not necessary to understand the recommendations. It is more useful, in this context, to provide the reader with background information concerning the development of prehistoric settlement patterns over time, the types of sites that represent differing patterns, and the relative complexity of each.

Archaeologists divide the prehistory of the Ohio Valley into four broad periods: The Paleoindian period, the Archaic period, the Woodland period, and the Late Prehistoric period. These periods are defined by various differences in technology, subsistence strategies, and settlement patterns. Generally speaking, the Paleoindian and Archaic periods are times during which subsistence was based on hunting and gathering, while the Woodland and Late Prehistoric periods represent a period of food production through various levels of gardening.




Historic Meandering of the Little Miami River

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Figure 5

The archaeological study of hunter-gatherers has been heavily influenced by the work of Lewis Binford. Binford's (1980) model, which he bases on studies of San (bushmen) and Nunamiut Inuit settlement and subsistence (1980:5,10), distinguishes between foragers (San) and collectors (Nunamiut). According to Binford's analysis, groups that employ a foraging strategy make seasonal residential moves between "patches" of resources (Binford 1980:5). The seasonal residential base is located near one of these patches, and foragers range out from the base collecting resources on an "encounter" basis (Binford 1980:5). Typically, food is not stored, and daily gathering trips are necessary. Archaeologically, the residential base will be expressed as a site with remains of processing, manufacturing, and maintenance activities (Binford 1980:9). The other principal site type is the location, which is a place where extractive activities are conducted. Because these activities are "low bulk" extractions, the sites are very short-term occupations.

In contrast to foragers, collectors store food during at least some season of the year and are have "logistically organized food-procurement parties" (Binford 1980:10). These parties leave the residential camp to procure specific resources at specific, known locations. These resources are processed in the field, and the produce returned to the residential camp. In addition to the residential camps and locations that constitute the sole site types under a foraging system, collectors also produce additional archaeological site types. These include, but may not be limited to the following: the field camp, or temporary residence; the station, or observation or data gathering point; and the cache, or location where bulk-extracted resources are stored before they can be returned to the residential base (Binford 1980:11-12).

Naturally, most groups will fall somewhere between these two extremes. This must be true if one wishes to use it in the context of North American archaeology, in that in Binford's model archetypal foragers do not store food (1980:9). It is difficult to conceive of a manner in which a group of people, no matter how small, could survive the winter in a temperate climate without recourse to stored provisions. If one permits at least a moderate level of food storage to foragers, there arises the issue of how a group of people engaged in low-bulk extraction produce sufficient surplus to provide winter sustenance. One must permit both some level of food storage, and some level of high-bulk extraction among foragers for the broader concept to be applicable to North America. In such a case, some number of resource extractive "locations" must be permitted as site types. In a temperate setting there would seem to be a "breaking point" between the two extremes that would be reflected by the presence or absence of field camps, or temporary residences.

Although Binford proposed his model more than 25 years ago, the forager-logistical collector paradigm remains central to anthropological and archaeological debate concerning hunter-gatherers. This can be seen directly in the work of authors such as Boisvert (1986), Stafford (1991), Sutton (2000), and indirectly in the current debate centering around the emergence of cultural complexity and the relationship between complexity and mobility (see in particular the papers compiled by Bar-Yosef and Rocek [1998]). Archaeologically, one would expect a foraging society to be visible as a series of very similar, generalized, low-density archaeological sites that display a full range of manufacturing, maintenance, and subsistence activities. In contrast, a collecting society would be visible as a diverse assemblage of sites, some large and generalized, and some small with a limited assemblage that reflects a certain procurement task, such as hunting or the processing of nuts or other plant foods. The size

and density of a residential camp would be dependent upon the size of the group inhabiting it, the duration of the occupation, and the number of times that the site was re-occupied.

In North American archaeology, the Paleoindian period and the earlier part of the Archaic period generally are considered to be closer to the foraging model. Although some amount of food was almost certainly stored, sites are small, dispersed, and largely redundant, indicating that small groups were ranging widely in pursuit of resources. Although these sites, particularly buried sites, often are considered to be eligible for inclusion in the NRHP, they are generally small and simple to deal with in archaeological terms.

