

# PHASE I ARCHAEOLOGICAL SURVEY OF THE PROPOSED ENVIRONMENTAL MANAGEMENT DISPOSAL FACILITY IN CENTRAL BEAR CREEK VALLEY, ROANE COUNTY, TENNESSEE



by  
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*Prepared for*

URS | CH2M Oak Ridge, LLC



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# PHASE I ARCHAEOLOGICAL SURVEY OF THE PROPOSED ENVIRONMENTAL MANAGEMENT DISPOSAL FACILITY IN CENTRAL BEAR CREEK VALLEY, ROANE COUNTY, TENNESSEE

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# MANAGEMENT SUMMARY

From April 23 through May 3, 2018, Cultural Resource Analysts, Inc., personnel conducted an archaeological survey of the proposed Environmental Management Disposal Facility within the Oak Ridge Reservation in Roane County, Tennessee. The survey was conducted at the request of Connie Le of URS/CH2M Oak Ridge, LLC, on behalf of the United States Department of Energy (DOE) Office of Environmental Management (OREM). The project consists of an archaeological survey of approximately 59 ha (145 acres) of land within the area of the proposed disposal facility and the associated support facilities.

Land use variability in the project area and associated surface conditions necessitated that field methods include intensive pedestrian survey with supplemental screened shovel testing. Survey methods varied according to topographic setting and past and current land use practices. The majority of the project area consisted of mixed young-growth forest and areas of known disturbance. Shovel probes were preformed within disturbed areas to confirm the extent of disturbance.

Prior to the fieldwork, a records review was conducted at the Tennessee Division of Archaeology. The review indicated that one previous professional survey and three recorded archaeological sites were within a 1.6-km (1.0-mi) radius of the project area. The survey did not cross the project area and the previously recorded sites were outside the boundaries of this investigation.

The current investigation resulted in the identification of five previously unrecorded archaeological sites (Sites 40RE613–40RE617) and a historic cemetery. Sites 40RE613, 40RE614, and 40RE615 were all ‘historic farmsteads/residences’. Site 40RE616 was a ‘multicomponent prehistoric/historic’ site. Site 40RE617 was a ‘prehistoric habitation without mounds’. ‘Historic farmstead/residence’, ‘multicomponent prehistoric/historic’, and ‘prehistoric open habitation without mounds’ are all specific temporal and site classifications used within the field of archaeology. The temporal designation of ‘prehistoric’ encompasses the era before the European contact period, and ‘historic’ designates the era from the contact period up to the 1950s. An ‘open habitation without mounds’ is a specific site classification for any area that has evidence of occupation without any associated mound structures and a ‘farmstead/residence’ consists of all residential, homestead, or farming settlements.

Newly recorded Site 40RE613 was a ‘farmstead/residence’ dating from the late nineteenth to mid-twentieth century which correlates with the community of Bear on an 1895 map. The site consisted of a standing rock and mortar chimney, a possible well/cellar depression, and a rock pile. Site 40RE614 was a mid-twentieth century ‘farmstead/residence’. Not much is known about Site 40RE614; no artifacts were recovered during this investigation, but a standing rock chimney feature was present. Site 40RE614 correlates with a structure on a 1941 map and the site was previously recorded as a “historic site” by the United States Department of Energy, though was not recorded as such by the Tennessee Department of Archaeology (TDOA). The newly recorded Site 40RE615 was a mid-twentieth-century ‘farmstead/residence’. Not much is known about Site 40RE615; no artifacts were recovered from the site, however, two rock debris piles and a marked hand-dug pre-1940s well feature were present. The site correlates with a structure on a 1941 map and was previously identified as a “historic site” by the United States Department of Energy, though was not recorded as such by the Tennessee Department of Archaeology. Site 40RE616 was a ‘multicomponent prehistoric/historic’ site consisting of an ‘open habitation without mounds’ and a ‘farmstead/residence’. Artifacts recovered from Site 40RE616 indicated that it was occupied in the late nineteenth century until the mid-twentieth century. The residence was likely part of the community of Bear, attested by the 1895 map. Not much can be said about Site 40RE616’s prehistoric component. The newly recorded Site 40RE617 consisted of an ‘indeterminate prehistoric open habitation without mounds’. Site 40RE617 abuts the project boundary line and may extend beyond the project boundaries. A single prehistoric isolated find (IF 1) was recorded during this investigation.

The historic cemetery, known as the Douglas Chapel Cemetery was recorded during this investigation. The cemetery consisted of the graves of 15 individuals. Of the 15 graves, 4 graves had formal headstones, 8 had informal fieldstone markers, and 3 were unmarked grave depressions. The cemetery appears on the 1941 map as the Douglas Chapel Cemetery. The earliest known grave is from 1880 and the latest is from 1905. It is likely that Douglas Chapel and the cemetery served the community of Bear in the late nineteenth century until the early twentieth century. Avoidance or relocation is recommended for this cemetery. The United States Department of Energy has indicated that they will avoid the Douglas Chapel Cemetery and preserve it in-situ.

The project area is within the Oak Ridge Reservation (ORR). The United States War Department purchased approximately 22,662 ha (56,000 acres) in 1943 for the Manhattan Project, which included the entire project area. The property is now owned by the United States Department of Energy. When the federal government purchased the land, all standing structures were demolished. The historic structures associated with Sites 40RE613–40RE616 were likely destroyed at this time. The United States Department of Energy previously practiced vegetation management by means of controlled burns. The extensive previous disturbance is throughout the project area. All the recorded sites were highly disturbed and appeared to contain no buried cultural deposits.

Because of their limited research potential, no further work is recommended at these five sites. Sites 40RE613–40RE616 are recommended not eligible for inclusion in the National Register of Historic Places, and the portion of Site 40RE617 within the project area is considered not eligible, although this site remains officially unassessed as it potentially extends outside of the project area and further work would be needed in order to delineate the true extent of the site. No sites listed in or eligible for the National Register of Historic Places will be affected by the proposed construction activity. As long as the Douglas Chapel cemetery will be avoided, archaeological clearance for this project is recommended.

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# LIST OF ACRONYMS

ACRONYM	MEANING
AEC	Atomic Energy Commission
CEW	Clinton Engineering Works
CFR	Code of Federal Regulations
CPC	Cumberland Presbyterian Church
CRA	Cultural Resource Analysts, Inc.
DOE	Department of Energy
GJBC	George Jones Memorial Missionary Baptist Church
LAR	Land Acquisition Records
MED	Manhattan Engineer District
MLRA	Major Land Resource Area
MOA	Memorandum of Agreement
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
ORR	Oak Ridge Reservation
OREM	Office of Environmental Management
RCDB	Roane County Deed Book
ROW	Right of Way
RPA	Register of Professional Archaeologists
RSI	Restoration Services, Inc.
TDOA	Tennessee Division of Archaeology
THC	Tennessee Historical Commission
TNSHPO	Tennessee State Historic Preservation Officer
TVA	Tennessee Valley Authority
USACE	United States Army Corps of Engineers



# I. INTRODUCTION

Between April 23 and May 3, 2018, Cultural Resource Analysts, Inc. (CRA), personnel conducted an archaeological survey of the proposed Environmental Management Disposal Facility (EMDF) within the Oak Ridge Reservation, Roane County, Tennessee (Figure 1). The survey was conducted at the request of Connie Le of URS/CH2M Oak Ridge, LLC (UCOR), on behalf of the United States Department of Energy (DOE). The project area is located in the Oak Ridge Atomic Reservation in central Bear Creek Valley, southwest of the city of Oak Ridge, Tennessee (Figure 2). Fieldwork was conducted by Julia K.C. Gruhot, J. Howard Beverly, Thomas H. McAlpine Jr., and Karen Clark.

The fieldwork was conducted in accordance with the National Historic Preservation Act (NHPA) of 1966 as amended and its implementing regulations (36 CFR Part 800, as revised). The survey and its resulting technical report were executed according to the guidelines provided by the Tennessee Division of Archaeology (TDOA) and the Tennessee Historical Commission (THC). All project related materials will be permanently curated at University of Tennessee – Knoxville and the McClung Museum, upon an agreement reached between that institution and DOE.

## Project Description

The project area was located in central Bear Creek Valley, Roane County, Tennessee. The project area totaled approximately 59 ha (145 acres), the majority of which was investigated through pedestrian survey supplemented with screened shovel testing (see Figures 2 and 3). The project area consisted of terraces, sideslope, and ridge line landforms. The vegetation was primarily mixed secondary growth forest.

The project area is part of the Oak Ridge Reservation (ORR). The EMDF project is a proposed waste disposal facility that will be built to accommodate waste that will be generated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERLA) to clean up the DOE's Oak Ridge Reservation. The types of waste that will be disposed at the EMDF will include low-level radioactive waste, Resource Conservation and Recovery Act (RCRA) hazardous waste, and mixed low-level/hazardous waste. The waste will consist of demolition debris and soil. In addition to the landfill, the EMDF project site will include areas to accommodate a landfill wastewater treatment system, storm water retention basins, a soil borrow site, and rerouting of the existing Haul Road and Bear Creek Road.

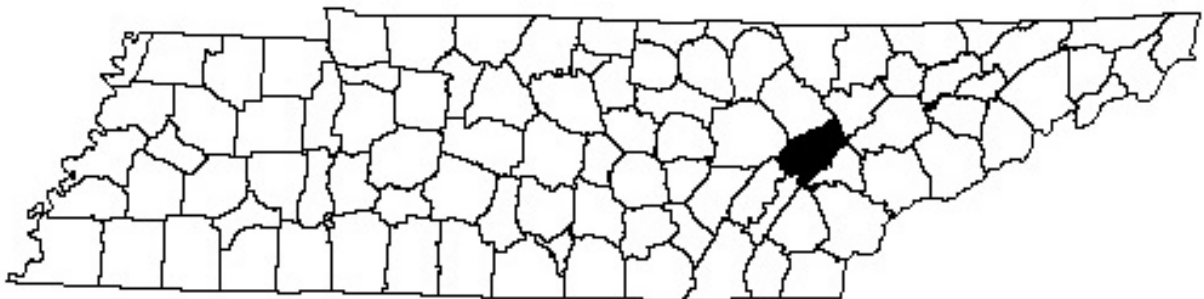


Figure 1. Map of Tennessee depicting Roane County.

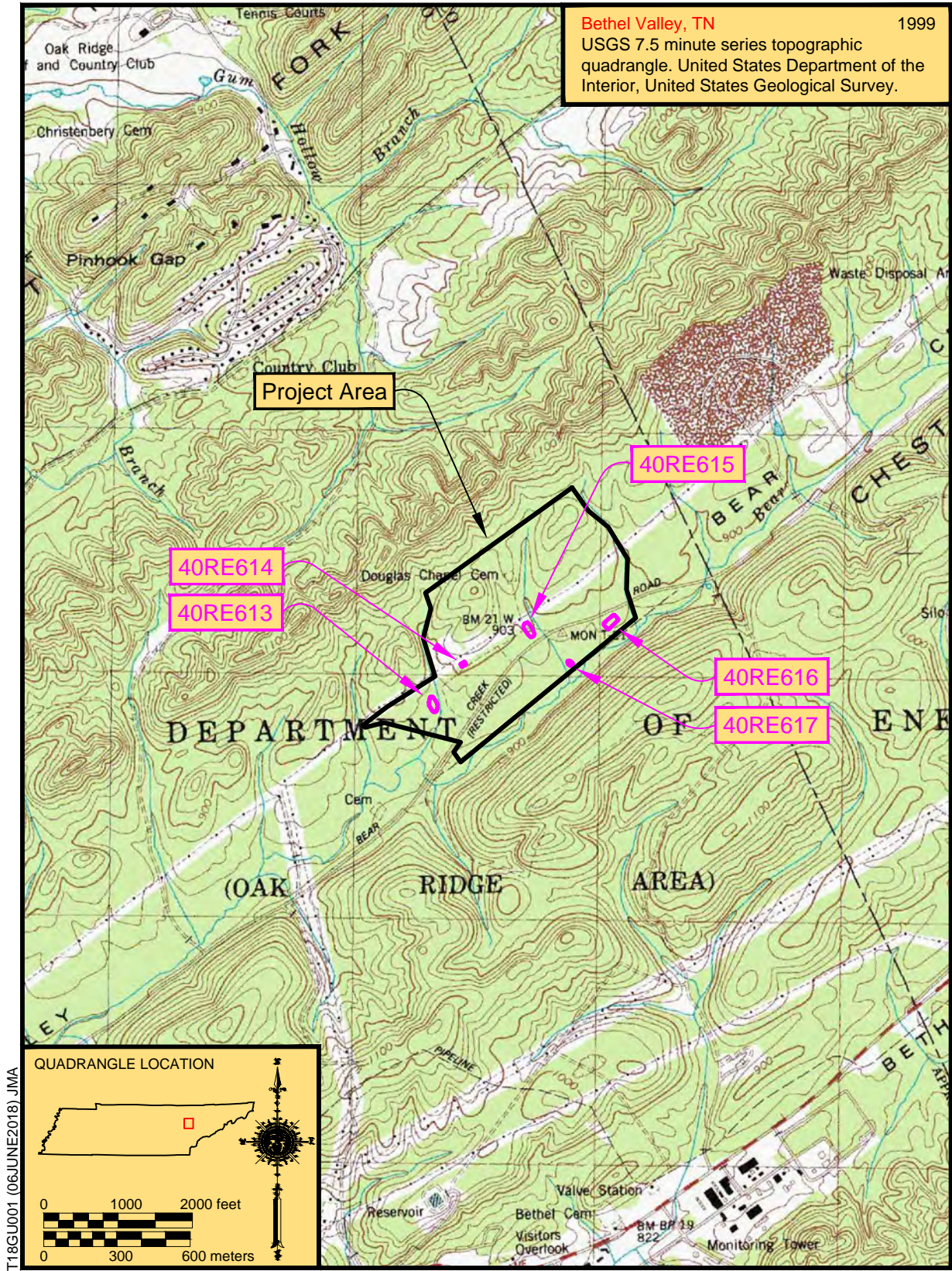


Figure 2. Site location map depicting field methods.

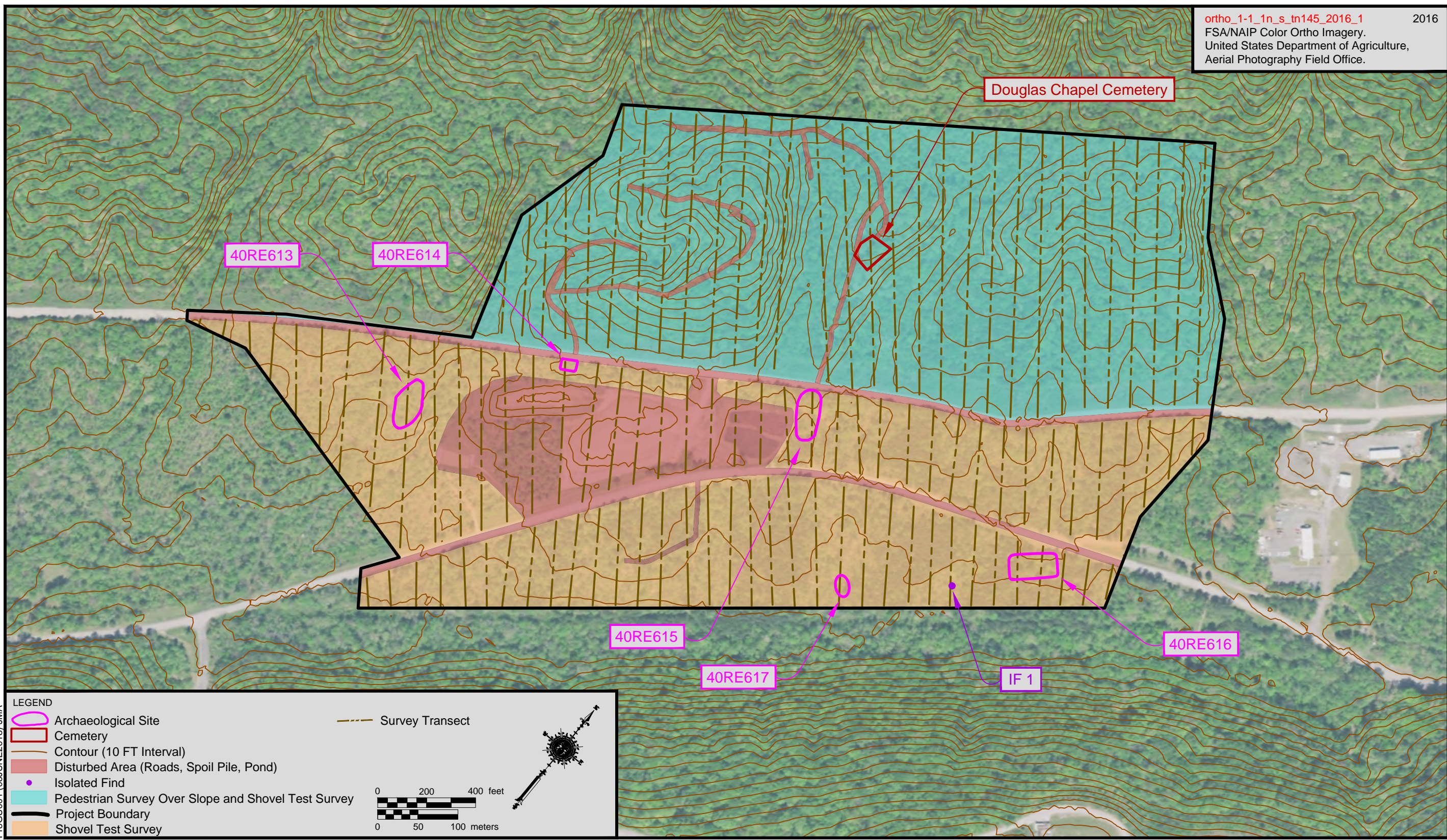


Figure 3. Project area on topographic quadrangle.



## Purpose of Study

This study was conducted to comply with the substantive requirements of Section 106 of the National Historic Preservation Act. This project is on federal land and is federally funded, and therefore considered an undertaking subject to 106 review. The purpose of the survey was to identify, locate, and assess any potential effects this project might have on archaeological resources within the project area and to evaluate the eligibility of the sites for inclusion on the National Register of Historic Places (NRHP). To do this, we followed these objectives:

1. Identify prehistoric and historic archaeological sites located within the project area;
2. Determine, to the extent possible, the age and cultural affiliation of sites;
3. Establish the vertical and horizontal boundaries of sites; and
4. Establish the degree of site integrity and potential for intact cultural deposits to be present.

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 is in keeping with the standards set forth by the TDOA and the THC. Cultural material, field notes, records, and site photographs will be curated with the Department of Anthropology at the University of Tennessee – Knoxville and the McClung Museum.

## Summary of Findings

Prior to fieldwork a records review was conducted by Thomas H. McAlpine at the TDOA. The review indicated that one previous professional archaeological survey had been conducted and three archaeological sites had been recorded within a 1.6-km (1.0-mi) radius of the project area. Neither the site nor the previous survey were located within the current project area.

The current survey resulted in the identification of five archaeological sites. Sites 40RE613, 40RE614, and 40RE615 were ‘historic farmsteads/residences’. Site 40RE616 was a ‘prehistoric/historic multi-component’ site. Site 40RE617 was a ‘prehistoric open habitation without mounds’. Site 40RE613 was a historic artifact scatter with a standing stone chimney and a well/cellar depression feature associated with a ‘historic farmstead/residence’. The ‘historic farmstead/residence’ was occupied from the late nineteenth to early twentieth century and correlates with a map structure depicted on a map from 1935 (United States Geological Survey [USGS] 1935). A map from 1895 located the community of Bear near Site 40RE613 (USGS 1895). Site 40RE614 consisted of a standing stone chimney feature and no recovered artifacts. Site 40RE614 was occupied in the mid-twentieth century and correlates with a map structure that appears on a map from 1941 but does not appear on earlier maps (USGS 1941). Site 40RE615 was comprised of a hand-dug well and two stone debris piles; no artifacts were associated with the site. The ‘historic farmstead/residence’ was occupied in the mid-twentieth century and correlates with a map structure that appears on a map from 1941 but does not appear on earlier maps (USGS 1941). The DOE had previously identified Sites 40RE614 and 40RE615 as “historic sites”; however, they were not documented with the TDOA as such. Site 40RE616 was a ‘multi-component prehistoric/historic’ artifact scatter with a basement/cellar depression feature. The ‘historic farmstead/residence’ was occupied from the late nineteenth to the mid-twentieth century and correlates with a map structure depicted on a map from 1935 (USGS 1935). The nineteenth-century occupation of Site 40RE616 indicates that it was considered part of the Bear community on the 1895 map (USGS 1895). Site 40RE617 was a light-density scatter of prehistoric lithic artifacts. The southern boundary of Site 40RE617 could not be delineated due to the project boundaries. It is possible that the site extends to the south.

Sites 40RE613–40RE616 and the portions of Site 40RE617 within the project area are recommended not eligible for listing in the NRHP due to the paucity of cultural materials, lack of depositional integrity, and the lack of research potential. As a result, no further work is recommended for any of the sites.

However, as the site boundary for Site 40RE617 potentially extends outside of the current project area, NRHP eligibility could not be assessed for the unrecorded portion of the site. Therefore, if the project area is extended at the location of Site 40RE617, additional archaeological investigations will be needed to assess the potential impacts to the potential unrecorded portion of the site. No archaeological sites listed in, or eligible for listing in, the NRHP will be affected by the proposed construction activities of the current project. Therefore, archaeological clearance is recommended.

A historic cemetery, known as the Douglas Chapel Cemetery, was recorded during this investigation. The cemetery consists of the graves of 15 individuals. Of the 15 graves, 4 graves had formal headstones, 8 had informal fieldstone markers, and 3 were unmarked grave depressions. The cemetery appears on the 1941 map (USGS 1941) as the Douglas Chapel Cemetery. The earliest known grave is from 1880 and the latest is from 1905. It is likely that Douglas Chapel and the cemetery served the community of Bear in the late nineteenth century until the early twentieth century. Avoidance or relocation is recommended for this cemetery. The DOE has indicated that they will avoid the Douglas Chapel Cemetery and preserve it in-situ.

## 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. The project area is located in the Appalachian Ridge and Valley region (Figure 4). Topography, vegetation, hydrology, soils, lithic resources, and climate for the project area are discussed below.

### Climate and Environment

The regional climate is temperate, with cool winters and warm summers. 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). 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 (circa 12,900 to 11,600 cal. B.P.) 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

Tennessee Geographic Regions



Figure 4. Regions of Tennessee.

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. By the end of the Pleistocene, the area would have been covered by spruce and pine boreal forests, but as the temperatures continued to rise, the makeup of the forest shifted to a mesic oak-hickory forest. By circa 5500 B.C., a period of warming and drying of the climate, known as the Althithermal, began and lasted until approximately 2500 B.C. Since the end of the Altithermal, the climate has cooled and become more humid (Delcourt and Delcourt 1983).

The climate today in Roane County is marked by relatively mild temperatures, with average temperatures ranging from 37.8 degrees F to 86.1 degrees F. The area receives an average of 56.79 inches of precipitation annually, which includes 4 inches of snowfall. The majority of the rainfall occurs from March through July. On average, the last frost occurs in mid-April, and the first occurs in mid-October (Davis and Yaeger 2002).

The Mississippian Aged Fort Payne outcrops within 1.5 km (northwest) of the project area and is of interest due to the presence of chert that would have been of interest to prehistoric groups in the area. The Fort Payne formation is massive and occurs in portions of Tennessee, Alabama, Mississippi, Kentucky, and Illinois. Chert from the Fort Payne Formation occurs in a variety of colors and was of great economic importance to prehistoric people of the Highland Rim and surrounding areas (Amick 1985, 1987; Faulkner and McCollough 1973; Penny and McCollough 1976).

Roane County is divided into two major physiographic regions. Most of the county is within Major Land Resource Area 128 (Southern Appalachian Ridges and Valleys), and approximately a quarter of the county lies within the Major Land Resource Area 125 (Cumberland Plateau and Mountains) (Davis and Yaeger 2002). The Southern Appalachian Ridge and Valley physiographic area is characterized by sediments from the Paleozoic Era such as limestone, sandstone, siltstone, and shale, as well as dolomite from the Ordovician and Cambrian periods (Ammons et al. n.d.a; Fenneman 1938). The Cumberland Plateau and Mountains physiographic area is characterized by Paleozoic Era rock types such as conglomeritic sandstone, siltstone, shale, and coal (Pennsylvanian Period) and are underlain by Mississippian Period shales, limestone, and dolomite (Ammons et al. n.d.b; Fenneman 1938). Major Land Resource Area (MLRA) 125 is generally used today for timber production as well as pasture and vegetable crops. MLRA 128 is commonly used for growing tobacco, corn, and hay, as well as pasture lands.

The animal population consists of a wide variety of mammal species, including deer, rabbit, squirrel, raccoon, and bear, as well as numerous reptiles, amphibians, and avian species. A wide variety of aquatic species are present in the Tennessee, Emory, and Clinch Rivers as well as their tributaries. The prehistoric suite of faunal resources likely resembled the modern assemblage, although the diversity of species has been reduced as the forests were cleared for human settlement. Once important game species, such as elk and bison, have been extinct in this area since the early nineteenth century (McCollough and Faulkner 1973).

## Description of Project Area

The project area is located approximately 18.0 km (11.2 mi) northeast of Kingston and 6.4 km (4.0 mi) southwest of modern Oak Ridge, on either side of Bear Creek Road (See Figures 2 and 3). It covers approximately 59 ha of land. Elevations in the project area range from 265 m (870 ft) above mean sea level (AMSL) on the floodplain of Bear Creek and 335 m (1,100 ft) AMSL along Pine Ridge to the north. Bear Creek and its tributaries drain the project area.

Landforms in the project area consisted primarily of terraces, sideslopes, and ridges, along with floodplains. Vegetation in the project area was primarily mixed secondary-growth forest (Figure 5). Wooded areas consisted of deciduous and coniferous trees with scrub and briar undergrowth. Ground surface visibility was obscured by vegetation or leaf litter throughout the project area.



