DELAWARE DEPARTMENT OF TRANSPORTATION

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown, New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Agreement 1533 - Task 8

Phase II Archaeological Survey Report
Sites 7NC-F-118, 7NC-F-119, 7NC-F-155

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Phase II Archaeological Survey Report Sites 7NC-F-118, 7NC-F-119, and 7NC-F-155

by

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ABSTRACT

This report documents the results of Phase II Archaeological Surveys performed at three sites within the U.S. Route 301 Project corridor. The Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119) are located in Middletown, New Castle County, Delaware. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located in Saint Georges Hundred, New Castle County, Delaware. The proposed U.S. Route 301 project consists of approximately 17.5 miles of a four-lane toll highway that will extend from the Maryland-Delaware border to State Route 1, just south of the SR 1 Bridge over the Chesapeake and Delaware Canal. This *Phase II Archaeological Survey Report* represents the final cultural resource work performed for the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The work was performed for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA).

The Reynolds Historic/Prehistoric Site (7NC-F-118) is located approximately 0.5 miles north of the intersection of Middletown Warwick Road and Warwick Road and extends over approximately 20 acres. The site contains materials from the Archaic through Woodland II periods. The Phase II investigations yielded four prehistoric features and prehistoric lithic resources. C-14 dates and temporally diagnostic artifacts suggest that the portion of the prehistoric portion of the site investigated during the Phase II investigations dated from the fourth century AD. Historic material recovered include artifacts from the late eighteenth-century/early nineteenth-century and later nineteenth century. Analysis of the historic and prehistoric artifacts indicated that the portions of the site investigated during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places. No additional archaeological work is recommended for the portions of the Reynolds Historic/Prehistoric Site (7NC-F-118) that lie within the project's APE.

The Area 8 Prehistoric Site (7NC-F-119) is located approximately 0.3 miles north of the intersection of Middletown Warwick Road and Warwick Road on a relatively flat upland setting adjacent to a wooded area and extends over approximately 7.7 acres. The Phase II work focused only on the prehistoric component of the site. The site yielded prehistoric artifacts with diagnostics dating from the Archaic through the Woodland II periods, although the portion examined during Phase II appears to date to the Woodland I period. Analysis of the prehistoric artifacts indicated that the portions of the site investigated during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places. No additional archaeological work is recommended for the portions of the Area 8 Prehistoric Site (7NC-F-119) that lies within the project's APE.

The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located approximately 0.89 miles southwest from the intersection of Boyds Corner Road and Cedar Lane Road and measures approximately 2.7 hectares (6.7 acres). The Phase II work focused only on the prehistoric component of the site. The site yielded prehistoric artifacts with diagnostics dating from the Archaic through the Woodland II periods. Analysis of the prehistoric artifacts indicated that the portions of the site investigated during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places. No additional archaeological work is recommended for the for the portions of the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) that lies within the project's APE.

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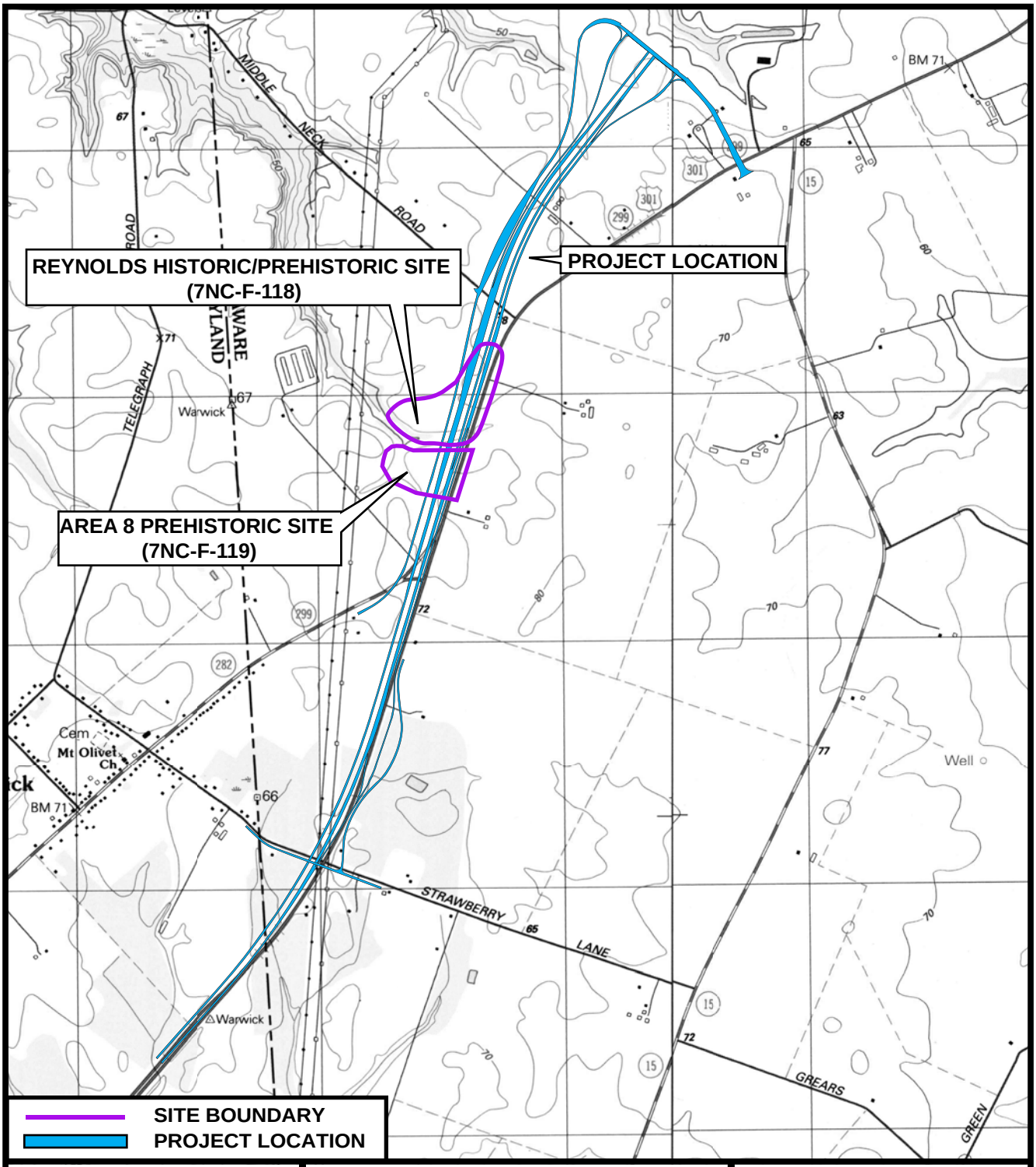
INTRODUCTION

This report documents the results of three Phase II Archaeological Surveys performed for the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119) are located in Middletown, New Castle County, Delaware and were identified within Section 3 of the proposed U.S. Route 301 corridor by Richard Grubb & Associates, Inc. (Figure 1; USGS 1993a, 1993; Grossman-Bailey, Hayden and Springsted 2010). The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located in Saint Georges Hundred, New Castle County, Delaware and was identified within Section 1 of the proposed U.S. Route 301 corridor by Hunter Research, Inc. (Figure 2; USGS 1993b, 1993c; Liebenknecht and Burrow 2010). The proposed U.S. Route 301 project consists of approximately 17.5 miles of a four-lane toll highway that will extend from the Maryland-Delaware border to State Route 1, just south of the S.R. 1 Bridge over the Chesapeake and Delaware Canal. Section 3 of the proposed project extends from the Maryland-Delaware border to Levels Road, a distance of approximately 4.5 miles. The proposed S.R. 301 project within Section 3 consists of the construction of a new four-lane highway, Levels Road interchange, the relocation of Warwick Road and Strawberry Lane and associated off ramps, concrete barriers, culverts over stream crossings, earthen berms, and approximately 14 potential storm water management facilities. Section 1 of the proposed project extends for a distance of approximately 5 miles, from the intersection with S.R. 1 to Middletown Warwick Road. The proposed S.R. 301 project within Section 1 includes the construction of a new four-lane highway, concrete barriers, culverts over stream crossings, earthen berms, and potential storm water management facilities. This *Phase II Archaeological Survey Report* represents the final cultural resource work performed for the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The work was performed for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA).

The purpose of the Phase II Archaeological Surveys was to identify and evaluate the eligibility of the three sites for inclusion in the National Register of Historic Places. The eligibility for each site was assessed based on local and state historic context documents and according to the *Guidelines for Evaluating and Registering Archaeological Properties* (Little et al. 2000).

The Phase II Archaeological Surveys were conducted in accordance with federal and state laws that protect significant cultural resources, including historic and archaeological sites. Federal and state mandates for cultural resource protection include: The Department of Transportation Act of 1966; as amended in 1968; the National Environmental Policy Act of 1969; the National Historic Preservation Act of 1966 (NHPA) (as amended); Executive Order 11593; and the Archaeological and Historic Preservation Act of 1974. This legislation requires that the effect of any federally assisted undertaking on historically significant buildings, structures, objects, or sites be taken into account during project planning. All work was performed in accordance with 36 CFR §800, and the Delaware State Historic Preservation Office (DSHPO), *Guidelines for Architectural and Archaeological Surveys in Delaware* (DSHPO 1993, revised 2010).

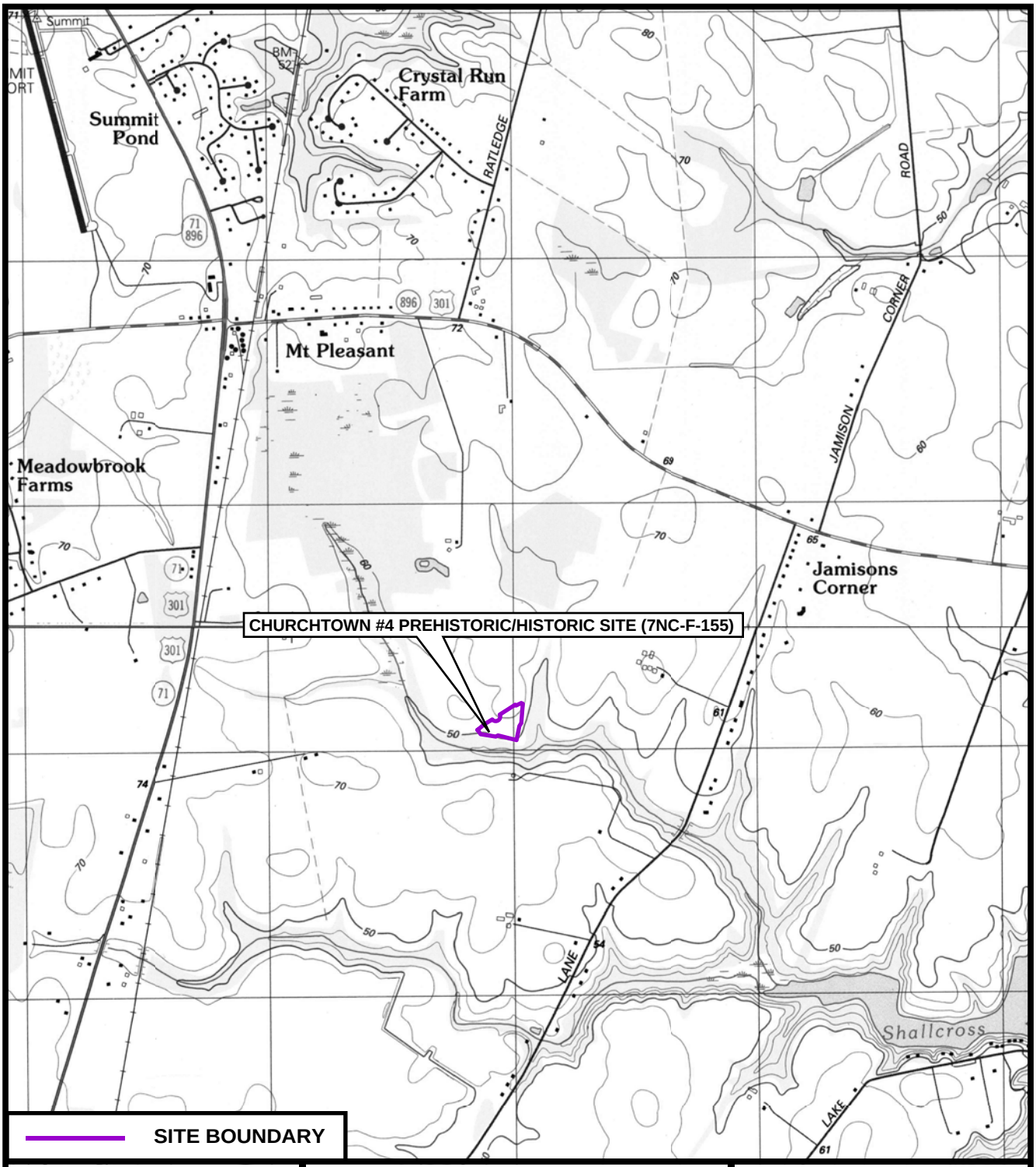
The research and field analysis for these projects were undertaken during February, March, April, May, and June of 2011. The Phase II work was performed by Cultural Heritage Research



QUADRANGLE LOCATION	SCALE	SOURCE
DELAWARE N	0ft 2000ft 0m 609.6m Prepared by CHRS, Inc.	USGS 1993a CECILTON, MD-DE USGS 1993b MIDDLETOWN, DE

PROJECT AND SITE LOCATION MAP - REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118) AND AREA 8 PREHISTORIC SITE (7NC-F-119)

FIGURE 1



QUADRANGLE LOCATION	SCALE	SOURCE
DELAWARE N	0ft 2000ft 0m 609.6m Prepared by CHRS, Inc.	USGS 1993b MIDDLETOWN, DE USGS 1993c SAINT GEORGES, DE

PROJECT AND SITE LOCATION MAP - CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155)

FIGURE 2

Services, Inc. (CHRS, Inc.) of Lansdale, Pennsylvania. Kenneth J. Basalik, Ph.D. served as the project's Principal Investigator. Justin D. McKissick served as the Field Archaeologist. Philip Ruth conducted the historical research. Lab work was performed by Chris Civello. Graphics for the report were prepared by Crystal Hall and editorial work was executed by Kevin Quigg and Maria Rossi of the CHRS staff (Appendix A).

BACKGROUND RESEARCH

Environment

The geography and environment of the U.S. Route 301 Corridor have been described in several project related documents (A.D. Marble & Company 2006; Richard Grubb & Associates, Inc. 2009). This data is summarized here with specific references to Section 1 and Section 3.

The proposed U.S. 301 Project is located within the Mid-Peninsular Drainage Divide Zone and the Mid-Drainage Zone of the Upper Coastal Plain Physiographic Province. Typical topography for the region consists of gently rolling hills that separate headwater streams of various drainages which empty into the Delaware and Chesapeake Bays. Elevation changes are very slight throughout the area with steeper slopes occurring only near stream banks. Water sources in the zone consist of low-order streams, swamps located in poorly drained soil areas, and bay/basin features (A.D. Marble & Company 2006; Richard Grubb & Associates, Inc. 2009).

On site soils for the three site locations consist of well-drained Reybold Queponco Complex (RdA) on 0-2% slopes and well-drained Reybold Silt Loam (ReB) on 2-5% slopes (NRCS 2012). These soils are part of the Matapeake-Sassafras Association, which are characterized as "nearly level to steep, well-drained, medium textured to moderately course textured soils on uplands" (Matthews and Lavoie 1970; A.D. Marble & Company 2006).

The vegetation for the region once consisted mainly of mixed hardwood forests. For the last 300 years, the vegetation has consisted mainly of agricultural fields with areas of hardwood trees and wetlands. Within Section 3, at the Reynolds Historic/Prehistoric site (7NC-F-118), the current vegetation consisted of an agricultural field, most recently planted with barley. The Area 8 Prehistoric Site (7NC-F-119) was also located within an agricultural field; however, no crop had been planted at the time of the survey. A small tributary of the Great Bohemia Creek, young trees, shrubbery, and a wetland separated the two sites. Within Section 1, The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) was also located within an agricultural field, most recently planted with corn that had been harvested before the field survey. The site was bordered to the south by Spring Mill Branch and to the east by Taylor's Branch, which are surrounded by dense forest and shrubbery.

Prehistoric Context

The prehistoric period of the Delmarva Peninsula is divided into five chronological periods: the Paleo-Indian (~13,000-6500 BC), Archaic (~6500-3000 BC), Woodland I (~3000 BC-AD 1000), Woodland II (AD 1000-1650), and the Contact Period (AD 1650-1750). The division in periods is

based on the cultural differences that exist between consecutive periods and the relative cultural continuity within each period. The following descriptions of these five periods are summaries derived from a variety of existing resources.

Paleo-Indian Period (~13,000-6500 BC)

The earliest, widely recognized tradition in the northeastern United States is the Paleo-Indian. The period begins as the last Pleistocene ice sheets were receding from Eastern North America and the environment was changing to a mixture of deciduous, boreal, and grassland biomes with alternating wet and dry seasons. This tradition is believed to have been characterized by small, mobile hunter-gatherer groups subsisting mainly on large mammals, many of which are now extinct or no longer present in the area (mastodon, bison, moose, and caribou) (Leslie 1973; Marshall 1982, Custer 1989).

The artifact distinctive to this tradition is the fluted projectile point, which is a lanceolate-shaped point with a central flake removed from both faces along on the longitudinal axis. The points, along with a number of related tools, have been found in association with various floral and faunal resources at sites across the eastern United States (Gardner 1974). The Paleo-Indian Period is marked by specific cultural ecological adaptations to the Pleistocene and Early Holocene environments. Two models for Paleo-Indian settlement/subsistence patterns have been proposed. According to Gardner (1974, 1977) the predominance of cryptocrystalline lithic material in the production of fluted projectile points may have influenced the distribution of settlements and the overall size and shape of exploitative territories. Gardner states that groups may have been restricted to a territory of 48.3 to 112.7 kilometers (30 to 70 miles), with movements being circling around the known sources of the cryptocrystalline material (Gardner 1977, 1979). An alternative theory argues that the groups were not limited to settlement in areas that possessed large outcrops of cryptocrystalline. In this model, groups would have obtained lithic raw materials from secondary sources of the fine-grained material such as pebbles and cobbles, while engaging in other subsistence activities.

Custer has outlined the expected site types for the Paleo-Indian Period and they include quarry, quarry reduction, base camps, base camp maintenance stations, and hunting sites (Custer 1984, 1986). Site patterning indicates that Paleo-Indian groups preferred settlements located on high terraces or knolls that overlooked a river or stream (Leslie 1973; Marshall 1982, Custer 1989). The majority of Paelo-Indian sites discovered in central Delaware within the Midpeninsular Drainage Divide Zone have consisted of isolated point and tool surface finds. The Hughes Early Man Complex (7K-E-10, -24, -33), located in central Kent County, Delaware contains a set of three sites from the tradition that are located within a similar topographic setting to that of the proposed U.S. 301 project. The complex, which consists of six Paleo-Indian artifact concentrations found on well-drained knolls overlooking a freshwater wetland/swamp, include a Clovis point, a Mid-Paleo point, a Kirk and Palmer notched point, and a variety of bifacial and flaked tools (Custer 1984, 1989).

Archaic Period (~6500-3000 BC)

The Archaic period is categorized by a number of adaptations to a changing Holocene environment. The climate of the Middle Atlantic region began to transform to a warmer and wetter

environment. The boreal forests began to diminish as they were displaced by mixed hemlock-oak forests (Custer 1990). The change in climate also altered the type of game available. Most of the mega-fauna became extinct as the new vegetation provided food for smaller game, such as deer and turkey that had begun to dominate the area. The early Holocene also brought a rise in sea level, which had a profound effect on the Delmarva Peninsula. Flooding of coastal lowlands and the inundation of river systems brought about a complex estuary system. A number of interior swamps and wetlands were also created, allowing for an increase in the variety and density of floral and faunal resources available to archaic groups (A.D. Marble & Company, Inc. 2005).

Archaic peoples also altered their stone tool kits. The Paleo-Indian fluted points disappeared and were replaced with a variety of stemmed and notched forms. Along with a change in the point shape, the tool kits grew in size and became less specialized as plant processing tools, such as grinding stones, mortars, and pestles, became more prevalent (Custer 1989, Stewart and Cavallo 1991).

Changes in the environment and the available resources brought about a shift in the settlement patterns from those previously seen during the Paleo-Indian period. Hunting and gathering remained the main lifestyle; however, groups likely grew in size. According to Custer (1984, 1989), Archaic settlement systems would include Macroband base camps, Microband base camps, and Procurement camps. Macroband base camps would typically be located in areas with access to a variety of high-value subsistence resources. These areas were likely located on terraces of major drainages and along the edges of interior wetlands/swamps and would be able to support the seasonal aggregation of multiple groups. Microband base camps would typically be located in areas with generally lower carrying capacity. These areas were likely located in sheltered areas with access to marshes, along smaller drainages, or within other areas that would have provided relatively concentrated subsistence resources during the colder months of the year. These base camps would likely have been used mainly by single families during the less productive seasons of the year. Procurement camps consisted of small, ephemeral sites located near essential resources. The site locations would have been dependent on the specific resource that was being exploited and the environmental niche in which they could be found (Custer 1984, 1989). Five Archaic archaeological sites (7NC-F-39, 7NC-F-18, 7NC-F-2, 7NC-G-145, and 7NC-D-115) were identified within the U.S. 301 project area prior to the institution of Phase I archaeological testing.

Woodland I Period (~3000 BC-AD 1000)

The Woodland I Period is characterized by changes in the subsistence strategies and the settlement systems for groups residing on the Delmarva Peninsula. The climate takes another dramatic shift in the Middle Atlantic region as there was a continued warming and drying period. The hemlock-oak forests were replaced with oak and hickory forests. The rising sea level slowed and large estuarine environments formed, bringing an increase in shellfish and anadromous fish populations. A new, diverse set of plants would also have been associated with these new environmental settings (A.D. Marble & Company, Inc. 2005).

The Woodland I tool kit contains only minor changes when compared to the Archaic tool kits. Plant processing tools became more common, which indicates that gathering practices had become more important. Projectile point shapes stayed relatively the same; however, broad-bladed knife-

like tools became more prevalent. Some material type used for stone tools became from non-localized sources, which indicates that regional trade and exchange systems had developed (Custer 1984).

With the increase in the variety and density of subsistence resources available, settlement patterns show signs of becoming more sedentary. Prehistoric groups would have begun to focus their hunting and gathering activities on a smaller set of ecological settings. Innovations in food storage and cooking techniques appeared through the use of storage pits as well as the development of steatite and ceramic containers. The first evidence of permanent structures is found in the Woodland I period. Settlements systems would have focused on major river floodplains and estuaries. Base camps would have increased in size as population increases occurred. With increased populations and the development of trade and exchange networks, it is likely that social organization changed with classifications and ranked societies forming within groups (Custer 1984, 1989, 1994). Eighteen Woodland I sites have been identified within the U.S. 301 project area prior to the institution of Phase I archaeological testing. Ten (7NC-F-14, 7NC-D-92, 7NC-H-12, 7NC-H-14, 7NC-H-15, 7NC-H-18, 7NC-F-67, 7NC-F-61, 7NC-D-197, and 7NC-F-63) consist of single component sites. The remaining 8 Woodland I sites (7NC-F-2, 7NC-J-54, 7NC-D-130, 7NC-D-113, 7NC-D-115, 7NC-J-208, 7NC-G-144, and 7NC-G-145) consist of multi-component sites (A.D. Marble & Company 2006).

Woodland II Period (AD 1000-1650)

The Woodland II Period is characterized in the Middle Atlantic by a change in subsistence strategies associated with the introduction of agriculture and large scale village life (Custer 1986). Aside from the introduction of cultivation, subsistence strategies within the Delmarva Peninsula were the same as those during the Woodland I. The climate and environmental biomes also remained very similar to those of the Woodland I Period (A.D. Marble & Company, Inc. 2005).

The biggest change between the Woodland I and Woodland II Periods happened to the ceramic and projectile point types. The triangular projectile point is developed and stone tools associated with horticulture and the processing of plant materials become prevalent. Within the Delmarva Peninsula, two cultural complexes are recognized for the Woodland II period: the Minguannan Complex and the Slaughter Creek Complex. Both complexes display a continued change in the social structure as villages continued to grow in size and trade networks grew in scope (A.D. Marble & Company, Inc. 2005).

The Minguannan Complex is found mainly in the northern portion of Delaware, northeastern Maryland, and portions of Pennsylvania. The ceramics associated with this complex consist of sand, grit, or crush quartz temper with some incised or cord-impressed designs. The likely settlement systems include large and small base camps with nearby procurement sites. Sites were likely very similar to those of the Woodland I period (Custer 1984).

The Slaughter Creek Complex is found within the central peninsula of Delaware to Virginia. The characteristic ceramic type associated with this complex is the Townsend ware. Townsend ware ceramics are tempered with crushed sea shell and contain fabric impressions on the exterior of the thin walls (Griffith 1982). While domesticates do not appear at many Slaughter Creek Complex

sites, the settlement patterns are fairly sedentary. Similar to the Minguannan Complex, the Slaughter Creek Complex settlement patterns were likely composed of large and small base camps with procurement sites at resource acquisition areas (Custer 1984, 1989).

Contact Period (AD 1600-1750)

The Contact Period begins with the arrival and settlement establishments of Europeans to the Delmarva Peninsula. As more Europeans moved into the region, the lifestyles of the Native American populations were greatly affected. A high demand for furs by the Europeans altered the economic orientation of Native American cultures. This trade network brought metal and other European goods into the Native American tool kits, thereby displacing stone and other traditional materials. However, the largest impact to the Native American lifestyle was the introduction to European diseases, which decimated populations. By the end of the Contact Period there were few Native Americans remaining on the Delmarva Peninsula and those that remained had abandoned the traditional life ways (A.D. Marble & Company, Inc. 2005).

Historic Context

The regional history of the Delmarva Peninsula is divided into five chronological eras: Exploration and Frontier Settlement (1630-1730), Intensified and Durable Occupation (1730-1770), Transformation from Colony to State (1770-1830), Industrialization and Capitalization (1830-1880), and Suburbanization (1880-1940). These five historic periods are defined in the State Historical Plan (De Cunzo and Catts 1990). The following descriptions of the periods are summaries derived from a variety of existing resources.

Exploration and Frontier Settlement (1630-1730): Fort Christina, located near present day Wilmington, was the first permanent European settlement on the Delmarva Peninsula. It was established in 1638 by the New Sweden Company and marked the first colonization of the region. Prior to its construction, the only European establishments of the Americas consisted of a few fur trading stations and the limited exploratory expeditions up the Delaware River. The fort quickly became the centerpiece of New Sweden and allowed for farmers and traders to begin populating the area (Weslager 1987).

In 1651, The West India Company constructed Fort Casimir near present day New Castle in order to block access to the Delaware River from the Swedes. This action was taken because the Dutch claimed prior ownership of the region from Captain Henry Hudson's 1609 expedition of the Delaware Bay. In 1654, the Swedes captured Fort Casimir and renamed it Fort Trinity. One year later, the Dutch returned with a large military force that recaptured Fort Trinity and seized Fort Christina. From 1654 to 1674, the control of the Delaware River and Delaware Bay transferred power between the Dutch, English, and Amsterdam. In 1682, William Penn and his representatives were granted the rights to the region by the Duke of York. This transferred economic and political control of Delaware to Philadelphia, which was William Penn's colonial government seat (Munroe 1978).

The landscape of Delaware during the Exploration and Frontier Settlement Period was heavily wooded, with a mixture of oaks, walnut, hickory, chestnut, and maple. Travel throughout the area

was mainly done via waterways as these offered the easiest, safest, and most effective means of transportation. Overland travel at the time was difficult as roadways were sparse and very poorly constructed.

The Swedish, Dutch, and English immigrants that settled throughout Delaware were tobacco, rye, and barley farmers. Farming and raising livestock quickly became the primary income-producing activity for residents (Herman and Sinders 1989). Towards the end of the Exploration and Frontier Settlement Period, farmers replaced these crops with wheat, which was in higher demand at the time. Local grain mills converted wheat to flour and bread, which were then shipped to Philadelphia for export to other North American colonies, Europe, and the West Indies (Lindstrom 1978, Pursell 1958, Scharf 1888). Along with agriculture and grain mills, lumber yards, brick yards, and iron production were the other major industries found throughout Delaware into the seventeenth century (Scharf 1888).

Farmsteads and "Plantations" were typically located on well-drained soils with clearings for a residence and agricultural fields. The structures associated with a farmstead consisted of small buildings, typically constructed of wood (frame or log) or brick on earthen foundations. Homes were built in a variety of plans including hall, hall-parlor, double-cell, cross-passage, and four-room. Along with the main dwelling, a number of outbuildings were usually located in the vicinity. These include kitchens, tobacco and grain sheds, milk houses, barns, smokehouses, privies, and meat houses (Herman 1987).

Intensified and Durable Occupation (1730-1770): The middle of the eighteenth century can be characterized as a time of population increase and commercial expansion in Delaware. The agricultural shift from tobacco to grain that began in the prior period continued. Large areas were cleared for cultivation and new areas were settled, which lead to improvements to the transportation networks. People began to move inland from the highly navigable rivers and streams (A.D. Marble & Company 2005).

In 1739, Wilmington was chartered and quickly developed into the largest city in Delaware. As a port of entry, Wilmington was an important link in the Philadelphia trade network. It acted as a receiving and distribution center for local and regional farm produce (Munroe 1978). Waterways in Delaware continued to be highly important for commerce and transportation as roadways were still relatively poor in condition. The few roadways that did exist were connected to river landings and the Delaware Bay. Throughout the eighteenth century, roads began to improve in both number and in condition. Roadway construction expanded out of Wilmington and New Castle to the north, south, and west allowing for the connection of the Delaware River to the Chesapeake Bay, of Kent and Sussex counties, and of southeastern Pennsylvania to Delaware (Munroe 1954).

Farming throughout the region remained the most important activity among residents. Farming practices consisted of grain cultivation and raise livestock. Wheat was the primary crop grown followed by rye, corn, barley, oats, and some vegetables. Farming practices shifted to a three or four field rotation. As the farming practices changed, so did the placement and layouts of the farm complexes. Farmsteads grew in size as larger fields were needed for agriculture. In the 1740s Georgian architecture expanded into the region as more permanent construction methods and

materials were used for homesteads. The outbuildings reflect the changes in farming as tobacco sheds were replaced with more durable granaries and barns (De Cunzo and Catts 1990).

Transformation from Colony to State (1770-1830): The start of this period was consumed by the political and social aspects of the American Revolution. The maritime economy along the Delaware River was disrupted by the British blockade of the colonies. British invasions of settlements along the river stole food, livestock, and slaves from the inhabitants. During the Revolutionary War, several military forces passed through Delaware. In 1777, a large British and Hessian army marched through Newark and Hockessin after landing in Cecil County, Maryland. The army, made up of some 17,000 troops, was engaged by a small group of continental soldiers and militia at Cooch's Bridge. The small group of American soldiers were forced to retreat. The British and Hessian army continued on to Wilmington and took control throughout the winter of 1777-78. In 1781, General Washington's army headed south to besiege the British forces at Yorktown. Washington marched his American and French troops through New Castle County (A.D. Marble & Company 2005).

The economy of Delaware began to slide during this period. As it relied heavily on agriculture, a decline in wheat prices combined with poor soil conditions and a lack of good farming land had a large impact on the region. Population growth continued into the early nineteenth century and farmers were forced to grow crops on unsuitable land. Many farmers were unable to turn profits into the 1820s and 1830s, forcing many of them to abandon farms and leave Delaware. The less productive and abandoned farms were incorporated into the holdings of wealthier farmers who remained in the region (Herman 1987).

While agriculture declined, manufacturing and commerce grew and were more productive during this period. Rapid industrialization and urbanization of the higher populated areas took place as there was a shift in the population dynamic within Delaware. People were moving from the job lacking agricultural areas to the urban centers where manufacturing jobs were in full demand. Manufacturing mills produced cotton, paper, snuff, rope walks, gunpowder, iron, and grist throughout the region. The Red Clay Creek, White Clay Creek, and Brandywine Creek were dammed and used for power (Pursell 1958, Munroe 1979).

Industrialization and urbanization was stimulated by the increased transportation network. The methods and routes of transportation made dramatic changes as turnpikes, canals, and railroads were introduced to the area. These changes and improvements to transportation fueled successful urban, agricultural, and industrial developments in Delaware (Gallatin 1808).

Industrialization and Capitalization (1830-1880): In northern Delaware, industrialization, urbanization, and transportation development continued to grow. As foreign markets decreased demand for agricultural goods, the regional farmers began to diversify their production. From 1830 into the 1870s, peaches became a chief crop grown in Delaware. Due to the favorable soils, climate, and rainfall, Delaware acted as the center for peach production in the eastern United States. In the 1870s a disease spread through the peach orchards and devastated the industry. Aside from peaches, farmers shifted focus from wheat and livestock to the production of corn, dairy, fruits, vegetables, and lumber (A.D. Marble & Company 2005).

The reemergence and success of both industry and agriculture can be attributed to the improved transportation systems that occurred through the 1830s. Mainly the construction of the Chesapeake and Delaware Canal and the development of the railroad systems throughout the state spurred the economic boom. The Chesapeake and Delaware Canal was started in 1824 and completed in 1829 (Gray 1960). The canal bypassed the major economic areas in northern Delaware. Approximately 2600 individuals worked on the construction of the canal. They lived in temporary frame shanties or within privately owned houses (Kellogg 1992). At the time of the canal's completion, only two roadways and the Delaware Railroad existed that crossed the canal, thus limiting travel between northern New Castle Delaware County and the rest of the Delmarva Peninsula. In 1831, the New Castle and Frenchtown Railroad Company formed and laid track all throughout the Delmarva Peninsula. The initial railroads consisted of iron strip topped wooden tracks lain on stone. For the first year, horse drawn carriages ran the railroads but were soon replaced with steam locomotives built by the Robert Stephenson Company in England (Warren 1970). Once completed, the Baltimore, Wilmington, and Philadelphia Railroads linked Delaware to sources of raw materials and added markets for finished product sales. The construction and completion of the Delaware Railroad in 1857 connected southern Delaware with the New Castle and Frenchtown Railroads, thus opening up southern Delaware to the economics of Wilmington (Kellogg 1992).

Suburbanization (1880-1940): Into the twentieth century, farming in Delaware again shifted focus. Farmers moved from staple crops, such as corn and wheat, to more perishable crops, such as tomatoes, apples, and potatoes. These crops were grown and shipped to larger markets in Philadelphia, New York, Baltimore and other nearby cities. Large industries purchased farmland and utilized up-to-date machinery, which cut costs in manpower. Small, independent farmers began focusing on fresh vegetables and fruit for local markets. Along with the shift in the crop types, the size of farms decreased as tenant farming became more prevalent. Downturns in the economy during the 1890s and 1930s, combined with a shrinking labor force, caused new farming techniques to be developed and pushed for more mechanization of farming equipment. Land owners, who had increased their holdings during the early nineteenth century, leased their property for cultivation to tenant farmers (Kellogg 1992).

The early twentieth century brought the introduction of the automobile to the region requiring new roadways to be built and old ones updated. This new roadway network throughout the region allowed for goods to be transported to more distant markets. Towns outside of cities experienced growth as the roadways allowed for quicker access to cities. The increased automobile travel and population growth of suburban areas facilitated a number of businesses that accommodated travelers along the new roadway systems (Kellogg 1992).

Site Specific Culture History

The only historic component discussed in this report is the Reynolds Historic/Prehistoric Site (7NC-F-118). The Area 8 Prehistoric Site (7NC-F-119) does not contain any historic component. Prior background research did not show any buildings or structures within the site area. The Churchtown #4 Prehistoric/Historic Site did contain a historic component; however, mitigation efforts to protect the historic component resulted in a redesign of the APE and an exclusion of the site from further archaeological work.