There is considerable archaeological debate concerning whether the Late Archaic period reflects a foraging or a collecting strategy. This debate often is discussed in terms of the presence or absence of a seasonal fission and fusion of social groups in response to spatial and temporal variability in resource availability (Boisvert 1986:1). The basic model involves large social groups (e.g., macrobands) that aggregated near abundant resources during part of the year, while smaller groups (e.g., microbands) split off from the larger group to exploit resource patches that were unevenly distributed across the landscape and through the seasons (Stafford 1994). In the Central Ohio Valley, this notion is perhaps best expressed in Vickery's (1976, 1980) and Janzen's (1977) models of Late/Terminal Archaic settlement and subsistence in the Ohio Valley region.

The earliest use of this type of model in the Ohio Valley was by Winters (1969), who constructed a seasonally scheduled model of group movement for the Late Archaic Riverton Culture, which is centered in the Wabash Valley of southern Indiana and Illinois. Winters' (1969) model is based on a fission–fusion paradigm, wherein the composition of the group fluctuates in response to seasonal and spatial variations in resource distribution. Winters are spent in large settlements, with smaller ancillary sites related to hunting and other resource extraction. Summers are spent in base camps that are slightly smaller than winter settlements, with ancillary sites that correspond to those associated with winter settlements. Spring and fall sites are transient camps, similar to winter settlements, but less intensely occupied. This pattern corresponds to Binford's (1980) collector strategy.

Vickery (1976, 1980) adopted this model is his analysis of the Late Archaic Maple Creek culture. He posited that the Maple Creek Site was a summer and fall base camp with some indications of spring occupations (Vickery 1976:251, 288). The site included approximately 5.7 acres (2.3 hectares) of concentrations of midden and features at the crest of the Ohio River levee at its confluence with Maple Creek, approximately 10 miles (16 kilometers) southwest of the project area. Excavations revealed evidence of intensive occupation, focusing on food processing and preparation, including earth ovens, roasting pits, refuse pits, a hearth, cache, and burials. Vickery's overall model suggests that upland subsidiary camps were used for hunting, collecting, raw material extraction and wintering, but that the base camp was the focus of harvesting of certain abundant riverine food sources and the focus of social life.

In direct response to Vickery's use of Winters' model, Boisvert (1986) examined the Glacken Site. This is a small Late Archaic "specialized hunting camp" (Boisvert 1986:3) located near an unusual natural feature, a saline spring known to have attracted large mammals since prehistoric times, located along a tributary to the Ohio River in northern Kentucky. Boisvert compared the feature assemblage from the Glacken Site to those from five additional Late

Archaic sites that had been defined as either "basecamps" (including the Maple Creek site) or "campsites" to determine the degree of difference in terms of their site function. Boisvert found that Late Archaic sites, whether large or small, were functionally nearly identical, and perceived differences in size are likely the result of the frequency of reoccupation (Boisvert 1986).

In either event, we know that Late Archaic sites can be both large and small, with larger sites often being located on the floodplains and terraces of rivers. These sites may be large and complex, and may contain burials, however, our current understanding of these sites is not adequate to predict where they will be found and whether they will contain burials. In many ways, these are the least predictable of site types.

The Woodland period follows the Archaic period. During the earlier portion of this period, two important technologies became widely adopted: ceramics and food production. The presence or absence of ceramics is the most common method by which archaeologists divide the periods. For the purposes of this study, however, the more important development is the adoption of food production as a subsistence strategy. As the practice of food production took hold, individual households which, during the Archaic period, would have moved freely in and out of bands of various sizes as their social and economic needs dictated, became less mobile as they became tied to their gardens. Habitation sites from this time generally are small, functionally redundant, and are not archaeologically complex.

The semi-sedentary lifestyle forced upon the household group by its new horticultural lifestyle deprived it of its primary means for integrating itself into the larger society. At the same time, the extent of the landscape available to the household group was reduced to a region within easy travel of its gardens. While this certainly has economic consequences, it would also have social consequences. As the household group became geographically isolated from other segments of the society, new methods of integration arose. Archaeologically, these methods are manifested in the form of ceremonial centers (such as earthworks) and burial mounds (Striker 2005). These centers can be located in most any geographical setting, but are easy to identify. Due to legal and political factors, the excavation of such sites is difficult, and these are considered high cost sites. Historically, there were many mounds and earthworks in the vicinity of Newtown, although most of these have been destroyed by development. A mound has been identified in the Hahn Field Archaeological District.