Figure 5. Overview of vegetation within project area, facing north.

As part of the Manhattan Project, all of the land within and around the project area was purchased by the United States government in 1943 and all of the inhabitants were forced to move. All of the structures, including the homes and outbuildings, were later demolished. Access to the project area is now controlled. The project area is primarily accessed from Haul Road, which is a controlled road (Figure 6). Haul Road bisects the project area and runs parallel to Bear Creek Road.

Disturbance was present throughout the project area. The systematic destruction of non-government structures in the 1940s and subsequent construction for the research facilities disturbed much of the project area. Logging activities and controlled fires used to suppress vegetation further disturbed the land within the project area. In recent years, several gravel access roads were cut to reach groundwater monitoring stations throughout the project area (Figure 7). A large disturbed area lies in the central project area between Haul Road and Bear Creek Road. A containment pond, borrow area, spoil pile, gravel lot, and push material are all located within this disturbance (Figure 8). Lack of surface soil has resulted in erosional landforms. Gullying from water runoff is present throughout the southern project area (Figure 9).

Little information could be found about the soil in the project area. According to the United States Department of Agriculture, Natural Resources Conservation Service Web Soil Survey, there are no digital data available for this area in Roane County. An outdated Soil Survey indicates that Apison soils are mapped within the project area (Swann et al. 1942).

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.



Figure 6. Overview of Haul Road, facing east.



Figure 7. Overview of gravel access road, facing west.



Figure 8. Disturbance and spoil area, facing northeast.



Figure 9. Pine woods surrounded by gully, facing east.

Apison series soils are classified as Ultisols, which are found on landforms that formed during the late Pleistocene or earlier (Soil Survey Staff 1999:721–726). Archaeological deposits would only be found on or very near the ground surface on landforms mapped with Ultisols.

Sediments observed in shovel probes conformed to the typical description of an eroded Apison soil profile. The typical probe revealed an O horizon of organic leaf matter and humus over an Ap horizon of yellowish brown (10YR 5/4) loam to approximately 15.0 cm (5.9 in) below ground surface (bgs). This was underlain by a subsoil of strong brown to yellowish brown (7.5YR 5/6 to 10YR 5/6) clay loam with shale fragments. Some probes revealed severely eroded profiles with a shallow organic layer above degraded shale bedrock.

### III. PREVIOUS RESEARCH AND HISTORY

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 TDOA 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 on the NRHP were situated within the current project area or within a 1.6-km radius of the project area. The TDOA file search was conducted on April 19, 2018. The work at TDOA consisted of a review of professional survey reports and records of archaeological sites for an area encompassing a 1.6-km radius of the project footprint.

#### Previous Investigations

*Thomas H. McAlpine, RPA*

Data from the TDOA revealed that one previous professional archaeological survey has been conducted within a 1.6 km radius of the project area. Three archaeological sites have been recorded in this area also. None of these survey areas or sites fall within the actual project area for the EMDF.

The records search revealed that two of the three sites in the file search area (40Re187 and 40Re567) are ‘historic farmsteads/residences’. The remaining site (40Re488) is a ‘multicomponent site with historic and prehistoric occupations’. The 1.6-km radius included areas within the Bethel Valley quadrangle (USGS 1999).

In April, 1988, archaeologists from Midsouth Anthropological Research Center conducted an archaeological survey for proposed borrow areas on Chestnut Ridge, in the Oak Ridge Reservation, Roane County, Tennessee (Stoops 1988). The project was performed at the request of the Environmental Resources Department of Martin Marietta. A total of 51 ha (126 acres) was surveyed for the west borrow area and 14 ha (35 acres) were surveyed for the east borrow area. Only the west borrow area is within 1.6 km of the project area. The west borrow area was surveyed by pedestrian survey at 10-m (33-ft) intervals and by fire-rake testing. In fire-rake testing, a 1 m (3 ft) square area was cleared of ground cover using a fire-rake. These fire-raked squares were placed 10 m (33 ft) or 20 m (66 ft) apart based on topography. As a result of the survey of the west borrow area, one previously unrecorded site was identified (40Re187). This site is within 1.6 km of the current project area.

Site 40Re187 was recorded as a ‘historic rural domestic house’ from the early twentieth century. The site consisted of a collapsed wood structure with brick chimney remains. No associated outbuildings were identified. Artifacts identified at the site included a metal paint can, Ball screw top lids with milk glass liners, handmade brick, vessel glass, and wire nails. The status of the site could not be assessed, as not enough data could be collected to determine its significance (Stoops 1988).

Sites 40Re488 and 40Re567 did not have associated reports, but information was obtained from the site forms found in the TDOA records. Site 40Re488 was a ‘multicomponent site’ with an ‘undetermined prehistoric open habitation’ component and a ‘historic rural domestic’ component. Site 40Re567 was a ‘historic rural domestic house’ from the twentieth century. NRHP status was not assessed for either site.

## 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 during the current investigations:

1895 Loudon, Tennessee, 7.5-minute series topographic quadrangle (USGS);

1935 Bethel Valley, Kentucky, 7.5-minute series topographic quadrangle (USGS);

1941 Bethel Valley, Kentucky, 7.5-minute series topographic quadrangle (USGS);

1953 Bethel Valley, Kentucky, 7.5-minute series topographic quadrangle. (USGS).

The reviewed historic maps provide useful information concerning the general locations of current and former structures located within, and adjacent to, the project area, and can alert the crew to the possible existence of historic deposits within a general area. The historic maps indicated that four map structures (MS) were located within the current project area (Figures 10 and 11). These areas were investigated for archaeological deposits according to accepted methodology, as described in the Methods section of the report.

The earliest map consulted was the 1895 topographic map. This map did not identify individual buildings but instead marked the location of communities (USGS 1895). The community of Bear was indicated within the project area. This community likely consisted of several homesteads spread throughout the general vicinity. The structures designated MS 1 and MS 2 first appear on the 1935 map, though it is likely that these residences were represented previously as part of the community of Bear (USGS 1935). All four map structures and the Douglas Chapel Cemetery appear on the 1941 map (USGS 1941). All of the map structures correspond with sites recorded during this investigation. MS 1 corresponds with Site 40RE613 with the standing chimney, Site 40RE616 appears to be the remains of a no longer extant MS 2, MS 3 was mapped at the location of Site 40RE614 where the chimney remains intact, and MS 4 corresponds with the well and debris associated with Site 40RE615.

## Cultural Overview

In order to assess the potential for significant cultural resources in the project area and to formulate expectations regarding the nature and types of cultural resources likely to be encountered, CRA archaeologists conducted cultural background research on the general physiographic region in which the project is located.

The human occupation of the Ridge and Valley physiographic province of Tennessee is divided into seven periods based on patterns of resource exploitation and technological innovation. The seven periods discussed consist of Pre-Clovis, Paleoindian, Archaic, Woodland, Mississippian, Historic Native American, and Euro-American Historic periods. These periods provide macro-level models of typical human occupations. The prehistoric chronology is based on extensive archaeological research conducted in the region by academic institutions, government entities, and private companies primarily since the 1930s. Historical information on Roane County was gathered primarily from online sources and existing technical reports on the area.

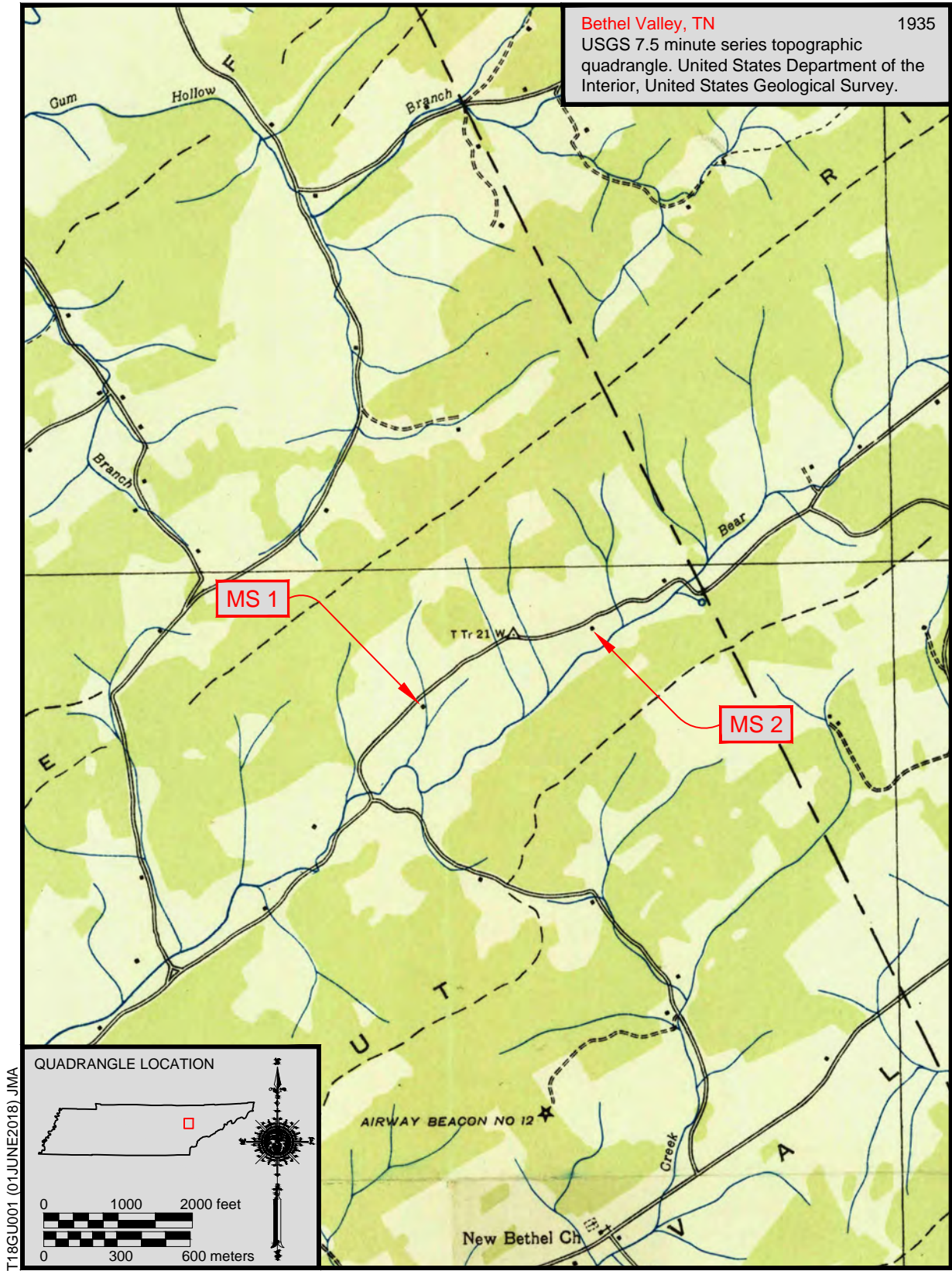


Figure 10. 1935 Bethel Valley topographic quadrangle depicting MS 1 and MS 2 (USGS 1935).

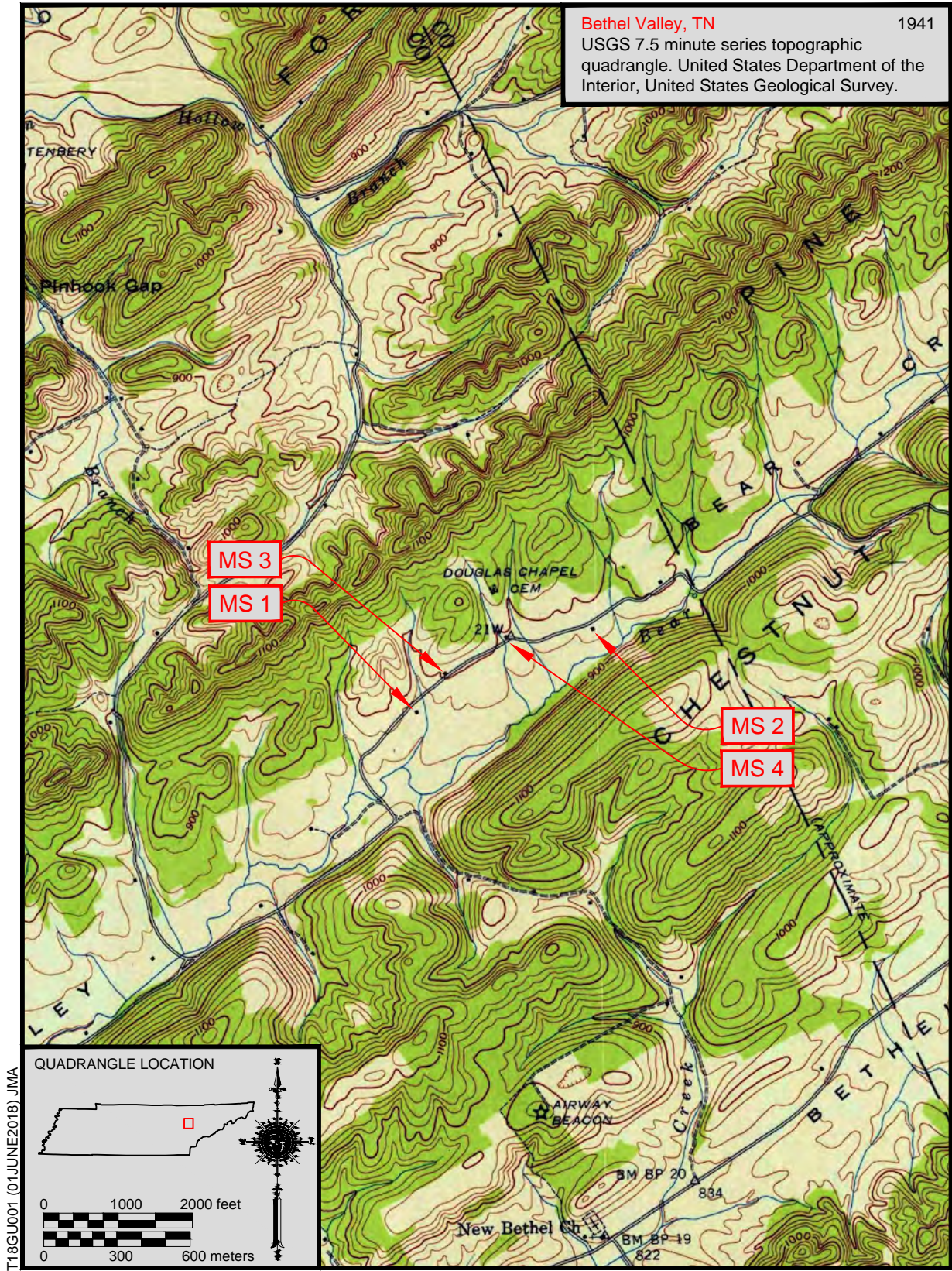


Figure 11. 1941 Bethel Valley topographic quadrangle depicting MS 1, MS 2, MS 3, and MS 4 (USGS 1941).

## **Pre-Clovis (Before 13,000 B.P.)**

The timing and actual entry point of the first humans into North America is still a topic for debate. Over the last decade there has been increasing data indicating human occupation in North America began circa 15,000 B.P. These data come from both archaeological and genetic/DNA research (e.g., Gilbert et al. 2008; Jenkins et al. 2012; Reich et al. 2012; Waters et al. 2011). While there has been some discussion of eastern routes to North America (e.g., Bradley and Stanford 2004, 2006; Stanford and Bradley 2012), the general consensus remains that humans entered North America from Asia via the Bering Strait. Waters and Stafford (2013:557) summarized the data to date and conclude that the First Americans originated in Central Asia and started entering the New World circa 16,000 BP. Clovis developed later and was a New World construct.

Several sites in the southeastern United States and surrounding regions have been suggested as pre-Clovis candidates. Among these are the Cactus Hill site in southeast Virginia (McAvoy and McAvoy 1997; Wagner and McAvoy 2004); the Topper site in South Carolina (Chandler 2001; Goodyear 1999; Goodyear and Steffy 2003); and the Debra L. Friedkin site in Texas (Waters et al. 2011). No pre-Clovis sites have been identified in the Ridge and Valley physiographic province of Tennessee, although evidence for earlier habitations has been noted at the Johnson Site in central/western Tennessee (Miller et al. 2012).

## **Paleoindian (13,000–9950 B.P.)**

The Paleoindian period is the earliest cultural period conclusively documented in the Ridge and Valley. The arrival of humans in this region was probably linked to the movements of the Pleistocene glaciers. During the Paleoindian period, the last of these glacial advances and retreats, called the Greatlakean Stadial (post-9900 B.C.), occurred. Although the glaciers never actually extended south of the Ohio River, the climatic effects probably did. This cooler, moister climate would affect the composition and distribution of floral and faunal communities (Delcourt and Delcourt 1982; Klippel and Parmalee 1982).

In summarizing the present state of knowledge concerning the dating of Clovis, Waters and Stafford (2013:544) state that “13 Clovis sites still provide the most accurate and precise ages for the Clovis Complex. The ages from these sites range from  $11,080 \pm 40$  14C yr BP to  $10,705 \pm 35$  14C yr BP or  $13,000 \pm 85$  to  $12,615 \pm 40$  cal yr BP.”

The Early Paleoindian Period (13,000–10,950 B.P.) marks the earliest verified habitation of the region and the end of the Pleistocene and is associated with Clovis. While a number of archaeologists have argued that Paleoindians were predominately big game hunters (e.g., Bonnicksen et al. 1987; Kelly and Todd 1988; Stoltman and Bærreis 1983), more recent review of the topic (Meltzer 1993) concluded that there is no widespread evidence for the specialized hunting of big game species (i.e., megafauna). Several authors (e.g., Davis 1993; Dincauze 1993; Meltzer 1993) now argue that the Paleoindian diet was more generalized and relied on a number of faunal and floral species. Megafauna would have been taken when encountered, but not to the exclusion of other species. An example of megafauna exploitation in the area was documented at the Coats-Hines Site in Williamson County, Tennessee. Excavations at the site produced a mastodon skeleton that showed signs of having been butchered (Brietburg et al. 1996). The Middle Paleoindian Period (10,950–10,450 B.P.) coincides with the beginning of the Holocene and the shift to gathering and hunting of smaller, modern mammal species. Cumberland, Simpson, and Suwannee hafted bifaces are typical of this period. The Late Paleoindian Period (10,450–9950 B.P.) coincides with the Younger Dryas, a brief period of cooler and drier conditions. Hardaway, Dalton, Quad, and Beaver Lake hafted bifaces are generally associated with the Late Paleoindian Period (Miller et al. 2012).

## **Archaic Period (9950–2950 B.P.)**

The Archaic Period begins with the end of the Younger Dryas and warmer, but fluctuating climatic conditions that stabilize to more or less modern conditions by the end of the period. Archaic people continued to move across the landscape to exploit seasonal resources, but environmental stresses led to an

increase in sedentism and the extraction of local resources. Larger sites are found along major waterways that have been interpreted as base camps based on the concentration of lithic materials and evidence of resource processing. The shift in procurement strategies are indicated by technological developments such as the atlatl, fish hooks, and stone bowls (Anderson 2001).

The Early Archaic (9950–7950 B.P.) was marked by climatic fluctuations that may have caused subsistence stress among human populations. This stress likely caused mobility to become more limited and shifted the focus of subsistence to a more varied diet reliant on locally available resources. The major lithic hafted bifaces associated with Early Archaic sites include Kirk Corner Notched Cluster, Big Sandy I, and a series of Bifurcate Base bifaces (Coe 1964; Justice 1987; Kneberg 1956).

During the Middle Archaic (7950–4950 B.P.), the climate warmed dramatically and became drier. The increasingly dry conditions caused additional stress on subsistence strategies of human populations and led to a focus on permanent water sources for base camps. The utilization of aquatic resources, especially freshwater shellfish, is indicated by large shell middens that are a hallmark of Middle Archaic sites. Kirk projectile points continue to be used, along with Morrow Mountain, White Springs, Benton, and Stanley cluster types. Ground stone tools, such as net sinkers, grooved axes, and atlatl weights begin to be utilized during this period (Chapman 1985).

By the beginning of the Late Archaic (4950–2950 B.P.), climatic conditions closely approximated the modern environment. Continued sedentism led to the earliest efforts at horticulture, with wild plants, such as sunflowers, sumpweed, maygrass, knotweed, little barley and gourds, being tended and utilized (Anderson 2001; Chapman and Watson 1993). Steatite bowls began to be used, as were early fiber-tempered ceramic vessels. The lithic tool box included Savannah River, Appalachian Stemmed, and Iddins hafted bifaces (Chapman 1985). Mounds of shell and earth were constructed near water sources, which indicate early cooperative efforts between bands and may mark the beginnings of ceremonialism (Anderson 2001; Kidder 2011).

## Woodland Period (2950–1950 B.P.)

The Woodland Period is characterized by increased sedentism and an increase in the reliance on horticulture, and eventually agriculture, as the primary subsistence strategy. Technological innovations included an increasing variety of ceramic vessels. Extensive inter-regional trade networks are also developed during the Woodland Period (Chapman 1985).

The Early Woodland (2950–1950 B.P.) is marked by the Watts Bar and Long Branch phases. The Watts Bar phase is characterized by quartz and sand tempered ceramics that are either cord-marked or fabric-impressed, while Long Branch ceramics are limestone tempered. Typical hafted bifaces of this time include large triangular types such as the Nolichucky, Greeneville, and McFarland (McCullough and Faulkner 1973).

The Middle Woodland (1950–1350 B.P.) saw an increase in the reliance on domesticated plants, including the earliest known use of corn in East Tennessee (Fritz 1993). Excavations at Icehouse Bottom in the Tellico Reservoir produced copper objects, sheets of mica, and ceramics decorated with non-indigenous motifs. These items are indicative of extensive trade from as far away as Illinois and the Gulf of Mexico (Chapman and Shea 1981). The Middle Woodland in East Tennessee is characterized by Candy Creek phase ceramics, which are limestone tempered and are either plain or decorated with brushed or cord-marked surfaces. Hafted bifaces found during the Early Woodland persist and Camp Creek, Conestee Triangular, and Bradley Spikes are introduced.

The Late Woodland (1350–1050 B.P.) is characterized by an expansion of human populations and an increase in centralized villages. Burial mounds are associated with these villages. Horticulture is largely replaced by agriculture by the end of the Late Woodland, with corn, tobacco, beans, and gourds becoming important crops. Social stratification and religious activities within chiefdoms increase, as does warfare

between chiefdoms (Anderson 2001). In East Tennessee, the Late Woodland is marked by the Hamilton Phase, which includes limestone tempered ceramics and small, triangular points such as the Jack's Reef, Hamilton Incurvate, and Madison (Wetmore 2002).

## Mississippian Period (1050–350 B.P.)

The Mississippian Period (1050–350 B.P.) is characterized by an increase in the rate of population growth, the growth of large, permanent villages, and a reliance on agriculture as the primary subsistence strategy. Mississippian peoples were organized by a complex social and political hierarchy. The construction of large mounds used for the placement of important political and religious structures is a hallmark of this period (Koerner et al. 2012).

The Early Mississippian (1050–950 B.P.) is marked by the use of shell-tempered ceramics. This period is referred to as the Martin Farm Phase. Houses within the village tended to be square or rectangular in shape and included wall trenches and single set posts. Small triangular projectile points, including the Hamilton and the Madison, were the primary type used throughout the Mississippian (Schroedl et al. 1985; Koerner et al. 2012).

The Middle Mississippian (950–650 B.P.) (Hiawassee Phase in East Tennessee) saw a shift in the location of villages from the first terrace or floodplain of rivers to older terraces. Houses tended to be either round or rectangular and were built using wall trenches at first, but changed to single set posts later. Platform mounds were constructed for the placement of civic structures and stockade walls were sometimes present. Mortuary practices became highly symbolic and are often referred to as the Southeastern Ceremonial Complex (SECC). The SECC includes a variety of motifs and personal adornments, such as gorgets, ear spools, and beads, all created from a variety of materials (Braly et al. 2012).

The Late Mississippian (650–350 B.P.) is known as the Dallas Phase in the Tennessee River Valley and the Mouse Creek Phase in the Chickamauga Basin. Dallas Phase houses are typically square and grouped into hamlets that formed towns, which were often palisaded. Mortuary practices indicate that status was determined by gender and age, with older males being considered higher status than younger males or females. Shell tempered ceramics persist with incising and filleting as decorative techniques. Effigy vessels were also produced from shell tempered clay. Madison and Hamilton points continue to be used, along with Dallas types (Harle et al. 2012).

## Historic Native American (A.D. 1600–1838)

It is widely accepted that by the time Hernando DeSoto made his way through eastern Tennessee in the 1540s he and his expedition encountered the Cherokee. It was suggested in 1894 (by Cyrus Thomas, an early researcher) that the Cherokee had occupied this area since the thirteenth century. This was later countered by Lewis and Kneberg (1946) who suggested that the Cherokee had instead replaced the Late Mississippian populations. John R. Swanton, who in 1939 published the findings of the United States DeSoto Expedition Commission, also refuted the Cyrus Thomas narrative of Cherokee prehistory in the area. Swanton found that the groups contacted by the De Soto expedition were probably linguistically affiliated with the Southern Division of Muscogean stock (Lewis et al. 1995). This was considered more tenable because of a Cherokee tradition which “held that the Creeks were present in eastern Tennessee when the Cherokee arrived (probably in the middle of the seventeenth century), and it seems likely that the Dallas culture which [has] tentatively been identified as Creek represents the dominant group in the Tennessee River portion of the Chickamauga Basin in the post-De Soto and pre-British contact period from the middle sixteenth to the early eighteenth century (Lewis et al. 1995:14).” The Cherokee expansion south meant the displacement of peoples in eastern Tennessee, including the Creek, who were still being pushed out of northern Georgia during the early historic period (White 2002).