Reynolds Historic/Prehistoric Site (7NC-F-118): [Note: Some of the historical and cartographical data cited in the following discussion was provided to CHRS, Inc. by phone and email in November 2010 by Richard Grubb Associates (RGA) historian Philip A. Hayden, who was contributing to a report submitted to the Delaware Department of Transportation in March 2011 under the title Draft Report, Phase Ib (Identification-Level) Archaeological Survey, U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown, New Castle County, Delaware and Electoral District 1, Cecil County, Maryland, Parent Agreement 1417, Task 9 (Grossman-Bailey, Hayden and Springsted 2011).]

Land and probate records indicate that, during the mid-1730s, Site 7NC-F-118 was part of a recently established 125-acre farm along the west side of the "road from Sassafras to Appoquinimink" (on the approximate alignment of present-day Middletown-Warwick Road, Route 301), within the jurisdiction of Cecil County, Maryland. It was noted in a December 1736 deed that this farm was occupied at that time by Nicholas Reynolds, who had taken provisional possession of the land a few years earlier through a bequest from his father, John Reynolds (Cecil County Deed Book 5:249).

Born into a Quaker family in southern Chester County, Pennsylvania in 1695, John Reynolds had just turned 22 when he acquired a 660-acre tract called "Sarah's Jointure" (sometimes spelled "Joynture"; lying "along the ridge between the headwaters of the Bohemia, the Appoquinimink, and the Sassafras Rivers") from Queen Ann County resident Richard Bennett on November 29, 1717 (Juker 2006:n.p.; Cecil County Circuit Court 3:136; Grossman-Bailey and Hayden 2009:3-18). On a map of lands around the headwaters of the Bohemia River, drafted around 1735 by William Rumsey Sr., the dwelling of John Reynolds was denoted on the west side of "black horse branch" (also known as "Herman's Branch" and "Mill Branch"), approximately 1,000 feet northwest of Site 7NC-F-118 (Rumsey Family Papers n.d.; a detail of this map was reproduced as Figure 3.3 and discussed on Pages 3-10 and 3-12 in Grossman-Bailey, Hayden and Springsted 2011). No structures were denoted on this map within Site 7NC-F-118, on the west side of the colonial precursor of Middletown-Warwick Road.

In composing his will on March 2, 1730, John Reynolds directed the executors of his estate (wife Mary and son Edward) to provide "deeds of gift" for several "tracts or parcels of land" to John and Mary's four children: William, Nicholas, Edward, and Mary (Cecil County Will Book AA1:336). The locations and dimensions of the tracts (subdivisions of Sarah's Jointure) were not specified in Reynolds' will. Presumably those details were to be recorded in the anticipated deeds of gift, following Reynolds' death. In the meantime, John and Mary's son Nicholas (probably still a teenager) occupied his intended portion of Sarah's Jointure: a tract later measured at 125 acres, immediately east of the Reynolds residence, bisected by Mill Branch and bounded on the east by the road between Middletown and Warwick. Nicholas was described as the owner and occupying "planter" of this property in a December 6, 1736 deed by which he conveyed the property (encompassing Site 7NC-F-118) to Cecil County carpenter Jacob Evertson, in consideration of £80 (Cecil County Deed Book 5:249).

No records pertaining to specific improvements made to the property during Nicholas Reynolds' occupation have come to light. If Nicholas indeed "lived" on the property (as stated in the December 1736 deed), he must have occupied at least a rudimentary residence there. While no structures were denoted within the not-yet-delineated bounds of Nicholas's 125-acre property on the circa-1735 map drafted by William Rumsey Sr. (Rumsey Family Papers n.d.), the price paid for the

property by Jacob Evertson in December 1736 (£80) suggests substantial improvement. A review of deeds involving Cecil County land conveyances in 1736 reveals that the going rate for unimproved land in that year was one-third to one-half pound per acre. Evertson paid £1.5 per acre for Nicholas Reynolds' tract (Cecil County Deed Book 5:249).

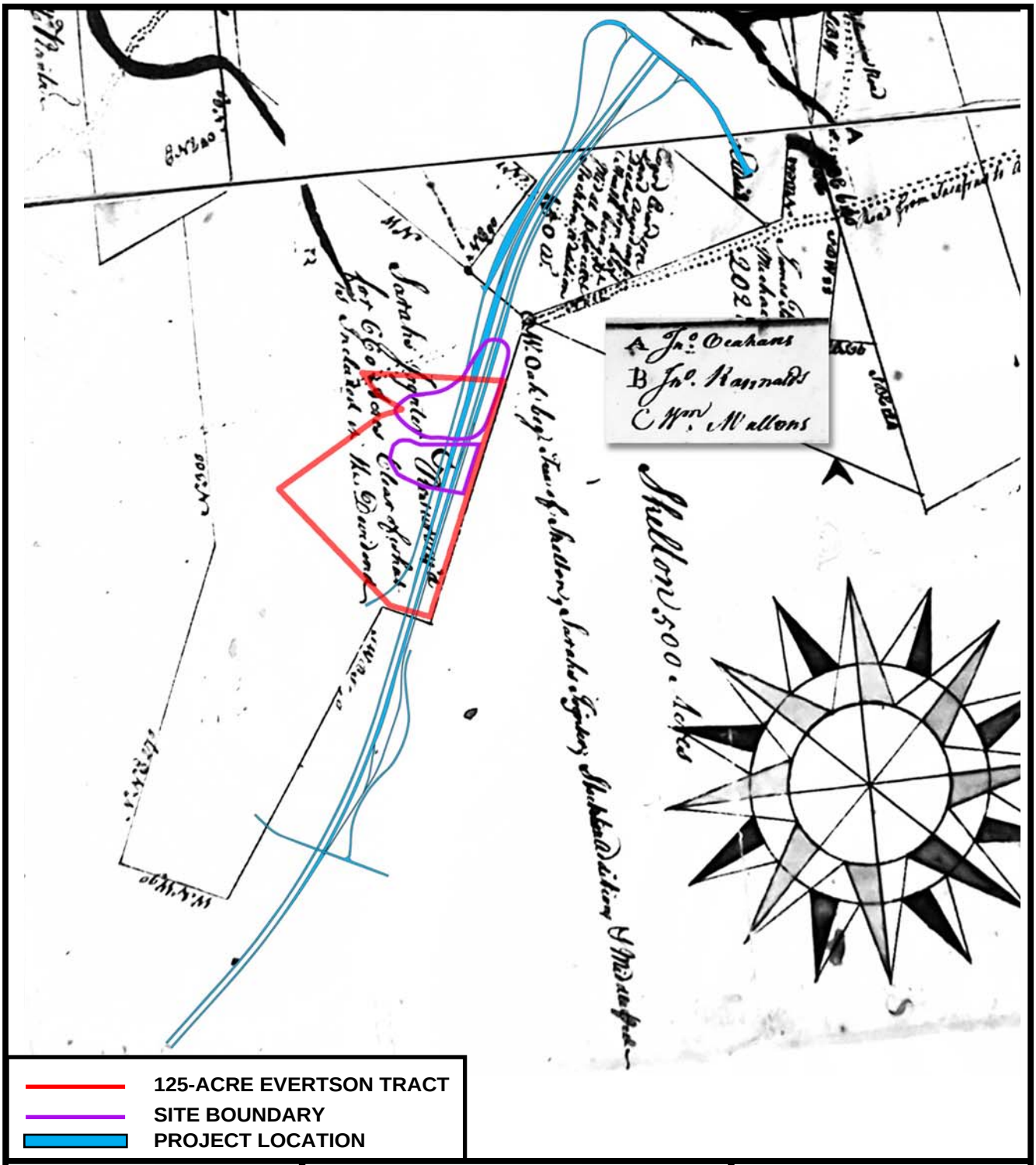
The size and boundaries of Nicholas' Reynolds' tract were officially recorded for the first time in the December 6, 1736 deed conveying the property to Jacob Evertson (Cecil County Deed Book 5:249) (the property's boundaries have been superimposed on a 1748 map of the area (Figure 3; Rumsey 1748). It was asserted in the deed that the property had been conveyed to Nicholas by his father John "by deed of gift dated March 2, 1730." No such "deed of gift" had been officially recorded, however, despite John Reynolds' instructions in the will he composed on that same date. The legality of Nicholas Reynolds' December 6, 1736 conveyance to Jacob Evertson was thus open to question, and, indeed, Nicholas' elder brother, William Reynolds, challenged the sale. To satisfy all parties, Nicholas paid William £5, and, by a deed dated July 26, 1738, William relinquished to Jacob Evertson any claim he had to the property (Cecil County Deed Book 5:462).

Jacob Evertson had been born in Bergen County, New Jersey, around 1709. He was approximately 27 years of age and probably still a bachelor when he acquired the 125-acre Reynolds property in December 1736 (Ward 2008:n.p.). He may have been living recently on a farm several miles to the west, along the Little Bohemia Creek (a.k.a. Middle Neck). His widowed father, Evert Evertson Sr., had leased that farm from Ephraim Augustine Herman on April 22, 1722 for the duration of Evert's life and the lives of his eldest son Evert Evertson Jr. and second-eldest son, Jacob (Brown 1998:152). The Evertsons were Anglican (later, Episcopal) members of St. Stephen's Parish, centered around present-day Earleville, Maryland (Peden Jr. and Peden 2008:87).

It is also possible that immediately prior to his acquisition of the 125-acre Reynolds tract, Jacob Evertson was living with his newly-married elder brother Evert on a farm just up the Middletown-Warwick road from the Reynolds tract, on what is today the north side of Middle Neck Road. The junior Evert (married to Elizabeth Harper in St. Stephen's Parish in July 1731) had acquired that 140-acre property (bounded "by lands called Skelton, Sarah's Joynture, Heath's Second and Fourth Parcels and by the land of Booker") from James Paul Heath through a Cecil County deed dated March 27, 1734 (Peden Jr. and Peden 2008:87; Ward 2006:n.p.). Even if Jacob only visited his brother and sister-in-law from time to time, he could easily have monitored activities on Nicholas Reynolds' property one-half mile to the south.

On December 30, 1742, Jacob Reynolds married Esther Van Horn (sometimes written "Hester"), daughter of Bergen County native Nicholas Van Horn, in St. Stephens Parish (Peden Jr. and Peden 2008:87). To this union were born at least 8 children: Elizabeth, Rebecca, Rachel, Jacob Jr., Esther, Evert, Barnet, and Frederick (Cecil County Will Book BB2:287). While Jacob had been identified in 1736 and 1738 deeds as a carpenter, he was identified in later records as a farmer. On a list of Cecil County taxables compiled in 1752, he was said to own either two or three slaves, as did his neighboring brother Evert Jr. (Ward 2006:n.p.).

No reliable documentary evidence pertaining to specific structures on the Evertson farm has been discovered. On a "Plat of Sundry lands at the Head of Bohemia River," drafted by 18-year-old schoolboy William Rumsey Jr. on July 20, 1748, a dwelling attributed to William Mullen ("Wm.



125-ACRE EVERTSON TRACT
SITE BOUNDARY
PROJECT LOCATION

	SCALE	SOURCE
N	0ft 2160ft 0m 658.4m Prepared by CHRS, Inc.	RUMSEY 1748

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
AREA CIRCA 1748

FIGURE 3

Mullens") was denoted within Site 7NC-F-118, and within the bounds of the 125-acre Evertson tract (Figure 3; Rumsey 1748) (Rumsey Jr. denoted the "Mullens" residence with the letter "C," as indicated in the map's key [inset]). This denotation appears to be in error, however. The novice mapmaker's father, William Rumsey Sr., a skilled surveyor and cartographer, had denoted the Mullen residence several hundred feet to the east of Site 7NC-F-118 when he drafted his circa-1735 map (Rumsey Family Papers n.d.). Moreover, both map-makers denoted the Mullen dwelling approximately 3,000 feet east of the John Reynolds dwelling, at least 300 feet east of the headwaters of Mill Branch, and on the east side of Middletown-Warwick Road. It thus appears that the junior Rumsey—perhaps in the course of borrowing data from his father's map—mistakenly located the Mullen dwelling within the bounds of the Evertson tract (which the senior William had not delineated on his map). Less understandable, however, is why neither mapmaker appears to have denoted a dwelling for either Nicholas Reynolds or subsequent occupant Jacob Evertson on the west side of Middletown-Warwick Road, in the vicinity of Site 7NC-F-118. Perhaps William Rumsey Jr. was aware of a dwelling in the vicinity of Site 7NC-F-118 when he drafted his map in 1748, and mistakenly attributed it to William Mullen (after consulting his father's circa-1735 map), rather than its actual owner, Jacob Evertson Sr.

Jacob Evertson Sr. served as Cecil County's Overseer of Roads in 1761, the same year that his brother Evert, on the neighboring farm to the north, died childless at the age of 53 (Gibb 2011:n.p.; Ward 2008:n.p.). Evert left a will by which he devised his clothes and 10 shillings to Jacob, his land to Jacob's son Evert (should Evert's widow ever remarry), £50 to Jacob's daughter Rebecca, and 10 shillings each to Jacob's minor children Jacob Jr., Elizabeth, Rachel, and Hester (Ward 2006:n.p.). Two-and-a-half years later, Jacob and his wife Esther inherited from Esther's recently deceased father Nicholas Van Horn a 110-acre farm lying approximately 1.5 miles south of the Evertson farm (Gibb 2011:n.p.).

Fifty-eight-year-old Jacob Evertson Sr. thus had two farms to consider when he composed his will on January 18, 1767 (Cecil County Will Book BB2:287). His bequests were as follows:

- £50 to unmarried daughter Elizabeth
- "a Horse called Dimond and Side Sadle and Bridle" to wife "Easther"
- £15 to married daughter Rebecca
- the remaining part of his personal estate—minus the widow's dower—divided equally among children Elizabeth, Rachel, Jacob Jr., Evert, Esther, Barnet, and Frederick
- "my dwelling Plantation, part of Sarah Joynture, containing one hundred and twenty and five acres of Land" to son Jacob Jr. when he reaches the age of 21
- the 100-acre farm, "formerly the Plantation of Nicholas Vanhorn," first to wife Esther and eventually to son Barnet, when he reaches the age of 21

Jacob also stipulated in his will that "Negro Harry and Negro Charles may be sold by my Executors," and that his wife Esther serve as "sole Executor of all my Estate" (Jacob's brother Evert had owned six slaves at the time of his death in 1761: "Negro Jack, Negro Prince, Negro Jenny, Negro Peg, Negro Dino, Negro Joe"; Cecil County Inventory Book 4, 1755-1786:264). Jacob died a few months after composing his will, which was probated on December 10, 1767 (Cecil County Will Book BB2:287).

Jacob Evertson Jr. was not yet 21 years of age when his father composed his will in January 1767, so he must have been born after 1746. Sometime between 1767 and 1791—as the farm he inherited from his parents came under the jurisdiction of St. Georges Hundred, New Castle County, Delaware State—the junior Jacob married a woman named Mary. This fact, and the births of probably one or more children, was presumably reflected in census records compiled in 1790, but those records are no longer available. The following year, Jacob and Mary Evertson were said to be living on their 125-acre farm along the west side of Middletown-Warwick Road on the day—June 7, 1791—when they conveyed the property to their next-door neighbor to the north: Jeremiah Reynolds (New Castle County Land Records I-2:272). The Evertsons may have remained on the property for some time after selling it to Jeremiah Reynolds. The only Jacob Evertson enumerated in a St. George's Hundred tax assessment compiled in 1797 was recorded as owning no taxable land, lots, houses, or slaves; his only taxable property was livestock valued at a hefty $136.90 (New Castle County 1797). Jacob was recorded as living with his wife, 9 children, and 4 slaves in the immediate vicinity of Jeremiah Reynolds' house when the 1800 decennial census was compiled (United States Bureau of the Census 1800). Jacob and his family were again recorded as near neighbors of Jeremiah Reynolds during the 1810 enumeration (in which Jacob's surname was mistakenly recorded as "Evilson") (United States Bureau of the Census 1810). However, on an "1805 Untitled Land Commission Map of 'Sarah's Joynture'" (reproduced as Figure 3.32 in Grossman-Bailey and Hayden 2009), no structures were denoted within the former bounds of the Evertson farm. The only structure denoted within a quarter-mile of Site 7NC-F-118 on this map was an unattributed "Dwelling House" denoted in the location of the John Reynolds residence on the circa-1735 and 1748 Rumsey maps.

Jeremiah Reynolds died intestate in 1810. His estate was settled as follows:

> Jeremiah['s] property devolved in equal shares to his widow [Janet] and children [James, Sarah, Jeremiah Jr., Mary (wife of Benjamin Green), Amelia, and Ann (widow of a Mr. Price)]. The personal estate, including the slaves, was sold. To support the widow and the other unmarried female members of the family, the children swapped assets, leaving the farm [including the 125-acre former Evertson tract] in the hands of the women (see Table 3.8). The [December 14, 1811] deed of transfer identified the 240-acre tract as the "home plantation whereon he [Jeremiah Reynolds] resided previous to his death" and described it as "in the actual possession" of the four women (New Castle County Land Records 1811a) (Grossman-Bailey and Hayden 2009:3-27 and Table 3.8).

Jeremiah Reynolds' widow Janet died sometime prior to 1843. By June, 1843, her daughter Ann had remarried, and was no longer living on the Reynolds farm with her unmarried sisters Sarah and Amelia. On June 17, 1843, the three sisters partitioned the Reynolds farm in order to give Ann an equitable share. Sarah and Amelia conveyed to Ann (whose married name was now "Cann") approximately 99 acres south of the Reynolds farmstead, "bounded on the west and southwest by Samuel Price, on the south and east and southeast by the road from Warwick to Middletown, and on the north by lands of Sarah and Amelia Reynolds" (Grossman-Bailey and Hayden 2009:Table 3.8) The conveyed parcel included most of the former Evertson farm, and all of Site 7NC-F-118. Less than a year later, by a deed dated March 23, 1844, Ann conveyed 96 acres of the former Evertson tract to neighboring farmer Samuel Price, in consideration of $1,000 (New Castle County Deed

Book O5:340). For decades thereafter, the Price family referred to those 96 acres as "the Reynolds Tract" (Grossman-Bailey and Hayden 2009:Table 3.20). On a map of New Castle County published in 1849, the former Jeremiah Reynolds farmhouse (located approximately 1,200 feet west of the intersection of Middle Neck and Middletown-Warwick Roads) was attributed to part-owner G[eorge] Reynolds (the dwelling was erroneously denoted on this map approximately 1,000 feet south of its actual location) (Price and Rea 1849). No structures were denoted on the 1849 map within Site 7NC-F-118. The nearest denoted structure other than the Reynolds residence was a dwelling attributed to "S[amuel] Price," on the site of the eighteenth-century John Reynolds dwelling.

Site 7NC-F-118 was depicted as vacant on maps of New Castle County published in 1868, 1881, 1895, and 1900, and no structures were apparent within or immediately adjacent to Site 7NC-F-118 on aerial Photographs taken in 1937, 1954, 1961, and 1968 (Beers 1868; Hopkins 1881; Baist 1895; USGS 1900; ASCS 1937, 1954, 1961, 1968). In each of the aerial Photographs, Site 7NC-F-118 appeared as a cultivated field.

RESEARCH DESIGN

Research Objectives

The purpose of the Phase II archaeological survey was to define the horizontal and vertical limits of the resources, establish the integrity of the resources, and evaluate the eligibility of the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) for listing in the National Register of Historic Places. All three sites were evaluated for inclusion based on one or more of the following criteria: Criterion A, site is important to the broad patterns of our history; Criterion B, site is associated with the lives of individuals important to our past; Criterion C, as an embodiment type, period, or method of construction; and Criterion D, site is a resource that has yielded or is likely to yield information important to our understanding of prehistory or history. Site evaluation was accomplished with systematic subsurface testing, in-depth analysis of the data obtained, and an articulation of the three sites into the existing body of information and literature pertaining to sites in the region. Prior investigations at the three sites included surface collections of artifacts and limited subsurface excavations.

A number of questions have been proposed for both the prehistoric and historic components to the sites. For the historic component at the Reynolds Historic/Prehistoric Site (7NC-F-118), it was believed that the Phase II excavations would yield significant information pertaining to the historic themes from the *Delaware Comprehensive Historic Preservation Plan* (Ames et al. 1989) including *Disappearing Historic Landscapes; Agriculture; Transportation and Communications; Settlement Patterns and Demographic Changes;* and *Major Families, Individuals, and Events.* It was postulated that the Reynolds Historic/Prehistoric Site (7NC-F-118) would provide significant information about settlement patterns and landholder changes as well as information pertaining to the lifestyles of tenants, slaves, and well-off farmers who occupied the lands. The site might also yield information about the eighteenth-century economic and social relations during the transition between periods (Grossman-Bailey, Hayden and Springsted 2010).

It was postulated that excavations at the prehistoric components of Reynolds Historic/Prehistoric Site (7NC-F-118), Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) would yield data to further define the Archaic, Woodland I, and Woodland II settlement systems; process of social transformation within specific sites or areas; further identify and define settlement patter level data for the cultural complexes; and inner-site comparisons between sites within different complexes (Grossman-Bailey, Hayden and Springsted 2010).

The data and research base for this work is primarily presented in the following documents:

1. 2009 Phase Ia (Reconnaissance-Level) Archaeological Survey, U.S. Route 301, Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown, New Castle County, Delaware and Electoral District 1 Cecil County, Maryland, Parent Agreement 1417, Task 3. Dover, Delaware: Prepared for Delaware Department of Transportation by Richard Grubb & Associates, Inc. (Grossman-Bailey and Hayden 2009).

2. 2010 Management Summary, Phase Ib (Identification-Level) Archaeological Survey, U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown, New Castle County, Delaware and Electoral District 1 Cecil County, Maryland. Parent Agreement 1417, Task 9. Dover, Delaware: Prepared for Delaware Department of Transportation and Federal Highway Administration by Richard Grubb & Associates, Inc. (Grossman-Bailey, Hayden and Springsted 2010).

3. Information supplied November 2010 by Ilene Grossman-Bailey of Richard Grubb & Associates, Inc.

4. Phase II Archaeological Management Summary Report Sites 7NC-F-118 and 7NC-F-119, U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland (McKissick and Basalik 2011a).

5. Phase Ia Archaeological Survey and Testing Strategy, U.S. Route 301 Project Development, Purple Section 1, St. Georges Hundred, New Castle County, Delaware Prepared for Delaware Department of Transportation by Archaeological & Historical Consultants, Inc. (Hay et al. 2009).

6. Phase Ia Cultural Resource Survey, U.S. Route 301, Section 2, St. Georges Hundred New Castle County, Delaware Prepared for Delaware Department of Transportation by Hunter Research, Inc. (Burrow et al. 2009).

7. Delaware Department of Transportation, U.S. Route 301, Section 1, New Areas (and Section 2, Area 17), St. Georges Hundred, New Castle County, Delaware, Phase Ib Archaeological Cultural Resource Survey, Parent Agreement 1415, Task 12 Management Summary. Prepared for Delaware Department of Transportation by Hunter Research, Inc. (Liebenknecht and Burrow 2010).

8. Information supplied by William Liebenknecht and Ian Burrow of Hunter Research, Inc.

9. Phase II Archaeological Management Summary Report, Site 7NC-F-155. Delaware Department of Transportation, U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland Agreement 1533 Task 2 (McKissick and Basalik 2011b).

METHODS

Introduction

Documentary research and analysis was conducted in an effort to identify structures that may have been located within or immediately adjacent to the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). This work included a review and evaluation of historical data presented in cultural resource reports previously prepared under U.S. Route 301 Mainline Contract 3. Additional historical data was collected from real estate, probate, census, tax, cartographic, Photographic, genealogical, and church records. While this data contributed to a better understanding of historical ownership of the Reynolds Historic/Prehistoric Site (7NC-F-118), as well as cultural activities and developments in and/or near the site, they provided no evidence of structures within the Reynolds Historic/Prehistoric Site (7NC-F-118). No evidence of structures was noted in the vicinity of the Area 8 Prehistoric Site (7NC-F-119) or the Churchtown #4 Prehistoric/Historic Site (7NC-F-155).

Phase II field excavations were comprised of 1-meter square test units within a grid established by the use of a total station. Soils were excavated by hand following natural stratigraphy to a depth of 10 centimeters into culturally sterile subsoil. All excavated soils were screened through ¼ inch hardware cloth. Artifacts were bagged by provenience. Descriptions of each stratum, including Munsell color, texture, sediments, and presence or absence of cultural material, were recorded on standardized forms. Profiles were drawn of all excavation units. Each unit was documented through 35mm black and white, 35mm color, and digital Photography. All completed test units were backfilled. If encountered, cultural features were drawn, mapped, Photographed, and, where appropriate, sampled.

The stratigraphic information was examined in tandem with the vertical and horizontal artifact distributions in order to determine the sequence, chronology and integrity of both the prehistoric and historic components of the site. Artifacts were washed and inventoried. Recovered artifacts were placed into re-sealable polyethylene bags with accompanying tags that list the appropriate provenience information.

Artifact processing was performed according to the Guidelines and Standards for the Curation of Archaeological Collections prepared by the Delaware Division of Historical and Cultural Affairs, Delaware State Museum.

Flake designations in the Artifact Inventory (Appendix B) follow the classification presented by Sullivan and Rozen (1985). Sullivan and Rozen use “interpretation-free categories” in classifying the materials. This technique strives to discern meaningful technological groupings

based upon differences in the percentages of the perceived debitage categories. The presence or absence of a single interior surface (detected by ripple lines, force lines, or a bulb of percussion), a point of applied force, and intactness of flake margins hierarchically defines each category. The method divides lithic debitage into four categories: (1) complete flakes; (2) broken flakes (incomplete but retaining platforms); (3) flake fragments (no platform but an identifiable "single interior surface"); and (4) debris (no identifiable "single interior surface").

Geomorphological Investigations were performed by Margaret Sams (Appendix C). Floatation samples were completed by Chris Civello of CHRS, Inc. staff (Appendix D). Radiocarbon dating analysis for the recovered carbon from features was performed by Beta Analytic Inc. of Miami, Florida (Appendix E).

The work attempted to provide sufficient analysis to permit an assessment of the site's eligibility for listing in the National Register of Historic Places. Artifact analysis included qualitative assessments (what objects were recovered, what were they made out of, how were they used, etc.) as well as quantitative assessments (how are the artifacts and artifact groups distributed across the sites, what are the relative proportions of artifact classes for the site, and/or within identified activity areas, etc.).

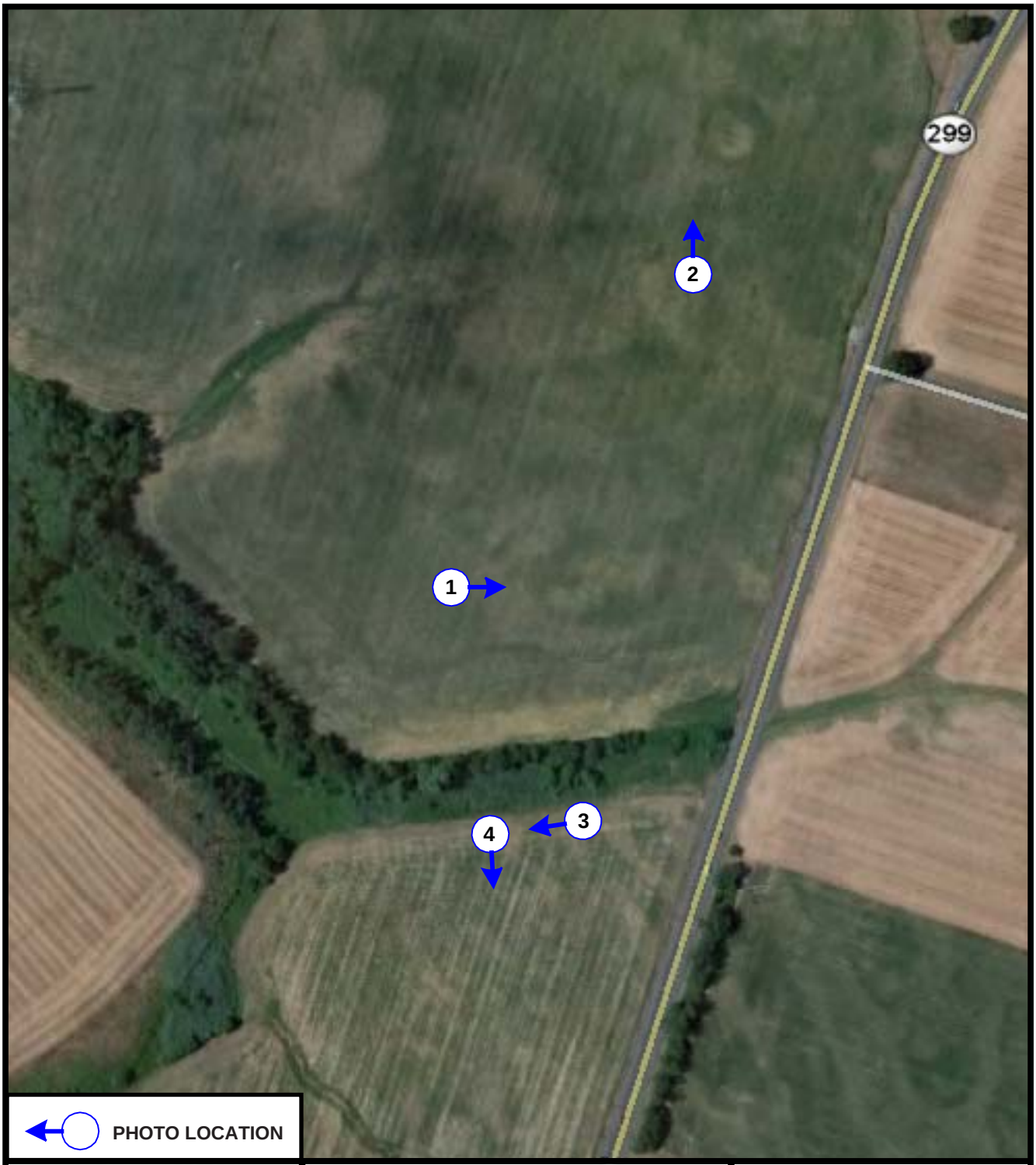
Reynolds Historic/Prehistoric Site (7NC-F-118)

The Reynolds Historic/Prehistoric Site (7NC-F-118) is located approximately 0.5 miles north of the intersection of Middletown Warwick Road and Warwick Road within an agricultural field (Figure 1; USGS 1993a, 1993b). The southern edge of the Reynolds Historic/Prehistoric Site (7NC-F-118) borders a tributary of Great Bohemia Creek. The site extends over approximately 20 acres and consists of concentrations of prehistoric, eighteenth-, and nineteenth-century artifacts The area was a recently cultivated field at the time of the Phase II work (Photographs 1, 2; Figure 4; Google Earth 2010).

Phase II archaeological investigations were conducted during the spring 2011 field season. The initial step included coordination with the land owner and tenant farmer for the parcel north of the tributary. The current Limit of Disturbance (LOD) was then flagged by Century Engineering, Inc. after which the survey grids were established. Based on the artifact densities from the Phase Ib investigations completed by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010), three separate areas were identified for additional testing within the site boundary. The three testing areas consisted of a concentration of prehistoric artifacts overlapping with a concentration of eighteenth- and early nineteenth-century artifacts in the southwest corner of the testing area, a concentration of architectural debris along the southeastern portion of the testing area, and a concentration of historic artifacts in the northern portion of the testing area.

Photograph 1: Overview of Concentration 1 and Concentration 2 within the Reynolds Historic/Prehistoric Site (7NC-F-118), facing east from Test Unit 1.

Photograph 2: Overview of Concentration 3 within the Reynolds Historic/Prehistoric Site (7NC-F-118), facing north from Test Unit 53.



	SCALE	SOURCE
N	0ft 350ft 0m 106.7m Prepared by CHRS, Inc.	GOOGLE EARTH 2010

PHOTO LOCATION MAP - REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118) AND AREA 8 PREHISTORIC SITE (7NC-F-119)

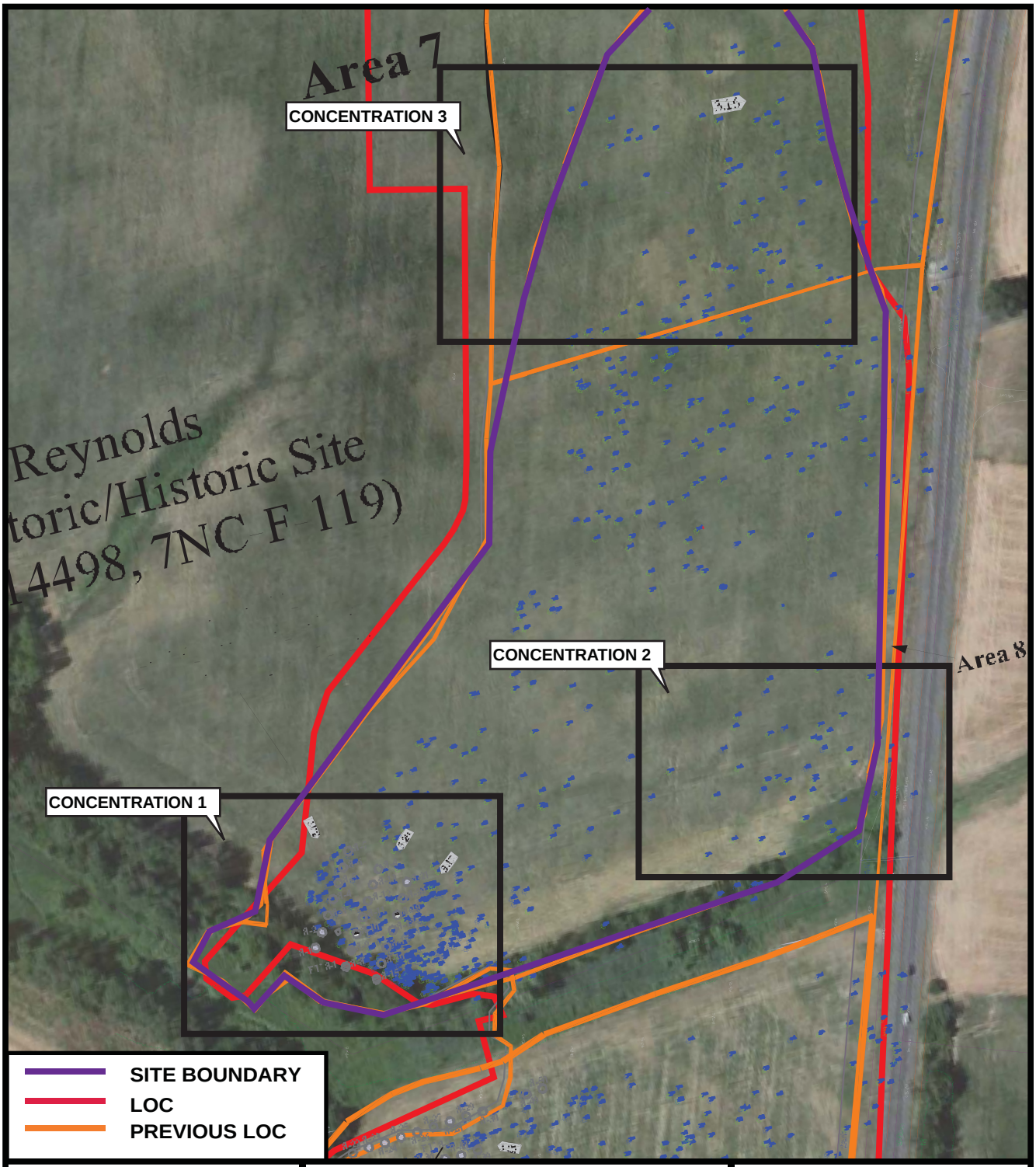
FIGURE 4

Initially, 83 test units were excavated within the three concentrations of artifacts (Figure 5; Google Earth 2010). Forty-two test units (TUs 1-42) were placed in a grid formation at 7.5 meter intervals in six rows within the concentration of prehistoric and historic artifacts in the south/southwestern portion of the site (Concentration 1) (Figure 6; Google Earth 2010). Three rows were placed 15 meters apart in order to include the Phase I shovel test pit locations in analysis. The remaining 3 rows were placed at a 7.5 meter interval. Ten test units (TUs 43-52) were placed in a crucifix formation at a 15-meter interval within a concentration of architectural artifacts within the southeastern portion of the site (Concentration 2) (Figure 7; Google Earth 2010). Thirty-one test units (TUs 53-83) were placed in a grid formation at a 7.5-meter interval in three rows within the concentration of historic artifacts (Concentration 3) within the northern portion of the site (Figure 8; Google Earth 2010).