During the later portion of the Woodland period and into the Late Prehistoric period, people intensified their reliance upon food production. During this time, settlements changed from disperse hamlets to permanent villages located near places suitable for raising their crops of starchy-oily seeds or maize, beans, and squash. These villages are much larger and archaeologically more complex than sites from preceding periods. In addition to their archaeological complexity, village sites often contain burials. There are sites that are ancillary to villages, such as hunting camps; however, the geographical setting of the project area is far more favorable for village location. Several village sites have been documented in the project area, including Hahn Village (33Ha10), Perrin Village (33Ha124), and the Madisonville site (33Ha14). Landowners have reported additional sites that are likely to be villages.

The potential for historical archaeological sites in the project area generally corresponds to the location of older historical development. Older properties throughout Newtown have a high potential to contain intact historical deposits in abandoned privy shafts and cisterns, as well as artifact-rich middens in residential yards.

Newtown is one of four communities established in Hamilton County during the late eighteenth century. The community began as a stockade built in 1790 by Revolutionary War veteran, Aaron Mercer, and was first known as Mercersburgh or Mercer's Station. By 1796 Mercer had laid out a small town with 28 lots. The section north of Main Street (present day SR 32) was named Newtown in 1803 by a group of local residents from Newtown, Virginia. The south section remained Mercersburgh until 1816, when the Newtown post office was established and united the village under a single name. By 1813 enough families had settled in the area to build the Newtown United Methodist Church. The first church was a small stone building, rebuilt in 1867 to its current Greek Revival appearance. As the town grew larger, a Baptist Church was built in 1841 and, in 1853, the Universalist Church was built. Newtown's churches help to illustrate the town's importance within Anderson Township, since by the mid-1850s its population was able to support three separate congregations.

Growth in Newtown slowed after the Civil War even though the narrow gauge railroad, the Cincinnati & Eastern, came to Newtown in 1882. Within two years, the tracks were changed to standard gauge and extended to Portsmouth, Ohio. Additional development took place along Church Street between the 1880s and 1900, when several large frame houses with Queen Anne details were constructed. The village officially was incorporated in 1901.

Newtown changed very little between 1900 and 1960, largely because industrial development did not take place here on a large scale. The village's location on a floodplain tended to discourage additional investment as well. After 1928, much of the fertile farmland on the north side of the village was turned into gravel pits. Along Newtown's northeast edge, in the river plain area, one-story light-industrial buildings and metal service buildings have replaced early farmhouses. Both active and abandoned gravel pits lie just outside of Newtown and toward Milford, Clermont County, particularly around Round Bottom Road near Broadwell Road. Much of the town appears to retain archaeological potential.

In addition to Newtown itself, the project area includes a portion of Shademore, a 1920s and 1930s summer camp along the Little Miami River. Most of the summer cottages have been destroyed or extensively altered for use for year-round living; however, it retains at least one swimming pool, a pavilion, and tennis courts.

# 3.0 ARCHAEOLOGICAL SENSITIVITY IN THE PROJECT AREA

As was noted above, the project area was divided into three zones. The archaeological sensitivity of each will be discussed in turn.

## *3.1 Zone 1*

Zone 1 includes the undeveloped land on the floodplains and terraces of the Little Miami River. Although the zone includes land on both sides of the river, Gray & Pape's investigations focused on the area south and west of the river, particularly the area within the NRHP-listed Hahn Field Archaeological District. The district was created to be as large as possible in order to incorporate as much property with high archaeological potential as possible (Robert Genheimer, personal communication 2008). The Hahn Village site, for which the district was named, can be seen on Figure 5 as 33Ha10. The site exists in two discreet portions. The westernmost of the two is a Fort Ancient village, while the easternmost is a Middle Woodland occupation. Both are known to contain burials (Robert Genheimer, personal communication 2008).

The Hahn Village site itself is located on property owned by Anderson Township Parks District. This property was formerly owned by the Turpin family, and Turpin Fischer, operator of Turpin Family Farms, provided valuable information concerning this, and other sites. According to Mr. Fischer, areas above 484 or 486 feet AMSL contain dense archaeological deposits. The Hahn Field site is located at this elevation; however, Mr. Fischer does not believe it is the densest site. The elevated area immediately west of the Hahn Field site is at least as dense, and Mr. Fischer reports being able to see individual post holes when the area is cultivated.