The Cherokee had large settlements along the Little Tennessee River in Tennessee, including Itsati (Echota) which has been considered the capital of the Cherokee (Mooney 2009). The Cherokee belong to

the Iroquoian linguistic family; despite the fact that Chota, Citico, Conasauga, Chilhowee, Tuskegee, and Tomotley are all Cherokee towns located along the Little Tennessee River with Muskogean derived names (Ethridge and Hudson 2002). The etymology of Cherokee vocabulary, therefore, is an effective example illustrating that these people were not static, but rather a fluid and diverse community with shifting borders, fluctuating populations, and advancing technologies. Prior to regular contact with Euro-Americans in the eighteenth century it is generally accepted that the Cherokee had an egalitarian political and social organization, and that it was not until the influx of trade goods that individuals had the opportunity to achieve status and rank instead of inherit it (Ethridge and Hudson 2002).

Euro-Americans sparked other political change as well. The American Revolution strained the Cherokee, as settlers encroached on their tribal lands, eager young warriors led by Dragging Canoe began attacking the colonists and settlers; while the more mature leaders (including his father Attakullakulla, who had traveled to England in 1730) desired to settle the disputes differently (Marshall 1998). This division would lead to Chickamauga Wars, which split the tribe when Dragging Canoe seceded and established the Chickamauga, or Lower Cherokee (Ethridge and Hudson 2002).

The earliest treaty with the Cherokee was signed in 1721, and between 1721 and 1835 another 36 treaties and degrees of courtesy and interest would be signed, which would whittle their land holdings in Tennessee down (Royce 2009). While efforts for the voluntary removal of the native populations in the east began in 1803 following the Louisiana Purchase, it was not until the Indian Removal Act of 1830 that an effort to remove the tribes at any cost was prioritized by Andrew Jackson (Logan n.d.). Small groups of Cherokees moved westward in 1831–1832, and thereafter as they were forced out of their homes. It was not until their forced removal in the winter of 1838 that the majority of the Cherokee people moved westward and settled in what is present day Oklahoma. This event is now known as the Trail of Tears. Areas associated with it were established as a National Historic Trail in 1987 (National Park Service 2012).

## Roane County History

Roane County is situated around the confluence of the Clinch, Emory, and Tennessee Rivers on the Eastern Escarpment of the Cumberland Plateau. This part of the state was included in Knox County when Tennessee was granted statehood in 1796. Roane County was established in 1801 and was named for the second governor of Tennessee, Archibald Roane. The earliest permanent Euro-American settlement was located at the confluence of the Clinch and Tennessee Rivers where a blockhouse was constructed in 1792. This point was near the boundary between the Territory of the United States South of the River Ohio and lands controlled by the Cherokee Nation which is near present-day Kingston, Tennessee. In addition, the Avery Trace was completed through the area by 1788, which connected Campbell's Station near Knoxville with the Cumberland settlements to the west. Concerned with the safety of travelers along the Avery Trace, Governor William Blount ordered General John Sevier to oversee the construction of a blockhouse to be manned by a small detachment of soldiers. By 1794, United States troops were serving escort duty for travelers headed for the Cumberland settlements (Fort Southwest Point 2013).

Following Tennessee's admission to the Union in 1796, the number of Americans travelling across the Cherokee territory between Knoxville and the Cumberland settlements increased dramatically. The military policy in the area shifted from one focused on protecting the travelers to a focus on protecting the rights of the Indians in the area. This approach was intended to prevent hostilities by preventing settlers from illegally settling on Cherokee lands, and removing those settlers that had already done so. This mission required a much larger number of soldiers than had been stationed at the blockhouse, so in 1797, a larger fort was constructed approximately .8 km (.5 mi) downstream. The fort was called Fort Southwest Point and would be manned by over 400 soldiers at one time. By 1801, the fort had become an important stop for travelers moving west and was the headquarters for Colonel Return J. Meigs, who served as the Indian Agent to the Cherokee for the United States government (Fort Southwest Point 2013).

As the Cherokee ceded lands to the United States through the early nineteenth century, the need for a military presence at Fort Southwest Point was greatly diminished. By 1806, the garrison had been greatly reduced and Colonel Meigs moved his headquarters to the Hiwassee District the next year. By 1811, the fort had been abandoned (Fort Southwest Point 2013).

With the activity surrounding Fort Southwest Point and the increased traffic on the road from Knoxville to the Cumberland settlements, the town of Kingston was founded along the road on land owned by Major Robert King in 1799. Kingston has been the county seat of Roane County since the founding of the county in 1801 and has the distinction of having been the capital of the State of Tennessee for one day, September 21, 1807. One of the provisions of the Tellico Treaty of 1805 was for the state capital to be moved to Kingston in exchange for Cherokee cessions on a large amount of land. The capital was moved to Kingston from Knoxville for a single day, technically meeting the conditions of the treaty, then returned to Knoxville the next day (Hall and Parker 2009; Wells 1927).

Like most of East Tennessee, Roane County voted overwhelmingly against secession in 1861, but its citizens were divided on the issue. Roane County residents served with several regiments on both sides of the conflict. Although the war did not directly impact them, all of the communities within Roane County were affected by the Civil War through the loss of males to military service and instability of the economy. Schools closed due to fears of “bushwhackers” and a lack of teachers (Moneymaker 1979) and some churches discontinued services until after the war, or disbanded all together.

During the course of the war, significant mineral deposits were discovered that later led to an increase in industrial development within the county, although agriculture and timber continued to be important to the economy. Colonel John Wilder, who led Union troops through the area during the Civil War, returned to organize the Roane Iron Company, and established the town of Rockwood in 1868. Industrial development continued through the end of the nineteenth century. The town of Harriman was founded in 1890 by the northern organizers of the East Tennessee Land Company, which developed the area because of the available natural resources and transportation network (Hall and Parker 2009).

In the twentieth century, major changes were brought about in Roane County by the actions of the United States government. In 1936, the completion of the Norris Dam across the Clinch River in Anderson County by the Tennessee Valley Authority (TVA) provided both flood control and cheap electricity to the region. This was followed in 1939 by the construction of Watts Bar Dam across the Tennessee River in Meigs County. The reservoir created by the completion of this dam in 1942 forced the relocation of many farmers with property along the river in Roane County (DuVall and Souza 1996).

### *Manhattan Project*

While the inundation of Watts Bar Reservoir affected mostly the western half of Roane County along the Tennessee River, the eastern half was more affected by the selection of a portion of Roane County as the location for a major installation of the United States Army Corps of Engineers (USACE) Manhattan District known as the Manhattan Project. American efforts to develop an atomic weapon began in 1942 when President Franklin Delano Roosevelt approved a report submitted by Dr. James B. Conant, Chairman of the National Defense Research Council, and Dr. Vannevar Bush, Director of the Office of Scientific Research and Development. The Conant-Bush report acknowledged that the creating of an atomic weapon was feasible and should be pursued. This resulted in the organization of the Manhattan Engineer District (MED) within the USACE, whose mission was to produce an atomic bomb within three years. Colonel Leslie R. Groves was selected to command the project (Johnson and Jackson 1981).

Colonel Groves began the process of selecting the locations for the production sites that would encompass the three Oak Ridge facilities almost immediately. The location in East Tennessee, known as Site X, was chosen in September 1942. In addition, facilities would be located at Hanford, Washington, on the Columbia River (Site W), and at Los Alamos in New Mexico (Site Y). The Hanford site would focus on the production of plutonium, which was used in the bomb dropped on Nagasaki, Japan on August 9,

1945, while the Tennessee site would produce the Uranium 235 used in the bomb dropped on Hiroshima on August 6, 1945. The components produced at these two facilities were shipped to Los Alamos, where the bombs were assembled (Johnson and Jackson 1981).

The site selected in East Tennessee provided an almost perfect location for the complex array of activities that were planned. The site was sparsely populated and relatively isolated from large population centers, with Knoxville located approximately 32 km (20 mi) to the east. TVA hydroelectric power dams at Norris and Watts Bar could provide the majority of the electrical power needed, and the Clinch River supplied a constant flowing source of water. The land was marginal for farming for the most part and could be purchased inexpensively. The area was accessible by rail and roadway. The topography of the site, with ridges separated by valleys, allowed for the separation of the various production facilities should an accident occur. Finally, the site was located far enough inland to preclude an enemy air attack (Johnson and Jackson 1981).

Acquisition of the property began in the fall of 1942, with initial plans calling for 52,000 acres of land to be acquired, although that would be later expanded to 59,000 acres. Unlike TVA, who had obtained almost all of its land through voluntary conveyance, the USACE filed a declaration of taking in Federal Court in Knoxville for 56,000 acres in Roane and Anderson Counties. This meant that many of the residents would be removed from their property before it had even been transferred and that no warning was required, although USACE generally allowed six weeks for the residents to leave. The prices paid for the land were generally insufficient for the owner to purchase comparable property elsewhere, and no financial assistance was given for the move. As the local residents were removed, the entire area was enclosed in barbed wire fencing and access was strictly controlled through seven gates, only three of which led directly into prohibited areas (Johnson and Jackson 1981).

By 1943, the MED area had been renamed the Clinton Engineering Works (CEW) and construction had begun. Plans called for the construction of four separate plants that would produce fissionable material in different ways. In February 1943, work began on a graphite reactor meant to produce small amounts of plutonium, designated X-10, and on Y-12, which used massive electromagnetic fields to separate U-238 and U-235. The construction of the plant where gaseous diffusion would be used to gather U-235, designated K-25, began in the fall of 1943. In 1944, a facility for the production of U-235 through thermal diffusion was constructed, S-50, but was quickly discontinued. K-25 was located near the Clinch River on the western edge of the reservation, with S-50 just west of it. The X-10 reactor was to the southeast in Bethel Valley, while the Y-12 plant was to the northeast of it on Bear Creek Road. The town of Oak Ridge was northeast of Y-12 in the northeastern corner of the reservation (Johnson and Jackson 1981).

## IV. METHODS

### Field Methods

The project area was investigated via systematic shovel testing and pedestrian survey. Areas with less than 50 percent surface visibility and less than 15 percent slope were shovel tested. Areas of greater than 15 percent slope, developed/obviously disturbed areas, and areas immediately adjacent to waterways were examined via pedestrian survey.

Shovel test probes (STPs) were performed at 30 m (100 ft) intervals on transects spaced 30 m apart within the site loci. When positive shovel tests were encountered, the interval was reduced to 15 m (49 ft) around the last positive shovel test to provide clear horizontal boundaries for the site without damaging the interior of the site. No shovel tests were excavated beyond the bounds of the project area.

Each shovel test measured approximately 35 cm (14 in) and was excavated to the culturally sterile subsoil where possible. Shovel test depths, soil descriptions, and recovered artifacts were recorded on standardized Shovel Test Forms developed by CRA. Soil colors were assigned using Munsell color charts,

and textures were described by United States Department of Agriculture standards. All soils were screened through .64-cm (.25-in) wire mesh, and all materials were retained for analysis, with the exception of obviously modern refuse such as plastic, aluminum can parts, and Styrofoam. Color photographs that illustrate the area and ground cover were taken of each site along the route. Written field notes were maintained by the field director.

## 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 analysis are discussed in each of the specific analysis sections of this report. All project related materials were prepared for curation in keeping with TDOA standards. All historic artifacts, field notes, records, and photographs will be curated at the University of Tennessee – Knoxville’s Department of Anthropology and prehistoric artifacts will be curated with the McClung Museum.

## V. MATERIALS RECOVERED

### Historic Materials Recovered

*Tanya A. Faberson, RPA*

#### *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 1.

Table 1. Historic Artifacts Recovered According to Functional Group.

Group	40RE613	40RE616	Total	Percent
Architecture	3	34	37	54.42
Clothing	1	1	2	2.94
Domestic	2	22	24	35.29
Furnishings	0	2	2	2.94
Maintenance/Subsistence	2	0	2	2.94
Personal	0	1	1	1.47
Totals	8	60	68	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 68 historic artifacts recovered during the current survey. The following provides a descriptive discussion of the types and age of artifacts recovered from Sites 40RE613 and 40RE616.

#### **Architecture Group (N = 37)**

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 = 6)*

Construction materials refer to all elements of building construction. For this project, the building materials collected consisted entirely of hand-made brick fragments (Table 2). 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).

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).

Table 2. Summary of Architecture and Clothing Group Items.

Class	Type	40RE613	40RE616	Total
<i>Construction material</i>	Brick	0	6	6
<i>Flat glass</i>	Window glass	0	2	2
	Plate glass	0	1	1
<i>Nails</i>	Indeterminate cut/wrought	0	1	1
	Late fully machine-cut	0	11	11
	Wire	3	9	12
	Indeterminate	0	4	4
<i>Clothing fastener</i>	Snap	1	0	1
<i>Footwear</i>	Leather upper/strap	0	1	1
	Totals	4	35	39

### *Flat Glass (n = 3)*

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. Three pieces of flat glass were recovered (see Table 2). Two were window glass, and one was plate glass. According to the Moir (1987) formula, the window glass fragments have thicknesses suggesting a date around 1885. However, since only two fragments were recovered, they are not considered reliable for contributing to the overall assessment of the temporal period of the site from which they came. The plate glass dates after 1917.

### *Nails (n = 28)*

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).

A total of 28 nails were recovered from the project area (see Table 2). Of the nails recovered, 1 was indeterminate cut/wrought, 11 were late fully machine-cut (Figure 12, Image a), 12 were wire-drawn (Figure 12, Image b), and 4 were indeterminate. The indeterminate wrought/cut nail was fragmentary, as were 8 of the late fully machine-cut nails, 10 of the wire nails, and all 4 indeterminate nails. Three of the late fully machine-cut nails were complete, and the pennyweights included 6d (n = 1) and 7d (n = 2). One wire nail had a 2d pennyweight, and 1 had a 12d pennyweight. All of the complete nails in the project assemblage were pulled. In general, smaller pennyweight nails are utilized for roofing, lathing, moulding, and finishing (2d–5d), while 6d nails are commonly used for light framing. Pennyweights of 7d–9d commonly are utilized for siding, and flooring and interior fittings; nails with pennyweights of 10d and above are most often utilized for flooring, boarding, wooden studding, rafters, and heavy framing (Faulkner 2000; Wentworth 1979). Overall, most the nails in the assemblage were pulled, indicating the disassembling and/or demolition of structures or other nail-fastened objects.



Figure 12. Examples of architecture group artifacts recovered: (a) pulled 7d (pennyweight) late fully machine-cut nail from Site 40RE616 STP 3, Zone I; (b) pulled 2d roofing wire-drawn nail from Site 40RE616 STP 5, Zone I; and (c) copper alloy clothing snap with attached woven cloth from Site 40RE613 STP 2, Zone I.

## Clothing Group (N = 2)

The clothing group includes buttons, clothing fasteners, footwear, and other clothing related items, such as belts, hats, and fabric (see Table 2). One clothing fastener and a footwear item were recovered. The clothing fastener consisted of a copper alloy snap with attached woven cloth (Figure 12, Image c). It was not assigned a specific date. The footwear item was a small piece of leather that appeared to be a shoe upper or at least a portion of a shoe strap. It appeared machine-stitched and likely dates to the twentieth century.

## Domestic Group (N = 24)

Artifacts included in the domestic group consisted of ceramics (n = 8), container glass (n = 13), and glass tableware (n = 3) (Table 3).

### *Ceramics (n = 8)*

The ceramics recovered were grouped into four major ware types: whiteware (n = 5), ironstone (n = 1), porcelain (n = 1), and stoneware (n = 1). Ceramics within each of these ware groups were separated into decorative types that have temporal significance. Each of these ware groups is reviewed below, followed by discussions of associated decorative types.

#### WHITEWARE (N = 5)

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. 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 Haggard 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. For this analysis, the primary determining factor in classification of a sherd as whiteware was the hardness and porosity of the ceramic paste.

Table 3. Summary of Domestic Group Items.

Class	Type	40RE613	40RE616	Total
<i>Ceramics</i>	Whiteware	1	4	5
	Ironstone	0	1	1
	Porcelain	0	1	1
	Stoneware	0	1	1
<i>Container glass</i>	BIM	1	2	3
	ABM	0	10	10
<i>Glass tableware</i>	Press-molded	0	3	3
	Totals	2	22	24

#### Plain/Undecorated (n = 4)

This decorative type includes vessels with no decoration. While some researchers such as Lofstrom et al. (1982:10) and Wetherbee (1980) include molded designs with “plain” whiteware, this report agrees with Majewski and O’Brien (1987:153) that molded vessels should be grouped on their own. Plain whiteware vessels became very popular following the Civil War and continued in popularity throughout the late nineteenth and early twentieth centuries (Faulkner 2000). Bacteriological research emerged after the Civil War, and it was not long before it became widely known in the medical community that there was a link between bacteria and disease (Duffy 1978:395). Bacteria could not be seen with the naked eye, however, and in spite of efforts by health officials to educate the public with regard to the connection between illness and bacteria, most people still held to the filth and miasmatic theories of disease (Rogers 1997:550). As the public became more educated on the subject, these ideas merged, and it became commonly thought that plain, undecorated wares were best suited for maintaining and serving bacteria-free food. That is, the public equated the simple, “clean” appearance of undecorated wares with the purity (i.e., bacteria-free) and cleanliness of what they were eating. The ceramic manufacturing industry followed suit in this line of thinking and met market demands, producing primarily plain wares, which resulted in increased competition between whiteware and ironstone manufacturers.

Purity crusades also indirectly helped increase the popularity of plain, white vessels in the late nineteenth and early twentieth centuries as social reformers—many of whom were white and middle class—focused on cleaning up city streets, improving sanitation, and ridding cities of disease epidemics. Part of this crusade was the public promotion of purity at the dinner table. Unfortunately, many of these white public health reformers were also motivated by Social Darwinist ideas, and sanitation problems and disease epidemics were often blamed on African Americans and East-European immigrants who were stereotyped as being the harbingers of disease and social decay (Friedman 1970:123).

Four undecorated whiteware sherds were recovered during the current project. All were too small to determine whether they were from plain vessels or whether they were undecorated parts of decorated vessels. These sherds were assigned a general date range of 1830 to the present (Majewski and O’Brien 1987:119). Identifiable vessel forms among the undecorated whiteware sherds included one plate and one teacup.

#### Decal (n = 1)

Decal decoration was rare before 1900 on ceramics other than imported porcelains (Majewski and O’Brien 1987:147). The process of decalomania consists of applying decals—designs printed on a film or paper—to ceramic vessels. This decorative technique is often confused with transfer printing; however, decals can be distinguished from transfer prints by the sharpness of the design, the presence of shading, the use of bright colors, and the slight relief often felt when touching the edge of a decal design (Majewski and O’Brien 1987:146). Decals are applied to vessels prior to the final firing and are usually put through the decorating kiln in order to harden the decal for permanency. The decals include stipple and line-engraved motifs created using a lithographic process in an assortment of colors (Majewski and O’Brien 1987:36).

In contrast to the polychrome sprig and broadline floral style popular in the mid-nineteenth century, floral decals are characterized by their use as a border or vessel accent. Frequently, these appeared as small sprays of flowers applied off-center and often were applied in conjunction with thin-line border stripes, raised-border motifs, hand painting, and gilding (Majewski and O’Brien 1987:36). Occasionally, decals were lightly touched up by hand in order to give a hand-painted appearance. Majewski and O’Brien (1987) suggest that this motif began in the late 1800s as an inexpensive alternative to multi-colored hand-painted techniques. Decals remained a popular method of decoration until the introduction of new decorating methods, including chromatic glazes and silk screening in the mid-twentieth century (Błaszczuk 2000:155). Decal decorations can occur on whiteware, ironstone, and porcelain.

One whiteware sherd with decal decoration was recovered during the current project (Figure 13, Image a). It had been part of a teacup at one time and dates from 1880 to 1940 (Blaszczyk 2000:155; Majewski and O'Brien 1987:147; Wegars and Carley 1982).

IRONSTONE (N = 1)

Ironstone is a white or gray-bodied, refined stoneware with a clear glaze. It is often indistinguishable from whiteware. Ironstone differs from whiteware in that the body is more vitreous and dense. In addition, a bluish tinge or a pale blue-gray cast often covers the body. In some cases, a fine crackle can be seen in the glaze; however, this condition is not as common as it is in whiteware (Denker and Denker 1982:138).

Confusion in the classification of white-bodied wares is further compounded by the use of the term as a ware type or trade name in advertising of the nineteenth century. Both ironstones and whitewares were marketed with names such as "Patent Stone China," "Pearl Stone China," "White English Stone," "Royal Ironstone," "Imperial Ironstone," "Genuine Ironstone," "White Granite," and "Granite Ware" (Cameron 1986:170; Gates and Ormerod 1982:8). These names do not imply that true ironstone was being manufactured. Some investigators avoid the distinctions entirely by including ironstones as a variety of



Figure 13. Examples of domestic group artifacts recovered: (a) decal-decorated whiteware teacup body sherd from Site 40RE616 STP 3, Zone I; (b) salt-glazed stoneware body sherd from Site 40RE616 STP 3, Zone I; (c) aqua BIM embossed recessed panel medicine bottle fragment from Site 40RE613 STP 1, Zone I; (d) clear ABM embossed recessed panel medicine bottle fragment from Site 40RE616 STP 3, Zone I; and (e) clear press-molded glass tableware body sherd from Site 40RE616 STP 8, Zone I.

whiteware. Others, however, such as Wetherbee (1980), refer to all nineteenth-century white-bodied earthenwares as ironstone. For this analysis, the primary determining factor in classification of a sherd as ironstone was the hardness and porosity of the ceramic paste. Sherds with a hard vitreous paste were classified as ironstone.

Charles James Mason is usually credited with the introduction of ironstone (referred to as Mason's Ironstone China) in 1813 (Dodd 1964:176). Others, including the Turners and Josiah Spode, produced similar wares as early as 1800 (Godden 1964). As a competitive response to the highly popular oriental porcelain, British potters initiated this early phase of ironstone production. The ironstone of this early phase bears a faint blue-gray tint and oriental motifs, much like Chinese porcelain. A second phase of ironstone began after 1850 in response to the popularity of hard paste porcelains produced in France. This variety of ironstone had a harder paste and reflected the gray-white color of French porcelains.

While some ironstones continued to use oriental design motifs after 1850, the general trend was toward undecorated or molded ironstones (Collard 1967:125–130; Lofstrom et al. 1982:10). Ironstone continued to be produced in England, and after 1870, it was also manufactured by numerous American companies. For many years, classic ironstone—the heavy, often undecorated ware—had been frequently advertised as being affordable and suitable for “country trade” (Majewski and O'Brien 1987:121). By the late 1800s, these thick, heavy ironstones began losing popularity and were often equated with lower socio economic status (Collard 1967:13). At the same time, ironstone manufacturers began shifting to thinner, lighter weight ironstones. As a result, this type of ironstone became popular tableware in American homes during most of the twentieth century (Majewski and O'Brien 1987:124–125). In spite of the shift towards thinner and lighter ironstones, heavy ironstone remained on the market and continues to be popular in hotel/restaurant service (hence, this heavy, twentieth-century ironstone is sometimes called “hotelware”) (Myers 2010). However, its production for home use all but ceased by the second decade of the twentieth century (Lehner 1980:11).

One ironstone sherd was recovered during the current project (see Table 3). It was a plain saucer rim and dates after 1830 (Majewski and O'Brien 1987:122).

#### PORCELAIN (N = 1)

Porcelain is the name given to high-temperature fired, translucent ware. This ware type was first developed by the Chinese. Chinese, or hard paste, porcelain was introduced to Europe by Portuguese sailors that had traveled to China during the sixteenth century. The formula for true, or feldspathic, porcelain was not discovered in Europe until 1708 and not marketed until 1713 (Boger 1971:266). The production of true porcelain was limited to three factories in England; all other products were softer porcelains made with glass, bone ash, or soapstone. Porcelain made with bone ash, often called “bone china,” became the preferred product after 1800, since the paste was harder and the ware was cheaper to produce with bone than with glass or soapstone (Mankowitz and Haggard 1957:179). Among the more affluent households in Europe and North America, porcelain was a common tableware used during the eighteenth and nineteenth centuries (Fay 1986:69). Porcelain production in America was not successful until 1826, and the number of porcelain factories in the United States remained small throughout the nineteenth century. In the lab, bone china can be differentiated from hard paste porcelain by placing it under ultraviolet light. Bone china fluoresces blue-white while hard paste porcelain fluoresces magenta (Majewski and O'Brien 1987:128).

One hard-paste porcelain sherd was recovered (see Table 3). It had a molded design and appeared to have been part of a small vessel at one time, likely a salt or pepper shaker. It dates between 1860 and 1900 (Faulkner 2000).

#### STONEWARE (N = 1)

Stoneware served as the “daily use” pottery of America, particularly rural America, after its introduction during the last decade of the eighteenth century. By 1850, this ware generally replaced coarse redware as the primary utilitarian ware used in American households. Stoneware is a semi-vitreous ware

manufactured of a naturally fine, but dense, clay. The pottery was fired longer and to a higher temperature than earthenwares; a kiln temperature of at least 1,200 to 1,250 degrees Celsius had to be obtained (Cameron 1986:319; Dodd 1964:274–275). As a result, stoneware generally exhibits a hard body and a very homogeneous texture. The paste may vary from gray to brown, depending on the clay source, and length and intensity of the firing.

Because this ware is fired at such high temperatures, its body is nonporous and well suited to liquid storage. Stoneware, as mentioned, was not typically manufactured as a refined ware (such as its cousin, ironstone, or eighteenth-century refined white salt-glazed stoneware), and hence, it was, for the most part, utilized for utilitarian activities associated with jars, churns, crocks, tubs, jugs, mugs, pans, and pots. These vessels were typically glazed, with salt glazing and slip glazing most common.

Although refined salt glazing was practiced in England during the eighteenth century, by 1780, the production of English salt-glazed tableware had been virtually supplanted by the manufacture of cream colored earthenwares (Lewis 1950:29). The salt-glazing technique continued to be utilized for utilitarian vessels, however, and was eventually introduced to the United States in the early nineteenth century. Salt glazing was accomplished by introducing sodium chloride into the kiln during the firing process, at which point the salt quickly volatilized. The vapor reacted with the clay to form a sodium aluminum silicate glaze (see Billington 1962:210; Dodd 1964:239). The surface of the glaze is typically pitted, having what is commonly known as an “orange peel” effect.