Analysis of the artifacts from the initial test units within each concentration were completed and a distribution plot was created using artifact counts from Phase I shovel test pits and Phase II test unit excavations. The number of prehistoric artifacts recovered from each shovel test pit during the Phase I work was multiplied by a factor of four to equate the STP testing area with that of a test unit. This data, combined with the number of prehistoric artifacts recovered from each test unit during the Phase II work, was used to generate a series of distribution maps employing SURFER©, a computer program that interpolates the data and produces isoplethic contour maps illustrative of artifact density. The resulting diagrams highlight areas of high and low artifact concentrations, which show artifact distribution patterns, and ultimately site outlines. An additional 13 test units were excavated within Concentration 1 at the Reynolds Historic/Prehistoric Site (7NC-F-118) based on historic and prehistoric artifact concentrations as well as prehistoric feature locations (Figure 6; Google Earth 2010). Four contingency test units (TUs 88-91) were placed around Test Unit 19, three (TUs 93-95) around Test Unit 30, two (TUs 92, 96) around Test Unit 33, and one (TU 84) around Test Unit 8. The three remaining contingency test units (TUs 85-87) were placed in an area that contained a high concentration of eighteenth-century artifacts. Upon completion of the test unit excavations and analysis of the artifacts, mechanical stripping was undertaken within portions of the site. Three trenches (two, 3-foot wide by 135-foot long and one, 7-foot wide by 28-foot long) were opened within Concentration 1. Two, 3-foot wide by 100-foot long trenches were excavated within Concentration 3 within the high artifact distribution area.

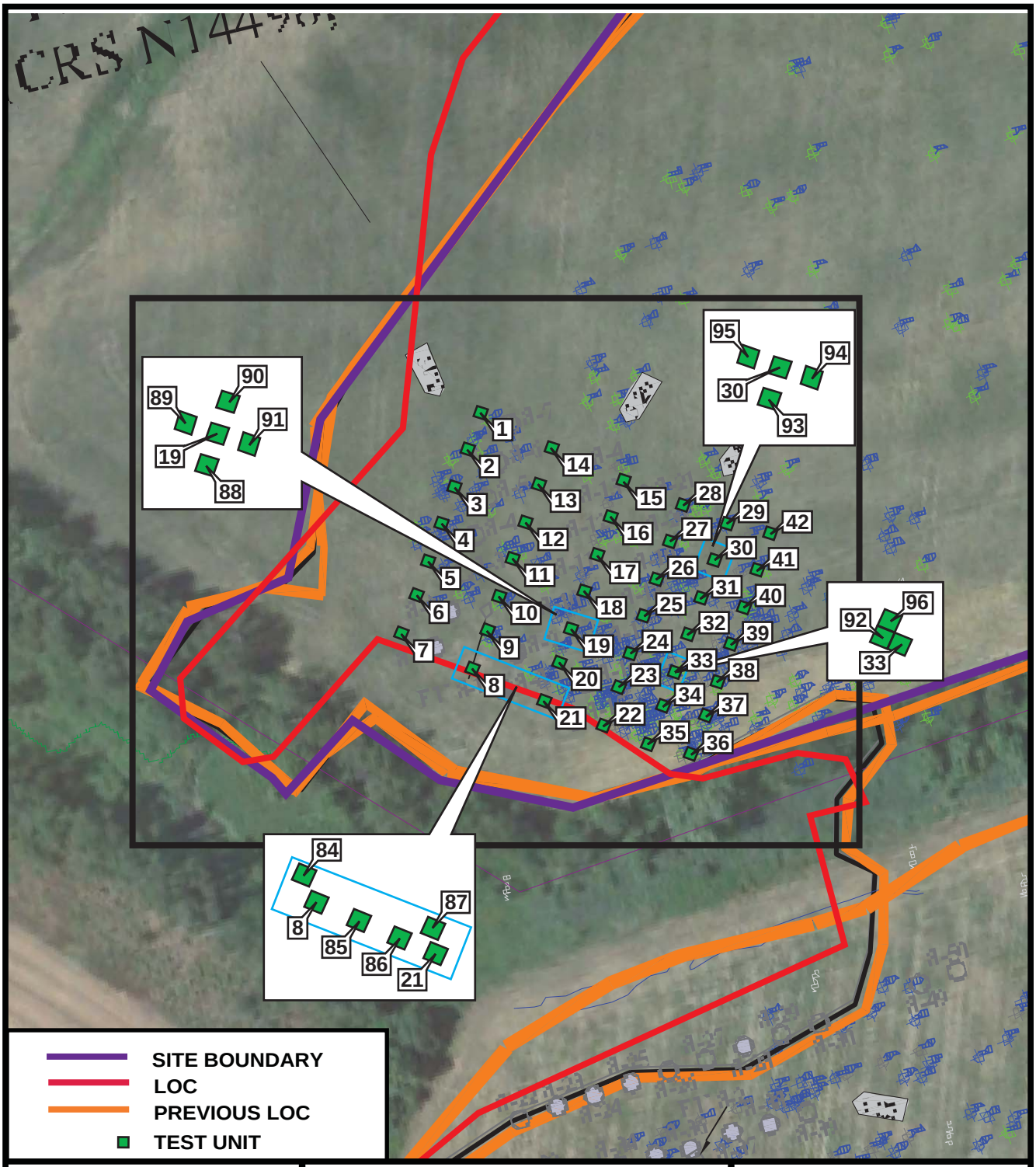
Area 8 Prehistoric Site (7NC-F-119)

The Area 8 Prehistoric Site (7NC-F-119) is located approximately 0.3 miles north of the intersection of Middletown Warwick Road and Warwick Road on a relatively flat upland setting adjacent to a wooded area and small tributary of the Great Bohemia Creek (Figure 2; USGS 1993b, 1993c). The site extends over approximately 7.7 acres and consists of a concentration of prehistoric artifacts within 100 meters of a water source. Recovered diagnostic artifacts date the occupation from the Archaic through the Woodland II periods (Photographs 3, 4; Figure 4; Google Earth 2010).



	SCALE	SOURCE
N	0ft 738.2ft 0m 225m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

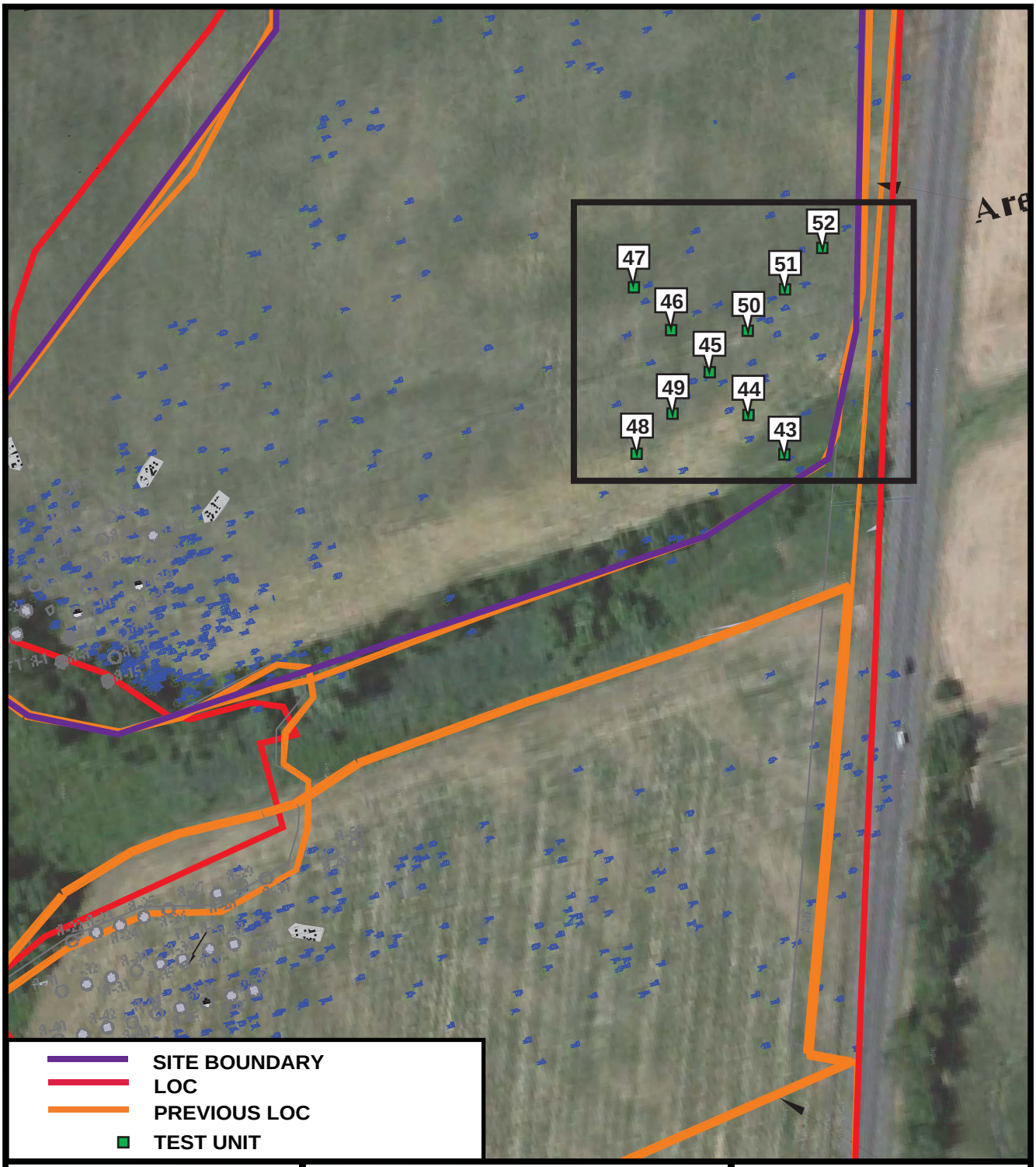
REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)	FIGURE 5



	SCALE	SOURCE
N	0ft 328ft 0m 100m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

PHASE II TEST LOCATIONS - REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118) - CONCENTRATION 1

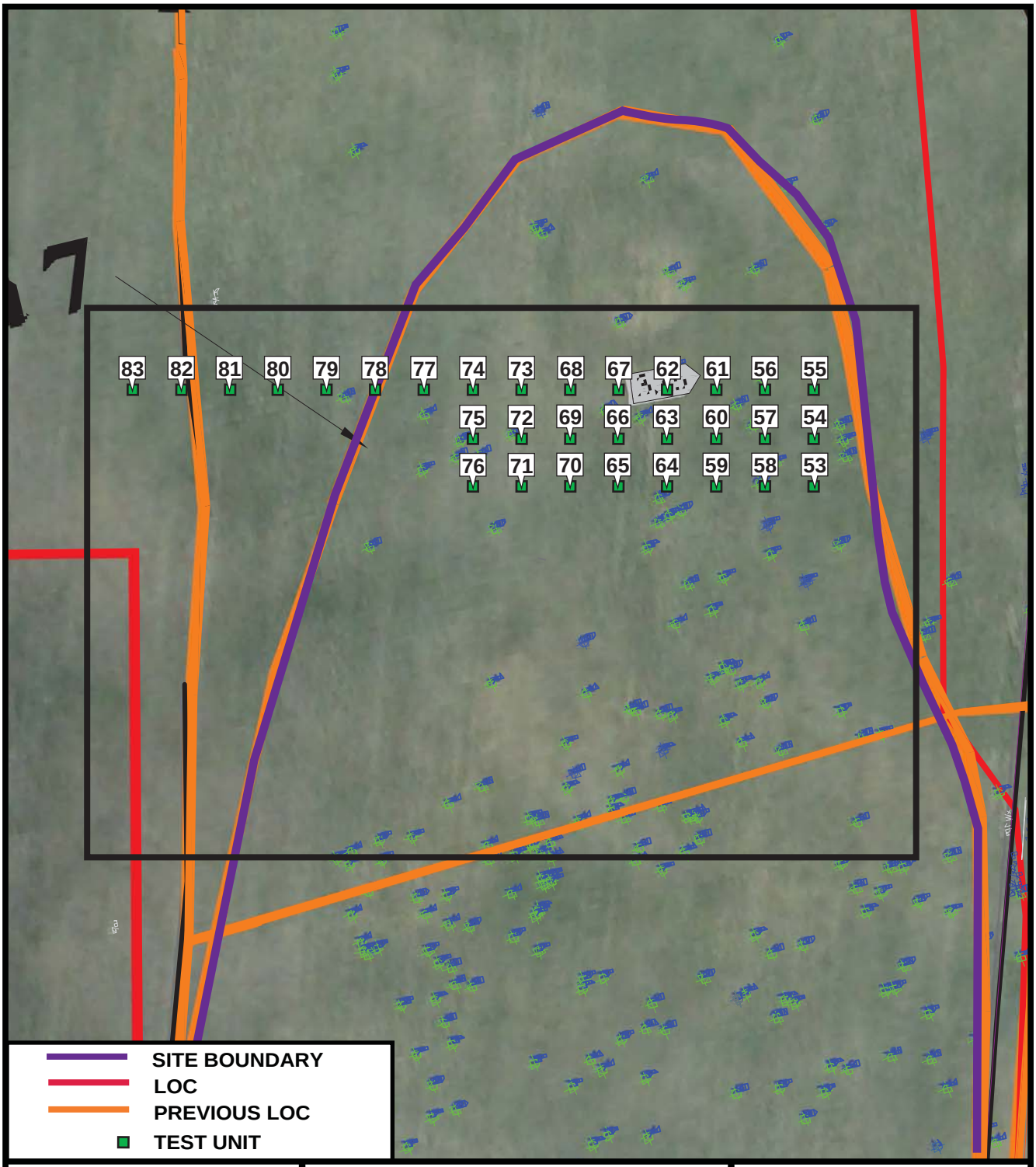
FIGURE 6



	SCALE	SOURCE
N	0ft 134.5ft 0m 41m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

PHASE II TEST LOCATIONS - REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118) - CONCENTRATION 2

FIGURE 7



	SCALE	SOURCE
N	0ft 103ft 0m 31.39m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

PHASE II TEST LOCATIONS - REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118) - CONCENTRATION 3

FIGURE 8

Photograph 3: Overview of the western portion of Area 8 Prehistoric Site (7NC-F-119) from Test Unit 1.

Photograph 4: Overview of the southern portion of Area 8 Prehistoric Site (7NC-F-119) from Test Unit 1.

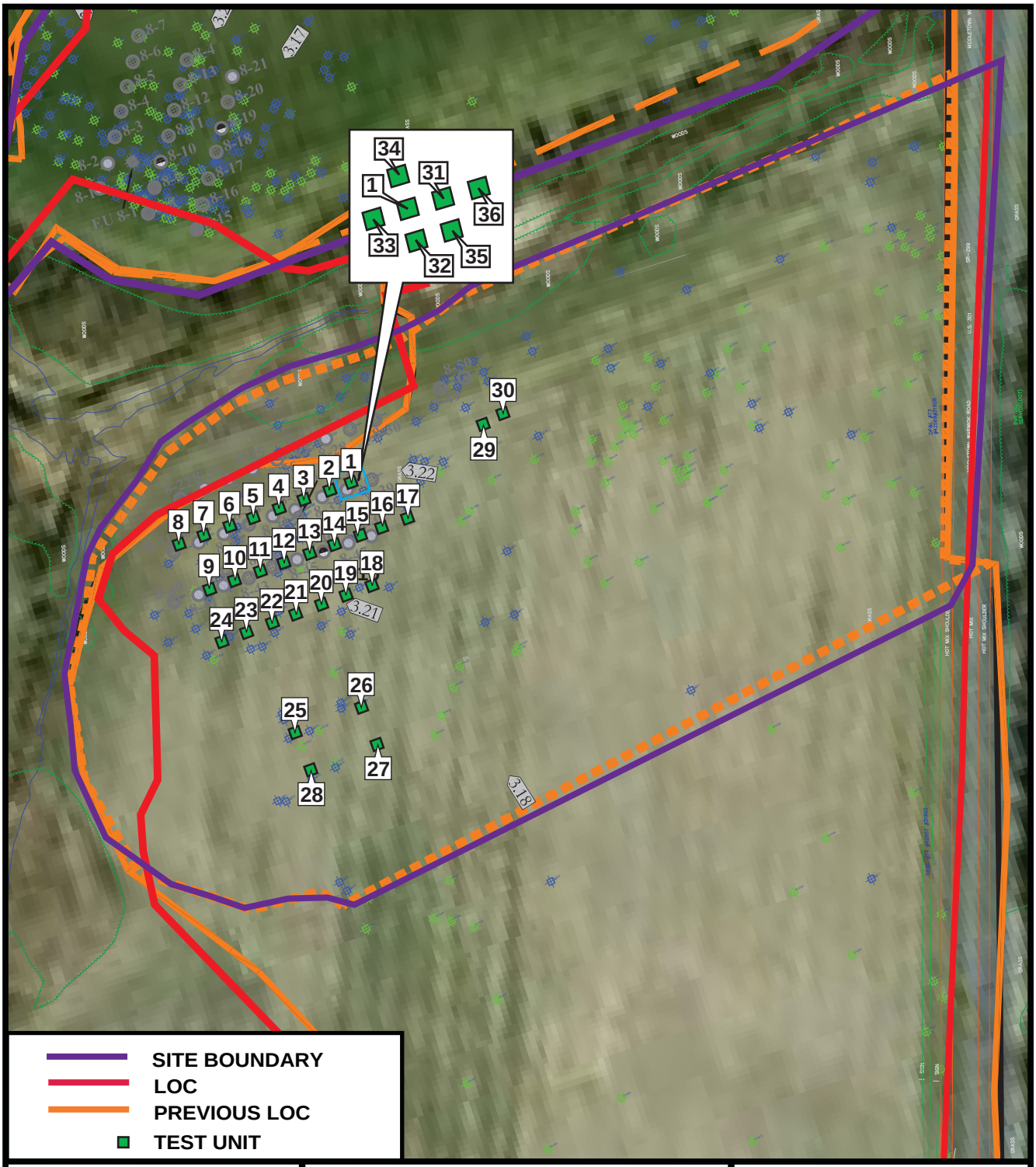
Phase II archaeological investigations were conducted during early spring 2011. The first step included coordination with the land owner and tenant farmer for the parcel south of the tributary. The current Limit of Disturbance (LOD) was then flagged by Century Engineering, Inc. after which the survey grids were established. Based on the artifact densities from the Phase Ib investigations completed by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010), two areas were identified for additional testing within the site boundaries. The two areas extend over approximately 7.7 acres and consist of concentrations of prehistoric artifacts.

Initially 30 test units were excavated within the area (Figure 9; Google Earth 2010). Twenty-four test units (TUs 1-24) were placed in a grid formation at 7.5 meter intervals in three rows 15 meters apart within the main artifact concentration. These test units were placed around the initial Phase I shovel test pits excavated by Richard Grubb & Associates. Four test units (TUs 25-28) were placed approximately 30 meters south of the main concentration at 22.5 meter intervals in two rows 15 meters apart. The final two test units (TUs 29-30) were excavated in a single row approximately 60 meters east of the main concentration at a 7.5 meter interval.

Analysis of the artifacts from the initial test units within each concentration was completed and a distribution plot was created using artifact counts from Phase I shovel test pits and Phase II test unit excavations. The number of prehistoric artifacts recovered from each shovel test pit during the Phase I work was multiplied by a factor of four to equate the STP testing area with that of a test unit. This data, combined with the number of prehistoric artifacts recovered from each test unit during the Phase II work, was used to generate a series of distribution maps employing SURFER©, a computer program that interpolates the data and produces isoplethic contour maps illustrative of artifact density. The resulting diagrams highlight areas of high and low artifact concentrations, which show artifact distribution patterns, and ultimately site outlines. An additional six test units (TUs 31-36) were excavated within the Area 8 Prehistoric Site (7NC-F-119) based on prehistoric artifact concentrations within the site. Four test units were placed 3.75 meters in the cardinal directions around Test Unit One. The remaining two contingency units were placed 3.75 meters to the south and east of Test Unit 31 based on artifact densities.

Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located approximately 0.89 miles southwest from the intersection of Boyds Corner Road and Cedar Lane Road within an agricultural field (Figure 2; USGS 1993b, 1993c). The site borders Spring Mill Branch to the south and Taylor's Branch to the east and consists of a prehistoric component and late seventeenth- to mid-nineteenth-century historic component. Design modifications were completed to protect the historic archaeological component of the site, which now is outside of the Area of Potential Effect (APE). Field investigations at the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) included only the prehistoric component, which is located near the confluence of the two streams. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) extends over approximately 2.7 hectares (6.7 acres) and consists of two concentrations of prehistoric artifact clusters (Photographs 5, 6; Figure 10; Google Earth 2010).



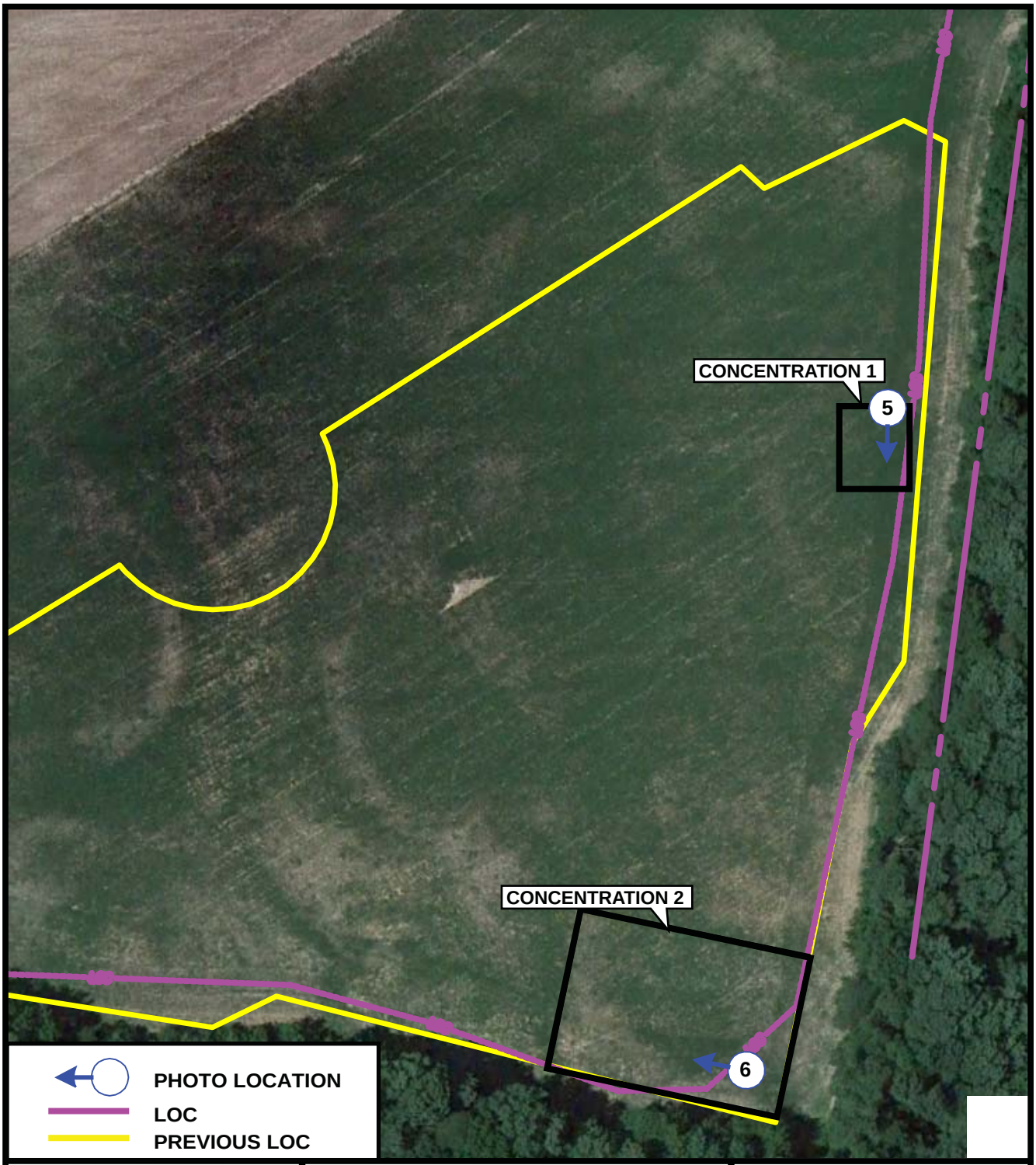
	SCALE	SOURCE
N	0ft 134.5ft 0m 41m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

PHASE II TEST LOCATIONS
AREA 8 PREHISTORIC SITE (7NC-F-119)

FIGURE 9

Photograph 5: Overview of the northern portion of the
Churchtown #4 Prehistoric/Historic Site (7NC-F-155), facing south.

Photograph 6: Overview of the southern portion of the
Churchtown #4 Prehistoric/Historic Site (7NC-F-155), facing west.



	SCALE	SOURCE
N	0ft 111ft 0m 33.83m Prepared by CHRS, Inc.	GOOGLE EARTH 2010

PHOTO LOCATION MAP - CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155)

FIGURE 10

Phase II archaeological investigations were conducted during April, May, and June 2011. The first step included coordination with the land owner and tenant farmer for the parcel. The current Limit of Disturbance (LOD) was then flagged by Century Engineering, Inc. after which the survey grids were established. Based on the prehistoric artifact densities from the Phase Ib investigations completed by Hunter Research, Inc., two areas (Concentration 1 and Concentration 2) were identified for additional testing within the site boundaries. The historic portion of the site is located to the west. This section has been removed from the APE and preserved; therefore, no additional archaeological work took place on the historic portion of the site.

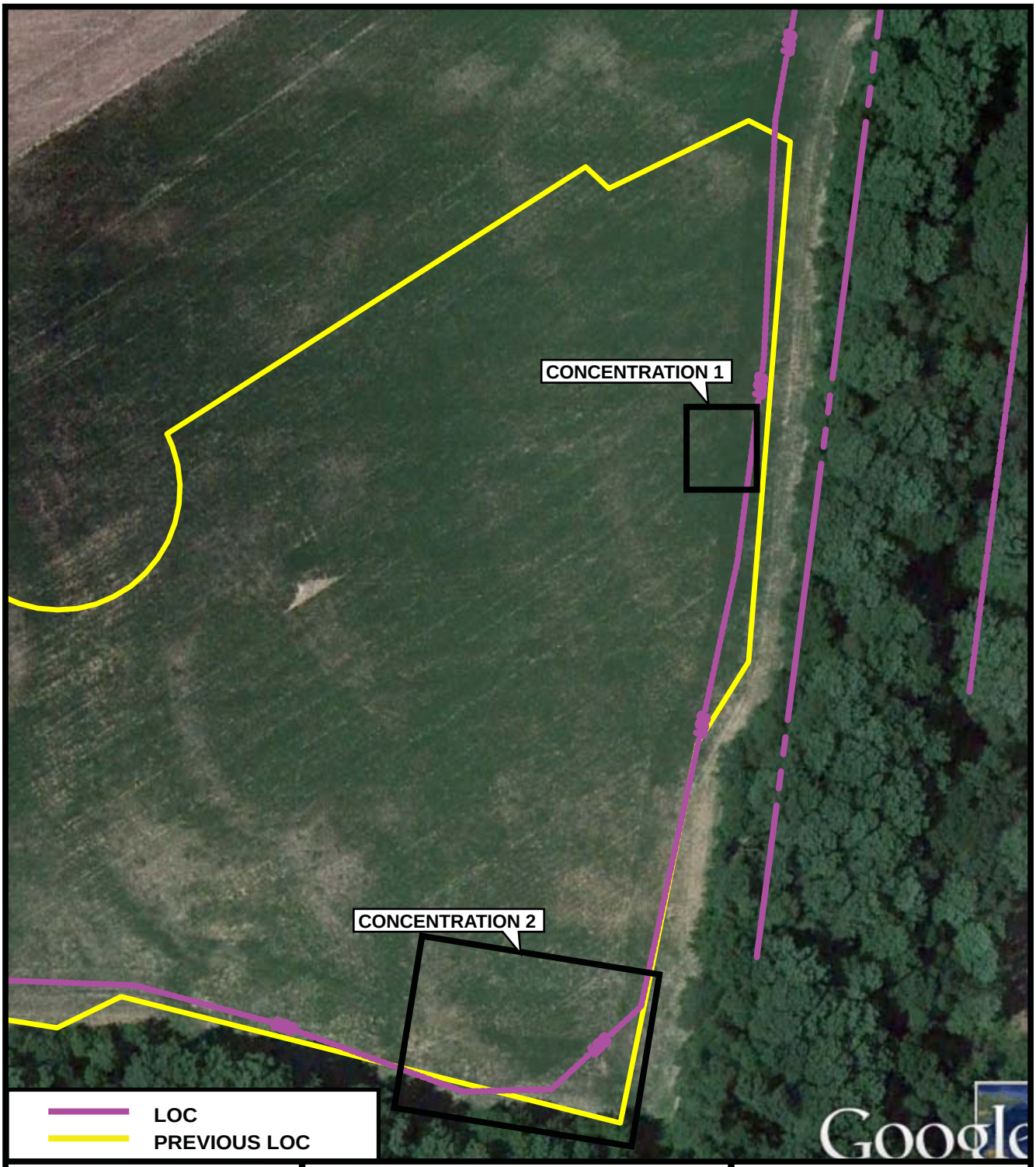
Initially 55 test units were excavated within the prehistoric areas (Figure 11; Google Earth 2010). Twelve test units (TUs 1-12) were placed in a grid formation at 5 meter intervals in three rows 5 meters apart within Concentration 1 (Figure 12; Google Earth 2010). The remaining 43 initial test units (TUs 13-55) were placed along the southern edge of the site in a 5-meter grid within Concentration 2 (Figure 13; Google Earth 2010).

Analysis of the artifacts from the initial test units within each concentration was completed. A distribution plot was created using artifact counts from the Phase II test unit excavations. This data was used to generate a series of distribution maps employing SURFER©, a computer program that interpolates the data and produces isoplethic contour maps illustrative of artifact density. The resulting diagram highlights the areas of high and low artifact densities, which show artifact distribution patterns, and ultimately site outlines. Based on the distribution plots, an additional six test units (TUs 56-61) were excavated within Concentration 2 of the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). Three test units were placed within the central portion of the testing area to fill in prior gaps in the grid (TUs 56, 57, 58). Two contingency units were placed at 2.5 meters to the north and south of Test Unit 20 (TUs 59, 60) and a final contingency test unit was placed 5 meters north of TU 19 and 5 meters west of TU 1 (TU 61).

FIELD DATA

Introduction

This report documents the results of three Phase II Archaeological Surveys performed for the Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119) are located in Middletown, New Castle County, Delaware and were identified within Section 3 of the proposed U.S. Route 301 corridor by Richard Grubb & Associates, Inc. (Grossman-Bailey, Hayden and Springsted 2010). The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located in Saint Georges Hundred, New Castle County, Delaware and was identified within Section 1 of the proposed U.S. Route 301 corridor by Hunter Research, Inc. (Liebenknecht and Burrow 2010). A majority of the information displayed below can also be found in *Phase II Archaeological Management Summary Report Sites 7NC-F-118 and 7NC-F-119* (McKissick and Basalik 2011a) and *Phase II Archaeological Management Summary Report, Site 7NC-F-155* (McKissick and Basalik 2011b).



	SCALE	
N	0ft 111ft 0m 33.83m Prepared by CHRS, Inc.	GOOGLE EARTH 2010

CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155) | **FIGURE 11**

SCALE

N

0ft 29.53ft

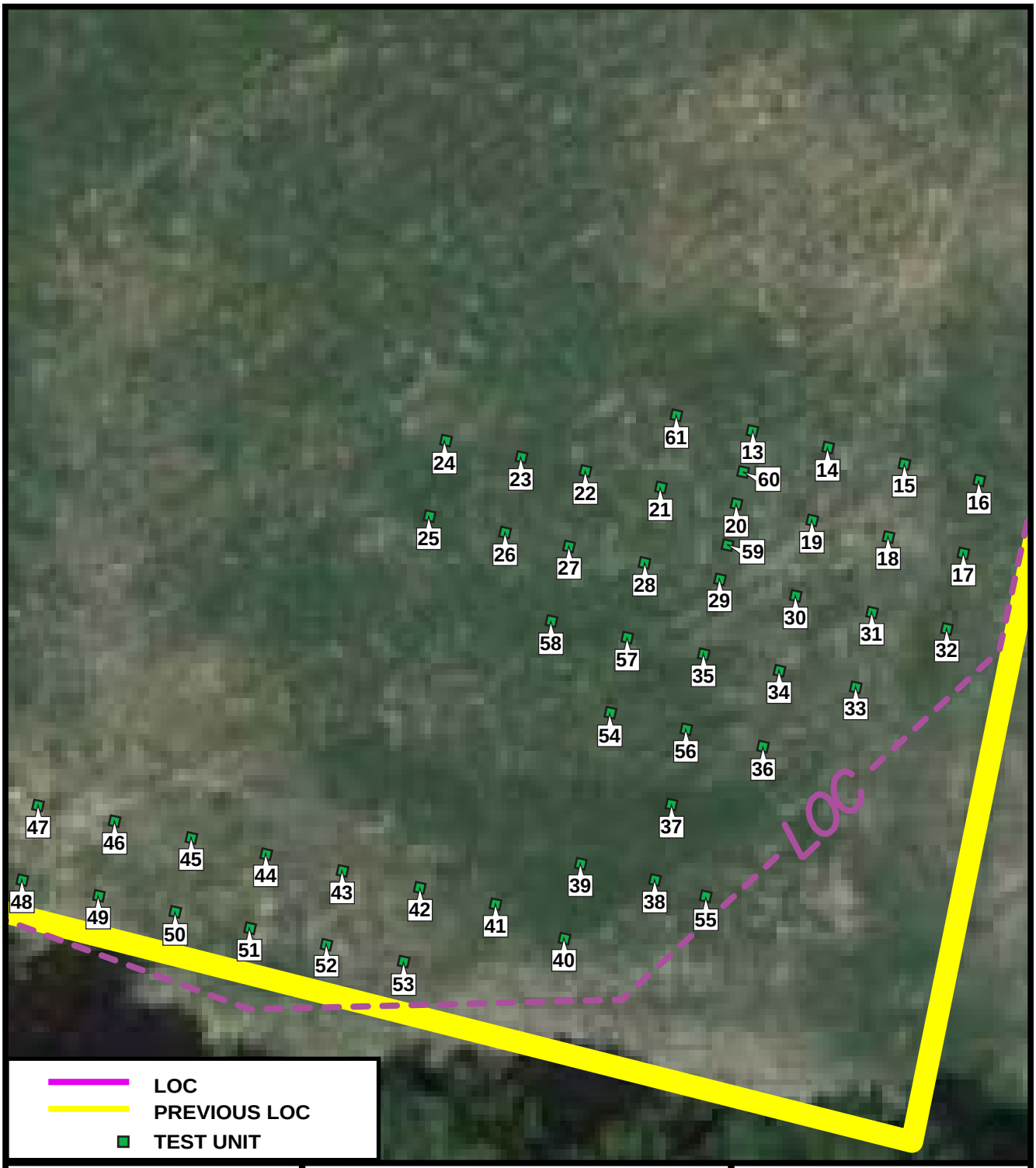
0m 9.001m

Prepared by CHRS, Inc.

GOOGLE EARTH 2010

PHASE II TEST LOCATIONS
CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155)
CONCENTRATION 1

FIGURE 12



SCALE

N

0ft 31ft

0m 9.449m

Prepared by CHRS, Inc.

GOOGLE EARTH 2010

PHASE II TEST LOCATIONS
CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155)
CONCENTRATION 2

FIGURE 13

Reynolds Historic/Prehistoric Site (7NC-F-118)

Phase I field investigations were completed by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010). The Reynolds Historic/Prehistoric Site (7NC-F-118) was initially determined to contain moderate to high potential for prehistoric resources and a moderate to high potential for historic resources based on background research. Phase I archaeological investigation began by plowing and discing the area. This was followed by two passes of surface collection by the Richard Grubb & Associates project team. The site was found to contain both a historic and prehistoric component within three separate artifact concentrations. Additional testing consisting of 21 Shovel Test Pits (8-1/8-21) excavated in three transects at a 7.5-meter interval and one Test Unit (EU 8-1) was placed near STPs 8-2 and 8-10 (Grossman-Bailey, Hayden and Springsted 2010).