Mr. Fischer reported that relatively few artifacts are seen in areas below 484 feet AMSL. He also notes, however, that the area below this elevation is subject to frequent flooding, which results in alluvial deposition, which may obscure archaeological sites. Most importantly, however, Mr. Fischer was able to report that ceramics rarely are found in the lower settings, and that project points in these areas are larger on average than on the rises. This information suggests that sites occupied by food producers are located on the elevated areas, while sites in the lower areas are limited to hunter-gatherer occupations. Finally, Mr. Fischer was able to show us the former locations of houses and other structures on the Turpin Farms property.

While on the Turpin Farms property, we were able to examine the bank of the Little Miami River. Our examination, coupled with the results of bores taken by H.C. Nutting, suggests that the area in which the Little Miami River has meandered during the historical period includes almost exclusively recent alluvium, and has very low potential to contain archaeological sites.


Archaeological Potential in Zones 1, 2, and 3

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ARCHAEOLOGY - HISTORY - HISTORIC PRESERVATION

Figure 6

Mssrs. Ed and David Motz operated a farm north of Clear Creek that includes a large part of the Hahn Field Archaeological District. The Motzes were gracious enough to meet with us and share information concerning the locations of archaeological sites on their property. In general, their observations concur with those of Mr. Fischer. Specifically, sites related to food producers tend to be located on elevations higher than 484 or 486 feet AMSL, while lower elevations tend to hold hunter-gatherer sites. David Motz provided specific information concerning the location of an unrecorded mound that is associated with a historical cemetery.

David Motz also was able to provide information concerning the potential for buried archaeological sites. He reported that while excavating for a water line southwest of 33Ha155, he uncovered several prehistoric features. These were located at a depth of approximately 3 feet (1 meter). This indicates that there is a potential for deeply buried archaeological sites throughout the area. However, these are likely to be related to hunter-gatherers, and therefore less complex than the sites located at higher elevations.

Little documentation is available for the areas north and west of the Little Miami River in Zone 1. The area to the west is within the historical meander zone, and the lack of sites reported north of the river suggests that this area also has been subjected to scouring and redeposition.

There is one area of historical development within Zone 1. This is Shademore, the 1920s and 1930s summer camp. It is certain that the summer camp itself, which has largely been demolished, constitutes an archaeological site, although its integrity and significance is not known. Furthermore, there remains the potential for prehistoric deposits in this area.

Zone 1 is rich in archaeological sites, and it is unlikely that an alternative could be selected through this zone that does not impact an archaeological site. However, sites are not all the same in terms of archaeological complexity. The available information suggests that village and burial sites are limited to areas with elevations above 484 or 486 feet AMSL, and that sites lower than this, as well as buried sites, are likely to be hunter-gatherer sites of lesser complexity. Historical sites are located in Zone 1 as well, although only one of these (a cemetery located on top of a prehistoric mound) is likely to contain burials.

We have divided Zone 1 into areas of relative archaeological sensitivity based on the expected complexity of sites located there. Areas of high sensitivity include areas that are expected to contain sites related to food-producing cultures. These sites are generally artifact-rich, highly complex, and have a high potential to contain human burials. Areas of moderate sensitivity include those areas that are known to contain or are likely to contain historical archaeological sites or prehistoric sites related to hunting and gathering cultures. Although these sites could be eligible for inclusion in the NRHP, they are less complex and easier to deal with than the sites in the area of high sensitivity. Finally, the area of low sensitivity includes areas that appear to have been impacted by relatively recent meandering of the river, and have a low potential to contain intact sites.

Areas of high sensitivity within Zone 1 are labeled from a to i on Figure 6. The boundaries of areas a, c, d, e, and g are drawn according to the boundaries of archaeological sites 33Ha155, 33Ha393, 33Ha587, 33Ha10, and 33Ha641, respectively. Area b corresponds to an area in which the property owner reported dense artifacts on the surface. This was field

verified by Gray & Pape archaeologists, although precise boundaries were not determined. The boundaries depicted on the map are based predominately on soil type, as the area of reported artifact concentration corresponded very closely to a particular soil type.

Areas f, h, and i correspond to dense artifact concentrations reported by the landowner and verified in the field by Gray & Pape archaeologists, although the precise limits of the locales were not determined. The boundaries of these areas were drawn based on the locations of know archaeological deposits and the correspondence of these deposits with specific elevations. Elevation data were taken from the 2-foot contour intervals provided to Gray & Pape by ENTRAN, combined with field observations. The boundaries of these areas follow natural breaks in elevation, but were refined if field observations conflicted with the generalized boundaries. For example, the boundaries of area f are based on the 484 contour, however, the northwestern boundary deviates from this contour because field observations indicated a fall off in artifact densities at a slightly different elevation.