Stoneware may also be coated with a colored slip (a suspension of fine clay and pigment). The Albany slip—named after the rich brown clay found near Albany, New York—first appeared in the 1820s. Initially, it was mainly used for the interior of stoneware vessels. However, by the 1850s, it was also used as an exterior glaze. Bristol slip, an opaque white slip, was introduced late in the nineteenth century. When used in combination with Albany slip, Bristol-slipped stoneware vessels have a general date range of 1880–1925 (Ketchum 1983:19; Raycraft and Raycraft 1990:5).

A third glaze often used on stoneware is the alkaline glaze. Like the Albany slip, it was developed in the 1820s. The basic alkaline glaze is made up of wood ash, clay, and sand. Other additions may be slaked lime, ground glass, iron foundry cinders, or salt. These additions affected the color and texture of the glaze. Colors vary from olive to brown to a gray-green or yellowish hue, depending on adjustments in proportion of ingredients (Ketchum 1991:9). Although not as prevalent, alkaline glazing has been used in combination with salt glazing. This causes the stoneware vessel to exhibit the colors of alkaline glazing with the pitted texture of a salt glaze.

One stoneware sherd was recovered during the current survey (see Table 3). It was salt glazed on the exterior and Albany slipped on the interior (Figure 13, Image b). It dates between 1820 and 1925 (Greer 1999; Ketchum 1983).

#### *Container Glass (n = 13)*

Research by Baugher-Perlin (1982), Jones and Sullivan (1985), Lindsey (2018), and Toulouse (1971) was used to analyze and date the container glass assemblage. Glass color was the only attribute that could be used for dating those fragments that were not identifiable as to type of manufacture.

The approximate date of manufacture for bottles and bottle fragments recovered from the project area was established by determining the manufacturing process associated with the bottle (i.e., creation of the base and lip of the container) and using any patent or company manufacturing dates embossed on the bottle.

When examining glass vessels, bottle lips can be informative. A lipping tool, patented in the United States in 1856, smoothes and shapes the glass rim into a more uniform edge than a hand-smoothed lip or “laid-on ring.” Certain types or styles of lips were associated with specific contents; for example, medicines were often contained in bottles with prescription lips (Jones and Sullivan 1985). A “sheared,” or unfinished, bottle lip typically dates before 1880.

Lipping tools were used throughout the middle and end of the nineteenth century until the advent of the fully automatic bottle machine (ABM) in 1903. It should be noted, however, that as automated bottle manufacture became available after the turn of the twentieth century (see below), tooled finishes continued to be produced—albeit in steadily decreasing numbers. That is, there is a lag time between tooled finishes and ABM finishes, and although ABM glass is given an inception date of 1903, most tooled-glass vessel sherds will be given a terminal date around the 1920s due to this lag time, unless other diagnostic characteristics are observed enabling one to give it an earlier terminal date.

Color also is an important aspect of container glass identification, and oftentimes it is used to date vessels/sherds in conjunction with other diagnostic characteristics. In the event that no other manufacturing characteristics are observable, glass color alone can be used to date container glass. Jones and Sullivan (1985) observed that chemicals color glass, either as natural inclusions or additions by the manufacturer. “Black glass” is one of the earliest glass colors, possibly dating back to mid-seventeenth-century Europe. It was not actually black, but more of a very dark olive green or olive amber. The coloring of the glass was usually the result of high iron concentrations as well as carbon, copper with iron, and/or magnesia (Jones and Sullivan 1985). It was called black because the color was so deep as to appear black unless held up to direct lighting (McKearin and Wilson 1978:9). “Black glass” protected contents from the effects of direct light and was strong and resilient. Typically, black glass was utilized for liquor, wine, and ale/beer, and was mass produced for ale and beer between 1840 and the 1880s (Lindsey 2018; Wilson and Wilson 1968). According to McKearin and Wilson (1978:229–232), black glass container sherds are not typically found on sites dating after 1880.

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). Amber glass had a general application in the mid-nineteenth century, but was not widely used until after 1860. Cobalt glass is produced with the addition of the coloring agent cobalt oxide to the glass batch (Lindsey 2018). The introduction of what Lindsey (2018) calls “true blue” glass began in 1840 with the production of soda, mineral water, and ink bottles.

With the growing public desire to see the contents of the bottles, clear glass came into demand and was popular beginning in the 1860s with the burgeoning public health movements following the Civil War (Baughner-Perlin 1982:261; Wiebe 1967). However, it should be noted that clear glass was available to a limited degree before this time, especially colorless leaded glass, which dates between 1827 and 1875 (Jones 2000:149, 161; Miller and Sullivan 1984). Opaque white, or “milk,” glass has been manufactured as long as glass has been made, but milk glass became common in the late nineteenth and twentieth centuries as it became frequently used in “containers, tablewares, and lighting devices” (Jones and Sullivan 1985:14). Aqua and olive colored glass were also used for many different containers, but they generally are not assigned specific dates due to their long period of use over the last several centuries. In some cases, however, aqua glass blown in mold sherds with no other diagnostic characteristics are assigned a date range of 1800–1920, and olive green sherds are given a date range of 1780–1920.

The manufacturing process can be roughly divided into three basic groups including free blown, blown in mold (BIM), and automatic bottle machine manufactured (ABM) vessels (Baughner-Perlin 1982:262–265). BIM and ABM glass were recovered from the current project. Each process is discussed separately below.

## BLOWN IN MOLD (BIM) (N = 3)

Most molded bottles are constructed in pieces and have distinctive seams. The dip mold was used from the late seventeenth through the mid-nineteenth century (Baugher-Perlin 1982:262). It leaves no seams, unless glass adhered to the edges of the bottle mold as it was attached to the free blown shoulder and bottle neck. The key mold, on the other hand, was a type of two-piece mold that was used from about 1750 to 1880 (Jones and Sullivan 1985:27). Key mold seams cross the base and are concealed in the corners of a flat-sided body.

The turn paste mold was used from circa 1870 to the early twentieth century and does not contain seams because the glass is blown into a container that is spun. The glass conforms to the mold from the centrifugal force produced. Vessels formed from this process usually have faint horizontal lines from the spinning process. The three-part mold has seams running around the shoulder of the vessel and partially up the neck of the vessel. This style of mold lost popularity around 1870. The blow back mold was another mold type, and this was used in the manufacture of jars such as the distinctive Mason jar, which was patented in 1858.

Embossing on container glass vessels was made possible by engraving the mold the glass was blown into. This was first conducted in the mid-eighteenth century and continued into the twentieth century. The panel bottle came into popular existence around 1860, and the shape of this vessel was useful because the name of the commodity or the manufacturing company could be changed on the bottle form by substituting a different “slug-plate” into the mold. This process can be identified through the distinctive seams, since they follow the rectangular shape of the nameplate. The date of the manufacturer’s patent on the bottle and the name of the company, when present, can often be utilized to determine a date of manufacture for the container.

The finish is the top part of the neck of a bottle or jar made to fit the cork or other closure used to seal the vessel. The finish is often simply referred to as either the lip or rim. Glass factories in the late nineteenth and early twentieth centuries produced a wide variety of finishes for their containers (Jones and Sullivan 1985:78). Finishes were formed by manipulating the glass at the end of the bottle neck, by shaping glass added to the end of the neck, by the lipping tool, or by being blown into a mold (Jones and Sullivan 1985:79). The term “finish” originated with the mouth-blown bottle manufacturing process where the last step in the completion of a finished bottle was to “finish the lip.”

Mouth-blown bottles were removed from the blowpipe by two primary methods: either through the cracking-off process or by shearing the neck off of the blowpipe. Once this was completed the bottle was reheated in a furnace to smooth out the sharp edges where the blowpipe was detached (Lindsey 2018). This method, referred to as fire polishing, was completed even if no specific finish was to be formed. Once this method was complete a finish could be either added or formed on the top of the bottle neck. These finish types included a laid-on ring, a rolled finish, a flared or flanged finish, an applied finish, and a tooled finish. The most commonly found finish types are the applied finish and the tooled finish. An applied finish was created when applied hot glass is added at the point where the blowpipe was removed. This applied hot glass was manipulated with various tools in order to form a wide variety of finish styles (Lindsey 2018). A tooled finish was created by reheating the severed end of the bottle near the neck. Once reheating or refiring the end of the neck was accomplished, a lipping tool was inserted into the neck of the bottle and rotated while squeezing the jaws to form the finish desired.

Three BIM glass sherds were recovered during the current survey (see Table 3). One was an aqua recessed panel medicine bottle fragment that was embossed, “ONIC” (Figure 13, Image c). The former contents of the bottle are unknown, although there is a great likelihood that this was some sort of tonic. It dates between 1865 and 1920 (Berge 1980; Fike 1987:5; Lindsey 2018; Miller and Sullivan 1984). The other two pieces of BIM glass were body sherds. One was clear, and the other was aqua. The vessel forms are unknown.

#### AUTOMATIC BOTTLE MACHINE (ABM) (N = 10)

The Owens automatic bottle-making machine was patented in 1903 and creates suction scars and distinctive seams that run up the length of the bottle neck and onto the lip. Bottles were being manufactured regularly with this machine by 1905, and by 1907, it was utilized to produce significant quantities of container glass vessels (Lindsey 2018; Miller and McNichol 2002). Hence, the ABM mold provides a firm manufacturing date at the beginning of the twentieth century. Another automatic bottle machine called the Individual Section was also used in the commercial production of bottles. This machine was widely used starting in 1925 and by 1940 became the most widely used bottle manufacturing device (Jones and Sullivan 1985:39). This bottle machine was more cost effective than the Owens machine, which was no longer used after 1955.

There were 10 glass fragments assigned to the ABM category during the current project (see Table 3). One of these was an aqua recessed panel medicine bottle fragment embossed, “VER”. The former contents of the bottle are unknown (Figure 13, Image d). One clear recessed panel bottle sherd also was recovered, as was a clear medicine vial sherd. Seven clear sherds also were recovered that could not be categorized as to vessel form. All of the ABM glass recovered dates after 1903.

#### *Glass Tableware (n = 3)*

Press molding was first used (although on a very small scale) in England in the late seventeenth century to make small solid glass objects, such as watch faces and imitation precious stones (Buckley 1934). By the end of the eighteenth century, decanter stoppers and glass feet for objects were also being produced (Jones and Sullivan 1985). The production of complete hollowware glass objects did not become possible until there were innovations in press-molded techniques in the United States during the late 1820s (Watkins 1930). Mass production of press-molded glassware was well established by the 1830s (Watkins 1930).

Earlier press-molded glass objects were predominately made of colorless lead glass (Jones and Sullivan 1985). William Leighton of the Hobbs-Brockunier Glass Works in Wheeling, West Virginia, invented lime glass. This type of glass looked like lead glass, had superior pressing attributes, and was much more inexpensive than lead glass (Revi 1964). Advancements in mold technology in the 1860s and 1870s led to the application of steam-powered mold operation. This in turn led to increased production and reduced costs (Revi 1964). Modern press molding is conducted entirely by machine (Jones and Sullivan 1985).

Press-molded table glass was made by dropping hot pieces of glass into a mold. A plunger was then forced into the mold, pressing the hot glass against it. The outer surface of the glass took on the form of the mold, while the inner surface of the glass was shaped by the plunger. The plunger was withdrawn and the glass object was removed from the mold. The surface of the glass was often fire polished to restore the brilliance of the glass surface that was disturbed by its contact with the mold (Jones and Sullivan 1985).

Press-molded glass may be recognized by several characteristics. Usually, the glass object must be open-topped in order for the plunger to be withdrawn from the mold. Narrow mouthed vessels were produced, but additional manipulation of the glass was necessary after the plunger was removed from the mold. Evidence of this manipulation should be present on the vessel (Jones and Sullivan 1985). There is no relationship between the exterior shape and design of a press-molded vessel to the interior shape and design because the plunger shapes the interior of the object most often leaving behind a smooth surface. This differs from earlier glass vessel production techniques like blown glassware, where interior shape was related to the exterior shape and design (Jones and Sullivan 1985).

Another characteristic of press-molded containers was that mold seams were generally present. The seams were sharp and distinct, unless steps had been taken to deliberately remove them. The texture of the glass surface of press-molded glass was disturbed and often disguised by an all-over stipple design. The edges of the designs on press-molded glass had a predisposition toward rounded edges. The bases of press-molded objects were usually polished. The quality of the designs on press-molded glassware was precise and the design motifs were numerous (Jones and Sullivan 1985).

In contrast to press-molded glass, cut glass generally had a polished, smooth, and glossy surface texture. The design edges were sharp and distinct. Cut glass designs consisted mostly of panels, flutes, and miters. The designs were often slightly uneven and asymmetrical. Mold seams were usually absent; they were polished off prior to cutting (Jones and Sullivan 1985). Contact-molded glass also differs from press-molded glass in that the exterior and interior of the vessel will portray parallel patterns. The interior of the vessel is also generally much more diffuse towards the base.

Three pieces of glass tableware were recovered (see Table 3). All were clear and press molded with a patterned design (Figure 13, Image e). No vessel forms were identifiable. They were assigned a date range of 1864 to the present.

### **Furnishings Group (N = 2)**

The furnishings category includes artifacts usually associated with the home or building, but that are not elements of the actual construction. Both furnishings group artifacts recovered during the current survey were lighting items (Table 4). One was a milk glass lamp shade fragment dating after 1880 (Figure 14, Image a) (Belknap and McKearin 1949). The other was a piece of lamp chimney glass dating between 1854 and 1940 (Faulkner 2008:100; Pullin 1986).

### **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, and fuel-related items such as coal. Two items were assigned to the maintenance and subsistence group (see Table 4). One was an iron/steel handle from a case or chest, such as what one would expect to find on a tool box (Figure 14, Image b). It was not assigned a specific date. The other item was a paint can rim fragment. It dates after 1906 (Berge 1980:261–262).

### **Personal Group (N = 1)**

The personal group includes artifacts assumed to have belonged to individuals. This category of artifacts includes health and grooming items, jewelry and beads, coins, music and art items, personal items, toys, and games. Tobacco products are also subsumed into this category. One toy artifact was recovered (see Table 4). One bisque porcelain doll body fragment was recovered (Figure 14, Image c). It dates from 1860 to 1925 (Coleman et al. 1968:74, 582).

## **Discussion**

There were 68 historic artifacts recovered during the current survey. The material collected is discussed in detail above, and summarized below in the individual site discussions.

**Site 40RE613:** A total of eight historic artifacts were recovered from this site. These included three wire nail fragments dating after 1880, one piece of undecorated whiteware dating after 1830, one aqua BIM recessed panel medicine bottle embossed “ONIC” dating between 1865 and 1920, one iron/steel chest/case handle, one paint can rim dating after 1906, and a metal clothing snap of an indeterminate date.

While very few artifacts were recovered from this site, the items in the assemblage suggest a possible date range for the site of late nineteenth to mid-twentieth century. One earlier historic map dating to 1895 generally only demarcates community locations and not structures, but it is notable that the site is shown near the community of Bear, however, a structure is shown in that location in 1935 on another available map. Based on the map data, the dwelling was constructed sometime before 1935, and the artifact assemblage is consistent with a domestic ‘farmstead/residence’ dating to at least the early twentieth century if not the turn of the twentieth century. Unfortunately, little can be said about the daily lifeways of the former site occupants based on the artifacts that were recovered. From what was recovered, the occupants likely used refined white earthenware tablewares, and they purchased at least one patent medicine.

Table 4. Summary of Furnishings, Maintenance and Subsistence, and Personal Group Items.

Class	Type	40RE613	40RE616	Total
<i>Lighting</i>	Lamp shade	0	1	1
	Lamp chimney	0	1	1
<i>Other maint/sub</i>	Case/chest handle	1	0	1
<i>Cans</i>	Paint can	1	0	1
<i>Toys and games</i>	Doll part	0	1	1
	Totals	2	3	5



Figure 14. Examples of furnishings, maintenance and subsistence, and personal group artifacts recovered: (a) milk glass lamp shade fragment from Site 40RE616 STP 3, Zone I; (b) iron/steel case/chest handle from Site 40RE613 STP 2, Zone I; and (c) bisque porcelain doll part from Site 40RE616 STP 3, Zone I.

**Site 40RE616:** A total of 60 historic artifacts were recovered from this site. These included 34 architecture group items, as well as clothing (n = 1), domestic (n = 22), furnishings (n = 2), and personal (n = 1) group items.

The construction materials in the architecture group consisted entirely of hand-made brick fragments, which date between 1800 and 1880. The flat glass included both window glass (n = 2) and plate glass (n = 1). The thicknesses of the window glass fragments were the same, and their measurement loosely suggests a date of 1885 using the Moir (1987) formula. The plate glass dates after 1917. A total of 25 nails were recovered from the site, and these included 1 was indeterminate cut/wrought nail, 11 late fully machine-cut nails, 9 wire nails, and 4 indeterminate nails. The indeterminate wrought/cut nail was fragmentary, as were 8 of the late fully machine-cut nails, 7 of the wire nails, and all 4 indeterminate nails. The pennyweights of the late fully machine cut nails were 6d (n = 1) and 7d (n = 2). The complete wire nails had pennyweights of 2d and 12d. All of the complete nails in the site assemblage were pulled. The clothing item recovered from this site consisted of a leather shoe upper or possible shoe strap with machine stitching. It likely dates to the twentieth century.

Twenty-two domestic group items were recovered from this site. These included ceramics (n = 7), container glass (n = 12), and glass tableware (n = 3). The ceramics included whiteware (n = 4), ironstone (n = 1), porcelain (n = 1), and stoneware (n = 1). Three of the whiteware sherds were undecorated and date after 1830. One teacup and one plate were identified. The fourth whiteware sherd was decal decorated, and it dates between 1880 and 1940. This sherd had been part of a teacup at one time. The ironstone sherd dates after 1830 and had been part of a saucer at one time. The porcelain sherd was molded and had been part of a small serving container, such as a salt or pepper shaker. It dates between 1860 and 1900. The stoneware sherd was salt-glazed on the exterior and Albany slipped on the interior. It dates between 1820 and 1925. Its vessel form is unknown. In general, the ceramics date from the late nineteenth century into the early to mid-twentieth century.

The container glass recovered from this site included BIM (n = 2) and ABM (n = 10). Both BIM fragments were body sherds. One was clear and the other, aqua. They date from the nineteenth into the early twentieth century. One ABM sherd was clear and embossed "VER." It had been part of a recessed panel medicine bottle at one time. Its former contents are unknown. Another clear recessed panel ABM sherd was recovered, but it was not embossed. The remaining ABM sherds were body sherds, and all were clear. Only one was identifiable as to vessel form, and it was a vial. Glass tableware (n = 3) recovered from the site was clear and press molded with a design/pattern. All three date after 1864 and the vessel forms are unknown.

The furnishings group artifacts recovered from this site included a piece of a milk glass lamp shade dating after 1880 and a piece of lamp chimney glass dating between 1854 and 1940. The single personal group item was a bisque porcelain doll part dating between 1860 and 1925.

Site 40RE616's historic artifact assemblage had an average date range of 1855–1924, and the mean date is 1890. The presence of mostly architectural and domestic group artifacts is consistent with the known use of the site as a domestic 'farmstead/residence'. The first available historic map showing a structure within the vicinity of the site dates to 1935. One earlier historic map dating to 1895 generally only demarcates community locations and not structures, but it is notable that the site is shown near the community of Bear. It is not known exactly when the house was constructed, but based on the materials recovered from the site during the current survey, it likely was in the late nineteenth century, at least by the 1870s or early 1880s. The domestic artifacts indicate that the site residents used both refined and utilitarian ceramics and purchased at least one patent medicine. They also used patterned glass tableware. Children were likely present at the site based on the presence of the doll part, but adults have been known to collect dolls as well. The residents were relocated and the house was demolished sometime between 1941 and 1943. Little more can be said regarding the daily lifeways of the former site occupants based solely on the cultural materials.

# Prehistoric Materials Recovered

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## Lithic Analysis

The current archaeological investigations recovered nondiagnostic prehistoric lithic artifacts at three archaeological resources (40RE616, 40RE617, and IF 1). The purpose of the following analysis was to provide an inventory of the recovered materials and an assessment of the likely temporal, spatial, and behavioral factors involved in the formation of the lithic assemblage. Analysis of the recovered lithic artifacts included flake debris analysis and technological analysis of the modified implements. The assemblages recovered from each of these archaeological resources will be described and analyzed in the following sections.

### *Laboratory Methods*

Lithic materials recovered from each of the sites were processed in three steps prior to analysis. The first step was to sort material into several general artifact categories (i.e., flake debris, cores, and modified implements). The second step consisted of recording attributes of these artifacts into a computer-coding format. The final step was to enter all artifact codes into a Microsoft Access® database, where data could later be manipulated.

A paradigmatic classification system (Dunnell 1971:70–76) was used to code lithic artifacts for analysis. In this form of classification, dimensions, or mutually exclusive features, are recorded for each artifact. Within each dimension are several possible attribute states. Artifact classes can then be formed by the intersection of these attribute states (Dunnell 1971:73). The scale of investigation and the determination of the classes examined are guided by the questions being asked of the data. This form of analysis is preferred over typological formats for the following reasons:

- 1) Lithic reduction is a dynamic process; therefore, forcing lithic material into static “types” is counterproductive to actually understanding prehistoric lithic technologies.
- 2) No a priori assumptions are necessary concerning the meaning of classes, as is common in typological formats.
- 3) Mutually exclusive classes are formed.
- 4) Analysis is possible at various levels of detail.
- 5) Classification does not obscure artifact variability (i.e., functional, stylistic, technological, and morphological) to the extent that typologies do.
- 6) Classification allows several different analytical techniques to be used to support or reject hypotheses generated of the data.

A total of seven lithic artifacts weighing approximately 3.2 g were recovered from the three archaeological resources. Table 5 summarizes the lithic artifacts recovered during the investigations. All of the flakes were classified as nondiagnostic flakes. No cores or tools were identified in the various lithic assemblages.

Table 5. Summary of Lithic Artifacts by Site.

Site	Provenience	Zone	Depth (cm bgs)	Ct	Wt (g)	Raw Material	Reduction Stage
40RE616	STP 3	I	0-18	1	1.7	Burnt	Early
40RE617	STP 1	I	0-25	3	0.3		--
40RE617	STP 1	I	0-25	1	0.7	Indeterminate	Early
40RE617	STP 2	II	10-21	1	0.3		--
IF 1	STP 1	I	0-4	1	0.2		--

## *Raw Materials*

Raw material type was determined based on parent geological formation when possible. An Indeterminate category was used for flakes that could not be assigned confidently to a parent geological formation. Determination of raw material type was made using published descriptions and by comparisons with a sample collection of locally occurring chert housed at CRA. Flakes smaller than .25 inch were counted and weighed, and no additional attributes were recorded. Raw material type was not assessed for these flakes, as they often exhibit no diagnostic characteristics that can be used to confidently identify a raw material type. In addition, .25-inch screens were used in the field; therefore, flake debris smaller than .25 inch is probably underrepresented in the lithic sample.

## *Flake Debris Analysis*

Flake debris is defined here as lithic waste that exhibits evidence of intentional removal from a parent piece but no evidence of further modification. Flake debris is a useful indicator of prehistoric activities because it is ubiquitous on most sites, exhibits evidence of the stage of manufacture during which it was produced, and unlike modified implements, was usually deposited where it was generated. The flake debris analysis provides information concerning prehistoric lithic technology and, in conjunction with other analyses, aids in determining site use.

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 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.

## **Results of Analysis**

The field investigations recovered a sparse lithic assemblage consisting of nondiagnostic prehistoric flakes ( $n = 7$ ; 3.2 g). No cores or tools were identified among the combined assemblage. Of the seven flakes, only two (2.4 g) were larger than .25 inch. Of the two flakes, neither could be identified according to a known lithic raw material. One flake exhibited thermal damage and was classified as Burnt (1.7 g), while the other flake (.7 g) could not be identified to a known chert type. The remaining five flakes were smaller than .25 inch. Materials smaller than .25 inch in size were counted and weighed with no further attributes recorded. These items, however, were examined for the presence of tool fragments, none of which were found in any of the assemblages.

The small-sized nature of the combined flake debris assemblage precludes a more detailed interpretation of the lithic-related activities conducted at these sites. The presence of at least two individual raw materials indicates that the site inhabitants had incorporated a narrow range of lithic raw materials into their existing toolkit. The overall lack of thermally altered materials, such as thermal shatter or fire-cracked rock (FCR), suggests that various thermal activities, such as cooking or heating, was not the primary focus of the prehistoric occupations. The presence of a single Burnt flake at Site 40RE616 does indicate that some form of thermal feature was likely present on-site.

The lack of temporally sensitive, or otherwise diagnostic artifacts precludes a determination of the temporal and/or cultural affiliation of the prehistoric occupations. Little else can be said of the combined small-sized lithic assemblage.

#### *Site 40RE616*

Investigations at Site 40RE616 recovered a single flake made from a thermally altered Burnt chert (1.7 g). This flake was recovered in STP 3 in the upper 18 cm (7 in) of the existing ground surface. It was classified as an early stage flake.

The fact that this flake was made from a thermally altered raw material indicates that thermal features, such as hearths or other cooking features, were once likely present at the site. The lack of temporally diagnostic artifact(s) prevents an accurate determination of the temporal and/or cultural assignment of the former inhabitants of the site. Beyond the fact that unspecified lithic reduction activities had taken place at this location, little else can be said of this single artifact.

#### *Site 40RE617*

The Site 40RE617 investigations recovered a total of five flakes (1.3 g) from two shovel tests (STP 1 and STP 2). All but one of the flakes were recovered from the upper-most soil horizon at depths shallower than 25 cm (10 in) bgs. The remaining flake, a smaller than .25-inch flake recovered in STP 2, was collected from the second horizon at a depth between 10 and 21 cm (4 and 8 in) bgs.

Of the five flakes, only one was larger than .25 inch and was manufactured from an Indeterminate chert (.7 g). It was classified as an early stage flake. The remaining four flakes were smaller than .25 inch (.6 g). Raw material identification could not be determined from these small-sized flakes.