The Phase I survey yielded three concentrations of artifacts. Concentration 1 consisted of a dense locus of prehistoric and eighteenth- to nineteenth-century artifacts located to the north of the tributary of Great Bohemia Creek. It measured approximately 4.6 hectares (11.3 acres) in size. The surface collection, shovel test pit and test unit excavations yielded 150 varied lithic artifacts from Concentration 1. Diagnostic artifacts include a quartz Archaic Vosburgh point, a quartz Koens-Crispin point, a Broadspear with broken stem, a Lamoka, two ferruginous quartzite Poplar Island points, and one ferruginous quartzite Bare-Island projectile point. A variety of other bifaces, tools, five cores, and debitage was also recovered. The historic artifacts recovered during the Phase I work date to the eighteenth- to nineteenth-century and consist of tin-glazed ware, black-glazed red earthenware, scratch blue white salt-glazed stoneware, white salt-glazed stoneware, English porcelain, Chinese Export porcelain, hard-bodied red earthenware, red earthenware, Whieldon teaware, olive wine bottle glass, and a white metal (silver) copper backed clothing button. Brick and glass were also recovered, indicating that a possible structure may have been located nearby. Concentration 2 is located to the south and east of Concentration 3 and measures approximately 1.6 hectares (3.9 acres). Artifacts consist of a few prehistoric lithic resources, including a quartz Bare Island point, a quartz side notched point, four tools, two cores, and debitage. Historic artifacts date to the eighteenth- to nineteenth-century and consist of whiteware, white granite, red earthenware, hard red bodied earthenware, creamware, and stoneware. A number of brick and window glass were also recovered. Concentration 3 was located north of Concentration 1 and measures approximately 1.7 hectares (4.3 acres). Historic artifacts consist of eighteenth-century artifacts such as white salt-glazed stoneware, Chinese export porcelain, red earthenwares, pearlware, olive wine bottle glass, and other early bottle glass. Prehistoric artifacts are a few lithic resources (Grossman-Bailey, Hayden and Springsted 2010).

Additional archaeological work was recommended for the Reynolds Historic/Prehistoric Site (7NC-F-118) to define the horizontal and vertical limits of the archaeological resources, to establish the integrity of the resource, and to assess the potential for eligibility in the National Register of Historic Places (Grossman-Bailey, Hayden and Springsted 2010). CHRS, Inc. performed the Phase II work as an additional 96 test units were excavated within the Reynolds Historic/Prehistoric Site (7NC-F-118). Test unit locations were based on high concentration areas derived from Phase I fieldwork. Fifty-five test units (TUs 1-42, 84-96) were excavated in a grid formation within the concentration of prehistoric and historic artifacts in the south/southwestern portion of the site (Concentration 1) (Figure 6; Google Earth 2010). Ten test units (TUs 43-52) were excavated in a crucifix pattern within a concentration of architectural artifacts within the southeastern portion of

the site (Concentration 2) (Figure 7; Google Earth 2010). Thirty-one test units (TUs 53-83) were placed in a grid formation within the concentration of historic artifacts (Concentration 3) within the northern portion of the site (Figure 8; Google Earth 2010).

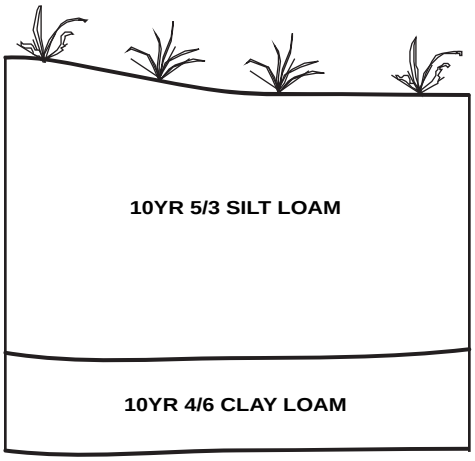
Within Concentration 1, all 55 test units (42 initial, 13 contingency) contained similar profiles, which consist of approximately 29 centimeters of brown (10YR 5/3 - 5/4) silt loam overlaid on a dark yellowish brown (10YR 4/6) to yellowish brown (10YR 5/4 - 5/8) clay loam culturally sterile subsoil (Figure 14). Test Units 10 and 37 were excavated to 1-meter to assess the stratigraphy of the site. Both test units contained similar profiles, which consist of approximately 29 centimeters of brown (10YR 4/3) silt loam over approximately 45 centimeters of yellowish brown (10YR 5/4) clay loam, all overlaid on a yellowish brown (10YR 5/6) sandy loam with approximately 20% rock (Photograph 7; Figure 15).

Six features were encountered during Phase II excavations. The encountered features are one plow scar (Feature 1), two basins (Features 2 and 4), a rodent burrow (Feature 3), one post hole (Feature 5), and one fire hearth (Feature 6).

Two small basin-like features (Features 2 and 4) were encountered within Test Units 8 and 19 (Photographs 8, 9). Each was approximately 60 centimeters wide by 80 centimeters long and 12 centimeters deep and consisted of a yellowish brown (10YR 5/4) silt clay loam with charcoal flecking. The surrounding soil consisted of a dark yellowish brown (10YR 4/6) silt clay loam culturally sterile subsoil. No artifacts were recovered from excavations within Feature 2. Six prehistoric artifacts were recovered from Feature 4, 1 quartz, 1 quartzite, 2 chert, and 2 limonite flakes. Radiocarbon dating was performed by Beta Analytic Inc. of Miami, Florida on carbon samples taken from the Features 2 and 4. Results recorded a measured radiocarbon age of 1640 +/- 30 BP for Feature 2 and 1620 +/- 30 BP for Feature 4 (Appendix E, Pages 3-4). Floatation samples were also completed for Features 2 and 4 by Chris Civello of CHRS, Inc. staff. Feature 2 yielded 8 American False Pennyroyal seeds (*Hedeoma pulegioides*) (Appendix D, Pages 1-2). Feature 4 yielded 18 Pigweed seeds (*Amaranthus sp*.), 66 American False Pennyroyal seeds (*Hedeoma pulegioides*), 1 Nimblewill seed (*Muhlenbergia schreberi*), and 4 Carpetweed seeds (*Mollugo verticillata*). Four flakes were recovered from the Feature 4 soil sample. The Feature 4 soil sample contained 2 jasper complete flakes, 1 quartz complete flake, and 1 quartz flake fragment. All 4 flakes were retouching or shaping flakes with no cortex (Appendix D, Pages 3-4).

A circular soil stain measuring approximately 22 centimeters in diameter and containing brown (10YR 4/3) silt loam was noted in the northwest quadrant of Test Unit 30. This feature was designated as Feature 5. Bisection of the feature revealed a conical shaped depression that extended approximately 27 centimeters into the surrounding subsoil (Photograph 10). The feature appears to be a post hole. No artifacts were recovered from Feature 5. Radiocarbon dating was performed by Beta Analytic Inc. of Miami, Florida on carbon samples taken from the Feature 5. Results recorded a measured radiocarbon age of 370 +/- 30 BP for Feature 5 (Appendix E, Page 5).

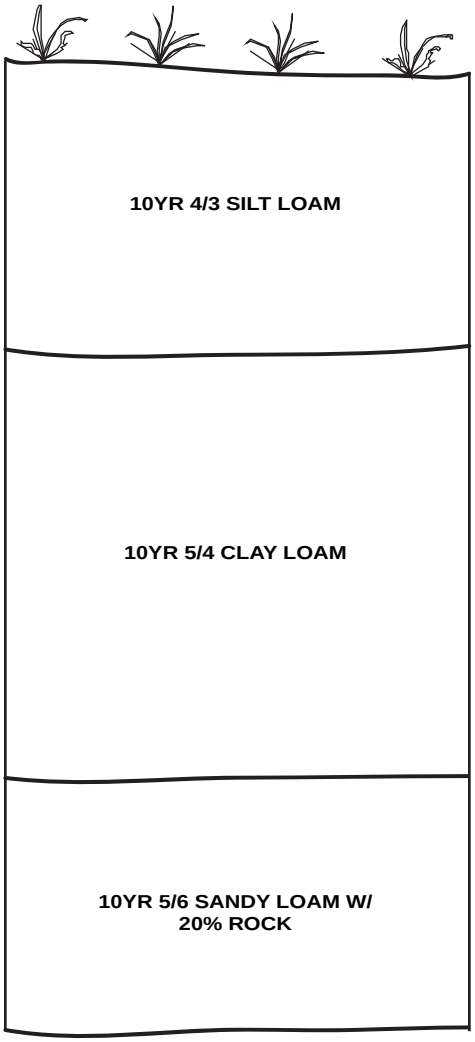
REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
TEST UNIT 5
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 5	FIGURE 14

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
TEST UNIT 10
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 10 | **FIGURE 15**

Photograph 7: Reynolds Historic/Prehistoric Site (7NC-F-118): Concentration 1, Test Unit 21, Closing profile view of the south wall.

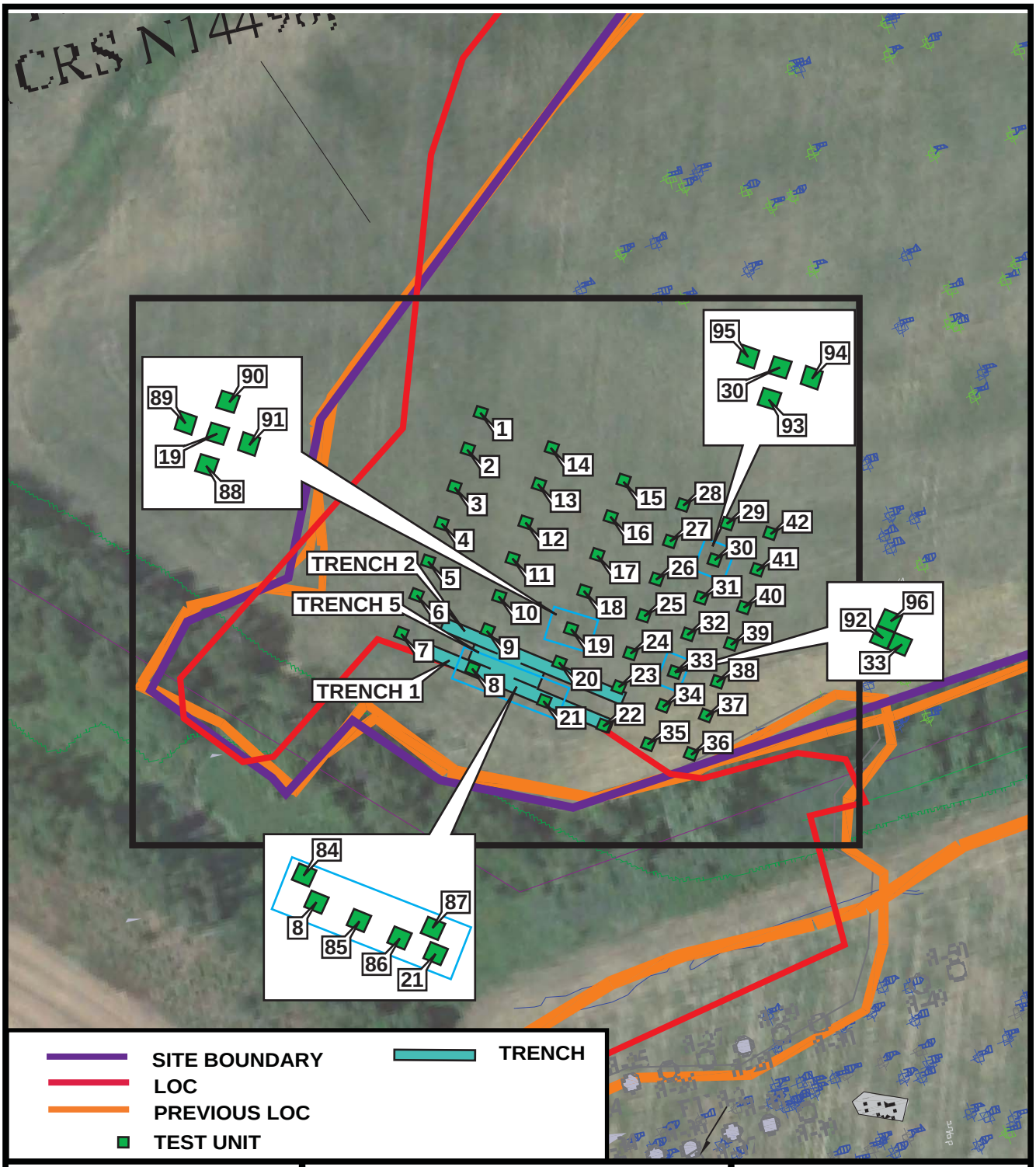
Photograph 8: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1, Test Unit 8, Closing plan view of Feature 2, a small basin feature.

Photograph 9: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1, Test Unit 19, Closing plan view of Feature 4, a small basin feature.

Photograph 10: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1: Test Unit 30: Closing plan view of Feature 5, a posthole.

Feature 6 was initially encountered within Test Unit 33 along the western wall and consisted of a yellowish brown (10YR 5/4) soil stain with charcoal flecking that measured approximately 70 centimeters in length and 17 centimeters wide. Contingency test units were excavated directly to the west (TU 92) and northwest (TU 93) of Test Unit 33 in order to expose the entire feature. Once exposed, Feature 6 consisted of an oval soil stain, yellowish brown (10YR 5/4) in color with light charcoal flecking and measuring approximately 194 centimeters long by 116 centimeters wide (Photographs 11, 12, 13, 14). A number of large rocks were located in a circular pattern within the southern half of Feature 6 while the northern half contained only the soil stain and charcoal flecking. The feature was bisected along the North/South axis with the eastern portion being removed first. The bisected portion was then divided into a north half and south half based on the presence of angular rocks. The completed excavation revealed two separate basins. The first was in the southern portion of Feature 6 and consisted of a circular basin that measured approximately 100 centimeters by 116 centimeters and 23 centimeters deep. A number of small angular rocks were recovered within this portion. Charcoal and soil samples were taken. The second basin was located within the northern portion of Feature 6. This basin measured approximately 100 centimeters by 60 centimeters and 32 centimeters deep. No angular rocks were recovered from within the northern basin. Artifacts recovered from Feature 6 consist of 28 flakes, 1 early stage biface, and 1 aboriginal sherd. A number of pieces of FCR were also recovered from the southern portion of the feature. Radiocarbon dating was performed by Beta Analytic Inc. of Miami, Florida on carbon samples taken from the southern portion of Feature 6. Results recorded a measured radiocarbon age of 1640 +/- 30 BP (Appendix E, Page 6). Two soil samples were taken for floatation from Feature 6 within the north and south portions of the western half excavations. Floatation was completed by Chris Civello of CHRS, Inc. staff. The southern portion soil sample contained 12 Pigweed seeds (*Amaranthus sp*.), 144 American False Pennyroyal seeds (*Hedeoma pulegioides*), and 1 Nimblewill seed (*Muhlenbergia schreberi*), and 1 Clover seed (*Trifolium sp*.). Additionally a single quartz flake fragment was also recovered. The flake recovered was a retouch or shaping flake with no cortex (Appendix D, Pages 5-6). The northern portion soil sample contained 4 Pigweed seeds (*Amaranthus sp*.), 52 American False Pennyroyal seeds (*Hedeoma pulegioides*), and 2 Nimblewill seeds (*Muhlenbergia schreberi*). The floatation sample also yielded 2 quartz complete flakes, 1 quartz broken flake, 1 jasper complete flake, 2 jasper flake fragments, and 1 chert broken flake (Appendix D, Pages 7-8). All flakes recovered were retouching or shaping flakes with no cortex

Analysis of the artifacts recovered from the excavations was plotted to create artifact distribution plots for both the prehistoric and historic artifacts. One distribution plot revealed a concentration of late eighteenth-century to early nineteenth-century artifacts near the southwestern edge of Concentration 1. Although the artifact concentration was not dense, with a total of 23 late eighteenth-/early nineteenth-century artifacts from Phase I and II testing, a decision was reached to mechanically strip this area to ensure that no subsurface features indicative of an early structure were present. Originally, two trenches measuring approximately 3 feet wide by 135 feet long were excavated across the high concentration of eighteenth-century artifacts to search for historic features (Figure 16; Google Earth 2010). The trenches were then flat shovel scraped with any soil anomaly troweled by hand. A soil anomaly consisting of lighter, heavily compacted soil stain was noticed in two areas approximately 15 feet apart and ran in the same east to west direction within Trench 1. The anomaly appeared to be the faint remnants of a building foundation. In order to better address the anomaly, stripping was conducted between, Trench 1 and Trench 2 in order to remove a large central section (which became Trench 5).

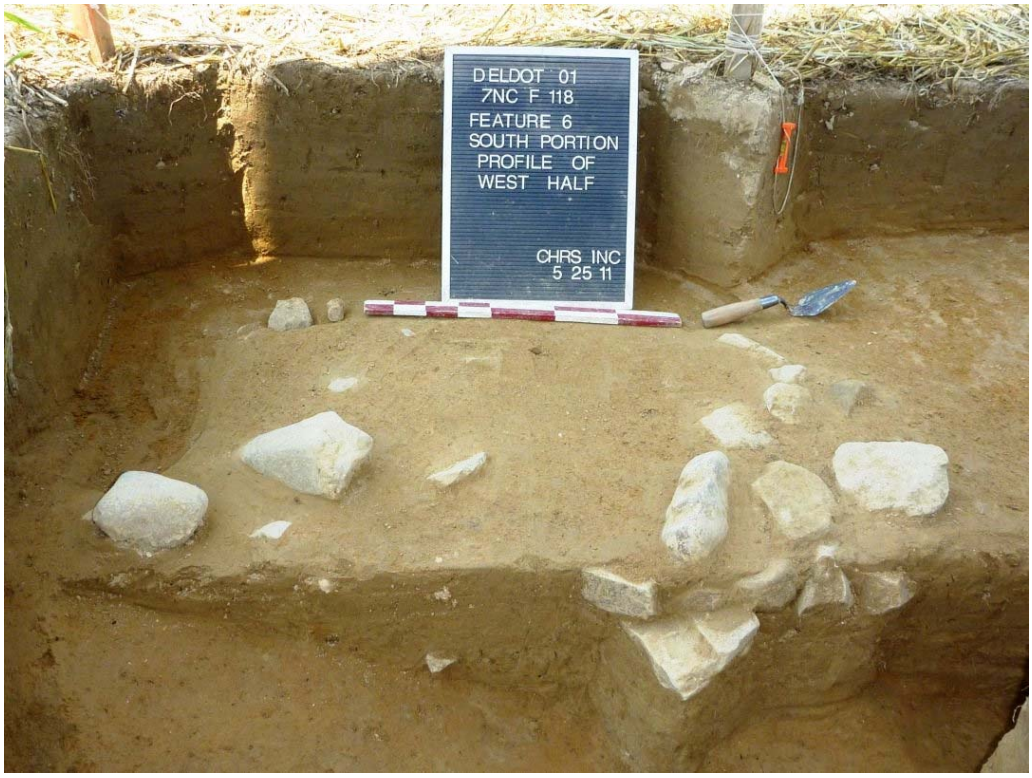


	SCALE	SOURCE
N	0ft 328ft 0m 100m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

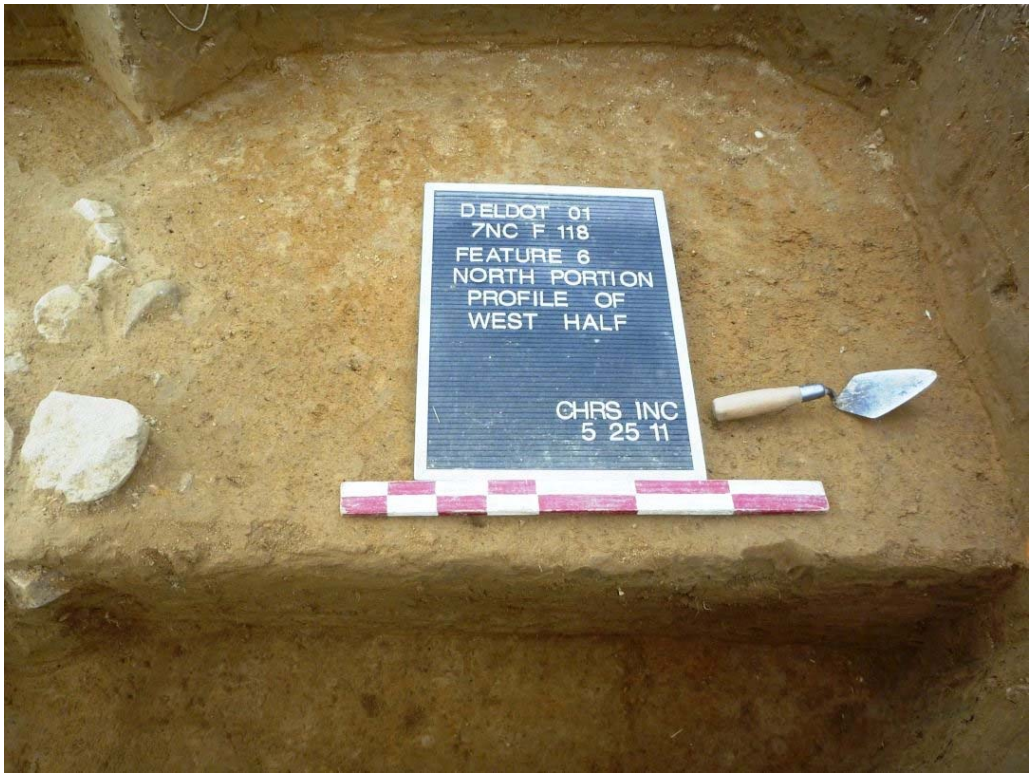
REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 1 - TRENCH LOCATIONS

FIGURE 16

Photograph 11: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1, Test Units 33, 92, and 96, opening planview of Feature 6: a prehistoric hearth.



Photograph 12: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1, Test Units 92 and 96, Bisected profile view of Feature 6, southern portion.



Photograph 13: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1: Test Units 92 and 96: Bisected plan view of Feature 6, northern portion.

Photograph 14: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1: Feature 6. Note the two separate basins within the northern and southern portions of the excavation.

Excavation of Trench 5 was completed in an effort to find a connection between the two anomalies. The light, compacted soil did not appear in Trench 5 and further scraping after a light rain revealed the compacted soils were easily removed and the lighter soil reverted to a darker color. It is likely that the soil anomaly was a result of the drying out from direct sunlight and heat faster than the surrounding soils. Additionally, 10 plow scars running in an east to west direction, one 3 inch PVC pipe, and three possible post holes were discovered within the three trenches opened in Concentration 1. The possible post holes were each individually excavated by bisection and yielded the darker soils undercutting the subsoil, indicating that they all were rodent burrows. The 3-inch PVC pipe was located within Trench 1 and is likely associated with irrigation for the agricultural field. Three of the ten plow scars were excavated completely and all three were similar in size and depth. A detailed planview was drawn at the completion of all stripping operations. No additional features were encountered during excavations.

Ten test units were excavated within Concentration 2. All 10 test units contained similar soil profiles. The soil profiles consisted of approximately 31 centimeters of brown (10YR 4/3 – 5/3) silt loam overlaid on a dark yellowish brown (10YR 4/6) to yellowish brown (10YR 5/4 – 5/6) clay loam culturally sterile subsoil (Photograph 15; Figure 17). No subsurface features were encountered.

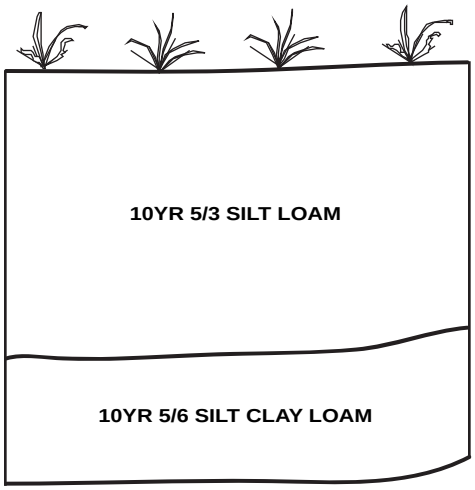
Thirty-one tests units were excavated within Concentration 3. All of the test units contained similar soil profiles. The stratigraphy consisted of approximately 26 centimeters of brown (10YR 5/3) to yellowish brown (10YR 5/4) silt loam overlaid on a dark yellowish brown (10YR 4/6) to yellowish brown (10YR 5/4 – 5/8) clay loam culturally sterile subsoil (Photograph 16; Figure 18). Test Unit 68 was excavated to 1 meter below ground surface in order to compare that stratigraphy with that within Concentration 1. Test Unit 68 had a profile consisting of approximately 28 centimeters of brown (10YR 5/3) silt loam, overlaid on 48 centimeters of yellowish brown (10YR 5/4) clay loam, overlaid on 10 centimeters of dark yellowish brown (10YR 4/6) sand, all overlaid on a brown (10YR 5/3) silt clay mottled with yellowish brown (10YR 5/6) sandy clay (Figure 19). No cultural features were encountered within the test units.

Analysis of the historic artifacts within Concentration 3 revealed a focus of late nineteenth-century artifacts as well as pieces of brick and mortar. While additional test units were not excavated due to the existing tight testing grid, mechanical stripping of the site was utilized to search for features. Two trenches (Trenches 3 and 4) measured approximately 3 feet wide by 100 feet long and were excavated diagonally through the high artifact density area. The trenches extended outside of the original testing area approximately 25 feet to each side (Figure 20; Google Earth 2010). Within Trench 3, a total of eleven plow scars were recorded along with two rodent burrows. Within Trench 4, a total of three plow scars were noted along with one rodent burrow. A detailed plan view of each trench was drawn at the conclusion of excavation and shovel scrapping. No other cultural features were encountered in the area.

Photograph 15: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 2, Test Unit 47, Closing profile view of the south wall.

Photograph 16: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 3, Test Unit 77, Closing profile view of the south wall.

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
TEST UNIT 45
CLOSING PROFILE SOUTH WALL

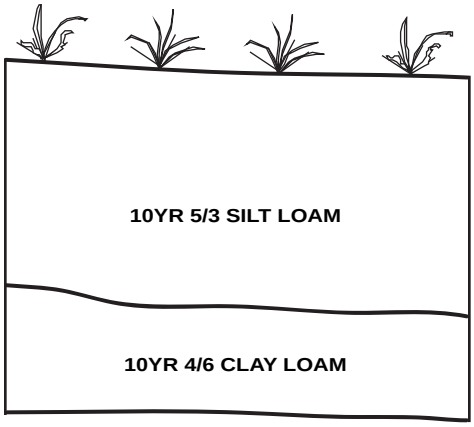


Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 45

FIGURE 17

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
TEST UNIT 85
CLOSING PROFILE SOUTH WALL

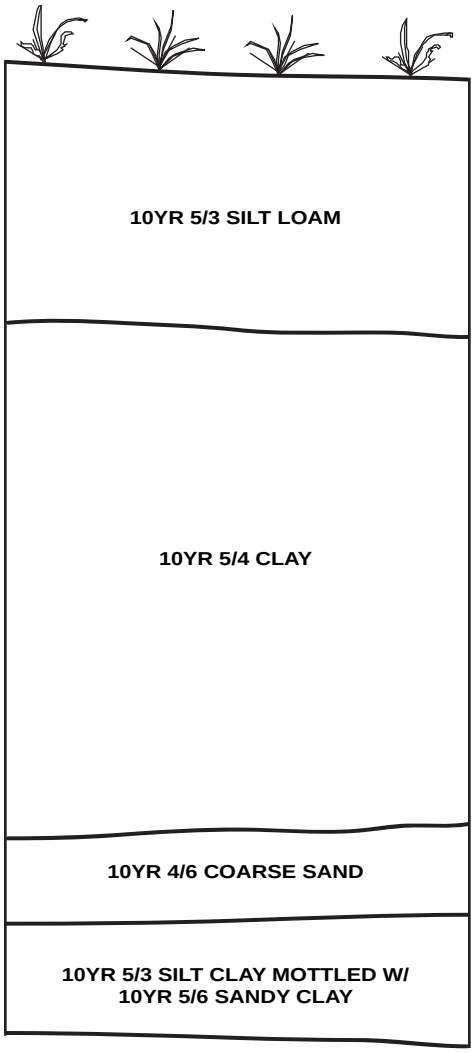


Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 85

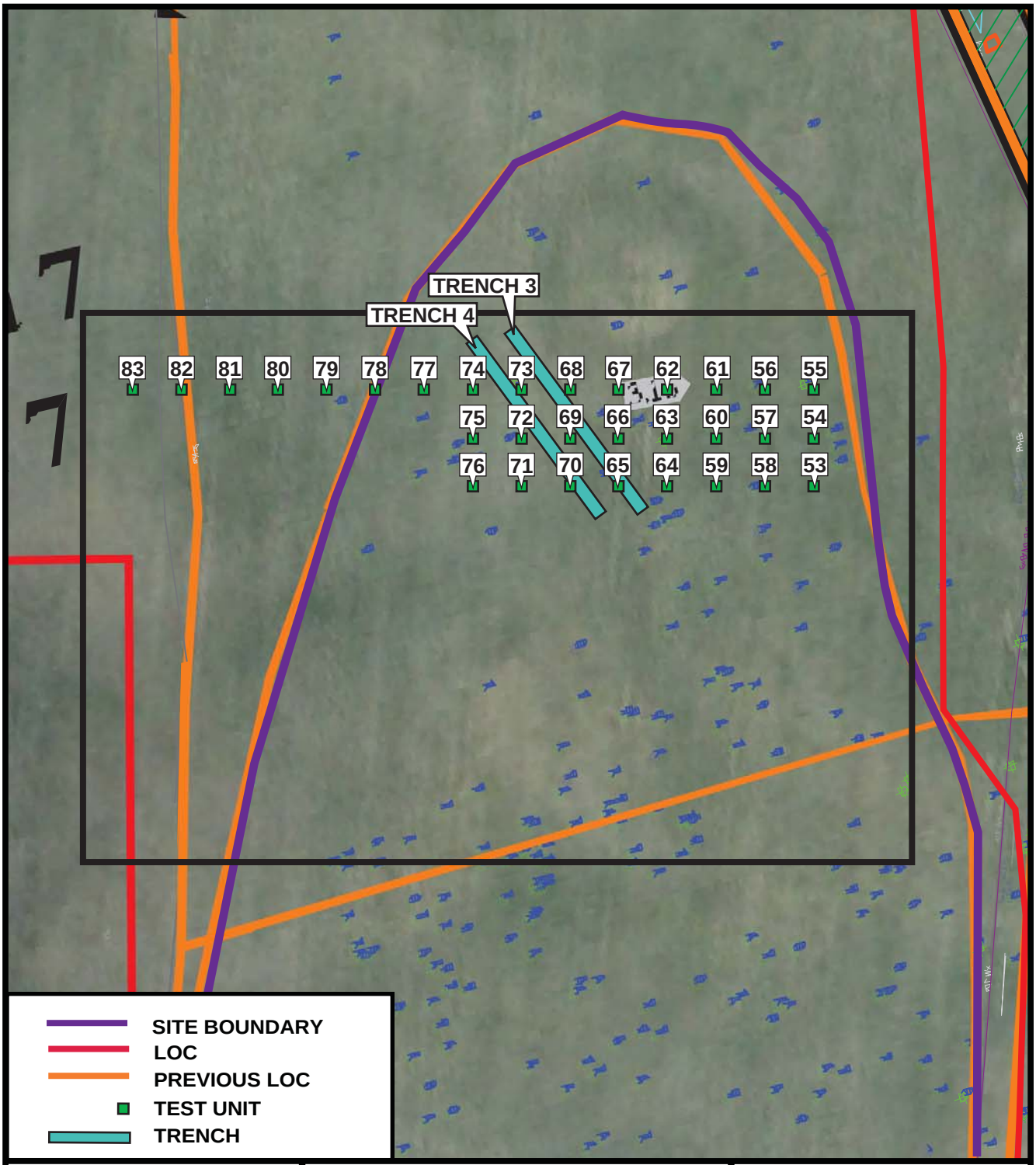
FIGURE 18

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
TEST UNIT 68
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 68 | **FIGURE 19**



	SCALE	SOURCE
N	0ft 103ft 0m 31.39m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 3 - TRENCH LOCATIONS

FIGURE 20

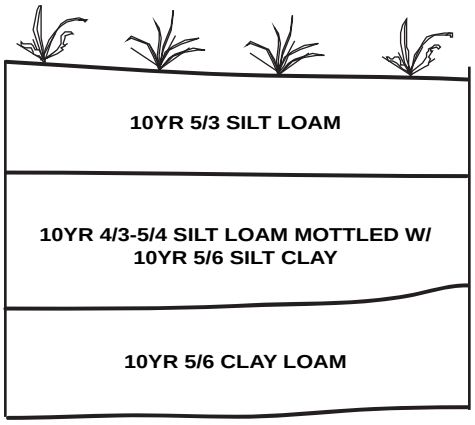
Area 8 Prehistoric Site (7NC-F-119)

Phase I field investigations were completed by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010). Area 8 was initially assessed as having moderate to high potential for prehistoric resources and a moderate potential for historic resources. Phase I archaeological investigation began by plowing and discing the area. This was followed by two passes of surface collection by the Richard Grubb & Associates project team. Approximately 117 prehistoric artifacts were recovered from the surface collection within Area 8. This concentration included tools, debitage, and cores. Additional fieldwork comprised of 27 shovel test pits (8-22/8-48) were excavated across the dense locations within Area 8 at 7.5 meter intervals in three rows 15 meters apart and one Test Unit (EU 8-2). Two additional shovel test pits (8-49, 8-50) were excavated approximately 20 meters east of the rest in a secondary concentration of artifacts. A total of 29 prehistoric artifacts were recovered from 17 shovel test pits and consist mainly of chert, jasper, limonite, quartz, and quartzite debitage, a quartz scraper, and a fragment of FCR. A single test unit was excavated within Area 8 during the Phase I work. A total of 14 additional prehistoric artifacts were recovered from the excavation. Five diagnostic artifacts were found from the fieldwork and consist of a chert Archaic Stanly point, a quartz Woodland I Bare Island point, a quartz Woodland II pentagonal or irregular triangle point, and two small quartz triangle points. The site boundary was determined based on the distribution of artifacts across the surface. Area 8 Prehistoric Site (7NC-F-119) measures approximately 200 meters by 110 meters (2.2 hectares) with the densest portion of the site being located near the tributary (Grossman-Bailey, Hayden and Springsted 2010).

Additional archaeological work was recommended for the Area 8 Prehistoric Site (7NC-F-119) to define the horizontal and vertical limits of the archaeological resources, to establish the integrity of the resource, and to assess the potential for eligibility in the National Register of Historic Places. CHRS, Inc. performed the Phase II work, as an additional 36 test units were excavated within Area 8 (Figure 9; Google Earth 2010). Test unit locations were based on high concentration areas derived from Phase I fieldwork. Thirty test units (TUs 1-24, 31-36) were placed in a grid formation within the main artifact concentration. Four test units (TUs 25-28) were placed approximately 30 meters south of the main concentration. The final two test units (TUs 29, 30) were excavated in a single row approximately 60 meters east of the main artifact concentration (Figure 9; Google Earth 2010).