## *3.2 Zone 2*

Zone 2 includes all areas of the floodplains and terraces of the Little Miami River that have been subject to historical development. This includes a portion of the Hahn Field Archaeological District, and the Perrin Village Archaeological District. There are also many known sites within Newtown and Mariemont that have been subjected to varying degrees of disturbance. Like Zone 1, Zone 2 is rich in archaeological sites, and our goal was to identify areas that are likely to have survived development relatively intact. Robert Genheimer (personal communication 2008), has conducted excavations within the limits of Newtown and knows the archaeology of the area well. He reports that development prior to World War II had little impact to archaeological sites, except within the footprint of buildings. For example, it is not uncommon for residents to find artifacts and bones in their yards while gardening. Areas subjected to later development generally have been so disturbed that no intact archaeological deposits remain.

As was noted in the brief historical overview, there was relatively little development in Newtown between 1900 and the 1960s. This constituted a fortunate coincidence for us, as the USGS topographic map for the area originally was drawn in 1960, and was revised much later. Areas showing revision clearly constituted recent development. We also had access to a range of historical aerial photographs, which allowed for a fairly fine level of analysis in terms of the period of development. Based on this information, we divided Zone 2 into areas of high, moderate, and low sensitivity based on their potential to contain intact archaeological sites (Figure 6). Areas of high sensitivity are those that are known to contain sites and do not appear to have been affected by recent development. Areas of moderate sensitivity are areas that are not known to contain sites, but have that potential because they have not been impacted by recent development. Areas of low sensitivity have been impacted by recent development.

Some areas within Zone 2 merit specific mention. First, the Perrin Village Archaeological District is located almost entirely within the bounds of the Little Miami Golf Center. Although intact sites have been documented in the bounds of the district, earthmoving activities associated with construction of the golf course in the 1960s is expected to have disturbed the majority of these sites. The district remains an NRHP listed property; however, it is likely that much of the district no longer has archaeological integrity.

Site 33Ha106 is a mound complex and cemetery that is individually listed on the NRHP as the Odd Fellows Cemetery Mounds 1 and 2. The mounds retains a high degree of archaeological integrity and should be avoided.

## *3.3 Zone 3*

Zone 3 is located east of Newtown, and includes the valley of McCullough Run and the surrounding uplands. Relative to Zones 1 and 2, there are few archaeological sites in this zone, and none are expected to be archaeologically complex, although there is always the potential for mounds to be located on ridge tops overlooking stream valleys. The archaeological potential for Zone 3 was modeled in a conventional way, based on soils, slope, and degree of disturbance.

Probability areas in Zone 3 are depicted on Figure 6. Even areas of high probability in Zone 3 are less likely to contain intact, significant archaeological sites than areas of moderate probability in Zone 1.

# 4.0 CONCLUSION

Under contract to ENTRAN, Gray & Pape has prepared recommendations concerning the archaeological potential of Segment II/III of the Eastern Corridor Projects, located in Hamilton and Clermont Counties, Ohio (Figure 1). The model is based on previous work conducted for the project (Weed 2002), documentary research, interviews with landowners and other knowledgeable parties, and an informal reconnaissance of the project area.

Gray & Pape divided the project area into three zones: Zone 1 is the undeveloped floodplains and terraces of the Little Miami River. Zone 2 includes floodplains and terraces that have been developed in historical times, and Zone 3 includes the valley and uplands east of the Village of Newtown. The zones are defined by the varying degrees of archaeological potential and the factors affecting the possible integrity of sites therein. Zone 1 is divided into areas of high, moderate, and low sensitivity based largely of the potential complexity of sites. Zone 2 is divided into areas of high and low probability based on the potential for sites to have survived historical development. Zone 3 is modeled based on slope and level of development.

Based on the results of this study, it appears likely that any alternative selected for the project will impact sites that are listed on or eligible for inclusion in the NRHP. However, the information presented here will be used to assist in the refinement of alternatives that will minimize impact to sensitive archaeological resources. This might be accomplished by limiting, as much as possible, the alternative corridors to areas of moderate and low sensitivity in Zone 1, and low sensitivity in Zone 2.

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