Little can be said of the lithic reduction activities that had occurred on-site. Raw material identification could not be determined for any of the flakes; thus source area(s) for the lithic raw materials could not be ascertained. The lack of temporally diagnostic lithic artifacts prevents the identification of the temporal/cultural affiliation of the prehistoric peoples that once occupied the site.

#### *IF 1*

This isolated find consists of a single smaller than .25-inch (.2 g) flake recovered from a shovel test. The flake was recovered from the upper 4.0 cm (1.6 in) of the current ground surface.

Given that this flake was made from an unspecified chert type (as it was smaller than .25 inch), no inference can be made of raw material utilization strategies. Beyond the fact that unspecified lithic reduction activities had taken place at this location, little else can be said of this single artifact.

## VI. RESULTS

During the course of the current survey, five previously unrecorded archaeological sites (Sites 40RE613–40RE617) were documented. A description of each of the sites is presented below, and the location of each site is depicted in Figure 2.

### Site 40RE613

Elevation: 268 m (880 ft) AMSL  
Component: historic  
Site type: Farmstead/residence  
Size: 1,650 sq m (17,760 sq ft)  
Distance to nearest water: 20 m (66 ft)  
Direction to nearest water: East

Type and extent of previous disturbance: 76–99 percent disturbed; destruction, fire, and erosion  
Topography: ridgeline  
Vegetation: secondary growth, young coniferous and deciduous trees  
Ground surface visibility: 0 percent  
Aspect: south, east, and west  
Recommended NRHP status: not eligible

## Site Description

Site 40RE613 was a light density subsurface scatter of historic artifacts with a standing stone chimney feature and a cellar/well depression feature. The site is located on a dissected upland ridge in the central project area, north of Bear Creek Road and south of Haul Road. The site is located 16 km (10 mi) southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee. It is characterized by secondary growth, as well as young coniferous and deciduous trees, that provided no ground surface visibility (Figure 15). The site was at an elevation of 268 m (880 ft) AMSL, sloping downward to the south, east, and west of the site.

The site was identified by a standing stone chimney and a well/cellar depression. A historic scatter was present in the topsoil of three positive shovel tests. The northern, eastern, and western boundaries were established by negative shovel test probes. The southern extent of the site was bounded by a drainage slope. The site measured 55 m (180 ft) north–south by 30 m (98 ft) east–west, covering a total of 1,650 sq m (17,760 sq ft). (Figure 16).

## Investigation Methods

A total of 16 shovel test probes were excavated in and adjacent to the site area. Three of the sixteen shovel test probes resulted in the recovery of artifacts. All artifacts were recovered from Zone I, the topsoil. All sediment from each of the shovel tests was visually inspected for cultural material and screened through .25-inch hardware mesh.



Figure 15. Overview of Site 40RE613, facing south.

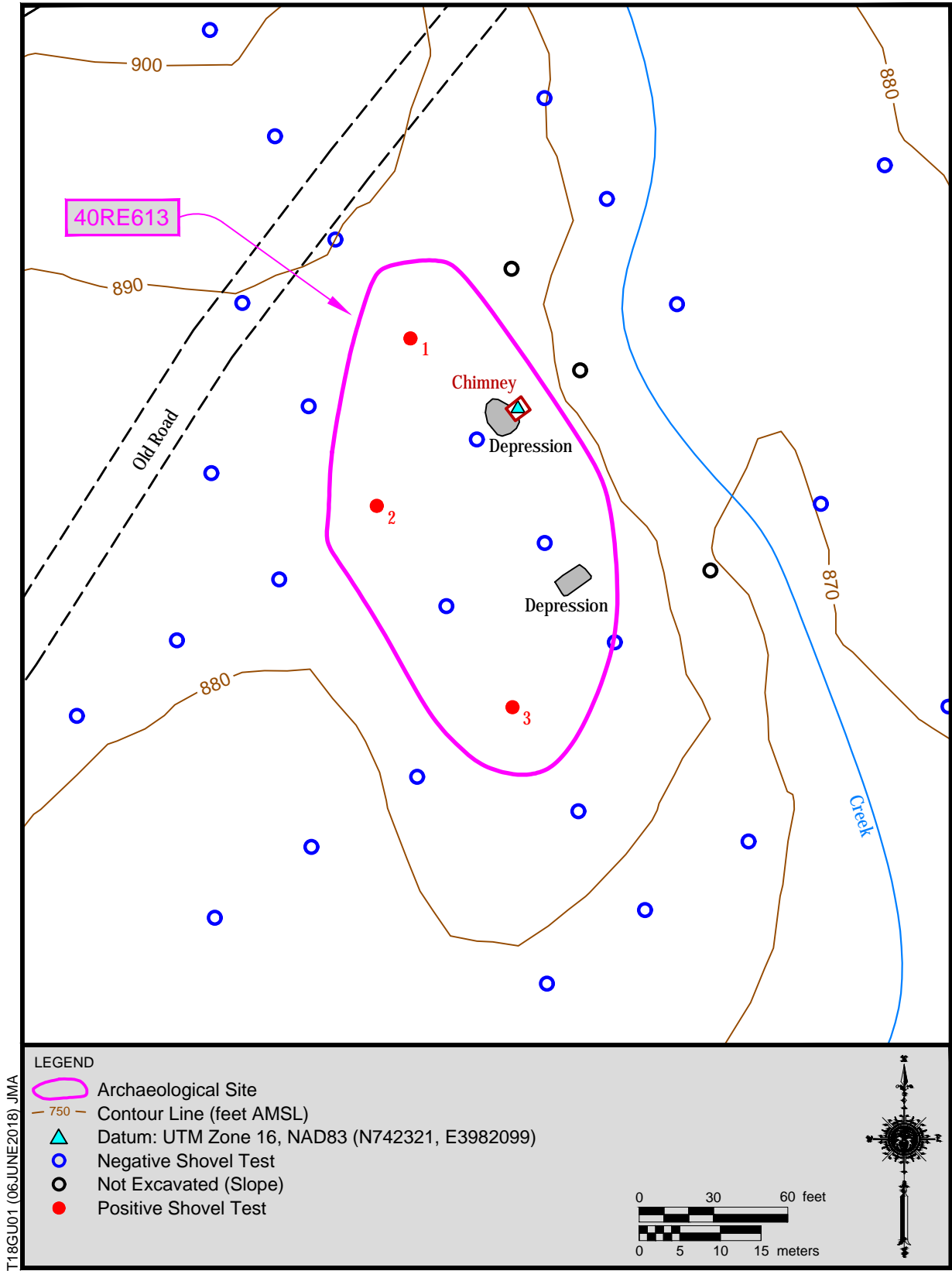


Figure 16. Site plan of Site 40RE613.

The artifacts from the positive shovel tests were collected and logged according to shovel test number and level. The site location was recorded on appropriate maps and a site map was sketched to show the position of shovel tests in relation to structures and topography. A site datum was established (STP 1) and its UTM coordinates were recorded on a Global Positioning System (GPS).

## Depositional Context

The site is located on topography mapped as belonging to the Apison soil series. Shovel testing revealed two soil horizons that were relatively consistent throughout the site. A typical shovel test consisted of a dark yellowish brown to brown (10YR 4/4 to 10YR 5/3) silty clay loam Zone I, which ranged in depth between 0 and 11–15 cm (4–6 in) bgs. Zone I was underlain by a yellowish brown (10 YR 5/6) silty clay loam Zone II subsoil with weathered shale (Figure 17). Artifacts were only found in Zone I in all positive shovel tests.

The soils at Site 40RE613 appeared to have been severely disturbed and eroded from the structure destruction and subsequent vegetation management. The topsoil at the site consisted primarily of subsoil (former B and C horizons). All artifacts at the site were recovered from the topsoil and, as such, have poor integrity.

## Artifacts

Historic materials recovered from Site 40RE613 consisted of eight artifacts, belonging to the architectural, domestic, and maintenance groups (Table 6). Architectural artifacts consisted of three wire nails dating after 1880. Domestic artifacts included a glass medicine bottle fragment and a whiteware ceramic sherd. The medicine bottle fragment was one aqua BIM recessed panel medicine bottle embossed “ONIC,” dating between 1865 and 1920. The whiteware dates after 1830. The maintenance and subsistence artifacts included one iron/steel chest/case handle and one paint can rim dating after 1906.

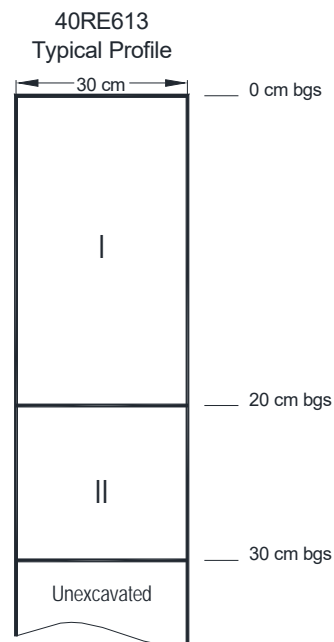


Figure 17. Typical soil profile for Site 40RE613.

Table 6. Artifacts Recovered from Site 40RE613.

Unit	Zone	Grid N	Grid E	Depth	Group	Class/Type	N =
STP 1	I	1000.00	1000.00	0–21 cm bgs	Domestic	BIM	1
STP 2	I	985.00	985.00	0–20 cm bgs	Architecture	Nails	3
STP 2	I	985.00	985.00	0–20 cm bgs	Clothing	Snap	1
STP 2	I	985.00	985.00	0–20 cm bgs	Domestic	Ceramic	1
STP 2	I	985.00	985.00	0–20 cm bgs	Maint/sub	Case/chest handle, paint can fragment	2
Total							8

The artifacts recovered from Site 40RE613 indicate a late-nineteenth- to mid-twentieth-century occupation. It is possible that the residence was constructed near the turn of the twentieth century due to early artifacts with open ended terminus dates.

## Features

Two features were observed, a standing stone chimney and a cellar/well depression. The chimney was approximately 8 m (20 ft) tall, composed of dry stacked limestone which was covered in vegetation (Figure 18). The depression was south of the chimney and appeared to be located outside the walls of the residence. The depression was 1 m (3 ft) in diameter and likely a cellar or a well and was, at the time of the survey, filled with water (Figure 19).

## Archival Data

*Kathryn Moore*

The earliest known landowner associated with Site 40RE613 (as well as Site 40RE614) is Thomas A. Cox and his wife Francis. It is unknown when he first acquired the property, but he was residing on the property from at least January 1912 to December 1912. In January of 1912, Thomas Cox deeded 106.5 acres to C. Ware, a resident of Pulaski, Kentucky, with the stipulation that Thomas and his wife would reside on the property until December 25th of that year (Roane County Clerks Office [RCCO] Deed Book [DB] C-4:315, Kingston, Tennessee). In 1914, C. Ware deeded the same 106.5 acres to Garrie Strickland (RCCO DB F-4:99). C. Ware is still listed as a resident of Pulaski, Kentucky, so it is unlikely that he ever resided on the property. In 1936, L.A. Strickland and his wife Garrie deeded the same 106.5 acres, now referred to as the Thomas A. Cox place, to W.L. Weaver and his wife Sarah. In 1946, the United States Atomic Energy Commission purchased the property as part of 108.7 acres from W.L. Weaver. It is unclear why the acreage changes from 106.5 acres in 1936 to 108.7 acres in 1946. It is possible that the land was resurveyed and the difference can be accredited to surveyor error.

## Summary and National Register Evaluation

Site 40RE613 was a ‘historic farmstead/residence’ dating from approximately the late nineteenth century to the mid–1940s. The structure was present on the 1935 and 1941 USGS topographic maps, but not on any later maps (USGS 1953, 1999). An 1895 topographic map marks the community of Bear in the approximate location of the site; other homes and structures in the vicinity would have been included in this community. When the atomic reservation was formed during the 1940s, the DOE razed most of the structures found within its boundaries. The structure was probably destroyed at this time.

The assemblage from Site 40RE613 consisted of a low density historic scatter, including only eight domestic and architectural artifacts. No deeply buried deposits were present and the depositional context of the artifacts was disturbed.



Figure 18. Standing limestone chimney, facing north.



Figure 19. Water filled cellar/well depression, facing north.

It is unlikely that further investigation of Site 40RE613 would produce information beyond that recorded during the current survey. The remains have poor depositional integrity. No historic artifacts were found below the topsoil. Furthermore, there is no evidence for belowground features. Site 40RE613 is not considered to have the potential to provide important information about local or regional history and is not eligible for the NRHP (Criterion D), and no further work is recommended. Therefore, cultural resource clearance is recommended.

## Site 40RE614

**Elevation:** 277 m (910 ft) AMSL

**Component:** historic

**Site type:** Farmstead/residence

**Size:** 225 sq m (2,422 sq ft)

**Distance to nearest water:** 120 m (394 ft)

**Direction to nearest water:** East

**Type and extent of previous disturbance:** 76–99 percent disturbed; destruction, fire, construction, and erosion

**Topography:** toe slope

**Vegetation:** secondary growth, young coniferous and deciduous trees

**Ground surface visibility:** 0 percent

**Aspect:** none

**Recommended NRHP status:** not eligible

### Site Description

Site 40RE614 consists of a standing stone chimney feature with no associated artifacts. The site is located on a landform that was once a toe slope in the central project area, north of Bear Creek Road and immediately south of Haul Road, surrounded by disturbance. The site is located 16 km (10 mi) southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee. The site is characterized by secondary growth, as well as young coniferous and deciduous trees, and the ground surface was covered by heavy undergrowth, leaf litter, and ground vegetation (Figure 20). The site was at an elevation of 277 m (910 ft) AMSL with slope to the south of the site.

The site was identified by a standing stone chimney surrounded by orange safety fencing with a DOE “historical site” marker. Disturbance defined the boundaries of the site. Haul Road formed the northern boundary of the site, a gravel road along the eastern boundary, and a borrow/spoil pile marked the southern and western boundaries.

No positive shovel probes were identified, and the site was bounded by disturbance on all sides. The site measured 15 m (49 ft) north–south by 15 m (49 ft) east–west, covering a total of 225 sq m (2,422 sq ft) (Figure 21).

### Investigation Methods

A total of four shovel tests were excavated in and adjacent to the site area. No artifacts were recovered from these probes. These tests revealed shallow disturbed deposits. All sediment from each of the shovel tests was visually inspected for cultural material and screened through .25-inch hardware mesh.

The site location was recorded on appropriate maps and a site map was sketched to show the position of shovel tests in relation to structures and topography. A site datum was established (the chimney feature) and its UTM coordinates were recorded on a GPS.



Figure 20. Site 40RE614 overview with historical marker, facing west.

## Depositional Context

The site is located on topography mapped as belonging to the Apison soil series. Shovel testing revealed extremely disturbed soils throughout the site. A typical shovel test consisted of an exposed and disturbed reddish brown (7.5YR 5/6) clay subsoil with weathered shale.

The soils at Site 40RE614 appeared to have been severely disturbed and eroded from the structure destruction, subsequent vegetation management, and construction of Haul Road and the surrounding disturbance area.

## Artifacts

No artifacts were recovered from Site 40RE614 during this investigation.

## Features

One feature was observed, a standing stone chimney. The chimney was approximately 8 m (20 ft) tall, was composed of limestone, sandstone, and mortar, and was covered in vegetation (Figure 22).

## Archival Data

*Kathryn Moore*

The earliest known landowner associated with Site 40RE614 (as well as Site 40RE613) is Thomas A. Cox and his wife Francis. It is unknown when he first acquired the property, but he was residing on the property from at least January 1912 to December 1912. In January of 1912, Thomas Cox deeded 106.5 acres to C. Ware, a resident of Pulaski, Kentucky, with the stipulation that Thomas and his wife would reside on the property until December 25th of that year (DB C-4:315). In 1914, C. Ware deeded the same 106.5 acres to Garrie Strickland (DB F-4:99). C. Ware is still listed as a resident of Pulaski, Kentucky, so

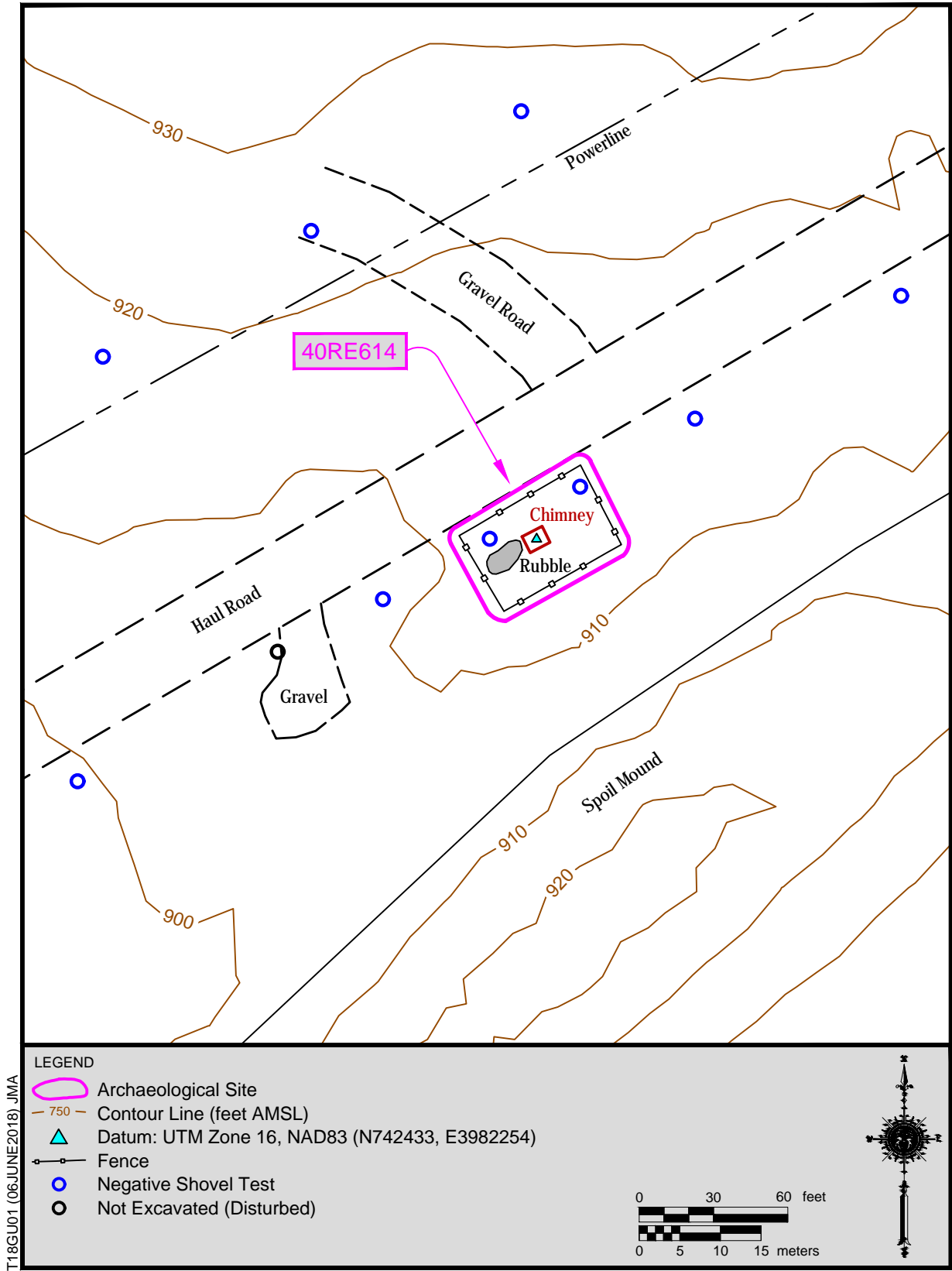


Figure 21. Site 40RE614 site plan.



Figure 22. Standing chimney at Site 40RE614, facing west.

it is unlikely that he ever resided on the property. In 1936, L.A. Strickland and his wife Garrie deeded the same 106.5 acres, now referred to as the Thomas A. Cox place, to W.L. Weaver and his wife Sarah. In 1946, the United States Atomic Energy Commission purchased the property as part of 108.7 acres from W.L. Weaver. It is unclear why the acreage changes from 106.5 acres in 1936 to 108.7 acres in 1946. It is possible that the land was resurveyed and the difference can be accredited to surveyor error.

## Summary and National Register Evaluation

Site 40RE614 was a 'historic farmstead/residence' dating to the mid-twentieth century. The structure was present on the 1941 USGS topographic map but not on the 1935 map and it is not depicted on more recent maps (USGS 1953, 1999). The structure was likely constructed between 1935 and 1941. When the atomic reservation was formed during the 1940s, the DOE razed most of the structures found within its boundaries. The structure was probably destroyed at this time. The only feature present was a standing chimney. No artifacts were recovered from this site.

It is unlikely that further investigation of Site 40RE614 would produce information beyond that recorded during the current survey. The remains have no depositional integrity. No historic artifacts were recovered. Furthermore, there is no evidence for belowground features. Site 40RE614 is not considered to have the potential to provide important information about local or regional history and is not eligible for the NRHP (Criterion D), and no further work is recommended. Therefore, cultural resource clearance is recommended.

## Site 40RE615

Elevation: 274 m (900 ft) AMSL

Component: historic

Site type: Farmstead/residence

Size: 1,000 sq m (10,764 sq ft)

Distance to nearest water: on-site

Direction to nearest water: south

Type and extent of previous disturbance: 76–99 percent disturbed; destruction, fire, and erosion

Topography: toe slope, terrace

Vegetation: secondary growth, young coniferous and deciduous trees

Ground surface visibility: 0 percent

Aspect: south, east, and west

Recommended NRHP status: not eligible

### Site Description

Site 40RE615 consists of a hand-dug well and two stone structural debris piles with no associated artifacts. The site is located on a landform that was once a toe slope to a terrace in the central project area, north of Bear Creek Road and immediately south of Haul Road, with a containment pond to the east. The site is located approximately 16 km (10 mi) southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee.

The site is characterized by secondary growth with young coniferous and deciduous trees that provided no ground surface visibility (Figure 23). The site was at an elevation of 274 m (900 ft) AMSL, sloping downward to the south, east, and west of the site.



Figure 23. Overview of Site 40RE615, facing north.

The site was identified by a DOE sign that marked the area as a “historic site”. The site consisted of two rock piles from the no longer extant structure and a hand-dug well. Immediately south of the area with the historic site marker, an old cut road ran towards the west. The hand-dug well was located on the south side of the old road. Disturbance defined the north and west boundaries of the site. Haul Road formed the northern boundary of the site and disturbance and a containment pond formed the western boundary. Slope marked the eastern boundary and negative shove probes marked the boundary to the south. The site measured 50 m (164 ft) north–south by 20 m (66 ft) east–west, covering a total of 1,000 sq m (10,764 sq ft) (Figure 24).

## Investigation Methods

A total of six shovel tests were excavated in and adjacent to the site area. No artifacts were recovered from these probes. These tests revealed shallow disturbed deposits. All sediment from each of the shovel tests was visually inspected for cultural material and screened through .25-inch hardware mesh.

The site location was recorded on appropriate maps and a site map was sketched to show the position of shovel tests in relation to structures and topography. A site datum was established (the stone debris piles) and its UTM coordinates were recorded on a GPS.

## Depositional Context

The site is located on topography mapped as belonging to the Apison soil series. Shovel testing revealed extremely disturbed soils throughout the site. There was no typical soil profile or consistency within the site boundaries.

The soils at Site 40RE615 appeared to have been severely disturbed and eroded from the structure destruction, subsequent vegetation management, and the construction of a containment pond to the east.

## Artifacts

No artifacts were recovered from Site 40RE615 during the current investigation.

## Features

Three features were observed, a pre-1940 hand-dug well and two stone debris piles. The hand-dug well had a modern cap in place and a sign marking it as a “pre-1940s hand-dug well” (Figure 25). The stone debris piles were in the mapped location of the structure associated with Site 40RE615 and are likely debris from the destruction of the structure (Figure 26).

## Archival Data

*Kathryn Moore*

In the nineteenth century, the Copeland family owned a large amount of acreage in the area, so it is uncertain who owned the exact tract that Site 40RE615 sits on, but the earliest landowner of that specific tract appears to be James Copeland. In 1887, James Copeland deeded 100 acres to his son, John H. Copeland (RCCO DB B-2:307–308; United States Bureau of the Census [USBC], 1850, Washington, D.C.). In 1902, John H. Copeland and his wife Mary deeded 60 acres to their son, G.J. Copeland (RCCO DB X-3:429–431; USBC 1880). G.J. Copeland also purchased 50 acres from Isaiah Hickman in 1907 (RCCO DB X-3:132). It is unclear which of these two tracts Site 40RE615 currently sits on, but G.J. Copeland sold the combined 110 acres to J.E. Johnson in 1909 (RCCO DB G-4:141). A year later, in 1910, J.E. Johnson deeded the 110-acre tract back to G.J. Copeland (RCCO DB H04:139). It is of note that in land deeds regarding the property containing Sites 40RE613 and 40RE614, dated as early as 1912, a Russell-Copeland Cabin is referenced for use as a boundary marker (RCCO DB F-4:99).