All 36 test units contained similar profiles, which consisted of approximately 10 centimeters of dark grayish brown (10YR 4/2) to brown (10YR 4/3-5/3) silt loam overlaid on a dark yellowish brown (10YR 4/6) to yellowish brown (10YR 5/6) clay loam culturally sterile subsoil (Figure 21). Test Units 14 and 28 were excavated to a depth of 100 centimeters to analyze the stratigraphy of the area. Both test units contained similar profiles, which consisted of approximately 11 centimeters of brown (10YR 5/3) silt loam over 23 centimeters of yellowish brown (10YR 5/4) silt loam over approximately 54 centimeters of yellowish brown (10YR 5/8) clay loam culturally sterile subsoil, all overlaid on a strong brown (10YR 5/6-5/8) sand with 80% small to medium rock (Photographs 17, 18; Figure 22). No prehistoric features were encountered during excavations. The prehistoric artifacts recovered from the Phase II excavation were plotted with the Phase I shovel test pit data to create an artifact distribution map of the Area 8 Prehistoric Site (7NC-F-119). Based on the results, no clear site patterns were evident. A decision was reached in consultation with DelDOT and SHPO archaeologists, that no mechanical stripping was required.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 20
CLOSING PROFILE SOUTH WALL



0in 7.87in

0cm 20cm

Prepared by CHRS, Inc.

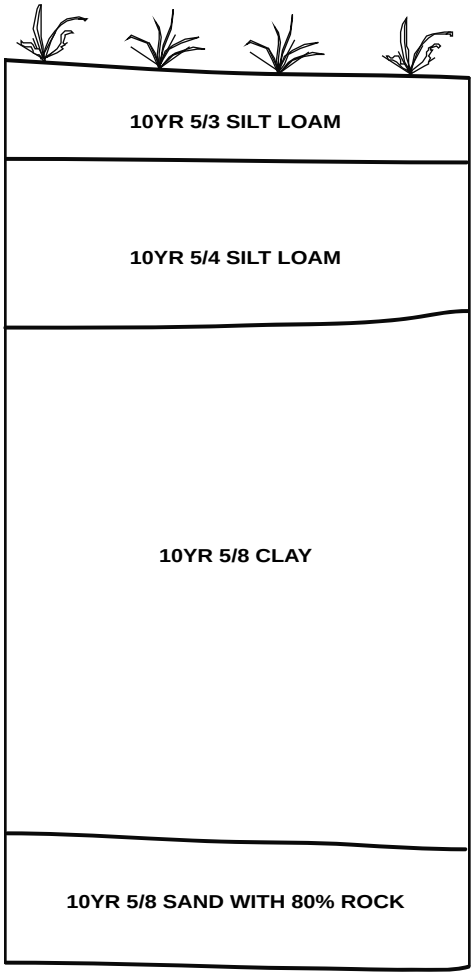
REPRESENTATIVE TEST PROFILE - TEST UNIT 20

FIGURE 21

Photograph 17: Area 8 Prehistoric Site (7NC-F-119): Test Unit 20: South wall.

Photograph 18: Area 8 Prehistoric Site (7NC-F-119): Test Unit 28: South wall.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 28
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 28

FIGURE 22

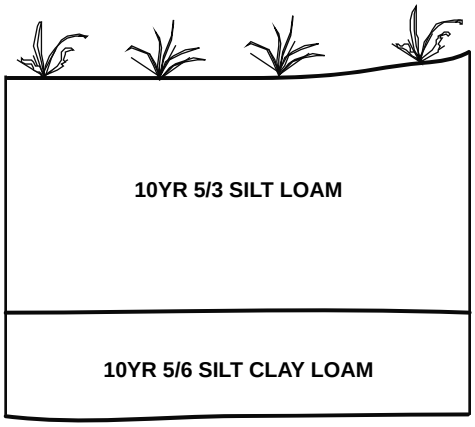
Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Phase I field investigations were completed by Hunter Research, Inc. (Liebenknecht and Burrow 2010). The area in which the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) was found had been determined to contain moderate to high potential for prehistoric resources. Phase I archaeological investigations began with plowing and discing the area. This was followed by two passes of surface collection by the Hunter Research, Inc. project team. A total of 1,172 prehistoric artifacts were recovered from the surface collection within the entire Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The artifact assemblage included tools, debitage, cores, and Fire Cracked Rock (FCR). Additional fieldwork included 33 shovel test pits excavated across areas of artifact concentration within the APE. A total of 25 prehistoric artifacts were recovered from the 33 shovel test pits and consisted mainly of chert, jasper, limonite, quartz, and quartzite debitage, and fragments of FCR. Additionally, four test units were excavated during the Phase I work. A total of 336 additional prehistoric artifacts consisting of a biface scraper, cores, debitage, hammerstones, a jasper drill, triangular projectile point, and one ceramic sherd were recovered from the test unit excavations. Features, consisting of one D-shaped pit and one fire hearth, were encountered in Test Units 2 and 4. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) measures approximately 2.7 hectares (6.7 acres) with the densest portion of the prehistoric artifacts being located near the tributary (Liebenknecht and Burrow 2010). Subsequent to the Phase I archaeology, the Limit of Construction (LOC) was more closely defined. The features identified during the Phase I archaeology then fell outside of the LOC for the Phase II Archaeological Survey.

Additional archaeological work was recommended for the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) to assess the potential for eligibility in the National Register of Historic Places for the prehistoric component. CHRS, Inc. performed the Phase II work with an additional 61 test units excavated within the site boundary. Test unit locations were based on high density areas derived from Phase I fieldwork. Twelve test units (TUs 1-12) were placed in a grid formation within the Concentration 1, located along the eastern edge of the site. The remaining test units (TUs 13-61) were placed within Concentration 2, which is located along the southern edge of the site (Figure 9; Google Earth 2010; Figure 10; Google Earth 2010; Figure 11; Google Earth 2010).

All 12 test units within Concentration 1 contained similar soil profiles. The stratigraphy consisted of approximately 26 centimeters of dark grayish brown (10YR 4/2) to brown (10YR 5/3) silt loam overlaid on a dark yellowish brown (10YR 4/6) to yellowish brown (10YR 5/6) silt clay loam culturally sterile subsoil (Figure 23). Test Unit 5 was excavated to a depth of 100 centimeters to analyze the stratigraphy of the area and contained a profile that consisted of approximately 29 centimeters of brown (10YR 5/3) silt loam over 40 centimeters of dark yellowish brown (10YR 4/6) clay loam culturally sterile subsoil, overlaid on a yellowish brown (10YR 4/6) sandy clay with 30% gravel, all overlaid on a greenish gray Gley 1 (6/5GY) mottled with pink (2.5YR 8/4) and dark grayish brown (10YR 4/2) sand (Photographs 19, 20; Figure 24). No prehistoric features were encountered during excavations.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 3
CLOSING PROFILE SOUTH WALL



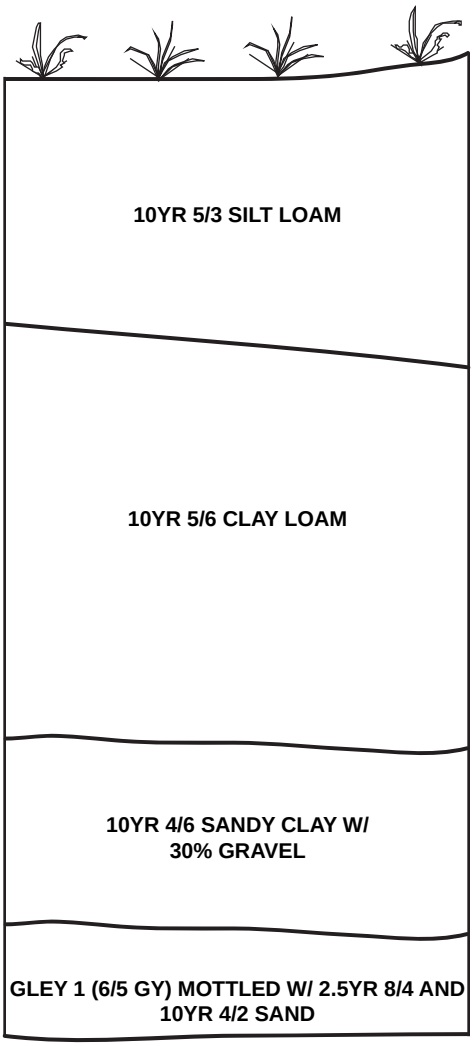
Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 3	FIGURE 23

Photograph 19: Churchtown #4 Prehistoric/Historic Site (7NC-F-155) Concentration 1: Test Unit 3, south wall.

Photograph 20: Churchtown #4 Prehistoric/Historic Site (7NC-F-155) Concentration 1: Test Unit 5, view of the south wall.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 5
CLOSING PROFILE SOUTH WALL



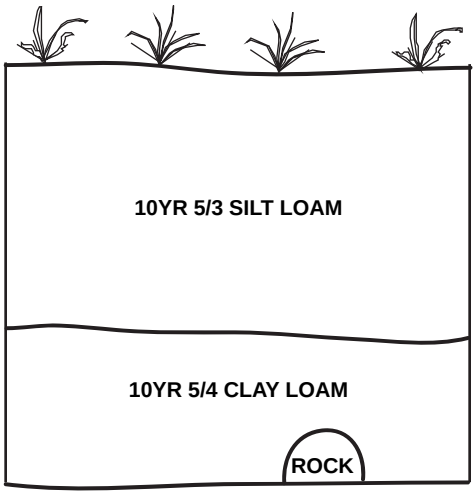
Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 5

FIGURE 24

All 50 test units within Concentration 2 contained similar profiles. The stratigraphy consisted of approximately 28 centimeters of dark grayish brown (10YR 4/2) to brown (10YR 5/3) silt loam overlaid on a yellowish brown (10YR 5/4-5/6) clay loam culturally sterile subsoil (Figure 25). Test Units 18, 24, 48, 52 were excavated to a depth of 100 centimeters to analyze the stratigraphy of the area which contained a profile that consisted of approximately 17 centimeters of brown (10YR 5/3) silt loam over 15 centimeters of yellowish brown (10YR 5/6) clay loam culturally sterile subsoil, overlaid on a yellowish brown (10YR 5/8) sandy clay with 30% gravel, overlaid on 16 centimeters of yellowish brown (10YR 5/8) course sand with 30% gravel, overlaid on a yellowish brown (10YR 5/8) sand mottled with dark grayish brown (10YR 4/2) sand with gravel and rock, all overlaid on a yellow (10YR 7/8) mottle with yellowish brown (10YR 5/8), sand (Photographs 21, 22; Figure 26). No prehistoric features were encountered during excavations.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 21
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

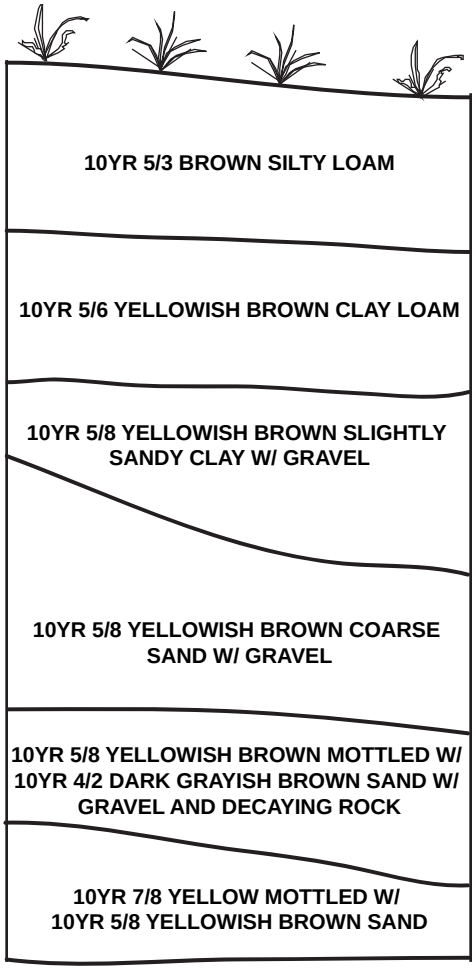
REPRESENTATIVE TEST PROFILE - TEST UNIT 21

FIGURE 25

Photograph 21: Churchtown #4 Prehistoric/Historic Site (7NC-F-155) Concentration 2: Test Unit 21, view of the south wall.

Photograph 22: Churchtown #4 Prehistoric/Historic Site (7NC-F-155) Concentration 2: Test Unit 53, view of the south wall.

AREA 8 PREHISTORIC SITE (7NC-F-119)
TEST UNIT 53
CLOSING PROFILE SOUTH WALL



Prepared by CHRS, Inc.

REPRESENTATIVE TEST PROFILE - TEST UNIT 53

FIGURE 26

ANALYSIS

Reynolds Historic/Prehistoric Site (7NC-F-118)

An analysis of the Phase I archaeological survey data suggested that the Reynolds Historic/Prehistoric Site (7NC-F-118) had four areas of artifact concentration. Based on the Phase I archaeological survey there was a concentration of prehistoric artifacts on the southern edge of the site, a concentration of eighteenth- and early nineteenth-century artifacts in the southwest corner of the site, an area along the southeastern portion of the site that has a concentration of architectural debris, and a concentration of historic artifacts in the northern portion of the site. As the highway design developed, the areas of impacts became smaller. The final LOC line was north and east of that studied by the Phase I archaeological survey. The majority of the area that contained eighteenth- and early nineteenth-century artifacts in the southwest corner of the site, was outside of the Area of Potential Effect for the project by the time the Phase II work commenced. This reduced the areas of artifact concentration to three. Concentration 1 became the area prehistoric artifacts on the southern edge of the site, with some historic material. Concentration 2 became the area along the southeastern portion of the site that had a light concentration of architectural debris. Concentration 3 became the concentration of historic artifacts in the northern portion of the site. The Reynolds Historic/Prehistoric Site extends over ~20 acres. The areas of the site tested during Phase II was ~2.5 acres. Concentration 1 tested over a ~0.7 acres, the area tested in Concentration 2 was ~1.1 acres and the Concentration 3 testing was ~0.7 acres.

Concentration 1: Concentration 1 was located along the southern edge of the site. The concentration contained both historic period and prehistoric artifacts. With the exception of a few artifacts, all of the artifactual material was recovered from the plow zone. Four prehistoric cultural features were encountered during excavations: Features 2, 4, 5, and 6. Features 2 and 4 were oval shaped basins the measured 80 centimeters long and 60 centimeters wide. Both features were ~12 centimeters deep. Feature 6 contained two basins that measured 100 centimeters long and 60 centimeters wide. Both basins were ~32 centimeters deep, the southern basin contained a large quantity of fire cracked rock, and was likely a hearth. Three of the basin shaped features had sufficient charcoal for C-14 dating. All three had dates around 1640 BP suggesting that they were contemporaneous. Although no temporally diagnostic artifacts were encountered during the Phase II archaeological survey, the Phase I archaeological survey recovered several points associated with the Woodland I period (Grossman-Bailey, Hayden and Springsted 2011:4-10).

A total of 269 prehistoric artifacts were recovered during Phase II excavations within Concentration 1 (Table 1). Artifacts consist mainly of complete flakes (40.9%), flake fragments (20.1%), broken flakes (7.8%), and debris (4.9%). No diagnostic artifacts were recovered during Phase II work. Other material in the prehistoric lithic assemblage includes 46 pieces of FCR (17.7%), one middle stage biface, one medial biface fragment, two hammerstones, two early stage bifaces, one late stage biface, two distal biface fragments, and four very small aboriginal sherds. About 44% of the lithic assemblage from the Phase II work was comprised of jasper. Quartz and limonite (ferruginous quartzite) comprised 16.1% and 15.7% of the assemblage respectively. Other lithics present include chert (12.9%) quartzite (7.9%), ryholite (2.3%) and chalcedony (0.9%). The mean length of the debitage was 15.43mm. The mean width of the debitage is 15.87mm and thickness 4.96mm. Although the mean size of the flakes is less than 20mm, suggesting late state

biface production or tool maintenance activities, the standard deviations for the each measurement is quite high, indicating that a considerable amount of primary lithic reduction was also being undertaken. This is also reflected in the number of cortical flakes encountered (approximately 21% of the lithic debitage exhibited cortex).

TABLE 1

PREHISTORIC ARTIFACT ASSEMBLAGE
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 1

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown
New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

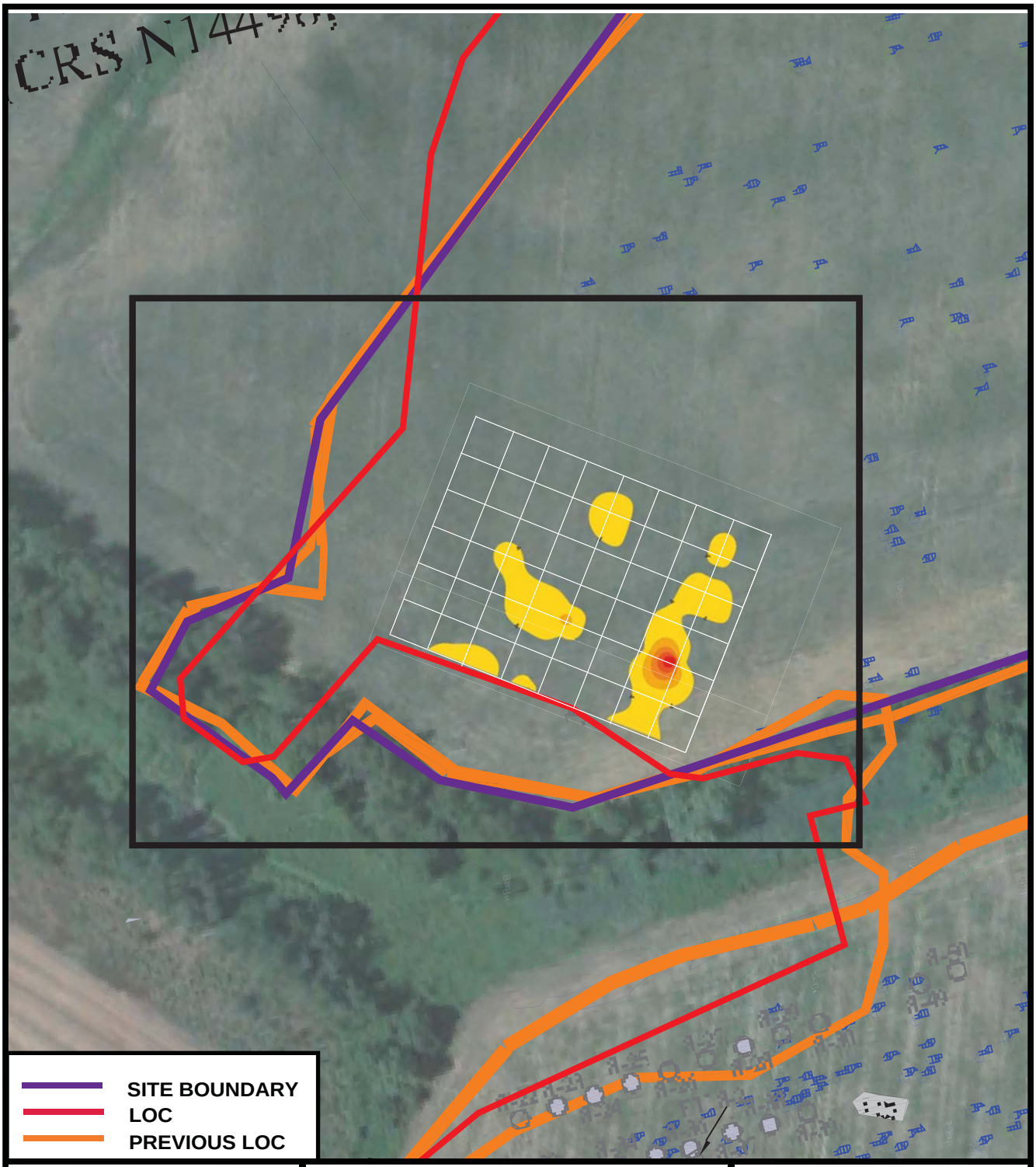
Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	110	40.9%	Early stage biface	2	0.7%
Flake fragment	54	20.1%	Middle stage biface	1	0.4%
Broken flake	21	7.8%	Late stage biface	1	0.4%
Debris	13	4.9%	Medial biface fragment	1	0.4%
Core	2	0.7%	Distal biface fragment	2	0.7%
Hammerstone	2	0.7%	FCR	46	17.7%
Aboriginal sherd	4	1.5%	Other	10	3.7%
Material	Number	Percent	Material	Number	Percent
Jasper	96	44.2%	Quartzite	17	7.9%
Chalcedony	2	0.9%	Rhyolite	5	2.3%
Quartz	35	16.1%	Chert	28	12.9%
Argillite	0	0.0%	Limonite	34	15.7%

DEBITAGE ONLY

Cortex	Number	Percent	Flake Type	Number	Percent
Cortical	33	16.7%	Decortication	29	15.7%
Partial	28	14.1%	Primary	23	12.4%
Non-cortical	137	69.2%	Thinning	62	33.5%
			Shaping	71	38.4%

Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	15.43	11.34	4.85	58.67
Width (in mm)	15.87	8.46	4.90	49.24
Thickness (in mm)	4.96	3.15	0.92	20.14

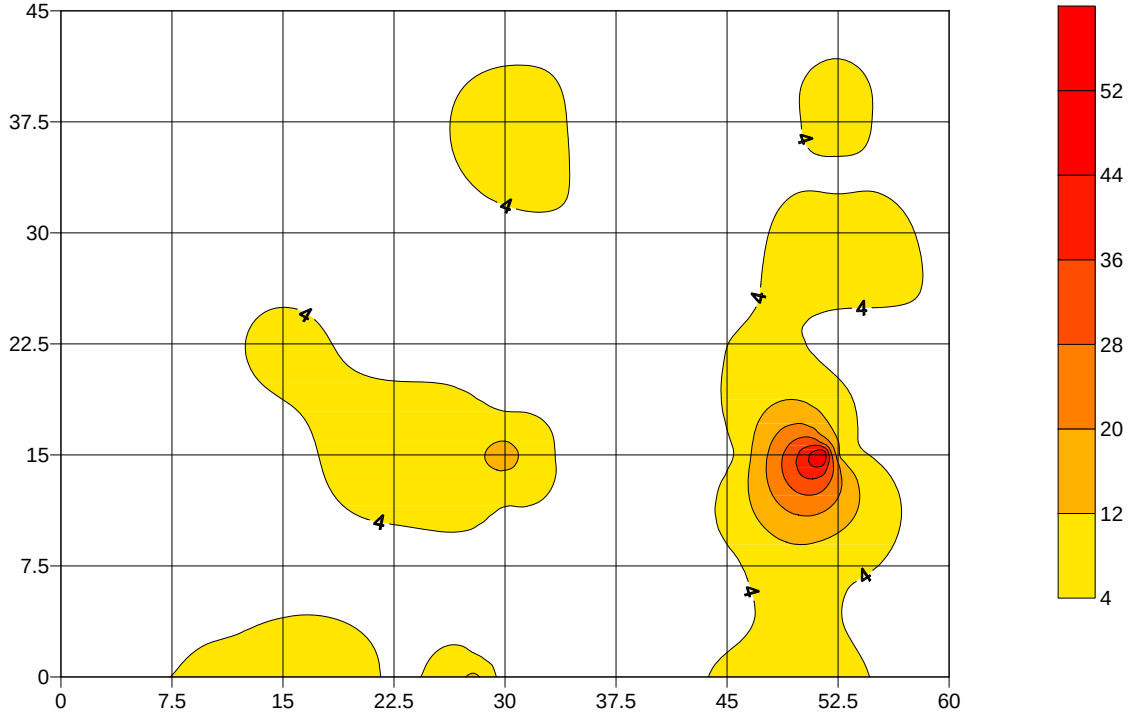
The distribution of the prehistoric artifacts across the site was plotted using Surfer®. Overall, artifact density was low. The isoplethic mapping shows the highest density in the vicinity of Test Unit 33 along the eastern edge of the area tested. Test Unit 33 contained Feature 6, a hearth and basin feature (Figure 27; Google Earth 2010; Figure 28). A secondary area is evident approximately ~20 meters to the west of the highest density area. This location is in the vicinity of Test Unit 19



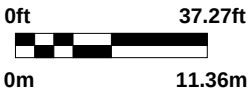
	SCALE	SOURCE
N	0ft 328ft 0m 100m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 1 - PREHISTORIC SURFER GRID LOCATION

FIGURE 27



SCALE



Prepared by CHRS, Inc.

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 1 - HISTORIC ARTIFACT DISTRIBUTION

FIGURE 28

that contained a basin feature. Another secondary area is evident ~15 meters southwest of Test Unit 19. This small concentration is associated with Test Unit 8, which also contained a small basin feature. Although no highly dense areas were present, relatively high artifact densities appear to concentrate in the vicinity of cultural features.

In some ways the Phase I surface collection mirrored the Phase II excavation work. The Phase II prehistoric artifact assemblage was 73.7% debitage, the Phase I surface collection was ~74% debitage. Both assemblages contained a high percentage of cortical material. Slightly more than 30% of the lithic assemblage from the Phase II work exhibit some cortex. Grossman-Bailey, Hayden and Springsted (2011:3-98) reports ~ 31% of the lithic debitage were cortical "which indicates a cobble or pebble origin. This indicates a portion of the lithic material was obtained from probably local cobble sources."

There are also differences between the surface collected material and that collected during the Phase II. For example: Grossman-Bailey, Hayden and Springsted (2011:4-10) indicates that there was a lack of FCR found in the surface collection and suggested "that cooking and heating were not important activities or occurred in other yet unidentified portions of the site." During the Phase II work FCR was found, but within a subsurface feature. The absence of FCR at the surface of the site, may be indicative that either few hearths are present in this portion of the site. The other possibility is that, if there are additional hearths present, they all have been deep enough to avoided being impacted by the plow.

Another difference between the Phase I and Phase II assemblages can be seen in the lithic material present. Both lithic assemblages contain a wide range of lithic material types, suggesting either repeated occupation by numerous groups through time or a base camp. Grossman-Bailey, Hayden and Springsted (2011:4-10) indicates the "Quartz was the dominant lithic material, but ferruginous quartzite, chert, jasper, and quartzite were also found…. No rhyolite and little argillite was found." For the prehistoric surface collected material in the vicinity of Concentration 1 ~59% of the lithic assemblage was quartz. Chert was the next most recovered material at ~14%, followed by jasper (~10.3%), ferruginous quartzite (limonite) (~8.3%), and quartzite (~6%). A flake of argillite flake was also encountered. In contrast, jasper was the dominant lithic material found during the Phase II work, representing more than 44 percent of the assemblage. Quartz and limonite were found in nearly equal quantities (~16%) and chert was nearly as plentiful (~13%). Both the Phase I and the Phase II assemblages contained small quantities of other materials. While the Phase I surface survey encountered a flake of argillite, the Phase II work encountered a few flakes of rhyolite and chalcedony and no argillite, indicating that these materials were available to the Native American inhabitants of the area, but in relatively small amounts. It is uncertain why the percentage of quartz is so high in the surface collection and jasper artifacts are the dominant material type in the Phase II work excavation work. Jasper is also the dominant material type in Concentrations 2 and 3 where it comprised nearly 80% of each areas' lithic material (see below; cf Tables 3 and 5).

No projectile points were encountered during the Phase II archaeological survey. However, the Phase I artifact assemblage included "a quartz Archaic Vosburgh [*sic*] point and several points associated with the Woodland I period: a quartz Koens-Crispin-like, a Broadspear with a broken stem, a Lamoka, two ferruginous quartzite Poplar Island-like, and one ferruginous quartzite Bare-Island-like, as well as other bifaces and tools, five cores, and debitage" (Grossman-Bailey, Hayden

and Springsted 2011:4-10). This data, derived from Area 8 north of the stream, indicates that "occupation at the site may date from the Archaic through the Woodland II (Middle Archaic through the Middle to Late Woodland) periods" (Grossman-Bailey, Hayden and Springsted 2011:4-10). While the mixed temporal context may reflect the overall site, it does not appear to characterize the area of Concentration 1. The Vosburg point, the Koens-Crispin-like point and the Broadspear fragment were located well north of Concentration 1, just south of Concentration 3. The points in Concentration 1 all have long periods of use, extending to roughly 1000 AD. The projectile points are thus comparable in date with the C-14 dates from the cultural features, all of which indicate an approximately 300 AD use of the area for this portion of the site.

A number of seeds were recovered from Features 2, 4, and 6 in Concentration 1 (Table 2). All of the features were basin shaped and roughly the same size. Feature 6 contained two basins, the south basin contained fire cracked rock. With the exception of the north basin of Feature 6, each of the basins produced sufficient carbon for C-14 dating. The majority of seeds of all species found were charred with the exception of the Carpetweed (*Mollugo verticillata*) found in Feature 4. However, uncharred specimens of pigweed (*Amaranthus sp*.) were also recovered suggesting that at least some of the material are modern intrusions. It is probable that the charred are contemporaneous with the features.

TABLE 2

SEEDS RECOVERED FROM FEATURES
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 1

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Feature 2	Feature 4	6 south basin	6 north basin	Notes
American False Pennyroyal (*Hedeoma pulegioides*)	American False Pennyroyal (*Hedeoma pulegioides*)	American False Pennyroyal (*Hedeoma pulegioides*)	American False Pennyroyal (*Hedeoma pulegioides*)	strongly aromatic herbaceous annual plant
	Pigweed (*Amaranthus sp*.)	Pigweed (*Amaranthus sp*.)	Pigweed (*Amaranthus sp*.)	amaranths edible as a leaf vegetable
	Nimblewill seed (*Muhlenbergia schreberi*)	Nimblewill seed (*Muhlenbergia schreberi*)	Nimblewill (*Muhlenbergia schreberi*)	Habitats include thin woodlands, rocky slopes, thickets, woodland edges,
		Clover (*Trifolium sp*.)		Meadows Habitats include thin woodlands
	Carpetweed (*Mollugo verticillata*)			Tropical plant edible

American False Pennyroyal (*Hedeoma pulegioides*) was found in all four basins. Pigweed (*Amaranthus sp.*) and Nimblewill (*Muhlenbergia schreberi*) were found in Feature 4 and both basins in Feature 6. Carpetweed (*Mollugo verticillata*) was only found in Feature 4 and clover (*Trifolium sp.*), represented by one seed, was only present in the south basin of Feature 6 (Table 2). All of the seed species are currently considered "weedy." Their habitats consist of thin woodlands, woodland edges, and meadows. If the charred seed remains are contemporaneous with the cultural features in which they were found, it suggests that the landscape surrounding Concentration 1 may have been adjacent to a small meadow. Whether the seeds represent material that was used by the site's occupants is uncertain. Amaranthus is an edible plant and appears on many prehistoric sites. False Pennyroyal is an aromatic herb.

The prehistoric artifacts suggest a variety of activities took place at this location within the site including tool manufacture and maintenance, processing of foods, and hunting. The number, variety, and density of artifacts within the prehistoric component suggest it may represent a portion of a small base camp that probably dates to the fourth century AD. Due to the relatively low artifact counts it is unlikely that additional archaeological fieldwork at the site will yield significant information to our understanding of local or regional prehistory in Delaware. It was proposed that the lithic artifacts recovered from the site may provide information on the production techniques and functions of stone tools, as well as potentially contribute to an understanding of settlement patterns. It was also proposed that the identification of lithic material types may provide insight into lithic raw material acquisition behaviors and use. No clear, concise conclusions concerning the research questions posed, could be drawn from the low density of artifacts in Concentration 1.

Concentration 1 also contained historic archaeological material. Grossman-Bailey, Hayden and Springsted (2011: 4-10) reports that "The historic artifacts recovered during the Phase I work date to the eighteenth to nineteenth century and consist of tin-glazed ware, black-glazed red earthenware, scratch blue white salt-glazed stoneware, white salt-glazed stoneware, English porcelain, Chinese Export porcelain, hard-bodied red earthenware, red earthenware, Whieldon teaware, olive wine bottle glass, and a white metal (silver) copper backed clothing button. Brick and glass were also recovered, indicating that a possible structure may have been located nearby." The greatest concentration of material encountered during the Phase I work was identified along the southwestern portion of the Phase I APE. Design changes reduced the project's impact, leaving this area out of the final APE for the project.

The Phase II archaeological work in Concentration 1 recovered 77 historic artifacts (Table 3). Approximately 44% of the historic archaeological assemblage was comprised of kitchen related material. Ceramics comprised ~71% of the kitchen group assemblage. Redware comprised ~65% of the ceramic assemblage. Whitewares were the next most prevalent ceramic (12.5%). Two sherds of Chinese export porcelain, two creamware sherds, a sherd of white salt glazed stoneware, and a sherd of tin-glazed earthenware were also encountered. The other kitchen group material was comprised of bottle glass. The bottle glass included colorless glass, amber glass, a green glass sherd with a crown cap finish, and a Coca bottle fragment. While the ceramics represent a time period that might extend from the late eighteenth through the third quarter of the nineteenth century, the bottle glass was all late nineteenth- or twentieth-century in date.

Non-brick architectural items comprised ~42% of the assemblage. Approximately two thirds of the material was window glass. The remaining items were nails. One nail was a cut nail, the others were all wire nails. Brick fragments from within Concentration 1 weighed 345.8 grams (a modern brick weighs ~ 2000 grams). The majority of this material was located along the southern most edge of the APE. Other historic artifacts included two kaolin pipe stem fragments, a metal shank button, an oyster shell, miscellaneous hardware, coal and coal ash.

TABLE 3

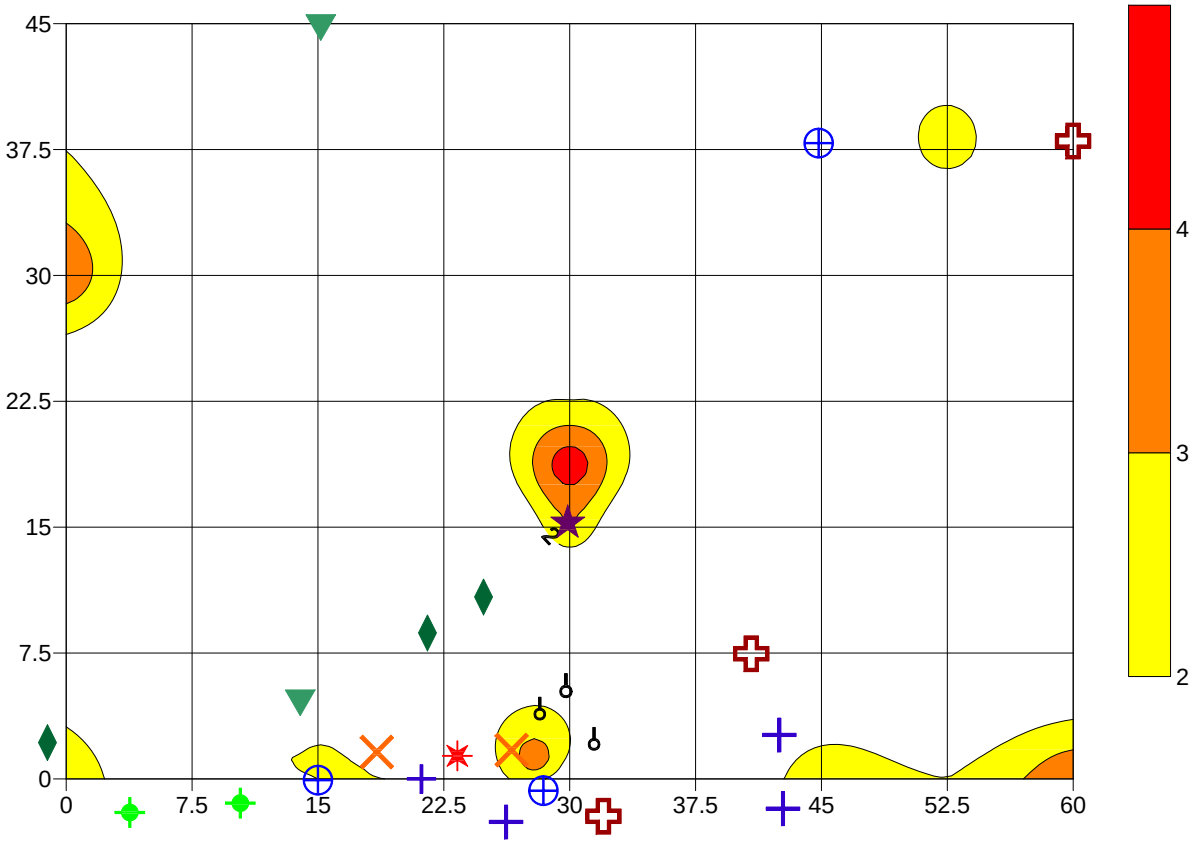
PERCENTAGE OF ARTIFACTS BY FUNCTIONAL TYPE
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 1

U.S. Route 301 Mainline Contract 3: Maryland/Delaware
State Line to North of Levels Road, St. Georges and
Appoquinimink Hundreds and Town of Middletown
New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Group	Percent of Assemblage		Ceramic Type	Percent
Kitchen	44.2		Redware	62.5
Ceramics		70.6	Stoneware	
Bottle glass		29.4	Yellowware	
Vessel glass			Creamware	8.3
Other			C.C. Ware	
Architecture	**42.8**		Pearlware	
Window		66.7	Whiteware	12.5
Nails		33.3	Ironstone	
Other❶			Porcelain	8.3
Furniture	**0.0**		Jackfield	
Personal	**0.0**		Dry-bodied redware	
Clothing	**1.3**		White Stoneware	4.2
Arms	**0.0**		White bodied ceramic	
Tobacco	**2.6**		Tin-glazed earthenware	4.2
Activities	**9.1**			
N	77❷		**N**	24

❶brick and mortar excluded
❷coal, cinder, wire, bone, and shell excluded

The distribution of the historic artifacts across the site was plotted using Surfer®. Overall, artifact density was low. No pattern was evident in the distribution of historic artifacts (Figure 29). The location of artifacts that may have been manufactured during the late eighteenth century were plotted over the isoplethic map. The number of artifacts is low, but shows a tendency to group toward the southern edge of the APE (Figure 29). A post hole feature was encountered in Test Unit 30, near the northeastern corner of the area tested. A C-14 date derived from carbon take from the feature was 340 +/- 30 BP. This date suggests a seventeenth-century presence on the property. However, no seventeenth-century or early to mid-eighteenth-century artifacts were recovered.