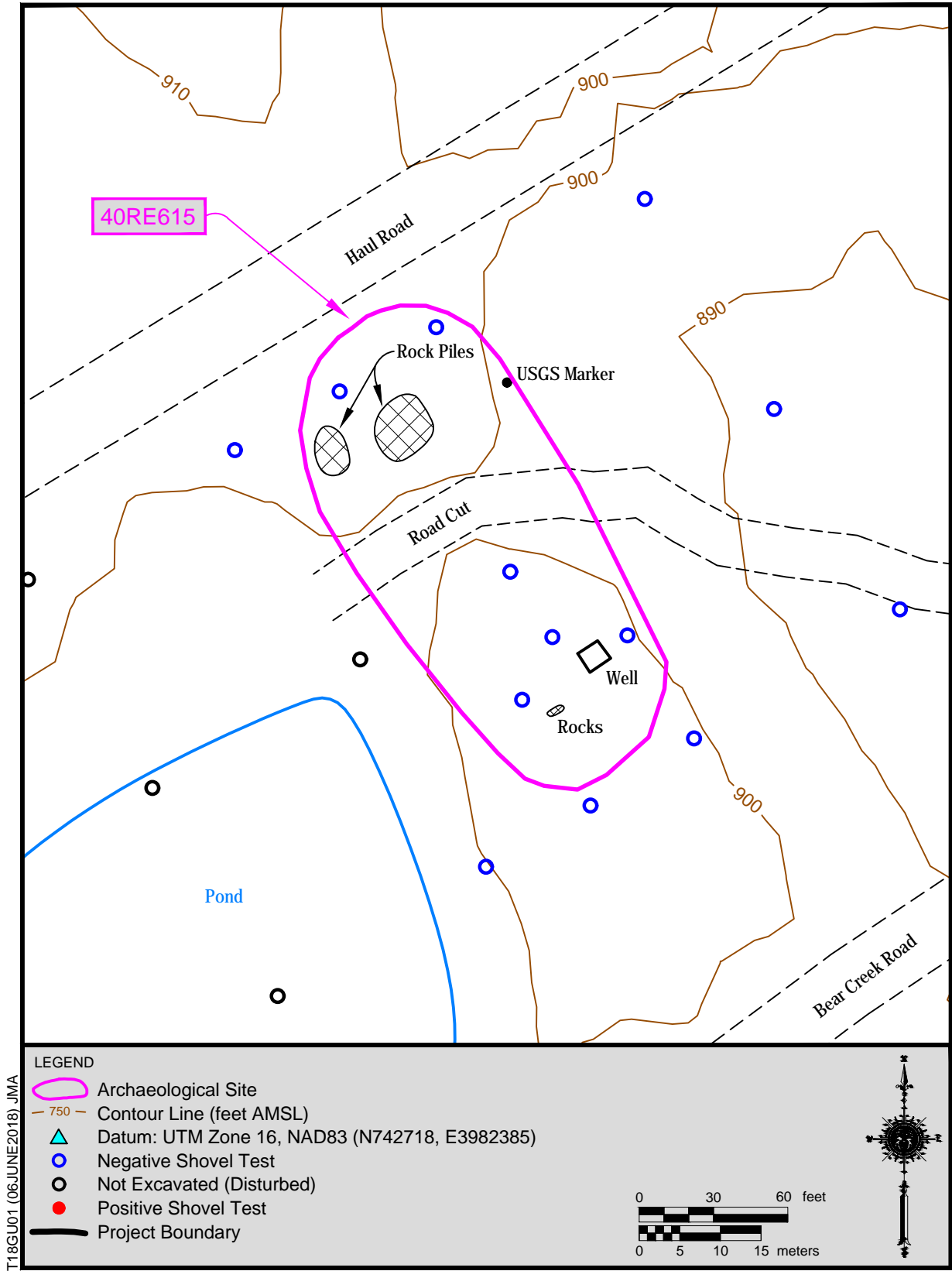


Figure 24. Site 40RE615 site plan.



Figure 25. Hand-dug well within Site 40RE615, facing south.



Figure 26. Stone debris piles located at map structure location, facing north.

In 1915, G.J. Copeland also purchased 60 acres from F.A. Cox, presumably the wife of Thomas A. Cox, who owned the property Sites 40RE613 and 40RE614 are located on. This deed description is duplicated in a separate deed book (RCCO DB L-4:106), so it is unclear if one or two 60 acre tracts were deeded to G.J. Copeland. It does not appear that Site 40RE615 was located on either tract.

In 1918, G.J. Copeland and his wife Minnie sold 230 acres, referred to as “the same lands conveyed to G.J. Copeland by F.A. Cox and J.E. Johnson,” to E.T. Ferguson and his wife Maude, who are listed as residents of Madisonville, Tennessee (RCCO DB K-4:400–401). In 1919, Walter Howell became the trustee to E.T. and Maude Ferguson’s estate, but when he refused to act, J.M. Pickens was appointed Substitute Trustee (RCCO Trustee Deed Book [TDB] 34:132, 54:120). In 1936, as a result of the property being defaulted on, it was taken over by the Federal Land Bank of Louisville (RCCO DB G-5:187–188). That same year, the Federal Land Bank sold 205.5 of the acres, with the exception of a 1-acre lot for a church, to R.G. Kite and his wife Zola (RCCO DB G-5:187–188). The deed does not specify which church the 1-acre lot is for, but the church is presumably Douglas Chapel, whose cemetery is marked on the 1941 USGS topographic quadrangle map (USGS 1941). In 1946, the United States Atomic Energy Commission purchased the property as part of 201.5 acres from R.G. and Zola Kite. It is unclear why the acreage changes from 205.5 acres in 1936 to 201.5 acres in 1946. It is possible that the land was resurveyed and the difference can be accredited to surveyor error.

## Summary and National Register Evaluation

Site 40RE615 was a ‘historic farmstead/residence’ dating to the mid-twentieth century. The structure was present on the 1941 USGS topographic map but not on the 1935 map and it is not depicted on more recent maps (USGS 1953, 1999). The structure was likely constructed between 1935 and 1941. When the atomic reservation was formed during the 1940s, the DOE razed most of the structures found within its boundaries. The structure was probably destroyed at this time. The only features present were a hand-dug well and two stone debris piles. No artifacts were recovered from this site.

It is unlikely that further investigation of Site 40RE615 would produce information beyond that recorded during the current survey. The remains have no depositional integrity. No historic artifacts were recovered. Furthermore, there is no evidence for belowground features. Site 40RE615 is not considered to have the potential to provide important information about local or regional history and is not eligible for the NRHP (Criterion D), and no further work is recommended. Therefore, cultural resource clearance is recommended.

## Site 40RE616

Elevation: 268 m (880 ft) AMSL

Component: prehistoric/historic

Site type: Open habitation without mounds and Farmstead/residence

Size: 1,800 sq m (19,375 sq ft)

Distance to nearest water: 90 m (296 ft)

Direction to nearest water: South

Type and extent of previous disturbance: 76–99 percent disturbed; destruction, fire, and erosion

Topography: remnant terrace

Vegetation: secondary growth, young coniferous and deciduous trees

Ground surface visibility: 0 percent

Aspect: south

Recommended NRHP status: not eligible

## Site Description

Site 40RE616 was a subsurface scatter of historic artifacts with a basement/cellar depression accompanied by a single prehistoric artifact. The site is located on a remnant terrace in the eastern project area, immediately south of Bear Creek Road. The site is located approximately 16 km (10 mi) southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee. The site is characterized by secondary growth, as well as young coniferous and deciduous trees. Ground surface was covered by leaf litter and ground vegetation. The site was at an elevation 268 m (880 ft) AMSL, sloping downward to the south towards Bear Creek.

The site was identified by architectural elements consisting of a depression comprising a possible basement/cellar, metal roofing, and cut stone, along with domesticated ornamental vegetation, on the south side of Bear Creek Road (Figure 27). Bear Creek Road formed the northern boundary of the site, and negative shovel probes defined the eastern, western, and southern boundaries. A historic scatter was present in the topsoil of seven positive shovel tests. The northern, eastern, and western boundaries were established by negative shovel test probes. The southern extent of the site was bounded by a drainage slope. The site measured 30 m (98 ft) north–south by 60 m (197 ft) east–west, covering a total of 1,800 sq m (19,375 sq ft) (Figure 28).

## Investigation Methods

A total of 28 shovel test probes were excavated in and adjacent to the site area. In the field, 8 positive shovel probes were identified; however, a positive probe with a single prehistoric artifact, a potential stone tool, proved to be negative after analysis. A total of 7 of the 28 shovel test probes resulted in the recovery of artifacts. All artifacts were recovered from the topsoil, Zone I, save for STP 2. This probe profile consisted of an organic Zone I and a Zone II that correlated with the description of the Zone I topsoil identified in all other positive probes. All sediment from each of the shovel tests was visually inspected for cultural material and screened through .25-inch hardware mesh.



Figure 27. Overview of Site 40RE616, facing west.

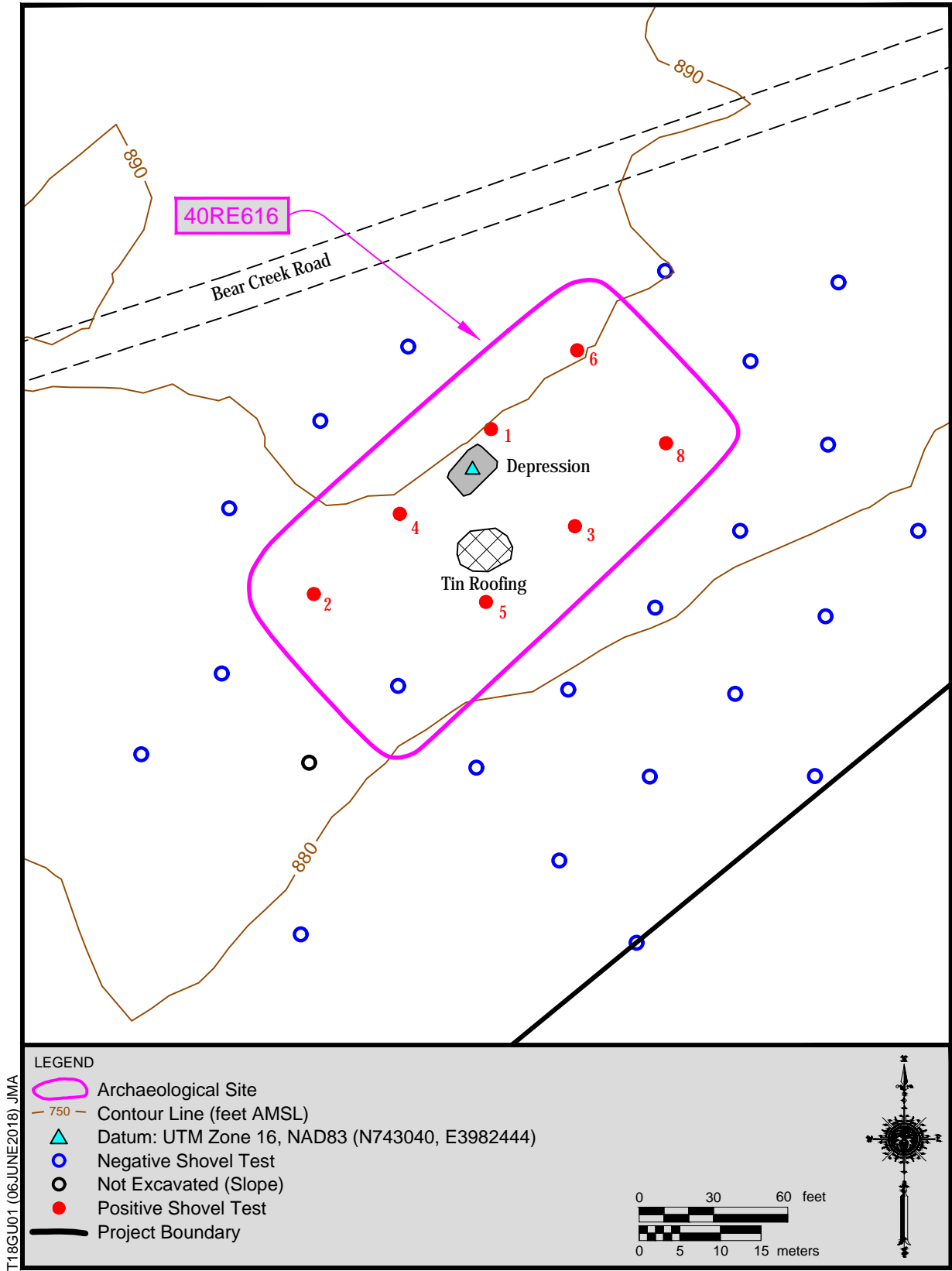


Figure 28. Site 40RE616 site plan.

The artifacts from the positive shovel tests were collected and logged according to shovel test number and level. The site location was recorded on appropriate maps and a site map was sketched to show the position of shovel tests in relation to structures and topography. A site datum was established (STP 1) and its UTM coordinates were recorded on a GPS.

## Depositional Context

The site is located on topography mapped as belonging to the Apison soil series. Shovel testing revealed two soil horizons that were relatively consistent throughout the site. A typical shovel test consisted of a brown (10YR 5/4) silty clay loam Zone I ranging in depth between 0 and 11–20 cm (4–8 in) bgs. Zone I was underlain by a light yellowish brown (2.5Y 6/3) clay loam Zone II subsoil with weathered shale (Figure 29). Zone I was covered by an O horizon consisting of leaf litter and decay, which was recorded as a separate zone in a single positive probe. This resulted in all artifacts being found in Zone I, save for a single Zone II recovery and as noted for this shovel test probe, it correlates with Zone I.

The soils at Site 40RE616 appeared to have been severely disturbed and eroded by the structure destruction and subsequent vegetation management. Apison soils in the area are prone to gullying and these erosional processes have stripped the upper soil from the site. The topsoil at the site consisted primarily of subsoil (former B and C horizons). All artifacts at the site were recovered from the topsoil and, as such, have poor integrity.

## Artifacts

A single prehistoric lithic was recovered from Site 40RE616. The lithic was a thermally altered early stage non-diagnostic Burnt chert flake (see Table 5). No additional prehistoric artifacts were recovered.

Historic materials recovered from Site 40RE616 consisted of 60 artifacts, belonging to the architectural, domestic, furnishing, clothing, and personal groups (Table 7).

Architectural artifacts consisted of nails, brick fragments, window glass, and plate glass. The brick fragments were hand-made were produced from 1800 to 1880. The window glass had a Moir thickness suggesting an 1885 production and the plate glass suggested a 1917 production.

Domestic artifacts included ceramic, BIM and ABM bottle glass, and glass tableware. Whiteware, ironstone, porcelain, and stoneware are dated between 1820 and 1940 with the general date range in the late nineteenth to the early twentieth century. An ABM glass medicine vial with indeterminate contents was recovered and clear and aqua BIM body fragments, which date to the nineteenth through the early twentieth century, were also recovered. The glass tableware has a terminus post quem of 1864.

Two artifacts belonged to the furnishing group, a lamp shade and a lamp chimney glass. The milk glass lamp shade was produced after 1880 and the chimney glass was produced between 1854 and 1940.

A shoe sole was the single clothing item and a ceramic doll part was the only personal artifact recovered. The shoe had machine stitching, which indicates a twentieth-century production. The doll fragment is dated from 1860 to 1925.

The artifacts recovered from Site 40RE616 indicate a late-nineteenth- to early-twentieth-century occupation. The average date for the artifacts recovered from Site 40RE616 is 1890, however, an occupation beginning in 1870 to 1880 is likely given the construction materials.

## Features

One feature was observed, a basement/cellar depression. The depression was irregular in shape, was approximately 2 m (6 ft) in diameter, was likely a basement or cellar, and was filled with stone debris, vegetation, and several young trees (Figure 30).



Figure 29. Typical soil profile for Site 40RE616.

Table 7. Historic Artifacts Recovered from Site 40RE616.

Unit	Zone	Grid N	Grid E	Dep	Group	Class/Type	N =
STP 1	I	1000.00	1000.00	0–11 cm bgs	Architecture	Nail	1
STP 1	I	1000.00	1000.00	0–11 cm bgs	Clothing	Footwear	1
STP 2	I	1000.00	970.00	0–5 cm bgs	Domestic	Ceramic	1
STP 2	II	1000.00	970.00	5–17 cm bgs	Domestic	ABM	1
STP 3	I	985.00	1000.00	0–18 cm bgs	Architecture	Nails	13
STP 3	I	985.00	1000.00	0–18 cm bgs	Domestic	Ceramics, ABM	8
STP 3	I	985.00	1000.00	0–18 cm bgs	Furnishings	Lamp shade	1
STP 3	I	985.00	1000.00	0–18 cm bgs	Personal	Doll part	1
STP 4	I	1000.00	985.00	0–19 cm bgs	Architecture	Window glass, nails	5
STP 5	I	985.00	985.00	0–15 cm bgs	Architecture	Nails	2
STP 5	I	985.00	985.00	0–15 cm bgs	Domestic	ABM, glass tableware	2
STP 6	I	1000.00	1015.00	0–16 cm bgs	Architecture	Brick, plate glass, nails	9
STP 6	I	1000.00	1015.00	0–16 cm bgs	Domestic	Ceramics, ABM	4
STP 8	I	985.00	1000.00	0–14 cm bgs	Architecture	Nails	4
STP 8	I	985.00	1000.00	0–14 cm bgs	Domestic	BIM, ABM, glass tableware	6
STP 8	I	985.00	1000.00	0–14 cm bgs	Furnishings	Lamp chimney glass	1
Total							60



Figure 30. Basement/cellar depression filled with secondary growth vegetation, facing south.

## Archival Data

*Kathryn Moore*

The earliest known landowner associated with Site 40RE616 is Robert Taylor. It is unknown when he first acquired the property, as he is never listed in the deed books as a Grantee in Roane County. However, it is likely that he resided on the property until 1865, when he sold 200 acres to E.W. Currier, as both men are listed as residents of Roane County (RCCO DB O-1:388). In 1868, E.W. Currier sold 120 acres to S.H. Milligan (RCCO DB Q-1:605–606). Two years later, in 1870, S.H. Milligan sold the same 120 acres to William K. Douglas (RCCO DB R-1:336–337). Two years after that, in 1872, William K. Douglas *[sic]* sold 160 acres to George W. Douglass *[sic]* (RCCO DB S-1:26–27). It is uncertain why the acreage changes from 120 acres in 1870 to 160 acres in 1872, but it is likely due to surveyor error, owing to the fact that the property descriptions are identical. In the 1872 deed, George Douglass *[sic]* is listed as a resident of Roane County, and the property is referred to as the former George W. Douglas tract in later deeds, so it is likely that George W. Douglas resided on the property from 1871 until 1901, when his heirs deeded 100 of the acres to John H. Copeland (RCCO DB B-3:339–340).

A year later, in 1902, John H. Copeland and his wife Mary gave 80 acres to their son W.L. Copeland (RCCO DB K-4:90). This is likely the same John H. Copeland that deeded the property containing Site 40RE615 to G.J. Copeland. W.L. and G.J. were apparently brothers (USBC 1880). It is of note that in land deeds regarding the property containing Site 40RE615, dated as early as 1902, a W.L. Copeland's dwelling house is referenced for use as a boundary marker (RCCO DB X-3:429–431). In 1917, W.L. Copeland deeded the 80 acres to Charles and Ada Brennan (RCCO DB K-4:91). They sold 35 acres to Robert Field in 1920 and in 1939, he sold the same 35 acres to Milum Davis, Jr. and his wife Pearl (RCCO DB N-5:202). In 1940, Milum Davis, Jr. sold the same 35 acres to P.S. Beal, with the caveat that the land was free from all encumbrances except for a trust deed to secure Judge H. Wallace a promissory note (RCCO DB Q-

5:518–519). In 1946, the United States Atomic Energy Commission purchased the property as part of 34.1 acres from P.S. Beal. It is unclear why the acreage changes from 35 acres in 1940 to 34.10 acres in 1946. It is possible that the land was resurveyed and the difference can be accredited to surveyor error.

## Summary and National Register Evaluation

Site 40RE616 was a multicomponent ‘prehistoric/historic open habitation and farmstead/residence’. The prehistoric habitation was of an indeterminate cultural and temporal affiliation and the ‘historic farmstead/residence’ dated from approximately the late nineteenth century to the mid–1940s. The structure was present on the 1935 and 1941 USGS topographic maps but not on any later maps (USGS 1953, 1999). A 1895 topographic map marks the community of Bear in the general vicinity of the site; other homes and structures, such as Site 40RE616, would have been included in this community. When the atomic reservation was formed during the 1940s, the DOE razed most of the structures found within its boundaries. The structure was probably destroyed at this time.

The assemblage from Site 40RE616 consisted of a single prehistoric lithic artifact and a medium density historic scatter, including 60 artifacts in seven shovel tests. No deeply buried deposits were present and the depositional context of the artifacts was disturbed.

It is unlikely that further investigation of Site 40RE616 would produce information beyond that recorded during the current survey. The remains have poor depositional integrity. No historic artifacts were found below the topsoil. Furthermore, there is no evidence for belowground features. Site 40RE616 is not considered to have the potential to provide important information about local or regional prehistory or history and is not eligible for the NRHP (Criterion D); no further work is recommended. Therefore, cultural resource clearance is recommended.

## Site 40RE617

Elevation: 265 m (870 ft) AMSL

Component: prehistoric

Site type: open habitation without mounds

Size: 250 sq m (2,691 sq ft)

Distance to nearest water: 30 m (100 ft)

Direction to nearest water: South

Type and extent of previous disturbance: 76–99 percent disturbed; fire, erosion

Topography: floodplain

Vegetation: secondary growth, young coniferous and deciduous trees

Ground surface visibility: 0 percent

Aspect: flat

Recommended NRHP status: not assessed

## Site Description

Site 40RE617 was a light density subsurface scatter of prehistoric artifacts. The site is located on a floodplain for Bear Creek, in the south-central project area, south of Bear Creek Road. The site is located approximately 10 miles (16 km) southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee. The site is characterized by secondary growth, as well as young coniferous and deciduous trees, which provided no ground surface visibility (Figure 31). The floodplain was at an elevation of 265 m (870 ft) AMSL, approximately 30 m (98 ft) north of Bear Creek.



Figure 31. Overview of Site 40RE617, facing north.

The site was identified by positive shovel probes. A prehistoric scatter was present primarily in the topsoil of two positive shovel tests. The northern, eastern, and western boundaries were established by negative shovel test probes. The southern extent could not be determined due to the project boundary and potentially extends outside of the project area. The site measured 25 m (82 ft) north–south by 10 m (33 ft) east–west, covering a total of 250 sq m (2,691 sq ft). (Figure 32).

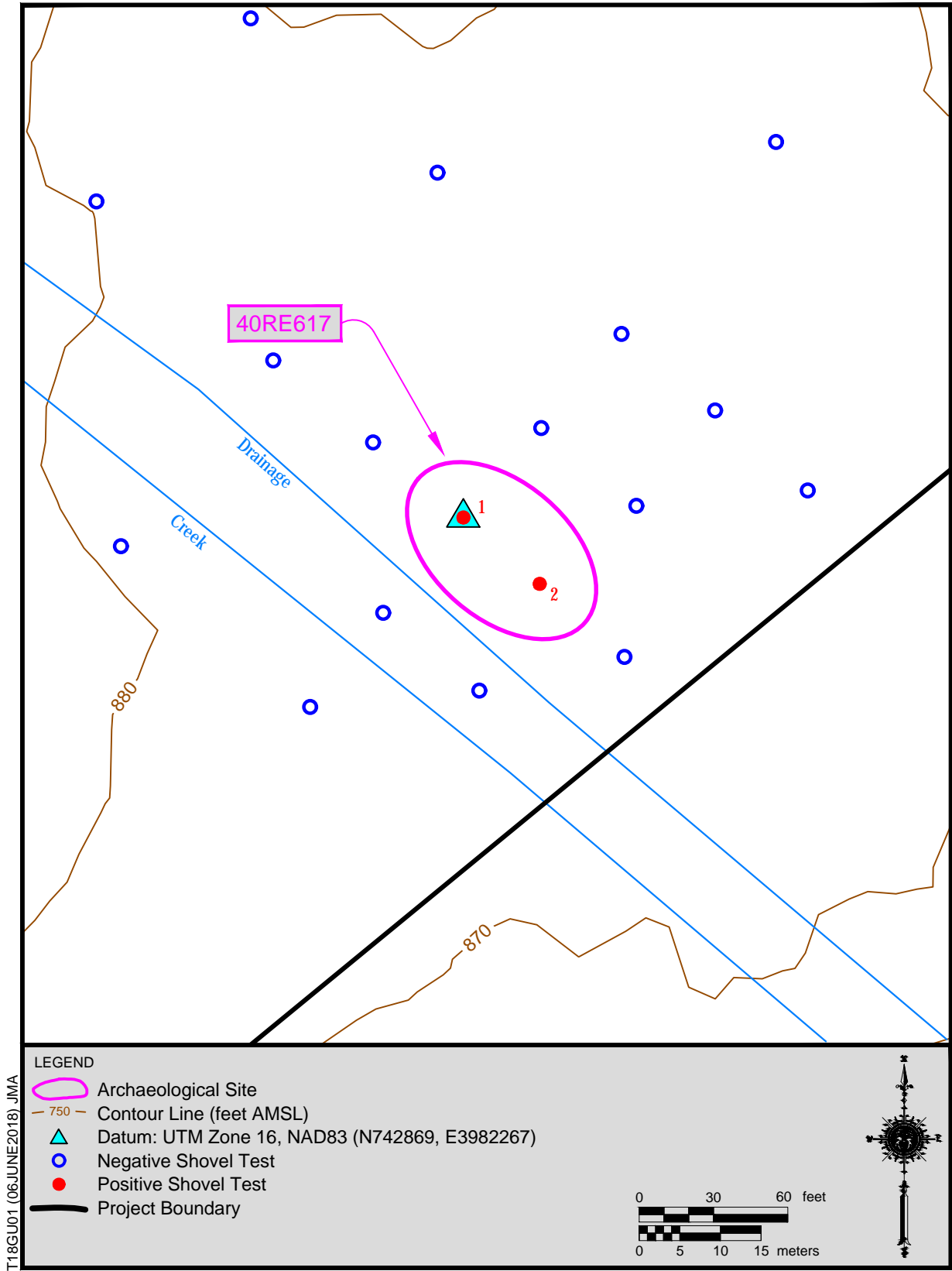
## Investigation Methods

A total of 13 shovel test probes were excavated within the site area. Two of the thirteen shovel test probes resulted in the recovery of artifacts. Almost all of artifacts were recovered from Zone I, topsoil, in one shovel test; a single micro-flake was found in Zone II in the other and was probably the result of bioturbation. All sediment from each of the shovel tests was visually inspected for cultural material and screened through .25-inch hardware mesh.

The artifacts from the positive shovel tests were collected and logged according to shovel test number and level. The site location was recorded on appropriate maps and a site map was sketched to show the position of shovel tests in relation to structures and topography. A site datum was established (STP 1) and its UTM coordinates were recorded on a GPS.

## Depositional Context

The site is located on topography mapped as belonging to the Apison soil series. Shovel testing revealed two soil horizons that were relatively consistent throughout the site. A typical shovel test consisted of a brown (10YR 5/4) loam Zone I to 26 cm (10 in) bgs. Zone I was underlain by a yellowish brown (10 YR 5/6) silty clay loam Zone II subsoil (Figure 33). Artifacts were mostly found in STP 1 and in Zone I. A micro-flake was recovered from Zone II in STP 2. Most artifacts at the site were recovered from the topsoil and, as such, have poor integrity. As noted, the single flake in Zone II was probably the result of bioturbation.



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Figure 32. Site 40RE617 site plan.



Figure 33. Typical soil profile for Site 40RE617.

## Artifacts

Prehistoric materials recovered from Site 40RE617 consisted of five lithic artifacts (see Table 5). The lithics consisted of flakes, only one of which was larger than .25 inch and could be analyzed. The latter was an early stage flake of indeterminate chert. All but one flake was recovered from the topsoil; a single micro-flake was recovered from the Zone II. No diagnostic artifacts were recovered, and no temporal or cultural affiliation could be determined. Not much can be said other than lithic production occurred in this area.

## Features

No features were observed during the investigation of the site, and no FCR, charcoal, or burned soil was observed in the plowed field or shovel tests.

## Summary and National Register Evaluation

Site 40RE617 was an ‘open habitation without mounds’ of an indeterminate temporal and cultural context. The assemblage from the site consisted of a very low density lithic scatter, including only one piece of debitage larger than .25 inch. No FCR, oxidized soil, or charcoal was noted during shovel testing. In general, the recovered prehistoric materials suggest short-term prehistoric utilization of this area.

It is unlikely that further investigation of Site 40RE617 would produce information beyond that recorded during the current survey. The remains have poor depositional integrity. Furthermore, there is no evidence for below ground features. Site 40RE617 is not considered to have the potential to provide important information about local or regional prehistory and is not eligible for the NRHP (Criterion D); no further work is recommended. Therefore, archaeological clearance is recommended.

## Isolated Find 1

UTM Coordinate: NAD83, Zone 16, N 3982351 E 742978

Elevation: 265 m (870 ft) AMSL

Distance to nearest water: 30 m (100 ft)

Direction to nearest water: south

Type and extent of previous disturbance: logging and fire; disturbance extent unknown

Topography: floodplain

Vegetation: secondary growth, young coniferous and deciduous trees

Ground Surface Visibility: 0 percent

Aspect: level

Description: One prehistoric artifact was recovered from a single shovel test in the south-central project area in the floodplain along Bear Creek (see Figure 3). The shovel test was located approximately 30 m (98 ft) north of Bear Creek (Figure 34). IF 1 consisted of a single flake measuring less than .25 inch and no analysis could be conducted. The nondiagnostic flake was recovered from within the topsoil. A total of 10 screened shovel tests were excavated within the project area at 15 m (49 ft) intervals in each of the survey grid directions. No additional cultural materials were recovered at the location.

## Douglas Chapel Cemetery

UTM Coordinate: NAD83, Zone 16, N 3982600 E 742623

Elevation: 286 m (940 ft) AMSL

Component: historic

Site type: Cemetery

Size: 624 sq m (6,717 sq ft)

Condition: good

Topography: ridgeline

Vegetation: secondary growth, young coniferous and deciduous trees

Aspect: south, east, and west

Recommended action: avoidance



Figure 34. Overview of IF 1, facing southwest.

## Description

The Douglas Chapel Cemetery is a historic cemetery. The cemetery is located on a dissected upland ridge in the central project area, north of Bear Creek Road and Haul Road. The site is located southwest of the city of Oak Ridge on the ORR in Roane County, Tennessee. The cemetery is well cared for and in good condition. The area is characterized by moss, young coniferous and deciduous trees, and some cut tree stumps (Figure 35). The cemetery is bounded by a wire and wood fence, which has two openings that serve as entrances, one in the north and another on the eastern boundary (Figure 36). The ridge was at an elevation of 286 m (940 ft) AMSL, sloping downward to the south, east, and west of the site.

The Douglas Chapel Cemetery consisted of 15 graves. Of the 15 graves, 4 had formal granite markers, 8 had crude fieldstone markers, and 3 were unmarked grave depressions. The cemetery measured 24 m (79 ft) north–south by 26 m (85 ft) east–west, covering a total of 624 sq m (6,717 sq ft) (Figure 37). While the age of the unmarked and crude fieldstone graves is indeterminate, the formal gravestones dated from 1880 to 1905; two identified members of the Hickman family, one Turpen, and the final was illegible due to weathering (Figure 38–42).

## Summary

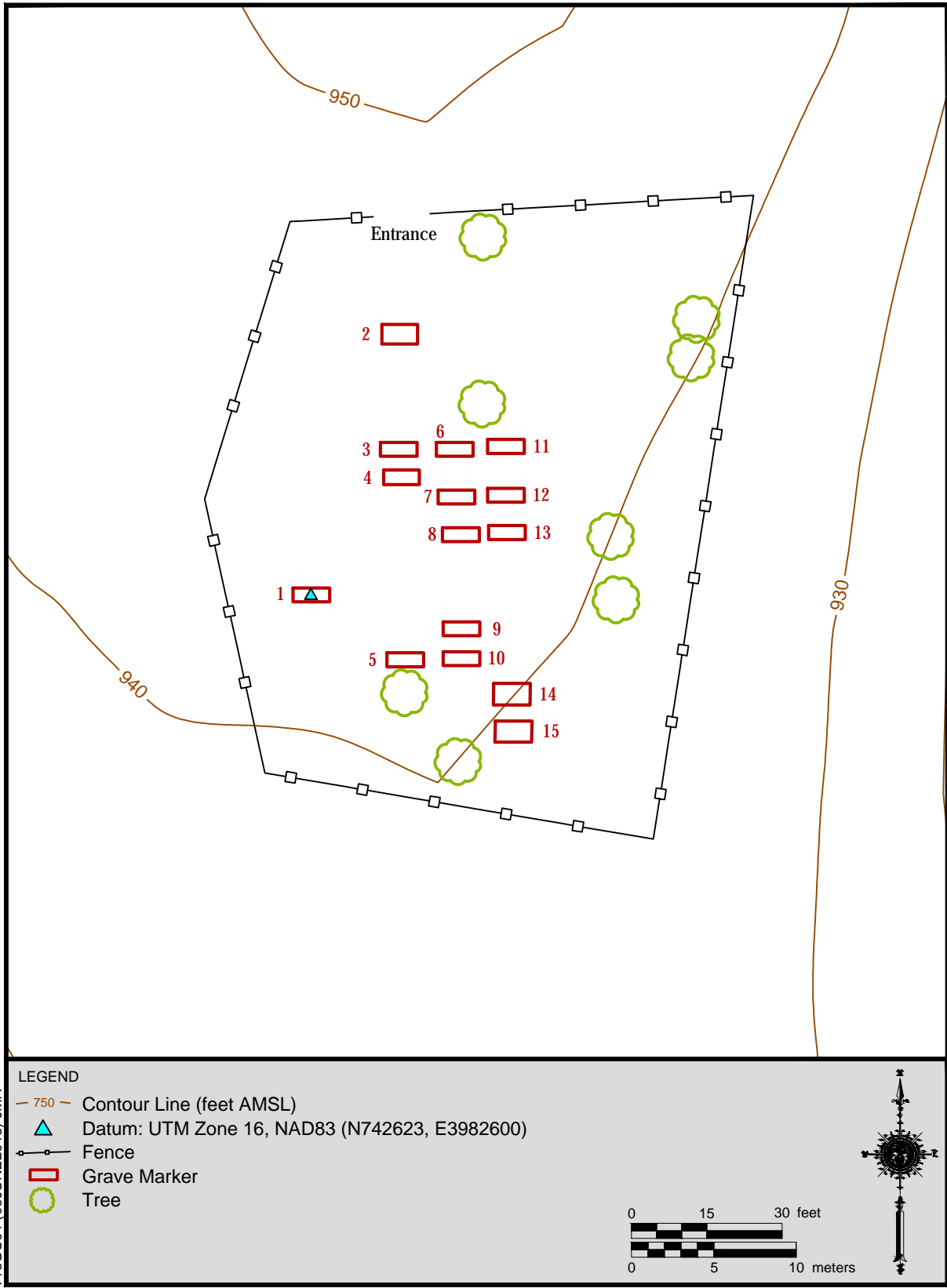
The Douglas Chapel Cemetery is a late-nineteenth to early-twentieth century historic cemetery. Fifteen graves are present at the site, but only four had formal markers and only three were legible. As finding next of kin would be difficult for the unmarked and fieldstone graves, relocation of the cemetery would be difficult. The DOE has indicated that avoidance is the preferred action. Therefore, avoidance is recommended for this cemetery.



Figure 35. Douglas Chapel Cemetery overview showing condition and vegetation, facing east.



Figure 36. Overview of Douglas Chapel Cemetery, facing southeast.



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Figure 37. Plan map for Douglas Chapel Cemetery.



Figure 38. Unmarked grave (Grave # 2), facing east.



Figure 39. Crude fieldstone grave marker (Grave # 3), facing east.

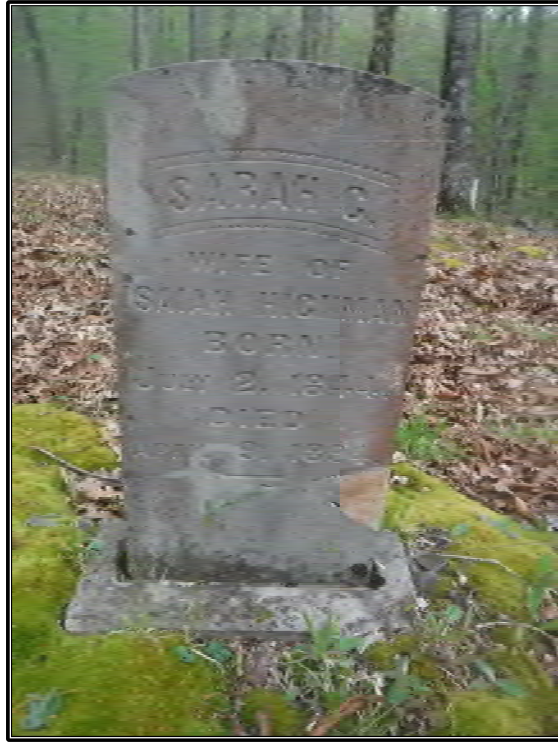


Figure 40. Sarah Hickman's formal gravestone (Grave # 7), facing east.



Figure 41. T.C. Turpen's formal gravestone with ornamental carving with footer (Grave # 11), facing east.



Figure 42. Illegible gravestone marker with footer (Grave # 10), facing east.

## VII. RECOMMENDATIONS AND CONCLUSIONS

Note that a principal investigator or field archaeologist 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.

The EDMF project required an archaeological survey to proceed. Intensive pedestrian survey with supplemental screened shovel testing was utilized over the 59-ha project area, which primarily was secondary growth forest. During this investigation, five previously unrecorded sites were identified (40RE613–40RE617) and the Douglas Chapel Cemetery were documented.

Site 40RE613 was a low density historic scatter with a standing chimney and cellar/well depression feature associated with a no longer extant late-nineteenth- to mid-twentieth-century ‘farmstead/residence’. Site 40RE614 was a standing chimney feature and Site 40RE615 was a hand-dug well feature with two stone debris piles, both associated with two separate mid-twentieth-century ‘farmstead/residences’. No artifacts were recovered from either Site 40RE614 or 40RE615. Site 40RE616 was a medium density historic scatter with a single prehistoric artifact which was a multicomponent ‘prehistoric/historic open habitation without mounds and a farmstead/residence’ site. The prehistoric component was of an indeterminate temporal and cultural affiliation and the ‘historic farmstead/residence’ was occupied from the late nineteenth century until the mid-twentieth century. Site 40RE617 was a low density subsurface scatter of prehistoric lithic artifacts of an indeterminate temporal and cultural affiliation.

The Douglas Chapel Cemetery consisted of the graves of 15 individuals. Of the 15 graves, 4 graves had formal headstones, 8 had informal fieldstone markers, and 3 were unmarked grave depressions. The cemetery appears on the 1941 map as the Douglas Chapel Cemetery. The earliest known grave is from 1880 and the latest is from 1905. It is likely that Douglas Chapel and the cemetery served the community of Bear in the late nineteenth century until the early twentieth century. Avoidance or relocation is recommended for this cemetery. The Douglas Chapel Cemetery will be avoided by the EDMF project and will be preserved in situ.

After the acquisition of over 56,000 acres by the United States War Department for the Manhattan Project in 1943, most standing structures were razed to the ground. Due to the extensive disturbance throughout the project area, the 1940s destruction, later logging, vegetation control via controlled burning, and recently cut roads throughout the forest, soil integrity has degraded. Erosion has affected the landscape and gullying was present throughout the project area. To this extent, all sites recorded during this investigation, including the portion of Site 40RE617 within the project area, were highly disturbed, appeared to contain no intact cultural deposits, and lacked depositional integrity; therefore, no further work is recommended. The NRHP status of the portion of Site 40RE617 that potentially extended beyond the project area could not be assessed. All other sites were not recommended for inclusion in the NRHP. Because no sites listed in, or eligible for listing in, the NRHP will be affected by the proposed project, archaeological clearance is recommended.

If any unanticipated discoveries are made during the course of the proposed construction, ground disturbing activities should cease and Michael C. Moore, State Archaeologist, should be notified at (615) 741-1588.

## REFERENCES CITED

Amick, Daniel S.

1987 *Lithic Raw Material Variability in the Central Duck River Basin: Reflections of Middle and Late Archaic Organizational Strategies*. Publications in Anthropology No. 50. Tennessee Valley Authority, Chattanooga. Report of Investigations No. 46. Department of Anthropology, University of Tennessee, Knoxville.

1985 Late Archaic Fort Payne Biface Manufacture at the Topsy Site (40WY204), Buffalo River Basin, Tennessee. *Southeastern Archaeologist* 4(2):134-151.

Ammons, J.T., R.J. Luxmoore, and R.E. Yoder

n.d.a MLRA 128:Southern Appalachian Ridges and Valleys. Southern Cooperative Series Bulletin #395. Electronic document. <http://soilphysics.okstate.edu/S257/book/mlra128/> [Accessed: 31Jan2014]. Ammons, J. T., R. E. Yoder and R. J. Luxmoore,

n.d.b MLRA 125:Cumberland Plateau and Mountains. Southern Cooperative Series Bulletin #395. Electronic document. <http://soilphysics.okstate.edu/S257/book/mlra125/> [Accessed: 31Jan2014].

Anderson, David G.

2001 Climate and Culture Change in Prehistoric and Early Historic Eastern North America. *Archaeology of Eastern North America* (29): 143 - 186.

Ball, Donald B.

1984 Historic Artifact Patterning in the Ohio Valley. *Proceedings of the Symposium on Ohio Valley Urban and Historic Archaeology* II:24–36.

Baughner-Perlin, Sherene

1982 Analyzing Glass Bottles for Chronology, Function, and Trade Networks. In *Archeology of Urban America: The Search for Pattern and Process*, edited by Roy S. Dickens, pp. 250–291. Academic Press, New York.

Belknap, E. McCamly, and George A. KcKearin

1949 *Milk Glass*. Crown Publishers, New York.

Berge, Dale L.

1980 *Simpson Springs Station Historical Archaeology in Western Utah 1974–1975*. Cultural Resource Series Number 6. Bureau of Land Management, Salt Lake City, Utah.

- Billington, Dora M.  
1962 *The Technique of Pottery*. Hearthsides Press Inc., New York.
- Blaszczyk, Regina Lee  
2000 *Imagining Consumers: Design and Innovation from Wedgwood to Corning*. Johns Hopkins University Press, Baltimore, Maryland.
- Boger, L. A.  
1971 *The Dictionary of World Pottery and Porcelain*. Charles Scribner and Sons, New York.
- Bonnichsen, Robson, Dennis Stanford, and J. Fastook  
1987 Environmental Change and Developmental History of Human Adaptive Patterns: The Paleo-Indian Case. In *North America and Adjacent Oceans during the Last Deglaciation*, edited by W. Ruddiman and H. E. Wright Jr., pp. 403–424. Geological Society of America, Boulder.
- Bradley, Bruce A. and Dennis J. Stanford  
2004 The North Atlantic Ice-Edge Corridor: A Possible Paleolithic Route to the New World. *World Archaeology* 36:459-478.  
2006 The Solutrean-Clovis Connection: Reply to Straus, Meltzer, and Geobel. *World Archaeology* 38:704-714.
- Braly, Bobby R., Michaelyn Harle, and Shannon D. Koerner  
2012 The Middle Mississippian period (A.D. 1100-1350). University of Tennessee, Knoxville.  
[http://web.utk.edu/~anthrop/research/TennesseeArchaeology/11\\_Middle\\_Mississippian\\_02062008.pdf](http://web.utk.edu/~anthrop/research/TennesseeArchaeology/11_Middle_Mississippian_02062008.pdf) Accessed October 23, 2012.
- Brietburg, Emmanuel, John Broster, Arthur Reeseam, and Richard Stearns  
1996 The Coates-Hines Site, Tennessee's First Paleoindian/Mastadon Association. *Current Research in the Pleistocene* (13):6-8.
- Broeksmit, Susan B., and Anne T. Sullivan  
2006 Dry-Press Brick: A Nineteenth-Century Innovation in Building Technology. *APT Bulletin* 37(1):45–52.
- Buckley, Francis  
1934 Old English Glass. The Birmingham Glass Pinchers. *Glass* 11(May):187–188.
- Cameron, Elisabeth  
1986 *Encyclopedia of Pottery and Porcelain, 1800–1960*. Facts on File Publications, New York.
- Chance, David H., and Jennifer V. Chance  
1976 *Kanaka Village, Vancouver Barracks 1974*. Reports in Highway Archaeology, No. 3. Office of Public Archaeology, University of Washington, Seattle.
- Chandler, J.M.  
2001 The Topper Site: Beyond Clovis at Allendale. *Mammoth Trumpet* 16(4):10–15.
- Chapman, Jefferson and Andrea Brewer Shea  
1981 The Archaeological Record: Early Archaic to Contact in the Lower Little Tennessee River Valley. *Tennessee Anthropologist* 6:61-84.
- Chapman, Jefferson and Patty Jo Watson  
1993 The Archaic Period and the Flotation Revolution in *Foraging and Farming in the Eastern Woodlands*, edited by C. Margaret Scarry, University Press of Florida. Pp: 27-37.

- Chapman, Jefferson  
 1985 *Tellico Archaeology: 12,000 Years of Native American History*. University of Tennessee, Department of Anthropology Report of Investigations No. 43, and Tennessee Valley Authority Publications in Anthropology No. 41 University of Tennessee, Knoxville.
- Coe, Joffre  
 1964 *The Formative Cultures of the Carolina Piedmont Area*. Transactions of the American Philosophical Society 54(5), American Philosophical Society, Philadelphia, PA.
- Coleman, Dorothy S., Elizabeth A. Coleman, and Evelyn J. Coleman  
 1968 *The Collector's Encyclopedia of Dolls*. Crown Publishers, New York.
- Collard, Elizabeth  
 1967 *Nineteenth-Century Pottery and Porcelain in Canada*. McGill University Press, Montreal, Canada.
- Davis, Leslie B.  
 1993 Paleo-Indian Archaeology in the High Plains and Rocky Mountains of Montana. In *From Kostenki to Clovis: Upper Paleolithic-Paleo-Indian Adaptations*, edited by O. Soffer and N. D. Praslov, pp. 263–278. Plenum, New York.
- Davis, Harry C. and Jennifer Yaeger  
 2002 Soil Survey of Roane County, Tennessee. Natural Resources Conservation Service. Electronic document.  
[http://www.nrcs.usda.gov/Internet/FSE\\_MANUSCRIPTS/tennessee/TN145/0/Roane\\_TN.pdf](http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/tennessee/TN145/0/Roane_TN.pdf)  
 [Accessed: 31Jan2014].
- Delcourt, Paul A. and Hazel R. Delcourt  
 1982 Formap Project: Forest Mapping across Eastern North America for the Past 20,000 Years. Paper presented at the 39th Annual Meeting of the Southeastern Archaeological Conference, Memphis.  
 1983 Later Quaternary Vegetation Dynamics and Community Stability Reconsidered. *Quaternary Research* 19:265-271.
- Denker, Ellen, and Bert Denker  
 1982 *The Warner Collector's Guide to North American Pottery and Porcelain*. Warner Books, New York.
- Dincauze, Dena F.  
 1993 Fluted Points in the Eastern Forests. In *From Kostenki to Clovis: Upper Paleolithic-Paleo-Indian Adaptations*, edited by O. Soffer, and N. D. Praslov, pp. 279–292. Plenum, New York.
- Dodd, Arthur Edward  
 1964 *Dictionary of Ceramics*. Philosophical Library Inc., New York.
- Duffy, John  
 1978 Social Impact of Disease in the Late Nineteenth Century. In *Sickness and Health in America: Readings in the History of Medicine and Public Health*, edited by Judith Walzer Leavitt and Ronald L. Numbers, pp. 395–402. University of Wisconsin Press, Madison.
- Dunnell, Robert C.  
 1971 *Systematics in Prehistory*. The Free Press, New York.
- DuVall, Glyn D. and Peter A. Souza  
 1996 *An Evaluation of Previously Recorded and Inventoried Archaeological Sites on the Oak Ridge Reservation, Anderson and Roane Counties, Tennessee*. Prepared for Oak Ridge National Laboratory, Oak Ridge, Tennessee by DuVall and Associates, Franklin, Tennessee.

- Ethridge, Robbie Franklyn and Charles Hudson  
2002 *The Transformation of the Southeastern Indians, 1540 – 1760*. University Press of Mississippi.
- Faulkner, Charles H.  
2000 *Historical Archaeology Laboratory Manual*. Department of Anthropology, University of Tennessee, Knoxville.  
2008 *The Ramseys at Swan Pond: The Archaeology and History of an East Tennessee Farm*. University of Tennessee Press, Knoxville.
- Faulkner, Charles H., and Major C.R. McCollough  
1973 *Introductory Report of the Normandy Reservoir Salvage Project: Environmental Setting, Typology, and Survey*. Report of Investigations No. 11. Department of Anthropology, The University of Tennessee, Knoxville.
- Fay, Robert P.  
1986 *Archaeological Investigations at Liberty Hall, Frankfort, Kentucky*. Kentucky Heritage Council, Frankfort, Kentucky.
- Fenneman, Nevin M.  
1938 *Physiography of the Eastern United States*. McGraw-Hill, New York.
- Fike, Richard E.  
1987 *The Bottle Book: A Comprehensive Guide to Historic, Embossed Medicine Bottles*. Pergerine Smith Books, Salt Lake City, Utah.
- Fort Southwest Point  
2013 Fort Southwest Point. <http://southwestpoint.com/history.htm>. Accessed October 8, 2013.
- Friedman, Lawrence J.  
1970 *The White Savage: Racial Fantasies in the Postbellum South*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- Fritz, Gayle J.  
1993 Early and Middle Woodland Period Paleoethnobotany in *Foraging and Farming in the Eastern Woodlands*, edited by C. Margaret Scarry, University Press of Florida. Pp: 39-56.
- Gates, William C., Jr., and Dana E. Ormerod  
1982 The East Liverpool Pottery District: Identification of Manufacturers and Marks. *Historical Archaeology* 16(1-2):1-358.
- Gilbert, M. Thomas P., Dennis L. Jenkins, Anders Götherstrom, Nuria Naveran, Juan J. Sanchez, Michael Hofreiter, Philip Francis Thomsen, Jonas Binladen, Thomas F. G. Higham, Robert M. Yohe II, Robert Parr, Linda Scott Cummings, and Eske Willerslev  
2008 DNA from Pre-Clovis Human Coprolites in Oregon, North America. *Science*, Published online April 3, 2008; doi: 10.1126/science.1154116.
- Godden, Geoffrey A.  
1964 *An Illustrated Encyclopedia of British Pottery and Porcelain*. Bonanza Books, New York.
- Goodyear, Albert C.  
1999 The Early Holocene Occupation of the Southeastern United States: A Geoarchaeological Summary. In *Ice Age Peoples of North America, edited by Robson Bonnicksen and Karen L. Turnmire*, pp. 432-481. Center for the Study of the First Americans, Corvallis, Oregon.
- Goodyear, Albert C., and K. Steffy  
2003 Evidence of a Clovis Occupation at the Topper Site, 38AL23, Allendale County, South Carolina. *Current Research in the Pleistocene* 20:23-25.