Eighteenth- to Nineteenth-Century Artifacts

- Kaolin Pipe Fragment
- Creamware
- Tin Glazed Earthenware
- Scratch Blue
- White Salt Glazed Stoneware
- Red Stoneware
- Designates Feature Locations
- Porcelains
- Olive Wine Bottle
- Late Creamware
- Redware

SCALE

0ft 37.27ft

0m 11.36m

Prepared by CHRS, Inc.

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 1 - HISTORIC ARTIFACT DISTRIBUTION

FIGURE 29

The presence of late eighteenth-/early nineteenth-century artifacts in Concentration 1 suggested that domestic structures from that period may be present in the area. However, the number of artifacts from this period is low. There are no cultural features within the APE that are suggestive of a dwelling. A number of research questions were proposed pertaining to the historic component of the site and what information may be gained from the artifacts. It was proposed that the historic artifacts may aid in an interpretation of the domestic economy at an individual site, as well as possibly provide an interpretation of the historic landscape. It was also discussed that work at the site may provide some information as to variations in landscape that could be attributed to cultural tradition, temporal period, economic status, or other factors. No historic features were encountered, the site is low density and the size of the artifacts is small (Photograph 23), making assignation of vessel forms uncertain. Additional archaeological work is unlikely to yield significant information pertaining to that period or information related to the eighteenth- or early nineteenth-century occupation of the property.

Photograph 23: Reynolds Historic/Prehistoric Site (7NC-F-118) Concentration 1:
Eighteenth-/early nineteenth-century artifacts – Note small size.
top row: creamware, blue painted Chinese export porcelain
bottom row: scratch blue white stoneware, slip decorated redware, tin glazed earthenware

Concentration 2: Concentration 2 was an area located along the southeastern portion of the site that had a light concentration of architectural debris (Figure 7; Google Earth 2010). The concentration of architectural debris in the southeastern portion of the site was primarily brick, with some window glass present. Artifacts found on the surface were widely scattered across a small rise near in proximity to the roadway. The landscape settling combined with the architectural debris, suggested that the concentration might be associated with the remains of an ephemeral structure. The architectural material found at the surface was spread over a roughly 100 meter area. All of the Phase I and Phase II archaeological material was encountered in the plow zone. No cultural features were found.

Eleven non-brick historic artifacts were recovered from Test Units 43 through 52 in Concentration 2. The artifacts included 3 redware sherds, 2 sherds of window glass, 3 creamware sherds, 1 olive green bottle glass sherd, 1 amber bottle glass sherd and one colorless bottle glass fragment, and a nail fragment that could not be identified as to type. Twenty pieces of brick were recovered from excavations. The brick fragments were small. The 20 brick fragments only weighed 76.5 grams (a whole modern brick weighs ~2000 grams). The historic artifacts recovered from the concentration area are likely late eighteenth-/early nineteenth-century (creamware, olive green bottle glass) to late nineteenth-century in date (amber and colorless bottle glass). The material appears to be a very light density artifact scatter. The artifacts are temporally mixed. No evidence of historic structures was found. There is insufficient data in Concentration 2 to draw any significant conclusions concerning the history of the property, or region.

Thirty prehistoric artifacts were also recovered from Test Units 43 through 52 (Table 4). No temporally diagnostic prehistoric artifacts were recovered. The artifacts were primarily lithic debitage, but two spalls and a cobble fragment were also recovered. Most of the material was jasper (~87%). One flake of chalcedony and three flakes made from chert were also found.

TABLE 4

PREHISTORIC ARTIFACT ASSEMBLAGE
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 2

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	6	20%	Broken flake	3	10.0%
Flake fragment	9	30%	Debris	9	10.0%
Other	2	10%			
Material	**Number**	**Percent**	**Material**	**Number**	**Percent**
Jasper	26	86.7%	Chert	3	10%
Chalcedony	1	3.3%			
DEBITAGE ONLY					
Cortex	**Number**	**Percent**	**Flake Type**	**Number**	**Percent**
Cortical	10	37.0%	Decortication	5	27.8%
Partial	8	29.7%	Primary	4	22.2%
Non-cortical	9	33.3%	Thinning	2	11.1%
			Shaping	7	38.9%

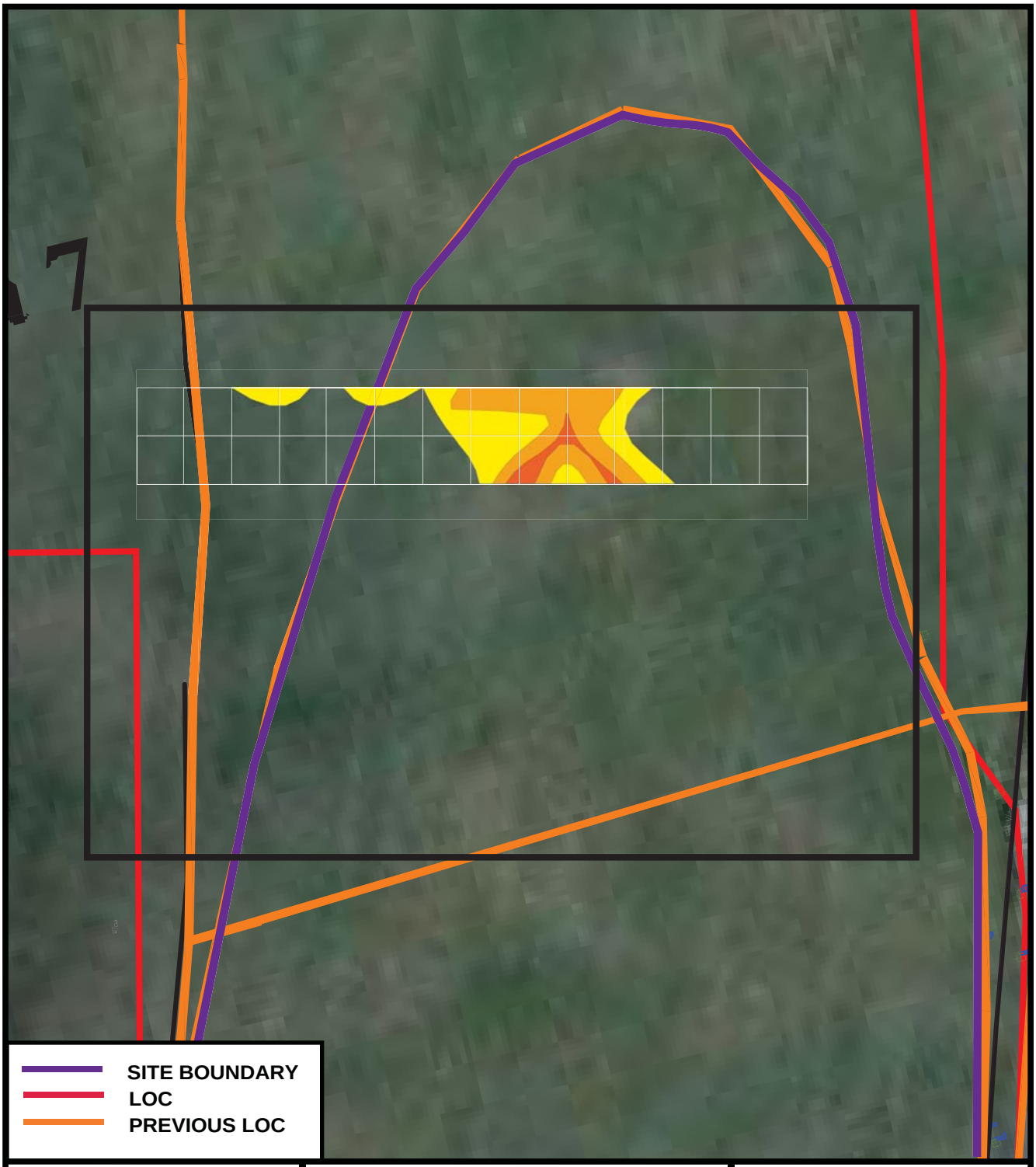
Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	11.71	5.84	5.81	27.54
Width (in mm)	10.89	6.36	4.71	36.71
Thickness (in mm)	4.37	3.96	0.82	19.38

All of the debitage was small (mean lengths and widths ~11-12mm with a standard deviation of ~6mm). There was no concentration of artifacts. Artifact density was light, averaging 3 flakes for 1-meter square. No features were encountered. No temporally diagnostic artifacts were recovered. There is insufficient data to draw any significant conclusions concerning local or regional prehistory.

Concentration 3: Concentration 3 was located in the northern portion of the site. The Phase I archaeological survey indicated a diffuse scatter of historic artifacts that dated from the late eighteenth to early nineteenth century (Figure 30; Google Earth 2010; Figure, 31). The Phase I archaeological work identified as light scatter of material in the vicinity of Concentration 3 "including olive bottle glass, white salt-glazed stoneware, Chinese Export porcelain, red earthenware (Philadelphia style black glazed pot and slip trailed ware), and pearlware, interpreted as a result of eighteenth-century activities… Nineteenth-century artifacts were also located in this area" (Grossman-Bailey, Hayden and Springsted 2011:3-75). Phase II archaeological testing found artifactual material only in the plow zone soils. The only cultural features identified through the excavation and mechanical stripping were plow scars.

A total 114 historic artifacts were recovered from Concentration 3 during the Phase II archaeological survey (Table 5). The majority of historic artifacts were kitchen related items (85.7%), almost 93% of which were ceramic items (Photograph 24). Pearlware sherds comprised ~41% of the ceramic assemblage, redware ~39%. Ceramics probably associated with food serving and consumption (pearlware, whiteware, semi-porcelain, porcelain, white stoneware, and refined redware) comprised ~58% of the assemblage, while ceramics probably associated with food preparation and storage (redware, yellowware, cc-ware) comprise ~42% of the assemblage.

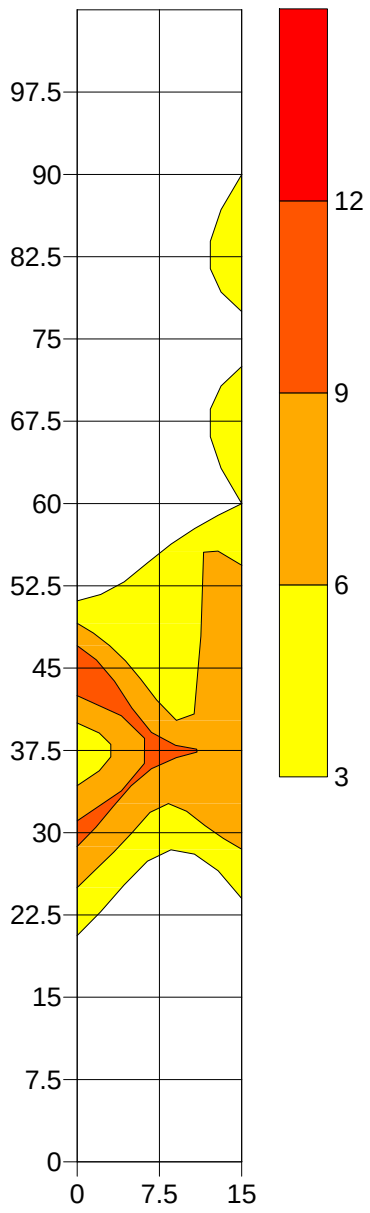
Photograph 24: Reynolds Historic/ Prehistoric Site (7NC-F-118)
Concentration 3: nineteenth-century artifacts
top row: yellowware, annular yellowware,
manganese glazed redware
middle row: pearlware; polychrome painted pearlware, blue painted pearlware, blue shell edged pearlware
bottom row: red transferprinted whiteware, blue transferprinted whiteware



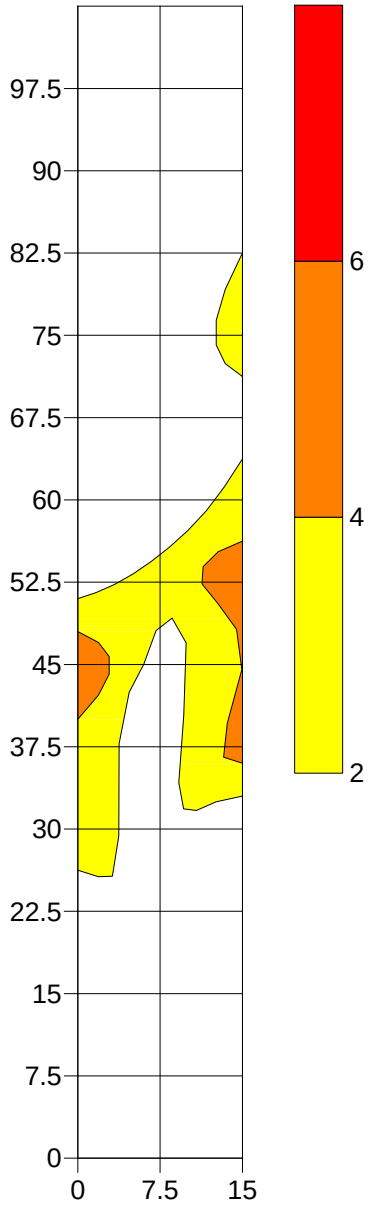
	SCALE	SOURCE
N	0ft 103ft 0m 31.39m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 3 - HISTORIC SURFER GRID LOCATION

FIGURE 30

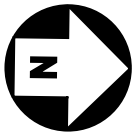


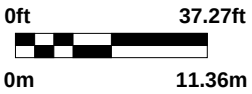
HISTORIC ARTIFACTS



BRICKS AND MORTAR

SCALE





Prepared by CHRS, Inc.

REYNOLDS HISTORIC/PREHISTORIC SITE (7NC-F-118)
CONCENTRATION 3 - HISTORIC ARTIFACT DISTRIBUTION

FIGURE 31

TABLE 5

PERCENTAGE OF ARTIFACTS BY FUNCTIONAL TYPE
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 3

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Group	Percent of Assemblage		Ceramic Type	Percent
Kitchen	**85.1**		Redware	38.9
Ceramics		92.8	Stoneware	
Bottle glass		7.2	Yellowware	2.2
Vessel glass			Creamware	
Other			C.C. Ware	1.1
Architecture	**10.5**		Pearlware	41.1
Window		41.7	Whiteware	11.1
Nails		58.3	Ironstone	
Other❶			Porcelain	1.1
Furniture	**0.9**		Jackfield	
Personal	**0.0**		Dry-bodied redware	
Clothing	**0.0**		White Stoneware	1.1
Arms	**0.0**		Semi-Porcelain	2.2
Tobacco	**0.9**		Refined redware	1.1
Activities	**2.3**			
N	114❷		**N**	90

❶brick and mortar excluded
❷coal, cinder, wire, bone, and shell excluded

The majority of the ceramics (pearlware, redware, whiteware, cc-ware) were consistent with a date in the second quarter of the nineteenth century. A sherd of Chinese export porcelain, a white salt glazed stoneware sherd, and a refined redware sherds were probably manufactured during the late eighteenth or early nineteenth century, but are not unusual in second quarter of the nineteenth-century sites.

Other historic artifacts included bottle glass sherds, a small number of window glass fragments, a small number of cut nails, and a kaolin pipe bowl fragment. A small amount of modern material was present at the site as well as brick (193.4 grams) and a small amount of coal and coal ash.

The historic artifacts in Concentration 3 represent a sheet midden. Grossman-Bailey, Hayden and Springsted (2011:3-86) suggested that the "deposit may be related to the eighteenth and nineteenth-century Reynolds family ownership – either the mid-eighteenth to early nineteenth-century Jeremiah Reynolds or the early to mid-nineteenth-century George Reynolds occupations." Although there are a few artifacts that may have been manufactured during the late eighteenth/early

nineteenth century, the concentration dates to the second quarter of the nineteenth century and is most likely associated with the George Reynolds occupation of the property. No significant cultural features were encountered. The density of the material is light. There is no indication that it is associated with any building that may have present in the APE. The material, although temporally consistent, is not functionally variable. Too few artifacts are present to provide significant insights into local or regional history.

Twenty prehistoric artifacts were recovered from Concentration 3 (Table 6). The assemblage was similar to that found in Concentration 2. No temporally diagnostic prehistoric artifacts were recovered. The artifacts were lithic debitage. Most of the material was jasper. Two flakes of quartzite and two of chert were also found. All of the debitage was small (mean lengths and widths ~12-13mm). There was no concentration of artifacts. Artifact density was light with an average of slightly more than one prehistoric artifact per for every two 1-meter squares excavated.

TABLE 6

PREHISTORIC ARTIFACT ASSEMBLAGE
Reynolds Historic/Prehistoric Site (7NC-F-118)
Concentration 3

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown
New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	7	35.0%	Broken flake	2	10.0%
Flake fragment	5	25.0%	Debris	5	25.0%
Other	1	5.0%			
Material	Number	Percent	Material	Number	Percent
Jasper	16	80.0%	Chert	2	10%
Quartzite	2	10.0%			
DEBITAGE ONLY					
Cortex	Number	Percent	Flake Type	Number	Percent
Cortical	6	31.6%	Decortication	4	28.6%
Partial	5	26.3%	Primary	1	7.1%
Non-cortical	8	42.1%	Thinning	4	28.6%
			Shaping	5	35.7%

Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	12.20	5.35	4.41	24.00
Width (in mm)	12.88	5.89	7.08	26.20
Thickness (in mm)	4.50	3.81	1.05	15.41

Conclusions - Reynolds Historic/Prehistoric Site (7NC-F-118): Phase II archaeology at the Reynolds Historic/Prehistoric Site (7NC-F-118) included examination of both prehistoric and historic archaeological remains. Only Concentration 1 exhibited a sufficient number of artifacts to be a focus for detailed evaluation of prehistoric remains. The prehistoric component of the site was identified during the Phase I archaeological work as multicomponent. While the mixed temporal context may reflect the overall site based upon temporally diagnostic artifacts recovered from the surface, it does not appear to characterize the area of Concentration 1. The prehistoric artifacts recovered from Concentration 1 are comparable in date with C-14 dates from the cultural features encountered. The data indicates an approximately 300 AD use of the area for the Concentration 1 portion of the site.

Analysis of the prehistoric artifacts suggest a variety of activities took place at this location within the site including tool manufacture and maintenance, processing of foods, and hunting. The number, variety, and density of artifacts within the prehistoric component suggest it may represent a portion of a small base camp that probably dates to the fourth century AD. Due to the relatively low artifact counts it is unlikely that additional archaeological fieldwork at the site will yield significant information to our understanding of local or regional prehistory in Delaware. It was proposed that the lithic artifacts recovered from the site may provide information on the production techniques and functions of stone tools, as well as potentially contribute to an understanding of settlement patterns. It was also proposed that the identification of lithic material types may provide insight into lithic raw material acquisition behaviors and use. No clear, concise conclusions concerning the research questions posed, could be drawn from the low density of artifacts in Concentration 1. The site will not provide any additional information important to our understanding of local or regional prehistory.

Three areas containing historic artifacts were examined with the Reynolds Historic/Prehistoric Site (7NC-F-118). The late eighteenth- to early nineteenth-century artifacts from Concentration 1, as well as the architectural artifacts from Concentration 2 and the nineteenth-century artifacts from Concentration 3 are all likely related to the Reynolds family ownership of the property. Although there is some evidence of a slight concentration of late eighteenth- or early nineteenth-century deposits along the southern edge of Concentration 1, if an eighteenth-century occupation is present, it likely lies outside of the APE. The historic artifacts in Concentration 1 and 2 are temporally mixed. Concentration 3 artifacts generally date to the second quarter of the nineteenth century with a scattering of late twentieth and twenty-first century items. All of the recovered artifacts are relatively small in size which would limit any analysis based on vessel forms. The light artifact scatter, small artifact size, and lack of historic features or structural remains suggest that there were no buildings within these portions of the APE. The historic archaeological material will not provide information important to our understanding of local or regional history.

Area 8 Prehistoric Site (7NC-F-119)

Site 7NC-F-119, Area 8 Prehistoric site, consists of a concentration of prehistoric artifacts in an agricultural field on the south side of a headwater tributary to the Great Bohemia Creek. The site measures approximately 300 meters by 160 meters (4.8 hectares) with the densest part of the site within approximately 70 meters of the tributary. The site likely extends beyond the boundaries of the APE. The densest artifact concentration at the prehistoric site is located between 70 and 100

meters from the tributary on a flat area above the tributary. The site extends away from the tributary with more diffuse artifact distributions further south and east. The Phase I work identified a concentration of 160 prehistoric artifacts from the surface collection, STPs, and test unit. including tools, debitage, and five cores. The majority of artifacts from both the Phase I and Phase II archaeological surveys were recovered from the plow zone. No prehistoric features were encountered during the archaeological excavations.

A total of 211 prehistoric artifacts were recovered during Phase II excavations (Table 7). Artifacts consist mainly of debitage. Complete flakes comprised 42.2% of the total assemblage. Flake fragments were 25.5%, broken flakes 15.2%, and debris 11.8% of the total assemblage. A single jasper projectile point (Photograph 25) was encountered. The point is an untyped small stemmed point. The Phase I archaeology survey recovered "a chert Archaic Stanly point, a quartz Woodland I Bare Island point, and a quartz Woodland II pentagonal or irregular triangle and small quartz triangle points" (Grossman-Bailey, Hayden and Springsted 2011:4-14). Based on the presence of these diagnostic artifacts recovered during the Phase I Archaeological Survey, Grossman-Bailey, Hayden and Springsted (2011:4-14) sees the prehistoric occupation dating from the Archaic through the Woodland II periods. While this characterizes Area 8 as a whole, it may not reflect the area examined by the Phase II work. The Stanly point for example is located 150 meters east of the area examined. The small quartz triangle point fragments are present south of the area that was the focus of the Phase II work. Stewart has found similar triangular points within Late Archaic contexts (Stewart 1998). Within the area of concentration, all of the points appear to be consistent with Woodland I occupations.

Photograph 25: Area 8 Prehistoric Site (7NC-F-119): Jasper point from TU 1

Other prehistoric artifacts included a quartz mid-stage biface, a limonite medial biface, a hammerstone, two cores, and 5 pieces of FCR. About 42% of the lithic assemblage from the Phase II work was comprised of jasper. Quartz comprised 24.9% and chert 20.0% of the Phase II assemblage. Other lithics present include quartzite (7.8%), rhyolite (0.5%) and limonite (4.4%).

The mean length of the debitage was 14.69mm. The mean width of the debitage is 14.25mm and mean thickness was 4.73mm. The majority of material was less than 20mm, suggesting late state biface production or tool maintenance activities. The maximum size of the debitage is somewhat large (~47mm in length), suggesting that a considerable amount of primary lithic reduction was also being undertaken. This is also reflected in the number of cortical flakes encountered. Approximately 38% of the lithic debitage exhibited cortex. The amount of cortex may be indicative of the use of cobble sources for the lithic material utilized.

TABLE 7

PREHISTORIC ARTIFACT ASSEMBLAGE
Area 8 Prehistoric Site (7NC-F-119)

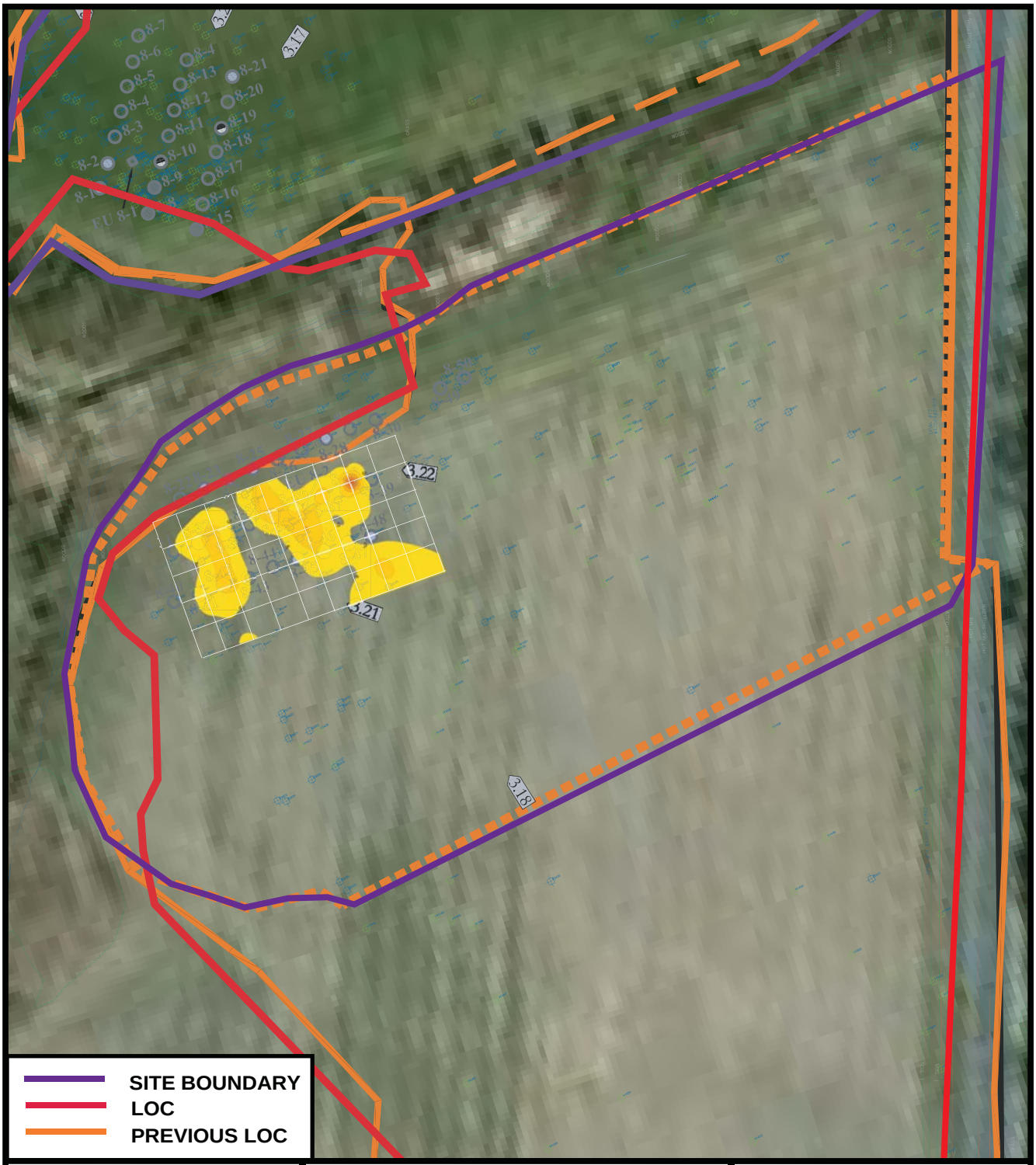
U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	89	42.2%	Point	1	0.5%
Flake fragment	54	25.5%	Middle stage biface	1	0.5%
Broken flake	32	15.2%	Medial biface fragment	1	0.5%
Debris	25	11.8%	Distal biface fragment	2	0.0%
Core	2	0.9%	FCR	5	2.4%
Hammerstone	1	0.5%			
Material	**Number**	**Percent**	**Material**	**Number**	**Percent**
Jasper	87	42.4%	Quartzite	16	7.8%
Quartz	51	24.9%	Rhyolite	1	0.5%
Chert	41	20.0%	Limonite	9	4.4%
DEBITAGE ONLY					
Cortex	Number	Percent	Flake Type	Number	Percent
Cortical	48	24.0%	Decortication	27	15.4%
Partial	29	14.5%	Primary	19	10.9%
Non-cortical	123	61.5%	Thinning	69	39.4%
			Shaping	60	34.3%

Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	14.69	7.26	4.22	47.32
Width (in mm)	14.25	6.88	4.74	38.46
Thickness (in mm)	4.73	3.39	0.92	19.81

The prehistoric artifacts recovered from the Phase II excavation were plotted with the Phase I shovel test pit data to create an artifact distribution map of the Area 8 Prehistoric Site (7NC-F-119) (Figure 32; Google Earth 2010; Figure 33). Artifact density was low overall. A relatively dense area was encountered at Test Unit 1 on the northern edge of the APE. Slightly less dense areas are evident just south and east of the relatively high density of material found in Test Unit 1. No other clear site patterns were evident in the distribution of the artifacts.

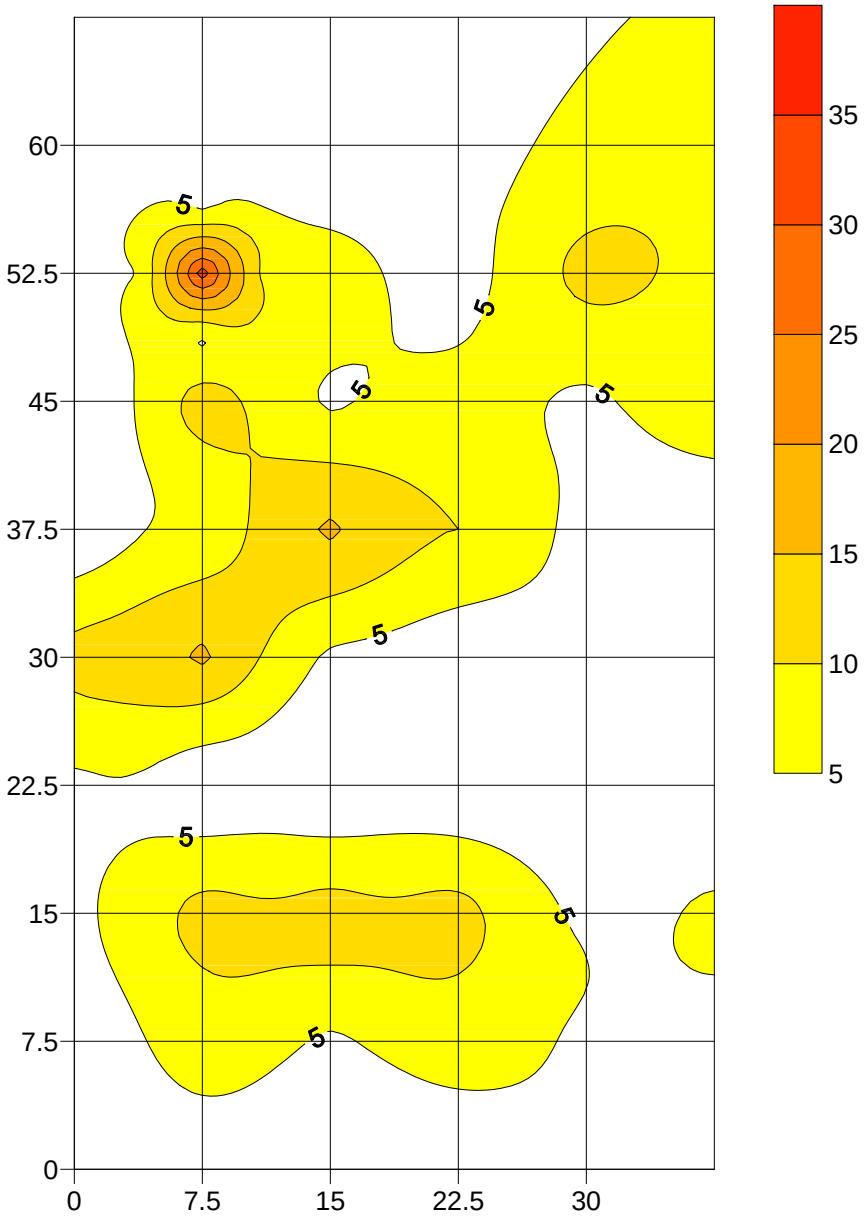
There are a number of differences between the surface collected material and that collected during the Phase II work. For example: approximately 95% of the Phase II assemblage was lithic debitage. Only about 74% of the Phase I surface collected material was debitage. Another difference between the Phase I and Phase II assemblages can be seen in the lithic material present. Both lithic assemblages contain a wide range of lithic material types, suggesting either repeated occupation by numerous groups through time or a base camp. For the prehistoric surface collected



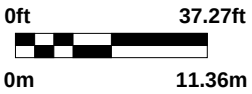
	SCALE	SOURCE
N	0ft 134.5ft 0m 41m Prepared by CHRS, Inc.	GOOGLE EARTH 2010 RGA 2010

AREA 8 PREHISTORIC SITE (SITE 7NC-F-119)
PREHISTORIC SURFER GRID LOCATION

FIGURE 32



SCALE



Prepared by CHRS, Inc.

AREA 8 PREHISTORIC SITE (7NC-F-119)
PREHISTORIC ARTIFACT DISTRIBUTION

FIGURE 33

material in the portion of Area 8 south of the tributary, ~61% of the lithic assemblage was quartz. Chert was the next most recovered material at ~18%, followed by jasper (~7.9%), ferruginous quartzite (limonite) (~7%), and quartzite (~4%). several flakes of argillite were also encountered. In contrast, jasper was the dominant lithic material found during the Phase II work, representing more than 42 percent of the assemblage. Quartz and chert were found in nearly equal quantities (~20%). Quartzite was ~7.8% of the assemblage and limonite was ~4%. Both the Phase I and the Phase II assemblages contained small quantities of other rhyolite and argillite indicating that these materials were available to the Native American inhabitants of the area, but in relatively small amounts. It is uncertain why the percentage of quartz is so high in the surface collection and jasper artifacts are the dominant material type in the Phase II work excavation work.

The artifacts from Area 8 Prehistoric Site (7NC-F-119) lie just across a small stream from Concentration 1 of the Reynolds Historic/Prehistoric Site (7NC-F-118). The initial assessment of the prehistoric components of these two areas was that they were part of the same archaeological site within Area 8 (Grossman-Bailey, Hayden and Springsted 2010). The analysis of the data from Concentration 1 of 7NC-F-118 suggests that Concentration 1 represented a Woodland I occupation, that might be tightly focused in the fourth century AD. The portion of the Area 8 Prehistoric Site (7NC-F-119) site examined during the Phase II appears to represent Woodland I occupation(s). A comparison of the two Phase II assemblages shows many similarities (Table 8). The data suggest that similar activities were being undertaken at both sites.