- Greene, Lance K.  
1992 The Penfield is Mightier than the Sword: Machine Made Bricks in Knoxville and Knox Co. Tennessee. In *Proceedings of the Tenth Symposium on Ohio Valley Urban and Historic Archaeology*, edited by Amy Young and Charles Faulkner, pp. 74–91. Tennessee Anthropological Association Miscellaneous Paper No. 16.
- Greer, Georgeanna H.  
1999 *American Stonewares: The Art & Craft of Utilitarian Potters*. 3rd Ed. Schiffer Publishing, Atglen, Pennsylvania.
- Gurcke, Karl  
1987 *Bricks and Brickmaking, a Handbook for Historical Archeology*. The University of Idaho Press, Moscow, Idaho.
- Hall, Jere and Rachel Parker  
2009 Roane County. In *Tennessee Encyclopedia of History and Culture*, <http://tennesseeencyclopedia.net>. Accessed October 3, 2013.
- Harle, Michaelyn, Shannon D. Koerner, and Bobby R. Braly  
2012 The Late Mississippian Period (A.D.1350-1500). University of Tennessee, Knoxville.  
[http://web.utk.edu/~anthrop/research/TennesseeArchaeology/12\\_Late\\_Mississippian\\_01232008.pdf](http://web.utk.edu/~anthrop/research/TennesseeArchaeology/12_Late_Mississippian_01232008.pdf) [Accessed:23Oct2012].
- Hockensmith, Charles D.  
1997 A Study of Frankfort Bricks and Brickmaking, Franklin County, Kentucky. *Tennessee Anthropologist* 22(2):121–176.
- Holley, I.B., Jr.  
2009 The Mechanization of Brickmaking. *Technology and Culture* 50(1):82–102.
- Jenkins, Dennis L., Loren G. Davis, Thomas W. Stafford Jr., Paula F. Campos, Bryan Hockett, George T. Jones, Linda Scott Cummings, Chad Yost, Thomas J. Connolly, Robert M. Yohe II, Summer C. Gibbons, Maanasa Raghavan, Morten Rasmussen, Johanna L. A. Pajmans, Michael Hofreiter, Brian M. Kemp, Jodi Lynn Barta, Cara Monroe, M. Thomas, P. Gilbert, and Eske Willerslev  
2012 Clovis Age Western Stemmed Projectile Points and Human Coprolites at the Paisley Caves. *Science* 337:223–228.
- Johnson, Charles W. and Charles O. Jackson  
1981 *City Behind a Fence: Oak Ridge, Tennessee 1942-1946*. University of Tennessee Press, Knoxville.
- Jones, Olive  
2000 A Guide to Dating Glass Tableware: 1800 to 1940. In *Studies in Material Culture*, edited by Karlis Karklins, pp.141–232. The Society for Historical Archaeology, Pennsylvania.
- Jones, Olive, and Catherine Sullivan  
1985 *The Parks Canada Glass Glossary for the Description of Containers, Tableware, Flat Glass, and Closures*. Studies in Archaeology, Architecture and History. National Historic Parks and Sites Branch, Parks Canada.
- Justice, Noel D.  
1987 *Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington.
- Kelly, Robert, and Lawrence Todd  
1988 Coming into the Country: Early Paleo-Indian Hunting and Mobility. *American Antiquity* 53:231–244.

- Ketchum, William C., Jr.  
 1983 *Pottery and Porcelain*. Alfred A. Knopf, New York.  
 1991 *American Stoneware*. Henry Holt and Company, Inc., New York.
- Kidder, Tristram R.  
 2011 Transforming Hunter-Gatherer History at Poverty Point in *Hunter Gatherer Archaeology as Historical Process*, edited by Kenneth E. Sassaman and Donald H. Holly, Jr. The University of Arizona Press, Tuscon. Pp:95-119.
- Klippel, Walter E., and Paul W. Parmalee  
 1982 Diachronic Variation in Insectivores from Cheek Bend Cave, and Environmental Change in the Midsouth. *Paleobiology* 8:447–458.
- Kneberg, Madeline  
 1956 Some Important Projectile Point Types in the Tennessee Area. *Tennessee Archaeologist*, 12: 17-28.
- Koerner, Shannon D., Bobby R. Braly, and Michaelyn Harle  
 2012 The Early Mississippian Period (A.D. 900-1100). University of Tennessee, Knoxville.  
[http://web.utk.edu/~anthrop/research/TennesseeArchaeology/10\\_Early\\_Mississippian\\_01232008.pdf](http://web.utk.edu/~anthrop/research/TennesseeArchaeology/10_Early_Mississippian_01232008.pdf) [Accessed:23Oct2012].
- Lehner, Lois  
 1980 *Complete Book of American Kitchen and Dinner Wares*. Wallace-Homestead Books, Des Moines, Iowa.
- Lewis, Griselda  
 1950 *English Pottery*. Pellegrini and Cudahy, New York.
- Lewis, Thomas M. N. and M. Kneberg  
 1946 *Hiwassee Island: An Archaeological Account of Four Tennessee Peoples*. University of Tennessee Press, Knoxville.
- Lewis, Thomas M. N., Madeline D. Kneberg Lewis, and Lynne P. Sullivan  
 1995 *The Prehistory of the Chickamauga Basin in Tennessee*. University of Tennessee Press, Knoxville.
- Lindsey, Bill  
 2018 Historic Glass Bottle Identification and Information. Electronic document,  
<http://www.sha.org/bottle/index.htm>, accessed May 14, 2018.
- Lockhart, Bill  
 2006 The Color Purple: Dating Solarized Amethyst Container Glass. *Historical Archaeology* 40(2):45–56.
- Lofstrom, Edward U., Jeffrey P. Tordoff, and Douglas C. George  
 1982 A Seriation of Historic Earthenwares in the Midwest, 1780–1870. *Minnesota Archaeologist* 41(1):3–29.
- Logan, Charles Russell  
 n.d. *The Promised Land: The Cherokees, Arkansas, and Removal, 1794-1839*. Arkansas Historic Preservation Program, Little Rock, Arkansas.
- McAvoy, James M., and Lynn D. McAvoy  
 1997 *Archaeological Investigations of Site 44SX202, Cactus Hill, Sussex County, Virginia*. Research Report Series No. 8. Virginia Department of Historic Resources, Richmond.

- McCollough, M. C. R. and C. H. Faulkner  
1973 *Excavations of the Higgs and Doughty Sites: I-75 Salvage Archaeology*. Tennessee Anthropological Society Miscellaneous Paper No. 12. University of Tennessee, Department of Anthropology, Knoxville.
- McKearin, Helen, and Kenneth M. Wilson  
1978 *American Bottles & Flasks and Their Ancestry*. Crown Publishers, Inc., New York.
- Magne, Martin P. R.  
1985 *Lithics and Livelihood: Stone Tool Technologies of Central and Southern Interior B.C.* Archaeology Survey of Canada, Mercury Series No. 133, Ottawa.
- Majewski, Teresita, and Michael J. O'Brien  
1987 The Use and Misuse of Nineteenth-Century English and American Ceramics in Archaeological Analysis. In *Advances in Archaeological Method and Theory*, Volume 11, edited by Michael J. Schiffer, pp. 97–209. Academic Press, New York.
- Mankowitz, Wolf, and Reginald G. Haggard  
1957 *The Concise Encyclopedia of English Pottery and Porcelain*. Hawthorne Books, New York.
- Marshall, Ian  
1998 *Story Line: Exploring the Literature of the Appalachian Trail*. The University Press of Virginia.
- Meeks, Scott C. and David G. Anderson  
2012 Evaluating the Effect of the Younger Dryas on Human Population Histories in the Southeastern United States. In *Hunter-Gatherer Behavior: Human Response during the Younger Dryas*, edited by Metin I. Eren, pp. 111-138. Left Coast Press, Walnut Creek, California.
- Meltzer, David J. and Ofer Bar-Yosef  
2012 Looking for the Younger Dryas. In *Hunter-Gatherer Behavior: Human Response during the Younger Dryas*, edited by Metin I. Eren, pp. 249-268. Left Coast Press, Walnut Creek, California.
- Meltzer, David J.  
1993 Is There a Clovis Adaptation? In *From Kostenki to Clovis: Upper Paleolithic-Paleo-Indian Adaptations*, edited by O. Soffer and N. D. Praslov, pp. 293–310. Plenum, New York.
- Miller, Shane D., John B. Broster, Jon D. Baker, and Katherine E. McMillan  
2012 The First Peoples of Tennessee: The Early and Middle Paleoindian Periods (> 13,450-12,000 cal BP). University of Tennessee, Knoxville.  
[http://web.utk.edu/~anthrop/research/TennesseeArchaeology/04\\_The\\_First\\_Peoples\\_of\\_Tennessee\\_03032008.pdf](http://web.utk.edu/~anthrop/research/TennesseeArchaeology/04_The_First_Peoples_of_Tennessee_03032008.pdf) [Accessed: 23Oct2012].
- Miller, George L., and Tony McNichol  
2002 Dates for Suction Scarred Bottoms: Chronological Changes in Owens Machine-Made Bottles. Revised March 2010 with illustrations. Paper presented at the 2002 Society for Historical Archaeology meeting, Mobile, Alabama.
- Miller, George L., and Catherine Sullivan  
1984 Machine-Made Glass Containers and the End of Production for Mouth-Blown Bottles. *Historical Archaeology* 18(2):83–96.
- Moir, Randall W.  
1977 Window Glass: A Statistical Perspective. Manuscript on file, Archaeology Research Program, Southern Methodist University, Dallas, Texas.  
1987 Socioeconomic and Chronometric Patterning of Window Glass. In *Historic Buildings, Material Culture, and People of the Prairie Margin*, edited by David H. Jurney and Randall W. Moir, pp. 73–81. Richland Creek Technical Series, Vol. V. Southern Methodist University, Dallas, Texas.

- Money maker, Dorothy S.  
1979 *We'll Call It Wheat*. Adroit Printing Company, Oak Ridge, Tennessee.
- Mooney, James  
2009 *Historical Sketch of the Cherokee*; with introduction by Cary Michael Carney. Third reprint. Transactions Publishers, Brunswick, New Jersey.
- Myers, Adrian T.  
2010 Telling Time for the Electrified: An Introduction to Porcelain Insulators and the Electrification of the American Home. *Technical Briefs in Historical Archaeology* 5:31–42.
- National Park Service (NPS)  
2012 Electronic document. Trail of Tears National Historic Trail. <http://www.nps.gov/trte/index.htm> [Accessed 26Oct2012].
- Nelson, Lee H.  
1968 *Nail Chronology as an Aid to Dating Old Buildings*. American Association for State and Local History, Technical Leaflet 15. American Association for State and Local History, Madison, Wisconsin.
- Orser, Charles E., Jr.  
1988 *The Material Basis of the Postbellum Tenant Plantation*. The University of Georgia Press, Athens, Georgia.
- Penny, James S. Jr. and Major C.R. McCollough  
1976 The Normandy Lithic Resource Survey. In *Third Report of the Normandy Reservoir Salvage Project*, edited by Major C. R. McCollough and Charles H. Faulkner. Report of Investigations No. 16, Department of Anthropology, The University of Tennessee, Knoxville.
- Price, Cynthia R.  
1981 Early to Mid-Nineteenth Century Refined Earthenwares. In *A Guide for Historical Archaeology in Illinois*, edited by Charles E. Orser, Jr., pp. 24–48. Mid-American Research Center Research Paper Number 1. Loyola University, Chicago.
- Pullin, Anne G.  
1986 *Glass Signatures, Trademarks and Trade Names from the Seventeenth to the Twentieth Century*. Wallace-Homestead Book Company, Lombard, Illinois.
- Raycraft, Don, and Carol Raycraft  
1990 *Collector's Guide to Country Stoneware and Pottery*, Second Series. Collector Books, Paducah, Kentucky.
- Reich, David, Nick Patterson, Desmond Campbell, Arti Tandon, Stéphane Mazieres, Nicolas Ray, Maria V. Parra, Winston Rojas, Constanza Duque, Natalia Mesa, Luis F. García, Omar Triana, Silvia Blair, Amanda Maestre, Juan C. Dib, Claudio M. Bravi, Graciela Bailliet, Daniel Corach, Tábita Hünemeier, Maria Cátira Bortolini, Francisco M. Salzano, María Luiza Petzl-Erler, Victor Acuña-Alonzo, Carlos Aguilar-Salinas, and Samuel Canizales-Quinteros  
2012 Reconstructing Native American population history. *Nature*, Published online July 11, 2012; doi:10.1038/nature11258.
- Revi, Albert C.  
1964 *American Pressed Glass and Figure Bottles*. Thomas Nelson and Sons, New York.
- Roenke, Karl G.  
1978 *Flat Glass, Its Use as a Dating Tool for Nineteenth Century Archeological Sites in the Pacific Northwest and Elsewhere*. Northwest Anthropological Research Notes, Memoir No.4. Moscow, Idaho.

- Rogers, Naomi  
 1997 Dirt, Flies, and Immigrants: Explaining the Epidemiology of Poliomyelitis, 1900–1916. In *Sickness and Health in America: Readings in the History of Medicine and Public Health*, edited by Judith W. Leavitt and Ronald L. Numbers, pp. 543–554. Originally published 1978. University of Wisconsin Press, Madison.
- Royce, Charles C.  
 2009 *The Cherokee Nation*. Smithsonian Institution Press.
- Schroedl, Gerald F., R. P. S. Davis, Jr. and C. C. Boyd, Jr.  
 1985 *Archaeological Contexts and Assemblages at Martin Farm*. University of Tennessee, Department of Anthropology, Report of Investigations No. 38, and Tennessee Valley Authority Publications in Anthropology No. 42. University of Tennessee, Knoxville.
- Soil Survey Staff  
 1999 *Soil Taxonomy, A Basic System of Soil Classification for Making and Interpreting Soil Surveys*. 2nd ed. Agricultural Handbook Number 436. United States Department of Agriculture, Natural Resource Conservation Service, Soil Survey Division, Washington, D.C.
- South, Stanley  
 1977 *Method and Theory in Historical Archaeology*. Academic Press, New York.
- Sprague, Roderick  
 1981 A Functional Classification for Artifacts from 19th and 20th Century Historical Sites. *North American Archaeologist* 2(3):251–261.
- Stanford, Dennis J., and Bruce A. Bradley  
 2012 *Across Atlantic Ice: The Origin of America's Clovis Culture*. University of California Press.
- Stewart-Abernathy, Leslie C.  
 1986 *The Moser Farmstead, Independent But Not Isolated: The Archeology of a Late Nineteenth Century Ozark Farmstead*. Arkansas Archeological Survey Research Series No. 26, Fayetteville, Arkansas.
- Stoltman, James B., and David A. Baerreis  
 1983 The Evolution of Human Ecosystems in the Eastern United States. In *The Holocene*, edited by H. E. Wright, Jr., pp. 252–268. Late Quaternary Environments of the United States, Vol. 2. University of Minnesota Press, Minneapolis.
- Stoops, Jr., Richard W.  
 1988 *Reconnaissance Survey of Archaeological Resources within the East and West Borrow Areas on Chestnut Ridge, in the Oak Ridge Reservation*. Midsouth Anthropological Research Center, University of Tennessee.
- Swann, Brenda M.  
 2002 Material Culture at Presidio Santa Maria de Galve (1698–1722): Combining the Historical and Archaeological Records. *Southeastern Archaeology* 21(1):64–78.
- Swann, M.E., Wallace Roberts, E.H. Hubbard, and H.C. Porter  
 1942 *Soil Survey: Roane County Tennessee*. Series 1936, No. 15. United States Department of Agriculture. Bureau of Plant Industry. Washington, D.C.
- Toulouse, Julian H.  
 1971 *Bottle Makers and Their Marks*. Thomas Nelson, New York.
- U.S. War Department Land Acquisition Records  
 1943 U.S. War Department Land Acquisition Records. On file at the U.S. National Archives, Atlanta, Georgia.

- United States Geological Survey  
1895 Loudon, Tennessee, 7.5-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C.
- 1935 Bethel Valley, Tennessee, 7.5-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C.
- 1941 Bethel Valley, Tennessee, 7.5-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C.
- 1953 Bethel Valley, Tennessee, 7.5-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C.
- 1999 Bethel Valley, Tennessee, 7.5-minute series topographic quadrangle. United States Department of the Interior, Washington, D.C.
- Wagner, Daniel P., and Joseph M. McAvoy  
2004 Pedoarchaeology of Cactus Hill, a Sandy Paleoindian Site Southeastern Virginia, U.S.A. *Geoarchaeology* 19(4):297–322.
- Wagner, Mark, and Mary McCorvie  
1992 *The Archeology of the Old Landmark. Nineteenth Century Taverns Along the St. Louis Vincennes Trace in Southern Illinois*. Illinois Department of Transportation and the Center for American Archeology, Kampsville, Illinois.
- Walters, William D., Jr.  
1982 Nineteenth Century Midwestern Brick. *Pioneer America* 14(3):125–136.
- Waters, Michael R. and Thomas W. Stafford, Jr.  
2013 The First Americans: A Review of the Evidence for the Late-Pleistocene Peopling of the Americas. In *Paleoamerican Odyssey*, edited by Kelly E. Graf, Caroline V. Ketron, and Michael R. Waters, pp. 541-560. Center of the Study of the First Americans, Department of Anthropology, Texas A&M University.
- Waters, Michael R., Steven L. Forman, Thomas A. Jennings, Lee C. Nordt, Steven G. Driese, Joshua M. Feinberg, Joshua L. Keene, Jessi Halligan, Anna Lindquist, James Pierson, Charles T. Hallmark, Michael B. Collins, and James E. Wiederhold  
2011 The Buttermilk Creek Complex and the Origins of Clovis at the Debra L. Friedkin Site, Texas. *Science* 331:1599–1603.
- Watkins, Lura Woodside  
1930 *Cambridge Glass 1818 to 1888: The Story of the New England Glass Company*. Bramhall House, New York.
- Wegars, Priscilla, and Caroline D. Carley  
1982 “The Very Latest Rage:” Design Trends in Twentieth Century Ceramics. Paper presented at the annual meeting of the Society for Historical Archaeology, Philadelphia.
- Wells, Emma Middleton  
1927 *The History of Roane County, Tennessee, 1801-1870*. Lookout Publishing Company, Chattanooga, Tennessee.
- Wentworth, Dennis L.  
1979 Archaeological Test Excavations at Arryl House, Clermont, New York. *Journal of Field Archaeology* 6(1):29–39.

Wesler, Kit W.

1984 A Spatial Perspective on Artifact Group Patterning Within the Houselot. *Proceedings of the Symposium on Ohio Valley Urban and Historic Archeology* II:37-44.

Wetherbee, Jean

1980 *A Look at White Ironstone*. Wallace-Homestead Book Company, Des Moines, Iowa.

Wetmore, Ruth Y.

2002 The Woodland Period in the Appalachian Summit of Western North Carolina and the Ridge and Valley Province of Eastern Tennessee. In *The Woodland Southeast*, edited by David G. Anderson and Robert C. Mainfort, Jr. University of Alabama Press, Tuscaloosa, pp. 249-269.

Wiebe, Robert H.

1967 *The Search for Order, 1877-1920*. Hill and Wang, New York.

Wilson, Bill, and Betty Wilson

1968 *Spirits Bottles of the Old West*. Henington Publishing Company, Wolfe City, Texas.

White, Max E.

2002 *The Archaeology and History of the Native Georgia Tribes*. University Press of Florida, Gainesville.

## APPENDIX A. HISTORIC MATERIALS RECOVERED



Table A-1. Historic Materials Inventory.

Bag	Site	Unit #	Zone	Grid N	Grid E	Dep	Cat #	Group	Class	Type	Attr 1a Def	Attr 1b Def	Attr 2a Def	Attr 2b Def	Burned	Count	Wt (g)	Dia	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
001	40RE613	STP 1	I	1000.00	1000.00	0-21 cm bgs	1	D	Container Glass	Blown in Mold		Aqua glass	Embossed recess panel		FALSE	1			Body	Medicine	1865	1920	Fike 1987:5; Berge 1980; Jones & Sullivan 1985; Lindsey 2018; Miller & Sullivan 1984	emb "ONIC"
002	40RE613	STP 2	I	985.00	985.00	0-20 cm bgs	2	A	Nails	Wire nail	Fragment				FALSE	3					1880		Nelson 1968	
002	40RE613	STP 2	I	985.00	985.00	0-20 cm bgs	3	C	Other Fasteners	Wire Snap	Fastener	Copper alloy			FALSE	1		0.34 in						complete snap; small bit of woven cloth attached
002	40RE613	STP 2	I	985.00	985.00	0-20 cm bgs	4	D	Ceramics	Whiteware	Undecorated				FALSE	1			Body		1830		Majewski and O'Brien 1987:119	
002	40RE613	STP 2	I	985.00	985.00	0-20 cm bgs	5	M	Other	Case/chest handle			Iron / Steel		FALSE	1								utilitarian case/chest handle, such as for a a tool box or open container
003	40RE613	STP 3	I	955.00	985.00	0-9 cm bgs	6	M	Cans	Paint Can			Iron / Steel		FALSE	1					1906		Berge 1980:261-262	possible rim fragment
004	40RE616	STP 1	I	1000.00	1000.00	0-11 cm bgs	1	A	Nails	Wire nail	12d	Pulled			FALSE	1					1880		Nelson 1968	
004	40RE616	STP 1	I	1000.00	1000.00	0-11 cm bgs	2	C	Footwear	Upper	Footwear	Leather			FALSE	1					1900		estimated	shoe leather frag, possibly strap; machine stitched
005	40RE616	STP 2	I	1000.00	970.00	0-5 cm bgs	3	D	Ceramics	Whiteware	Undecorated				FALSE	1			Body	Teacup	1830		Majewski and O'Brien 1987:119	
006	40RE616	STP 2	II	1000.00	970.00	5-17 cm bgs	4	D	Container Glass	Automatic Bottle Machine		Clear glass			FALSE	1			Body		1903		Jones & Sullivan 1985; Lindsey 2018	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	6	A	Nails	Wire nail	Fragment				FALSE	3					1880		Nelson 1968	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	5	A	Nails	Late machine headed cut nail	Fragment				FALSE	3					1830	1890	Nelson 1968	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	5	A	Nails	Late machine headed cut nail	7d	Pulled			FALSE	2					1830	1890	Nelson 1968	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	5	A	Nails	Late machine headed cut nail	6d	Pulled			FALSE	1					1830	1890	Nelson 1968	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	7	A	Nails	Indet	Fragment				FALSE	4								
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	8	D	Ceramics	Whiteware	Undecorated				FALSE	1			Body with base	Plate	1830		Majewski and O'Brien 1987:119	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	8	D	Ceramics	Whiteware	Decal				FALSE	1			Body	Teacup	1880	1940	Blaszczyk 2000:155; Majewski & O'Brien 1987:147; Wegars & Carley 1982	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	9	D	Ceramics	Stoneware	Salt glazed exterior		Albany slipped interior		FALSE	1			Body		1820	1925	Greer 1999; Ketchum 1983	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	10	D	Container Glass	Automatic Bottle Machine		Clear glass			FALSE	4			Body		1903		Jones & Sullivan 1985; Lindsey 2018	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	10	D	Container Glass	Automatic Bottle Machine		Clear glass	Embossed recess panel		FALSE	1			Body	Medicine	1903		Jones & Sullivan 1985; Lindsey 2018	emb "VER"
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	11	F	Lighting	Lamp Shade_milk glass					FALSE	1					1880		Belknap & McKearin 1949	
007	40RE616	STP 3	I	985.00	1000.00	0-18 cm bgs	12	P	Toys and Games	Doll / Doll Part	Porcelain: bisque (slip cast)				FALSE	1			Doll: body		1860	1925	Coleman et al. 1968:74 & 582	
008	40RE616	STP 4	I	1000.00	985.00	0-19 cm bgs	13	A	Flat Glass	Window Glass					FALSE	2					1885	1885	Moir 1987	
008	40RE616	STP 4	I	1000.00	985.00	0-19 cm bgs	14	A	Nails	Late machine headed cut nail	Fragment				FALSE	1					1830	1890	Nelson 1968	
008	40RE616	STP 4	I	1000.00	985.00	0-19 cm bgs	15	A	Nails	Wire nail	Fragment				FALSE	2					1880		Nelson 1968	

Bag	Site	Unit #	Zone	Grid N	Grid E	Dep	Cat #	Group	Class	Type	Attr 1a Def	Attr 1b Def	Attr 2a Def	Attr 2b Def	Burned	Count	Wt (g)	Dia	Vessel Part	Vessel Type	Min Date	Max Date	References	Comments
009	40RE616	STP 5	I	985.00	985.00	0-15 cm bgs	16	A	Nails	Late machine headed cut nail	Fragment				FALSE	1					1830	1890	Nelson 1968	
009	40RE616	STP 5	I	985.00	985.00	0-15 cm bgs	17	A	Nails	Wire nail	2d	Pulled	Roofing		FALSE	1					1880		Nelson 1968	
009	40RE616	STP 5	I	985.00	985.00	0-15 cm bgs	18	D	Container Glass	Automatic Bottle Machine		Clear glass	Recessed panel		FALSE	1			Body	Medicine	1903		Jones & Sullivan 1985; Lindsey 2018	
009	40RE616	STP 5	I	985.00	985.00	0-15 cm bgs	19	D	Glass Tableware	Press mold: unleaded		Clear unleaded glass		Molded design/pattern	FALSE	1			Body		1864		Jones 2000:149; Miller & Sullivan 1984	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	20	A	Constr Material	Brick	Handmade brick:non-vitrified				FALSE	6	305.8				1800	1880	Walters 1982:128-130	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	22	A	Flat Glass	Plate Glass					FALSE	1					1917		Roenke 1978	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	21	A	Nails	Wire nail	Fragment				FALSE	2					1880		Nelson 1968	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	23	D	Ceramics	Whiteware	Undecorated				FALSE	1			Body		1830		Majewski and O'Brien 1987:119	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	24	D	Ceramics	Ironstone	Plain				FALSE	1			Rim	Saucer	1830		Majewski and O'Brien 1987:122	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	25	D	Ceramics	Porcelain: hard paste	Molded / embossed border				FALSE	1			Body	Salt/Pepper/Spice shaker	1860	1900	Faulkner 2000	
010	40RE616	STP 6	I	1000.00	1015.00	0-16 cm bgs	26	D	Container Glass	Automatic Bottle Machine		Clear glass			FALSE	1			Body	Medicine	1903		Jones & Sullivan 1985; Lindsey 2018	vial
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	27	A	Nails	Late machine headed cut nail	Fragment				FALSE	3					1830	1890	Nelson 1968	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	28	A	Nails	Cut / Wrought Nail - indet	Fragment				FALSE	1					1700	1890	Nelson 1968	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	29	D	Container Glass	Blown in Mold		Clear glass			FALSE	1			Body		1864	1920	Jones & Sullivan 1985; Lindsey 2018; Miller & Sullivan 1984	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	29	D	Container Glass	Blown in Mold		Aqua glass			FALSE	1			Body		1800	1920	Faulkner 2000	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	30	D	Container Glass	Automatic Bottle Machine		Clear glass			FALSE	2			Body		1903		Jones & Sullivan 1985; Lindsey 2018	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	31	D	Glass Tableware	Press mold: unleaded		Clear unleaded glass		Molded design/pattern	FALSE	2			Body		1864		Jones 2000:149; Miller & Sullivan 1984	
012	40RE616	STP 8	I	985.00	1000.00	0-14 cm bgs	32	F	Lighting	Lamp Chimney	Glass: clear		Plain		FALSE	1					1854	1940	Faulkner 2008; Pullin 1986:356	