The artifact types present are similar in both assemblages. The percentage of debitage in the Area 8 Prehistoric Site (7NC-F-119) is ~95% of the assemblage. At the Reynolds Historic/Prehistoric Site (7NC-F-118) debitage is ~77% of the assemblage; however, the percentage of artifact type is somewhat skewed by the quantity of fire cracked rock found in Feature 6 at the Reynolds Historic/Prehistoric Site (7NC-F-118). If the FCR is removed, the percentage of debitage in the assemblages is ~90%. The type of debitage is also somewhat similar. Sullivan and Rosen (1985) have suggested that complete flakes and debris are more likely to be produced during early stage lithic reduction, while broken flakes and flake fragments are more likely to be produced during late stage biface production or tool maintenance activities. There is a slightly greater percentage of complete flakes and debris in the Reynolds Historic/Prehistoric Site (7NC-F-118) debitage assemblage (62.1%) than in the Area 8 Prehistoric Site (7NC-F-119) (57.0%), that might suggest that a slightly higher percentage or early stage lithic reduction, but the data is not significantly different. A similar difference is evident when looking at the more traditional assessment of debitage categories. Decortication and primary reduction flakes are slightly more common at the Reynolds Historic/Prehistoric Site (7NC-F-118) and flake size is slightly larger.

Both sites are jasper predominant and both sites contain a mix of lithic material. The Reynolds Historic/Prehistoric Site (7NC-F-118) has a substantially larger percentage of material made from limonite (15.7% vs. 4.4%) and a corresponding smaller percentage of quartz and jasper objects. The similarity in the artifacts found at both sites, in conjunction with the distribution of temporally diagnostic artifacts at the Area 8 Prehistoric Site (7NC-F-119) would seem to add additional credence to the suggestion that the portion of the Area 8 Prehistoric Site (7NC-F-119) investigated represented Woodland I occupations.

TABLE 8

PREHISTORIC ARTIFACT ASSEMBLAGE
SITE 7NC-F-119 AND SITE 7NC-F-118 (CONCENTRATION 1)

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	7NC-F-118	7NC-F-119	Artifact	7NC-F-118	7NC-F-119
Complete flake	40.9%	42.2%	Point	0.0%	0.5%
Flake fragment	20.1%	25.5%	Middle stage biface	0.4%	0.5%
Broken flake	7.8%	15.2%	Medial biface	0.4%	0.5%
Debris	4.9%	11.8%	Distal biface	0.7%	0.0%
Core	0.7%	0.9%	FCR	17.9%	2.4%
Hammerstone	0.7%	0.5%	Other	3.4%	0.0%
Material	7NC-F-118	7NC-F-119	Material	7NC-F-118	7NC-F-119
Jasper	44.2%	42.4%	Quartzite	7.9%	7.8%
Quartz	16.1%	24.9%	Rhyolite	2.3%	0.5%
Chert	12.9%	20.0%	Limonite	15.7%	4.4%
DEBITAGE ONLY					
Artifact	7NC-F-118	7NC-F-119	Artifact	7NC-F-118	7NC-F-119
Complete flake	55.5%	44.5%	Broken flake	10.6%	16.0%
Flake fragment	23.7%	27.3%	Debris	6.6%	12.5%
Cortex	7NC-F-118	7NC-F-119	Flake Type	7NC-F-118	7NC-F-119
Cortical	16.7%	24.0%	Decortication	15.7%	15.4%
Partial	14.1%	14.5%	Primary	12.4%	10.9%
Non-cortical	69.2%	61.5%	Thinning	33.5%	39.4%
			Shaping	38.4%	34.3%

Variable	F-18 -Mean- F-19	F-18-Std. Dev. - F-19	F-18 -Min- F-19	F-18 -Max- F-19
Length (in mm)	15.43 14.69	11.34 7.26	4.85 4.22	58.67 47.32
Width (in mm)	15.87 14.25	8.46 6.88	4.90 4.74	49.24 38.46
Thickness (in mm)	4.96 4.73	3.15 3.39	0.92 0.92	20.14 19.81

Conclusions Area 8 Prehistoric Site (7NC-F-119): The function of the Area 8 Prehistoric Site (7NC-F-119) is uncertain. The site as defined during the Phase I work consisted of concentration of 160 prehistoric artifacts across the 27 acre parcel. Phase I and II excavations within the site concentration yielded an additional 354 prehistoric artifacts (143 Phase I; 211 Phase II). The Phase II work resulted in an artifact assemblage that contains a variety of resources fashioned from an assortment of lithic types. The diagnostic artifacts recovered from the portion of the site examined during the Phase II work suggests that the site represents a Woodland I occupation(s). The artifact assemblages suggests that the site may have been primarily used for short term habitation and for tool manufacture and maintenance activities, as suggested by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010). The low percentage of FCR and lack of features

might indicate that the site was not used for long-term habitation as cooking or heat-treatment appears to not have been a priority; however, evidence from Concentration 1 at the Reynolds Historic/Prehistoric Site (7NC-F-118), located just north of the stream that forms the boundary of the site, suggests that the lack of FCR and features may be the result of sampling error. Similarities between the artifact assemblage and temporal period of the Area 8 Prehistoric Site (7NC-F-119) and the Reynolds Historic/Prehistoric Site (7NC-F-118) hold open the possibility that the portion of the Area 8 Prehistoric Site (7NC-F-119) examined by the Phase II work represents a small base camp dating to the Woodland I period.

Due to the relatively low artifact counts it is unlikely that additional archaeological fieldwork at the site will yield significant information to our understanding of local or regional prehistory in Delaware. It was proposed that the lithic artifacts recovered from the site may provide information on the production techniques and functions of stone tools, as well as potentially contribute to an understanding of settlement patterns. It was also proposed that the identification of lithic material types may provide insight into lithic raw material acquisition behaviors and use. No clear, concise conclusions concerning the research questions posed, could be drawn from the data collected from the site. The Area 8 Prehistoric Site (7NC-F-119) will not provide any additional information important to our understanding of local or regional prehistory.

Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located approximately 0.89 miles southwest from the intersection of Boyds Corner Road and Cedar Lane Road within an agricultural field (Figure 2; USGS 1993b, 1993c). The site borders Spring Mill Branch to the south and Taylor's Branch to the east and consists of a prehistoric component and late seventeenth- to mid-nineteenth-century historic component. Design modifications were completed to protect the historic archaeological component of the site, which is now is outside of the Area of Potential Effect (APE). Field investigations at the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) included only the prehistoric component, which is located near the confluence of the two streams. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) extends over approximately 2.7 hectares (6.7 acres) and consists of two concentrations of prehistoric artifact clusters

Phase I field investigations were completed by Hunter Research, Inc. (Liebenknecht and Burrow 2010). The area in which the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) was found had been determined to contain moderate to high potential for prehistoric resources. A total of 1,172 prehistoric artifacts were recovered from the surface collection within the entire Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The artifact assemblage included tools, debitage, cores, and fire cracked rock (FCR). Additional fieldwork included 33 shovel test pits excavated across areas of artifact concentration within the APE. A total of 25 prehistoric artifacts were recovered from the 33 shovel test pits and consisted mainly of chert, jasper, limonite, quartz, and quartzite debitage, and fragments of FCR. Additionally, four test units were excavated during the Phase I work. A total of 336 additional prehistoric artifacts consisting of a biface scraper, cores, debitage, hammerstones, a jasper drill, triangular projectile point, and one ceramic sherd were recovered from the test unit excavations. Features, consisting of one D-shaped pit and one fire hearth, were encountered in Hunter's Test Unit 2 and 4. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) measures approximately 2.7 hectares (6.7 acres) with the densest portion of the

prehistoric artifacts being located near the tributary (Liebenknecht and Burrow 2010). Subsequent to the Phase I archaeology, the Limit of Construction (LOC) was more closely defined. The features identified during the Phase I archaeology and the areas of dense artifact concentrations are now outside of the APE were not examined during the Phase II Archaeological Survey. No prehistoric features were encountered during Phase II excavations.

The soils in the portion of the site investigated during the Phase II work had well developed soils forming in a silty veneer over coarse sandy and gravelly deposits, with variations in the thicknesses and depths of several of the soil horizons. A discontinuity between an upper aeolian silt mantle and a lower fluvio-marine sediments was clearly observable. Small amounts of fine gravel from below have been introduced into the silty aeolian mantle from long-term bioturbation from roots and small animals. A well developed argillic horizon was present in the subsoil of all of the profiles, indicating that long-term *in situ* weathering of the soils over this stable landform has occurred, at least throughout the entire Holocene Epoch. Based on the presence of diagnostic artifacts (points), prehistoric occupation was thought to date from the Archaic through the Woodland II periods.

No dense concentration of artifacts was present within the APE for the Phase II Archaeological survey. Light density concentrations of prehistoric archaeological material were present along the southern and eastern edges of the APE based on the Phase I surface collection. The light density concentration along the eastern edge of the site was designated as Concentration 1. The concentration of material along the southern edge of the APE was designated as Concentration 2.

Photograph 26: Churchtown #4 Prehistoric/Historic Site (7NC-F-155) Concentration 1: Limonite point

Concentration 1: Concentration 1 was located ~150 meters north of Spring Mill Branch and ~ 60 meters west of Taylor's Branch. The artifactual material was recovered from the plow zone. No cultural features were encountered. A total of 39 prehistoric artifacts were recovered during Phase II excavations from Concentration 1. Artifacts consist mainly of debitage. Eighty-two percent of the assemblage from Concentration 1 was debitage, including complete flakes (48.7%), flake fragments (20.5%), broken flakes (5.1%), and debris (7.7%). A single limonite projectile point, a jasper core, two pieces of pottery, and three pieces of FCR make up the remaining assemblage. The point is made of limonite. The point is unfinished but likely dates to the Woodland I period (Photograph 26). The pottery sherds were too small to identify as to type.

The lithic assemblage was made up of artifacts made primarily of jasper (47.1%) and chert (35.3%). Three quartz objects, two quartzite flakes, and one limonite point were recovered. Slightly less than half of the debitage contained some cortex. The mean size of the debitage was small (~12 to ~13mm) but the standard deviation is large, indicating that flakes reflected considerable variability in size.

TABLE 9

PREHISTORIC ARTIFACT ASSEMBLAGE
Churchtown #4 Prehistoric/Historic Site (7NC-F-155)
Concentration 1

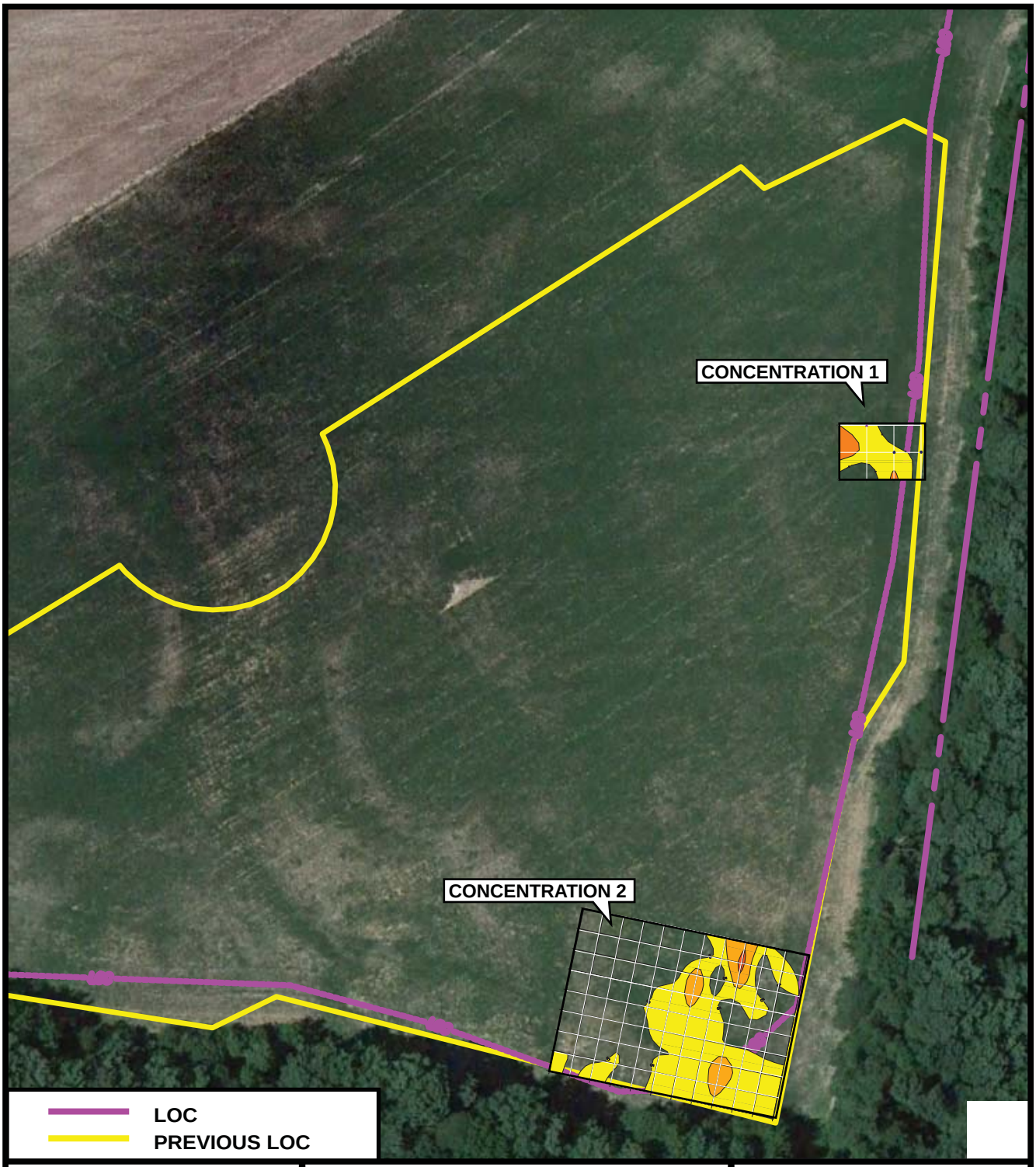
U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	19	48.7%	Point	1	2.6%
Flake fragment	8	20.5%	Core	1	2.6%
Broken flake	2	5.1%	FCR	3	7.7%
Debris	3	7.7%	Aboriginal sherd	2	5.1%
Material	Number	Percent	Material	Number	Percent
Jasper	16	47.1%	Quartzite	2	5.9%
Chert	12	35.3%	Limonite	1	2.9%
Quartz	3	8.8%			
DEBITAGE ONLY					
Cortex	Number	Percent	Flake Type	Number	Percent
Cortical	5	15.6%	Decortication	4	13.8%
Partial	9	28.1%	Primary	6	20.7%
Non-cortical	18	56.2%	Thinning	7	24.1%
			Shaping	12	41.4%

Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	13.14	12.39	5.62	74.28
Width (in mm)	11.78	11.83	6.02	40.19
Thickness (in mm)	3.06	3.28	0.53	24.10

The prehistoric artifacts recovered from the Phase II excavations within Concentration 1 were plotted to create isoplethic artifact distribution maps (Figure 34; Google Earth 2010; Figure 35). The small number of artifacts did not cluster. No clear site patterns were evident within Concentration 1

Conclusions – Concentration 1: Thirty-nine prehistoric artifacts were recovered from Concentration 1 (Table 9). The artifactual material was recovered from the plow zone. No cultural features were encountered. One temporally diagnostic prehistoric artifact was recovered. The limonite point appears to date to the Woodland I period. The majority of artifacts were lithic debitage. Most of the material was jasper. All of the debitage was small (mean lengths and widths ~12-13mm). There was no concentration of artifacts. Artifact density was light with an average of slightly more than three prehistoric artifact per 1-meter squares excavated.



SCALE

N

0ft 111ft

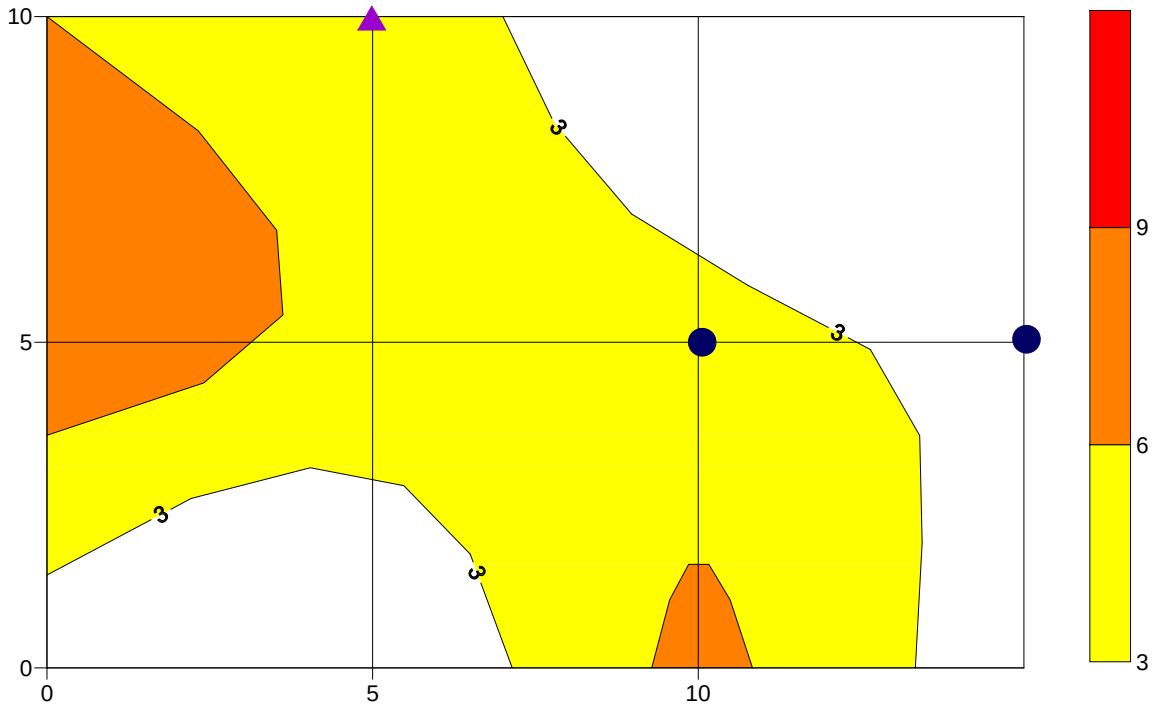
0m 33.83m

GOOGLE EARTH 2010

Prepared by CHRS, Inc.

CHURCHTOWN #4 PREHISTORIC/HISTORIC SITE (7NC-F-155)
SURFER GRID LOCATIONS

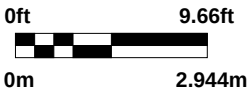
FIGURE 34



Point

Pottery

SCALE



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CHURCHTOWN #4 PREHISTORIC/HISTORIC (7NC-F-155)
CONCENTRATION 1 - PREHISTORIC ARTIFACT DISTRIBUTION

FIGURE 35

Concentration 2: Concentration 2 was located ~50 meters north of Spring Mill Branch and ~ 75 meters west of Taylor's Branch. The artifactual material was recovered from the plow zone. No cultural features were encountered during the Phase II archaeological survey. A total of 322 prehistoric artifacts were recovered from within Concentration 2 during Phase II excavations. Eight-four percent of the assemblage was lithic debitage (Table 10). An end scraper, middle stage biface, medial biface fragment, lateral biface fragment, two hammerstones, two late stage bifaces, two ground stones, one biface fragment, and 25 pieces of FCR make up the remaining assemblage.

TABLE 10

PREHISTORIC ARTIFACT ASSEMBLAGE
Churchtown #4 Prehistoric/Historic Site (7NC-F-155)
Concentration 2

U.S. Route 301 Mainline Contract 3: Maryland/Delaware State Line to North of Levels Road, St. Georges and Appoquinimink Hundreds and Town of Middletown New Castle County, Delaware and Electoral District 1, Cecil County, Maryland

Artifact	Number	Percent	Artifact	Number	Percent
Complete flake	151	46.9%	Point	1	0.0%
Flake fragment	72	22.4%	Early stage biface	0	0.0%
Broken flake	31	9.6%	Middle stage biface	1	0.3%
Debris	16	5.0%	Late stage biface	2	0.6%
Core	2	0.6%	Medial biface fragment	1	0.3%
Hammerstone	2	0.6%	Lateral biface fragment	1	0.3%
FCR	25	7.8%	Biface fragment	1	0.3%
Ground stone	2	0.6%	Other	14	4.4%
Material	Number	Percent	Material	Number	Percent
Jasper	143	49.0%	Quartzite	19	6.5%
Chalcedony	6	2.1%	Rhyolite	2	0.7%
Quartz	43	14.7%	Chert	76	26.0%
Argillite	0	0.0%	Limonite	3	1.0%
DEBITAGE ONLY					
Cortex	Number	Percent	Flake Type	Number	Percent
Cortical	57	21.1%	Decortication	53	20.9%
Partial	25	9.3%	Primary	18	7.1%
Non-cortical	188	69.6%	Thinning	78	30.7%
			Shaping	105	41.3%

Variable	Mean	Std. Dev.	Minimum	Maximum
Length (in mm)	13.64	7.72	6.32	60.06
Width (in mm)	12.74	6.55	5.49	43.16
Thickness (in mm)	4.13	3.39	0.66	24.10

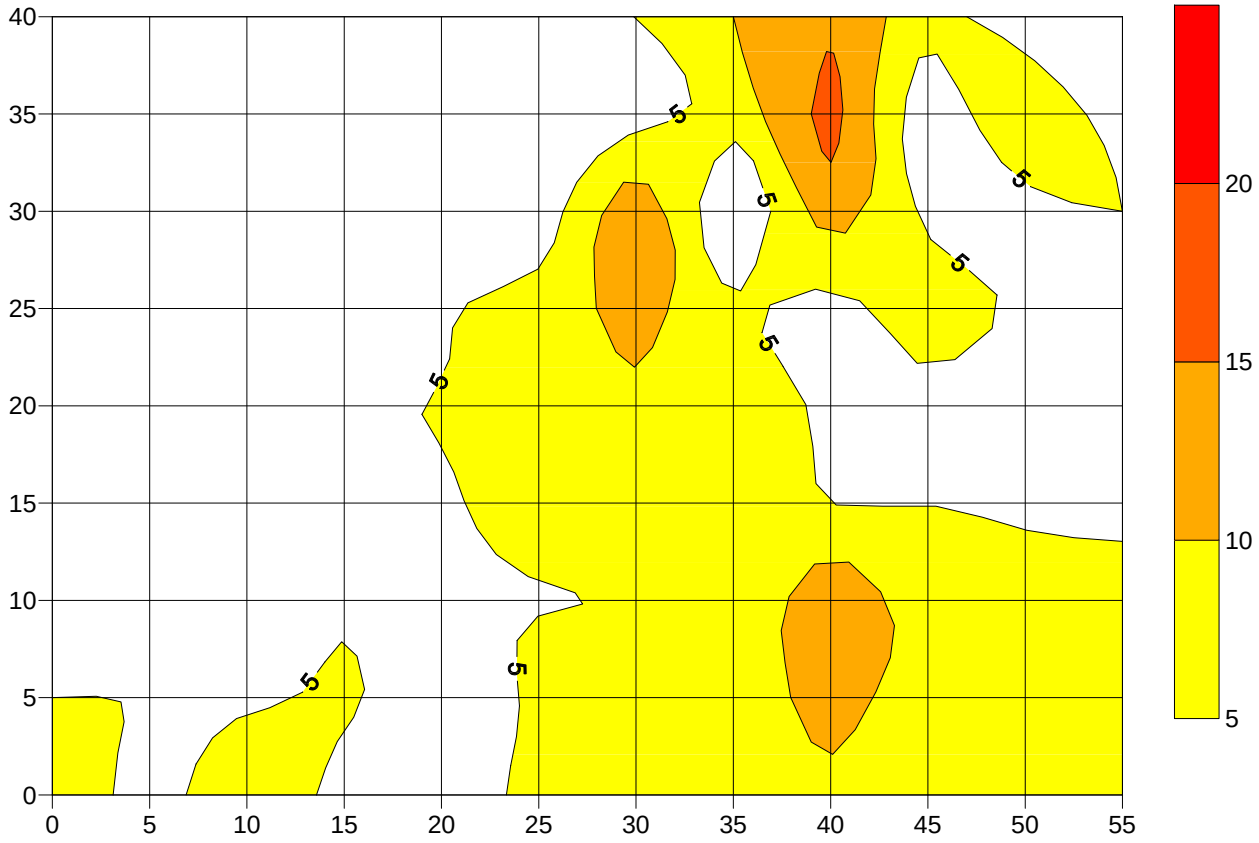
Jasper was the most prevalent lithic recovered. Nearly half of the material found was jasper. Chert was the next most abundant material found. Slightly more than a quarter of the lithic assemblage was chert. Quartz (14.7%) and quartzite (6.5%) were also present. A small number of limonite and rhyolite flakes were also present.

Complete flakes comprised 46.9% of the Phase II artifact assemblage and 55.9% of the debitage. Flake fragments were 22.4% of the assemblage and 26.7% of the debitage. Broken flakes (9.6%/11.5%), and debris (5.0%/5.9%) were present in smaller quantities. Sullivan and Rosen (1985) have suggested that complete flakes and debris are more likely to be produced during early stage lithic reduction, while broken flakes and flake fragments are more likely to produced during late stage biface production or tool maintenance activities. The high percentage of complete flakes and debris would suggest that primary lithic reduction was an important aspect of the activities undertaken at the site. This is supported in part by the percentage of debitage with cortex and a number of tested cobbles and pebbles recovered. Slightly more than 30% of the debitage exhibited some cortex.

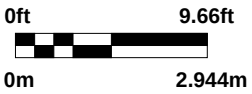
The data suggests that late state biface production or tool maintenance activities was also being undertaken. In addition to the variety of biface fragments encountered, flake size is consistent with such work. The majority of the debitage was less than 20mm in size. The mean length of the debitage was 13.6mm. The mean width of the debitage was 12.7mm and mean thickness was 4.13mm. The maximum size of the debitage is somewhat large (~60mm in length), suggesting that a considerable amount of primary lithic reduction was also being undertaken, probably from locally available cobble sources.

The prehistoric artifacts recovered from the Phase II excavations within Concentration 2 were plotted to create isoplethic artifact distribution maps (Figure 34; Google Earth 2010; Figure 36). Several small areas of artifact concentration were noted, but no clear site patterns were evident.

A comparison was made between the material recovered during the Phase I and Phase II artifact assemblages. The artifact assemblages were very similar even though the Phase I work included material associated with a cultural feature and cultural material that lay outside of the area of Phase II archaeological work. The largest difference lies in the quantity of FCR collected. Nearly 38% of the prehistoric cultural assemblage during the Phase I was FCR as compared to 7.8% of the Phase II work. The high quantity of FCR is likely related to the cultural feature encountered during the Phase I. This feature fell outside of the APE for the Phase II work. The remainder of the assemblage is similar for both assemblages. Debitage was the primary component. There was a slightly higher percentage of complete flakes and debris recovered during the Phase I work (~75%) than during the Phase II work (~62%) and lithic exhibiting cortex were slightly higher in the Phase I assemblage (~34%) than in the Phase II assemblage (~30%). Jasper was the most prevalent material in both assemblages although slightly less so in the Phase I lithic assemblage (~42.2% vs. ~49%). If material type is considered for only the debitage, jasper is represented in identical quantities (~47%). Quartz is the second most abundant material in the Phase I assemblage (~27%) followed by chert and quartzite in similar quantities (~14%) with a small amount of argillite, limonite, and rhyolite. Flake size was similar with 69% of the debitage assemblage measuring less than 20mm.



SCALE



Prepared by CHRS, Inc.

CHURCHTOWN #4 PREHISTORIC/HISTORIC (7NC-F-155)
CONCENTRATION 2 - PREHISTORIC ARTIFACT DISTRIBUTION

FIGURE 36

Conclusions – Concentration 2: A total of 322 prehistoric artifacts were recovered from within Concentration 2 during Phase II excavations (Table 10). The artifactual material was recovered from the plow zone. No cultural features were encountered during the Phase II work. No temporally diagnostic prehistoric artifact were recovered during the Phase II. The majority of artifacts were lithic debitage. Most of the material was jasper. All of the debitage was small (mean lengths and widths ~13mm). There was no concentration of artifacts. Artifact density was light with an average of slightly less than seven prehistoric artifacts per 1-meter squares excavated.

Conclusions – Churchtown #4 Prehistoric/Historic Site (7NC-F-155): The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) extends over approximately 2.7 hectares (6.7 acres). The function of the prehistoric component of the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is uncertain. The site as defined during the Phase I work included a concentration of lithic material near the confluence of two streams. A cultural feature, possibly a pit house, was encountered near the southeastern corner of the site. Prehistoric artifact distributions outside of this area were relatively diffuse. Temporally diagnostic material recovered from the Phase I work included artifacts that span the Archaic through Woodland II periods. A single Woodland I projectile point made from limonite was recovered from Concentration 1 during the Phase II work. The Phase II work resulted in an artifact assemblage that contains a variety of resources fashioned from an assortment of lithic types. The high percentage of cortical material, the presence of test cobbles, and the nature of the debitage indicate that primary reduction of cobbles was a major focus of the work at the site. The large number of biface fragments and the size and type of flakes encountered in the debitage, as well as utilization noted on about four percent of the debitage indicated that food and other encampment processes were also being undertaken. The site may represent the repeated use of the landscape for short term forays from a base camp for the purposes of replenishing lithic material from cobbles. The feature found during the Phase I work suggest that the landscape may have been occasionally occupied for an extended period of time. Based on the presence of diagnostic artifacts (points), prehistoric use of the landscape dates from the Archaic through the Woodland II periods. The portion of the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) examined during the Phase II archaeological survey will not provide any additional information important to our understanding of local or regional prehistory.

Conclusions

This region within the Delmarva Peninsula has been shown to contain a number of small, ephemeral prehistoric sites along drainages with larger sites being located near large stream confluences and adjacent to the Chesapeake Bay. The variety of sites span all time periods from Paleo-Indian to Woodland II. The three prehistoric sites identified in this report, the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-1119), and the Churchtown #4 Historic/Prehistoric Site (7NC-F-155) are similar in artifact number, variety, and density. It can be argued that each site contains components that represent procurement camps. Procurement camps, as described by Custer (1986), consist of areas where limited activities that focused on the extraction of resources and energy from the environment took place. The limited activities would have also limited the range of tool types (Custer 1986). Review of the lithic assemblages collected at each site and the landscape features of each site location provide the strongest evidence for the procurement camp argument.

While all three sites can fit into the procurement camp description and were likely used as such for a majority of the time, one site, the prehistoric component at the Reynolds Historic/Prehistoric Site (7NC-F-118), may also be associated with a Microband base camp. Custer (1986) describes the Microband base camp as being located in sheltered areas adjacent to small drainages that have a lower carrying capacity and the ability to provided subsistence resources during the colder months of the year. At these locations, the artifacts would show a wide range of tool types; however, they would be small in number as the camp would be temporary. At the Reynolds Historic/Prehistoric Site (7NC-F-118), a variety of tools were recovered, including projectile points, hammerstones, and a variety of bifaces. The most contrasting evidence that the site may have been used as a temporary Microband base camp is the features that were uncovered. A large hearth and two basins were discovered during excavations. The carbon dating of charcoal samples taken from each feature date to approximately AD 310-330, placing them within the Woodland I period (3000 BC – 1000 AD). Since all three of the features dated to the same approximate time, it can be suggested that they were all in use during the same occupation of the area and indicate a longer term stay than a temporary procurement camp. The same suggestion may be made for the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) as a pit feature with FCR and basin feature were encountered during Phase I excavations. No carbon or soil samples were taken during Phase I excavations and a realignment of the APE moved both features outside of the testing area. Therefore, further Phase II investigations could not be completed for the features and no direct time period can be linked.

In the regional context, it would appear that the Reynolds Historic/Prehistoric Site, Area 8 Prehistoric Site, and Churchtown #4 Prehistoric/Historic Site are likely related as to how they fit within the settlement/subsistence patterns of the region. The sites served as Procurement camps or Microband base camps for one or more Native American populations on the Delmarva Peninsula. The similar point types recovered, combined with the similar landscape, and lithic materials found indicate a shared knowledge of the local resources. A majority of the prehistoric sites that have been identified along the Route 301 corridor display signs of Procurement camps with a few possible Microband base camps. This fits well into Custer's descriptions of Settlement Systems for the Archaic through Woodland II traditions with a high number of Procurement and Microband base camps being located close to small drainages and on upland settings. It is likely that there are nearby Microband and Macroband base camps, likely located near the larger water sources. Evidence for this is indicated by reviewing archaeological sites along the Bohemia River and the Sassafras River drainages. In both instances, small (Procurement camps and Microbase camps) prehistoric sites were located at or near the headwaters of the two rivers while larger (Macroband base camps) were located closer to major stream confluences and the Chesapeake Bay (Grossman-Bailey, Hayden and Springsted 2010). In this case, the Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119) are two small sites that are part of the Bohemia River drainage system. The Churchtown #4 Historic/Prehistoric Site (7NC-F-155) is not part of the same drainage as the adjacent streams eventually flow into the Delaware River; however, the site type remains a likely long term Procurement camp with a possible short term Microband base camp occupation.

While there is prehistoric period cultural material within the APE at all three prehistoric sites to make statements concerning the prehistoric use of the landscape, the data remains limited. The low density of artifacts combined with the lack of features and an uncertainty of the cultural components present impedes any direct conclusions. The prehistoric components of the portions of the three

sites examined during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places.

Although there were historic artifacts found in each of the three sites, the Phase II archaeological survey only focused on the historic remains from the Reynolds Historic/Prehistoric Site (7NC-F-118). The presence of late eighteenth-/early nineteenth-century artifacts in Concentration 1 suggested that domestic structures from the Intensified and Durable Occupation period (1730-1770) and the Early Industrialization period (1770-1830) may have been present in the area. Excavations revealed a low number of historic artifacts. There are no cultural features within the APE that are suggestive of a dwelling. The number of artifacts in Concentration 2 is very small and widely distributed. There is no data suggesting that this area represents a significant occupation. Concentration 3 contains historic artifacts that are almost exclusively from the mid-nineteenth century, however they are of low density, and there are no cultural features within the APE that are suggestive of a dwelling or provide insights into how this portion of the site was used (Grossman-Bailey, Hayden and Springsted 2010).

There is insufficient historic period cultural material within the APE in any of the historic concentration areas to make meaningful statements concerning the historic use of the landscape. A number of research questions were proposed pertaining to the historic component of the site and what information may be gained from the artifacts. It was proposed that the historic artifacts may aid in an interpretation of the domestic economy at an individual site, as well as possibly provide an interpretation of the historic landscape. It was also discussed that work at the site may provide some information as to variations in landscape that could be attributed to cultural tradition, temporal period, economic status, or other factors. No historic features were encountered. All of the recovered artifacts are relatively small in size which would limit any analysis based on vessel forms. The light artifact scatter, small artifact size, and lack of historic features or structural remains suggest that there were no buildings within these portions of the APE. The historic archaeological material will not provide information important to our understanding of local or regional history, pertaining to Intensified and Durable Occupation period (1730-1770), the Early Industrialization period (1770-1830), to our understanding of lifestyles during those periods, or information related to the Reynolds ownership of the property. The historic components of the portions of the Reynolds Historic/Prehistoric Site (7NC-F-118) examined during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places.

SUMMARY AND RECOMMENDATIONS

This report documents the results of three Phase II Archaeological Surveys performed for the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The Reynolds Historic/Prehistoric Site (7NC-F-118) and the Area 8 Prehistoric Site (7NC-F-119) are located in Middletown, New Castle County, Delaware and were identified within Section 3 of the proposed U.S. Route 301 corridor by Richard Grubb & Associates, Inc. (Figure 1; USGS 1993a, 1993b; Grossman-Bailey, Hayden and Springsted 2010). The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located in Saint Georges Hundred, New Castle County, Delaware and was identified within Section 1 of the proposed U.S. Route 301 corridor by Hunter Research, Inc. (Figure 2; USGS 1993b, 1993c; Liebenknecht and Burrow 2010). The proposed U.S. Route 301 project consists of approximately

17.5 miles of a four-lane toll highway that will extend from the Maryland-Delaware border to State Route 1, just south of the S.R. 1 Bridge over the Chesapeake and Delaware Canal. Section 3 of the proposed project extends from the Maryland-Delaware border to Levels Road, a distance of approximately 4.5 miles. The proposed S.R. 301 project within Section 3 consists of the construction of a new four-lane highway, Levels Road interchange, the relocation of Warwick Road and Strawberry Lane and associated off ramps, concrete barriers, culverts over stream crossings, earthen berms, and approximately 14 potential storm water management facilities. Section 1 of the proposed project extends for a distance of approximately 5 miles, from the intersection with S.R. 1 to Middletown Warwick Road. The proposed S.R. 301 project within Section 1 includes the construction of a new four-lane highway, concrete barriers, culverts over stream crossings, earthen berms, and potential storm water management facilities. This *Phase II Archaeological Survey Report* represents the final cultural resource work performed for the Reynolds Historic/Prehistoric Site (7NC-F-118), the Area 8 Prehistoric Site (7NC-F-119), and the Churchtown #4 Prehistoric/Historic Site (7NC-F-155). The work was performed for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA).

Reynolds Historic/Prehistoric Site (7NC-F-118)

The Reynolds Historic/Prehistoric Site (7NC-F-118) is located north of the tributary to the Great Bohemia Creek and contains the location for portions of the proposed U.S. Route 301 main line. The site measures approximately 5.6 hectares (13.8 acres). Within the site boundary, three concentrations of artifacts were identified during Phase I work. Concentration 1, located in the south/southwestern portion of the site, contained both prehistoric and historic artifacts. Concentration 2 consisted of architectural artifacts within the southeastern portion of the site, and Concentration 3 consisted of historic artifacts within the northern portion of the site. The historic and prehistoric components of the site extend beyond the limits of the project's APE.

The artifacts recovered from Concentration 1 consist of prehistoric and eighteenth- to nineteenth-century artifacts. The results of the archaeological survey indicate that the prehistoric site function within Concentration 1 was likely that of a temporary Procurement camp; however, it may have acted for a short period of time as at Microband base camp. The low density of debitage and the presence of stone tools indicate that a variety of activities took place at the site, including primary lithic reduction, tool manufacture and maintenance, and food processing. Although material from the Archaic through Woodland II periods was found within the site, the prehistoric component from Concentration 1 may represent a use of the landscape during the fourth century AD. Due to the relatively low artifact counts it is unlikely that additional archaeological fieldwork at the site will yield significant information to our understanding of local or regional prehistory in Delaware. It was proposed that the lithic artifacts recovered from the site may provide information on the production techniques and functions of stone tools, as well as potentially contribute to an understanding of settlement patterns. It was also proposed that the identification of lithic material types may provide insight into lithic raw material acquisition behaviors and use. No clear, concise conclusions concerning the research questions posed could be drawn from the low density of prehistoric artifacts. The site will not provide any additional information important to our understanding of local or regional prehistory. The prehistoric components of the portions of the Reynolds Historic/Prehistoric Site (7NC-F-118) examined during the Phase II archaeological survey is not eligible for listing in the National Register of Historic Places.

The late eighteenth- to early nineteenth-century artifacts from Concentration 1, as well as the architectural artifacts from Concentration 2 and the nineteenth-century artifacts from Concentration 3 are all likely related to the Reynolds family ownership of the property. No historic features were encountered. All of the recovered artifacts are relatively small in size which would limit any analysis based on vessel forms. The light artifact scatter, small artifact size, and lack of historic features or structural remains suggest that there were no buildings within these portions of the APE. The historic archaeological material will not provide information important to our understanding of local or regional history, pertaining to Intensified and Durable Occupation period (1730-1770), the Early Industrialization period (1770-1830), to our understanding of lifestyles during those periods, or information related to the Reynolds ownership of the property. The historic components of the portions of the Reynolds Historic/Prehistoric Site (7NC-F-118) examined during the Phase II archaeological survey are not eligible for listing in the National Register of Historic Places.

The portion of the Reynolds Historic/Prehistoric Site (7NC-F-118) examined during the Phase II archaeological survey is not associated with one or more events that have made a significant contribution to the broad patterns of our history and is not eligible for listing in the National Register of Historic Places under Criterion A. The property is not associated with any notable individuals and is recommended not eligible under Criterion B. There are no substantial patterns in artifacts or features that reflect distinctive characteristics of a type, period or method of construction; or representative works of a master; or possession of high artistic values; or significant and distinguishable entities whose components may lack individual distinction (districts). The property is not eligible for listing in the National Register of Historic Places under Criterion C. Based on the analysis of the archaeological data the site has not yielded or is likely to yield information important to prehistory or history and is not eligible under Criterion D. The Reynolds Historic/Prehistoric Site (7NC-F-118) is not eligible for listing in the National Register of Historic Places.

Area 8 Prehistoric Site (7NC-F-119)

Area 8 Prehistoric Site (7NC-F-119) is located south of the tributary to the Great Bohemia Creek and contains the location for a proposed stormwater basin and Section 3 Mainline. The site measures approximately 4.8 hectares (11.86 acres) with the densest portions being located within 70 meters of the tributary. It is likely that the site extends beyond the limits of the APE.

The function of the prehistoric site is unknown. The diagnostic artifacts recovered at the site represent an Archaic through Woodland II tradition, indicating that the area was used by multiple groups over an approximate 6000 year span, although only Woodland I material was present in the area examined during the Phase II archaeological survey. The Phase II work resulted in an artifact assemblage that contains a variety of resources fashioned from an assortment of lithic types. The diagnostic artifacts recovered from the portion of the site examined during the Phase II work suggests that the site represents a Woodland I occupation(s). The artifact assemblages suggests that the site may have been primarily used for short term habitation and for tool manufacture and maintenance activities, as suggested by Richard Grubb & Associates (Grossman-Bailey, Hayden and Springsted 2010). Similarities between the artifact assemblage and temporal period of the Area 8 Prehistoric Site (7NC-F-119) and the Reynolds Historic/Prehistoric Site (7NC-F-118) hold open the possibility that the portion of the Area 8 Prehistoric Site (7NC-F-119) examined by the Phase II work represents a small base camp dating to the Woodland I period.

Additional archaeological work is not recommended for the Area 8 Prehistoric Site (7NC-F-119). The portion of the site examined during the Phase II archaeological survey is not associated with one or more events that have made a significant contribution to the broad patterns of our history and is not eligible for listing in the National Register of Historic Places under Criterion A. The property is not associated with any notable individuals and is recommended not eligible under Criterion B. There are no substantial patterns in artifacts or features that reflect distinctive characteristics of a type, period or method of construction; or representative works of a master; or possession of high artistic values; or significant and distinguishable entities whose components may lack individual distinction (districts). The property is not eligible for listing in the National Register of Historic Places under Criterion C. Based on the analysis of the archaeological data the site has not yielded or is likely to yield information important to prehistory or history and is not eligible under Criterion D. The Area 8 Prehistoric Site (7NC-F-119) is not eligible for listing in the National Register of Historic Places.

Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is located approximately 0.89 miles southwest from the intersection of Boyds Corner Road and Cedar Lane Road within an agricultural field (Figure 1; USGS 1993a, 1993b). The site borders Spring Mill Branch to the south and Taylor's Branch to the east and consists of a prehistoric component and late seventeenth- to mid-nineteenth-century historic component. It is likely that the site extends beyond the limits of the APE. Field investigations at the Churchtown #4 Prehistoric/Historic Site (7NC-F-155) were limited to only the prehistoric component, which is located near the confluence of the two streams. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) extends over approximately 2.7 hectares (6.7 acres). The portion of the site that was investigated by the Phase II Archaeological Survey consisted of two concentrations of prehistoric artifact clusters.

The function of the prehistoric site is unknown. The diagnostic artifacts recovered at the site represent an Archaic through Woodland II tradition, indicating that the area was used by multiple groups over an approximate 6000 year span. The site may represent the repeated use of the landscape for short term forays from a base camp for the purposes of replenishing lithic material from cobbles. The feature found during the Phase I work suggest that the landscape may have been occasionally occupied for an extended period of time.

The portion of the site examined during the Phase II archaeological survey is not associated with one or more events that have made a significant contribution to the broad patterns of our history and is not eligible for listing in the National Register of Historic Places under Criterion A. The property is not associated with any notable individuals and is recommended not eligible under Criterion B. There are no substantial patterns in artifacts or features that reflect distinctive characteristics of a type, period or method of construction; or representative works of a master; or possession of high artistic values; or significant and distinguishable entities whose components may lack individual distinction (districts). The property is not eligible for listing in the National Register of Historic Places under Criterion C. Based on the analysis of the archaeological data the site has not yielded or is likely to yield information important to prehistory or history and is not eligible under Criterion D. The Churchtown #4 Prehistoric/Historic Site (7NC-F-155) is not eligible for listing in the National Register of Historic Places.

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APPENDIX A

QUALIFICATIONS OF RESEARCHERS

QUALIFICATIONS OF RESEARCHERS

Principal Investigator:	Kenneth J. Basalik, Ph.D.
Professional Experience:	32 years
Education:	Ph.D. Anthropology, Temple University M.A. Anthropology, Temple University B.A. Anthropology, University of Pennsylvania
Project Responsibility:	Administration, report writing and review
Project Archaeologist:	Justin McKissick
Professional Experience:	4 years
Education:	M.A. Anthropology and Applied Archaeology, Eastern New Mexico University B.A. Anthropology, Clarion University of Pennsylvania
Project Responsibility:	Fieldwork, analysis, report writing
Senior Historian:	Philip Ruth
Professional Experience:	25 years
Education:	M.A. English, University Of New Hampshire B.A. English, Goshen College
Project Responsibility:	Historical research, review, analysis, and report writing
Archaeology Lab Manager:	Christina Civello
Professional Experience:	19 years
Education:	B.A. Anthropology/Art History, University of Delaware
Project Responsibility:	Artifact processing, supervision, artifact inventories and curation
Graphic Illustrator:	Crystal Hall
Professional Experience:	2 years
Education:	Advertising Design, Hussian School of Art Social Services, Bucks County Community College
Project Responsibility:	Graphics preparation
Editor:	Kevin Quigg
Professional Experience:	16 years
Education:	M.A. English, Beaver College B.A. Communications, Temple University
Project Responsibility	Report editing
Editor:	Maria Rossi
Professional Experience:	6 years
Education:	B.A. English with Communications, Gwynedd-Mercy College
Project Responsibility	Report editing

APPENDIX B

ARTIFACT INVENTORY

ARTIFACT INVENTORY

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Area 8 Site (7NC-F-119)								
Unit 1, Stratum A								
complete flake	quartz	tan-clear	cortical	primary	retouched, cobble	40.79	30.82	19.81
complete flake	quartz	pink	part cortex	primary	pebble	18.80	10.04	4.81
complete flake	quartz	white	no cortex	thinning		22.77	16.49	8.99
broken flake	quartz	white	no cortex	shaping		7.47	10.76	2.38
flake fragment	quartz	white	no cortex	thinning		23.51	23.54	7.80
flake fragment	quartz	white	no cortex	thinning		7.10	13.02	4.60
flake fragment	quartz	pink	part cortex	thinning	pebble	12.35	9.79	1.98
complete flake	quartzite	tan-gray	part cortex	primary	cobble	28.11	24.81	10.19
complete flake	jasper	tan	no cortex	thinning		14.64	14.46	3.04
complete flake	jasper	brown	cortical	shaping		7.81	7.49	1.34
complete flake	jasper	brown	no cortex	shaping		8.39	9.63	2.03
broken flake	jasper	red	no cortex	shaping	thermal treatment	10.90	9.09	2.44
flake fragment	jasper	red	cortical	decortication	pebble thermal treatment	16.12	19.16	5.17
flake fragment	jasper	brown	no cortex	thinning		10.68	10.75	3.06
flake fragment	jasper	red	no cortex	thinning		7.39	11.85	2.68
flake fragment	jasper	pink	no cortex	shaping	thermal treatment	8.38	8.04	1.85
debris	jasper	red	cortical		thermal treatment pebble	21.04	15.01	9.97
debris	jasper	brown	cortical		pebble	11.64	16.27	9.16
debris	jasper	red	cortical		thermal treatment pebble	10.26	8.54	6.23
debris	jasper	red	cortical		pebble	14.26	13.42	5.75
point	jasper	brown	no cortex			36.29	19.41	6.34
complete flake	chert	gray	no cortex	shaping		9.17	10.27	1.70
broken flake	chert	black	part cortex	thinning		8.15	10.11	4.09
broken flake	chert	gray	no cortex	thinning		9.33	12.56	4.33
broken flake	chert	gray	no cortex	shaping		6.94	10.20	2.32
flake fragment	chert	gray	no cortex	thinning	thermal treatment	11.31	10.48	3.72
flake fragment	chert	gray	no cortex	thinning		11.46	15.50	1.79
debris	chert	gray	cortical		pebble	26.19	17.61	15.76
complete flake	rhyolite	gray	no cortex	thinning		11.86	13.66	4.28
broken flake	limonite	brown	no cortex	shaping		8.17	12.56	2.10
flake fragment	limonite	brown	no cortex	thinning		16.63	18.72	3.05
FCR	quartz				50.1 grams			
hammerstone fragment								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 2, Stratum A								
flake fragment	quartz	pink	no cortex	thinning		10.11	12.99	5.44
complete flake	jasper	red	no cortex	shaping		13.88	10.74	1.93
complete flake	jasper	brown	no cortex	shaping	eraillure scar	10.04	9.65	1.97
complete flake	jasper	brown	no cortex	shaping		8.40	7.00	1.54
broken flake	jasper	brown	cortical	decortication	pebble	22.37	20.73	6.90
broken flake	jasper	brown	cortical	decortication	pebble	10.50	13.21	4.26
broken flake	jasper	brown	no cortex	thinning		13.62	12.94	1.83
flake fragment	jasper	brown	cortical	decortication	cobble	31.15	23.15	12.23
flake fragment	jasper	red	no cortex	thinning	utilized, half-moon scalar on 1 margin	29.04	25.92	7.85
complete flake	limonite	brown	no cortex	thinning		22.66	22.85	6.18
hard plastic								
Unit 2, Stratum B								
broken flake	quartzite	white	no cortex	thinning	retouched	21.11	23.01	5.25
complete flake	jasper	brown	cortical	decortication	cobble	37.65	34.10	10.36
flake fragment	jasper	brown	part cortex	primary		16.85	22.08	8.26
Unit 3, Stratum A								
complete flake	jasper	red	no cortex	thinning	thermal treatment	14.11	6.99	3.49
debris	jasper	red	part cortex			18.53	7.94	7.12
complete flake	chert	gray	cortical	decortication	bipolar, pebble	20.89	6.44	5.68
Unit 3, Stratum B								
flake fragment	quartz	white	cortical	decortication	pebble	11.90	16.79	4,69
debris	quartz	tan	cortical		cobble	47.32	21.75	16.36
FCR	sandstone				297.0 grams			
Unit 4, Stratum A								
broken flake	quartz	clear	cortical	primary	cobble	19.58	18.90	8.06
complete flake	quartzite	gray	no cortex	thinning		26.98	22.62	5.87
possible core	quartzite	tan	cortical		cobble	50.26	41.33	39.74
complete flake	jasper	brown	cortical	decortication	pebble	13.41	11.20	3.88
complete flake	jasper	brown	no cortex	shaping		8.94	7.86	2.63
complete flake	jasper	red	no cortex	shaping		9.29	10.57	2.26
flake fragment	jasper	brown	cortical	decortication	pebble	9.71	12.26	6.04
complete flake	chert	gray	part cortex	thinning	pebble	9.12	10.00	2.71
complete flake	chert	black-white	no cortex	shaping		11.71	13.01	2.33
flake fragment	chert	black	cortical	decortication	pebble	7.96	13.13	3.41
flake fragment	chert	gray	no cortex	thinning		13.23	5.32	1.94
debris	chert	black	cortical		cobble	19.53	17.50	9.80

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
2 FCR	quartzite				317.7 grams			
<u>Unit 4, Stratum B</u>								
debris	quartzite	pink	cortical		cobble	30.42	24.12	10.73
flake fragment	chert	gray	no cortex	shaping		7.58	7.99	1.74
<u>Unit 5, Stratum B</u>								
flake fragment	quartz	white	part cortex	primary	cobble	18.64	17.72	5.35
<u>Unit 6, Stratum A</u>								
flake fragment	quartz	white	no cortex	thinning		13.01	7.12	3.84
flake fragment	quartzite	white	no cortex	shaping		5.86	7.99	1.52
complete flake	jasper	brown	cortical	decortication		8.17	6.90	2.49
debris	jasper	brown-tan	part cortex			12.72	9.40	5.77
complete flake	chert	black	no cortex	shaping	thermal treatment spall	12.97	8.97	2.93
<u>Unit 6, Stratum B</u>								
debris	quartz	pink-clear	no cortex			27.73	14.04	9.14
complete flake	quartzite	pink	no cortex	shaping		8.20	8.82	2.40
complete flake	jasper	brown	no cortex	shaping		11.48	9.17	2.45
complete flake	chert	gray	no cortex	shaping		7.53	8.71	1.90
flake fragment	chert	black	part cortex	primary		13.94	18.44	5.81
debris	chert	gray	cortical		pebble	17.44	16.78	9.15
FCR	quartzite				41.2 grams			
<u>Unit 7, Stratum A</u>								
plastic strip (modern)								
<u>Unit 7, Stratum B</u>								
complete flake	quartz	tan	cortical	decortication		7.35	10.61	1.79
complete flake	quartz	white	part cortex	primary	pebble	13.49	10.25	6.13
complete flake	quartzite	gray	no cortex	thinning		31.11	26.13	7.92
broken flake	quartzite	gray	no cortex	thinning	utilized, microscopic scalar on 1 margin	22.24	37.26	9.30
complete flake	jasper	brown	cortical	decortication	pebble	19.46	21.32	5.18
broken flake	jasper	brown	no cortex	shaping		8.76	5.67	1.16
flake fragment	jasper	red	no cortex	thinning		18.46	12.32	4.24
debris	jasper	brown	cortical		bipolar, pebble	19.26	15.79	5.54
<u>Unit 8, Stratum B</u>								
complete flake	limonite	brown	part cortex	thinning		24.44	30.54	5.14

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 9, Stratum A								
complete flake	jasper	red	no cortex	shaping		11.92	7.65	2.43
flake fragment	jasper	brown	cortical		pebble	17.50	19.75	7.03
Unit 9, Stratum B								
flake fragment	jasper	red	no cortex	shaping	thermal treatment	6.45	8.44	2.00
Unit 10, Stratum A								
complete flake	quartz	white	no cortex	shaping		9.84	9.50	2.86
broken flake	quartz	clear	no cortex	thinning		11.15	15.50	4.21
flake fragment	quartz	white	no cortex	thinning		15.32	18.50	5.87
flake fragment	quartz	clear	no cortex	thinning		13.61	12.27	2.93
complete flake	jasper	brown	no cortex	shaping	eraillure scar	6.76	6.60	1.87
Unit 10, Stratum B								
complete flake	quartz	white	cortical	decortication	utilized, large shallow scalar on 1 margin, cobble	24.99	24.38	9.92
complete flake	quartz	white	part cortex	primary		15.91	18.15	7.70
broken flake	quartz	white	no cortex	thinning		19.75	14.42	7.90
Unit 11, Stratum A								
complete flake	quartz	white	no cortex	shaping		8.91	7.23	1.58
complete flake	quartz	tan	no cortex	shaping		9.66	9.27	2.42
Unit 11, Stratum B								
complete flake	quartz	tan	no cortex	thinning		14.84	9.64	3.30
complete flake	quartz	white	no cortex	shaping		8.76	8.99	2.35
complete flake	quartz	tan	no cortex	shaping		9.69	12.41	3.01
flake fragment	quartz	white	no cortex	thinning		14.23	12.88	4.87
complete flake	quartzite	pink	cortical	decortication	cobble	26.64	36.77	9.58
complete flake	jasper	brown	part cortex	thinning	utilized, microscopic scalar on 1 margin, pebble	17.86	20.61	4.19
complete flake	jasper	brown	no cortex	thinning	eraillure scar	15.99	15.27	2.97
complete flake	jasper	red	no cortex	shaping		10.54	8.95	1.12
flake fragment	jasper	brown	cortical	decortication		7.34	9.76	3.19
flake fragment	jasper	brown	no cortex	thinning		8.91	8.03	3.10
Unit 12, Stratum B								
flake fragment	chert	gray	no cortex	shaping		6.28	9.12	0.96
Unit 13, Stratum A								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
broken flake	chert	black	no cortex	thinning		13.12	9.43	5.02
<u>Unit 14, Stratum A</u>								
broken flake	quartz	white	no cortex	shaping		8.65	10.79	2.53
flake fragment	quartzite	white	no cortex	shaping		10.46	10.99	1.84
complete flake	jasper	red	no cortex	shaping		9.76	7.56	1.69
flake fragment	chert	gray	no cortex	shaping		8.42	6.85	1.60
broken flake	limonite	black	no cortex	thinning	thermal treatment	10.54	13.83	2.94
<u>Unit 14, Stratum B</u>								
complete flake	quartz	white	no cortex	thinning		19.12	22.91	6.26
complete flake	quartz	white	no cortex	shaping		10.01	5.73	1.75
flake fragment	quartz	white	part cortex	primary		12.80	23.50	5.30
broken flake	quartzite	tan	cortical	decortication	cobble	17.38	21.44	4.93
complete flake	jasper	red	no cortex	thinning		20.07	19.34	5.26
<u>Unit 15, Stratum A</u>								
broken flake	quartz	white	no cortex	thinning		17.08	22.49	6.29
debris	quartz	pink	part cortex		cobble	29.31	25.25	14.63
colorless bottle glass								
<u>Unit 15, Stratum B</u>								
complete flake	quartz	tan	part cortex	primary		26.02	35.75	12.49
complete flake	quartz	white	no cortex	thinning		11.55	12.14	4.44
complete flake	chert	black	no cortex	thinning		15.30	22.54	6.38
complete flake	limonite	brown	no cortex	thinning		18.71	15.99	2.98
<u>Unit 16, Stratum A</u>								
complete flake	jasper	red	part cortex	thinning	pebble	9.86	12.51	2.47
debris	jasper	brown	cortical		pebble	23.00	12.64	8.41
window glass								
<u>Unit 16, Stratum B</u>								
middle stage medial biface fragment	quartz	white	no cortex			24.66	18.73	11.38
<u>Unit 17, Stratum A</u>								
complete flake	jasper	brown-gray	no cortex	thinning	utilized, small stepped scalar on 1 margin	18.78	23.42	3.72
whiteware base								
<u>Unit 17, Stratum B</u>								
complete flake	jasper	brown	part cortex	primary	pebble	18.64	26.94	6.70

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 18, Stratum A								
complete flake	quartz	clear	no cortex	shaping		10.24	11.62	2.09
complete flake	jasper	brown	no cortex	shaping		8.50	7.65	1.25
complete flake	chert	gray	no cortex	thinning		12.57	8.65	2.16
complete flake	chert	gray	no cortex	shaping		8.57	7.76	1.38
flake fragment	chert	black	no cortex	thinning		11.51	13.91	2.08
flake fragment	chert	gray	no cortex	thinning		12.13	10.68	1.63
complete flake	limonite	brown	no cortex	thinning		10.80	13.20	2.09
Unit 19, Stratum A								
flake fragment	quartz	white	no cortex	thinning		13.81	15.52	7.68
complete flake	jasper	red	part cortex	thinning		19.49	7.22	3.33
debris	jasper	red	cortical		thermal treatment pebble	21.04	15.79	6.69
Unit 20, Stratum B								
complete flake	quartz	white	no cortex	shaping		12.54	11.23	2.63
Unit 21, Stratum B								
complete flake	jasper	red	no cortex	shaping		7.00	6.52	0.92
Unit 22, Stratum A								
complete flake	quartz	clear	no cortex	shaping		10.81	7.57	1.69
complete flake	quartzite	tan	no cortex	shaping		8.66	13.43	2.95
flake fragment	jasper	red	no cortex	thinning	thermal treatment	13.66	10.58	5.66
flake fragment	chert	gray	no cortex	thinning		9.42	9.35	1.97
Unit 22, Stratum B								
complete flake	quartzite	red	part cortex	thinning		21.58	20.00	4.22
complete flake	jasper	red	no cortex	shaping		11.86	8.25	2.58
Unit 23. Stratum A								
complete flake	quartz	white	no cortex	thinning		11.04	10.97	3.22
Unit 23, Stratum B								
complete flake	quartz	tan	part cortex	primary	cobble	32.23	23.45	10.12
flake fragment	quartz	clear	no cortex	shaping		5.28	10.87	2.06
broken flake	chert	gray	no cortex	shaping	utilized, small stepped scalar on 1 margin (49)	10.77	12.01	3.29
Unit 24, Stratum A								
complete flake	quartz	white	part cortex	primary		25.16	27.85	13.73
debris	jasper	red	cortical		thermal treatment pebble	8.27	11.47	3.87

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 25, Stratum A								
complete flake	jasper	brown	no cortex	thinning	bipolar, utilized, small deep scalar on 1 margin	27.68	19.86	5.37
broken flake	jasper	red	cortical	decortication		25.37	18.93	4.41
broken flake	jasper	brown	no cortex	thinning		14.72	13.21	6.49
flake fragment	jasper	red	cortical	decortication		4.22	13.79	3.90
debris	jasper	red	cortical		thermal treatment	10.09	16.30	4.33
debris	jasper	red	cortical		thermal treatment	21.67	14.01	11.23
complete flake	chert	black	no cortex	shaping		9.41	7.51	1.42
broken flake	chert	black	no cortex	shaping		9.66	8.68	1.88
flake fragment	chert	black	no cortex	shaping		7.20	10.01	2.01
redware; manganese glaze whiteware								
Unit 26, Stratum A								
broken flake	jasper	brown	no cortex	thinning		14.42	13.24	3.28
Unit 27, Stratum A								
complete flake	chert	gray	no cortex	shaping	thermal treatment	9.37	9.24	2.00
plastic strip (modern)								
Unit 27, Stratum B								
flake fragment	jasper	red	part cortex	primary	thermal treatment pebble	15.04	7.35	3.41
core fragment	jasper	red-gray	no cortex		multidirectional	21.96	18.80	17.51
Unit 27, Stratum C								
complete flake	jasper	red	no cortex	shaping	spall, thermal treatment	8.89	8.91	1.87
Unit 29, Stratum A								
complete flake	quartzite	gray	no cortex	primary		27.36	22.65	11.63
Unit 29, Stratum B								
flake fragment	quartzite	brown	cortical	decortication	cobble	10.59	13.74	2.06
debris	jasper	brown-white	cortical		pebble	16.79	13.93	8.92
oyster shell								
Unit 29, Stratum C								
complete flake	chert	gray	no cortex	shaping		7.98	6.06	1.17
Unit 30, Stratum A								
debris	chert	black	cortical		utilized, large	26.92	38.46	13.25

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
					shallow scalar on 1 margin (49)			
Unit 30, Stratum B								
complete flake	jasper	red	cortical	decortication	pebble	8.74	7.11	1.80
flake fragment	jasper	red	cortical	decortication	pebble	12.70	20.97	6.40
					thermal treatment			
complete flake	chert	black	no cortex	shaping		8.91	4.74	1.45
Unit 31, Stratum A								
complete flake	quartz	tan	cortical	decortication		19.24	17.00	4.57
flake fragment	jasper	red	cortical	decortication	pebble	7.96	7.32	3.46
					thermal treatment			
flake fragment	chert	gray	cortical	decortication	pebble	15.26	16.05	4.59
broken flake	limonite	brown	no cortex	thinning		8.40	10.53	2.01
whiteware; blue painted								
Unit 32, Stratum A								
complete flake	jasper	brown	part cortex	primary	pebble	9.01	13.04	2.94
broken flake	jasper	brown	no cortex	thinning		12.16	16.17	3.70
broken flake	jasper	red	no cortex	thinning		8.66	6.70	2.67
flake fragment	jasper	red	no cortex	thinning	thermal treatment	12.66	9.34	3.10
flake fragment	jasper	red	no cortex	thinning		9.26	10.35	2.64
flake fragment	jasper	brown	no cortex	shaping		9.66	7.26	1.76
complete flake	chert	black	no cortex	shaping	thermal treatment	8.64	8.24	2.18
medial biface fragment	limonite	brown	no cortex			44.56	26.10	10.42
Unit 33, Stratum A								
debris	quartz	white	no cortex			16.61	20.58	9.26
complete flake	jasper	brown	no cortex	thinning		11.49	11.38	3.74
Unit 33, Stratum B								
complete flake	jasper	brown	no cortex	shaping		12.45	10.48	2.72
broken flake	jasper	brown	no cortex	shaping		10.18	7.61	1.80
2 brick (1.7 grams)								
Unit 34, Stratum A								
complete flake	quartz	white	part cortex	primary		15.46	13.04	5.98
flake fragment	quartz	pink	part cortex	primary	utilized, large deep scalar on 1 margin, scraper?	19.00	34.43	12.18
complete flake	jasper	brown	no cortex	shaping		11.05	13.55	2.67
brick (2.1 grams)								
Unit 34, Stratum B								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	jasper	brown	no cortex	thinning		25.04	16.20	7.00
debris	chert	black	cortical		thermal treatment	11.94	18.00	4.01
5 brick (4.6 grams)								
metal hardware fragment; hook?								
coal (0.3 grams)								
<u>Unit 35, Stratum A</u>								
broken flake	jasper	brown	no cortex	thinning		17.71	15.56	2.44
broken flake	jasper	brown	no cortex	shaping		11.78	11.26	2.01
flake fragment	jasper	red	cortical		thermal treatment	9.42	15.80	2.96
complete flake	chert	black	no cortex	thinning		20.17	11.64	3.90
debris	chert	black	part cortex		thermal treatment	37.06	30.41	14.40
brick (0.1 grams)								
<u>Unit 36, Stratum A</u>								
flake fragment	quartz	tan	no cortex	thinning		18.96	18.23	7.40
broken flake	chert	black	no cortex	shaping		9.52	7.64	1.24
debris	jasper	red	part cortex		thermal treatment	10.78	10.19	6.82

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<u>Unit 1, Stratum A</u>								
flake fragment	jasper	red	cortical	decortication	spall, pebble thermal treatment	14.80	18.89	2.66
flake fragment	jasper	red	part cortex	primary		8.78	10.90	5.61
complete flake	rhyolite	gray	no cortex	shaping		11.35	10.95	2.87
<u>Unit 2, Stratum A</u>								
2 window glass								
2 brick (14.8 grams)								
<u>Unit 3, Stratum A</u>								
1 redware; lead glaze								
2 chinese export porcelain; blue painted								
1 colorless bottle glass								
complete flake	jasper	red	part cortex	primary	pebble	15.08	13.45	3.34
complete flake	jasper	brown	no cortex	shaping		7.82	7.53	1.49
flake fragment	jasper	red	cortical		thermal treatment pebble	8.99	10.58	4.76
complete flake	chert	black	no cortex	thinning		12.32	7.93	5.87
<u>Unit 4, Stratum A</u>								
1 brick (0.6 grams)								
flake fragment	jasper	gray-	no cortex	primary	bifacially worked	28.06	35.64	12.38

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
		red						
complete flake	chert	white	no cortex	thinning		14.20	11.77	4.83
complete flake	limonite	brown	no cortex	shaping		9.25	11.22	1.46

<u>Unit 5, Stratum A</u>

1 brick (0.4 grams)

complete flake	jasper	red	part cortex	thinning	pebble	8.76	6.94	2.32
complete flake	jasper	brown	no cortex	shaping		6.94	6.02	1.89
debris	jasper	brown	cortical		pebble	6.84	6.60	4.23

<u>Unit 6, Stratum A</u>

1 redware; manganese glaze

<u>Unit 7, Stratum A</u>

2 redware; manganese glaze

1 window glass

2 brick (1.0 grams)

complete flake	jasper	brown	cortical	decortication	pebble	25.57	23.00	8.78
complete flake	jasper	red	no cortex	shaping		8.23	7.22	1.36
debris	chert	gray	no cortex			13.44	6.65	5.84

<u>Unit 8, Stratum A</u>

1 redware; manganese glaze

1 creamware

2 brick; 1 burned/glazed (232.1 grams)

5 PVC pipe fragments

1 black plastic bag fragment

distal biface fragment	quartz	white	no cortex		point tip	10.28	7.92	2.95
complete flake	jasper	red	cortical	decortication	pebble	9.13	7.65	2.96
					thermal treatment			
complete flake	jasper	red	no cortex	shaping		10.51	9.48	1.53
flake fragment	jasper	red	cortical	decortication	pebble	6.03	10.89	1.63
					thermal treatment			
debris	jasper	gray-red	part cortex		thermal treatment pebble	11.64	10.50	5.88
flake fragment	chert	black	no cortex	shaping		8.36	8.94	1.14
broken flake	rhyolite	gray	no cortex	shaping		10.17	10.02	2.01
complete flake	limonite	brown	no cortex	shaping		13.19	11.19	2.96
complete flake	limonite	brown	no cortex	shaping		10.89	9.96	2.17

<u>Unit 9, Stratum A</u>

2 window glass

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
2 brick (3.9 grams)								
complete flake	jasper	red	no cortex	thinning	thermal treatment	18.95	18.72	3.60
<u>Unit 10, Stratum A</u>								
2 brick (0.9 grams)								
flake fragment	jasper	red	no cortex	shaping		5.02	4.90	0.93
<u>Unit 11, Stratum A</u>								
1 unidentifiable nail fragment								
complete flake	quartz	white	no cortex	shaping		9.77	8.17	2.11
flake fragment	quartz	tan	part cortex	thinning	pebble	12.73	14.73	5.59
complete flake	jasper	brown	part cortex	primary	pebble	16.55	9.54	4.60
complete flake	chert	white	no cortex	shaping		8.05	6.76	1.13
complete flake	limonite	brown	no cortex	shaping		10.41	10.82	2.54
2 FCR	quartzite							
<u>Unit 12, Stratum A</u>								
2 brick (8.9 grams)								
<u>Unit 13, Stratum A</u>								
1 cut nail fragment								
debris	jasper	brown	cortical		cobble	50.33	32.99	12.03
<u>Unit 14, Stratum A</u>								
1 kaolin pipe stem								
<u>Unit 16, Stratum A</u>								
complete flake	quartz	tan	part cortex	primary		33.99	23.85	12.19
complete flake	quartz	white	no cortex	shaping		8.63	7.67	1.43
flake fragment	quartz	white	no cortex	shaping		5.57	7.17	0.92
complete flake	jasper	red	no cortex	thinning	thermal treatment	20.16	12.22	5.35
complete flake	jasper	brown	no cortex	shaping		10.92	10.92	2.41
complete flake	jasper	red	cortical	decortication	pebble thermal treatment	8.72	7.66	2.74
broken flake	jasper	brown	part cortex	shaping		6.56	6.67	1.27
complete flake	chert	gray	no cortex	shaping		8.67	7.98	1.30
flake fragment	rhyolite	gray	no cortex	thinning		11.58	18.53	4.53
1 colorless bottle glass								
<u>Unit 17, Stratum A</u>								
1 window glass								
1 brick (0.2 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 17, Feature 3 east ½								
flake fragment	jasper	red	no cortex	thinning		4.85	8.61	2.09
early stage distal biface fragment	jasper	brown	part cortex		utilized, large shallow scalar on 1 margin	42.08	34.67	18.03
Unit 18, Stratum A								
complete flake	quartz	white	no cortex	thinning		28.52	29.26	4.78
complete flake	jasper	brown	no cortex	shaping		8.92	8.33	0.96
complete flake	chert	gray	no cortex	shaping		11.39	13.36	2.59
2 redware; clear lead glaze int. / eroded slip trailed ext.								
1 brick (15.9 grams)								
Unit 19, Stratum A								
complete flake	quartz	white	cortical	decortication	pebble	11.17	11.37	3.32
flake fragment	quartz	white	no cortex	thinning		13.71	21.81	5.46
debris	quartz	white	no cortex			13.98	16.78	4.48
complete flake	jasper	red	no cortex	shaping		10.40	6.58	1.06
flake fragment	jasper	brown	cortical	decortication		8.00	6.58	2.74
spall	jasper	gray-red	cortical		thermal treatment	9.69	8.12	2.90
broken flake	limonite	brown	no cortex	thinning		20.33	21.13	5.26
broken flake	limonite	brown	no cortex	shaping		10.39	11.16	1.64
flake fragment	rhyolite	gray	no cortex	thinning		17.54	19.66	3.97
1 FCR	sandstone				54.8 grams			
1 redware; manganese glaze								
1 white stoneware, scratch blue								
1 amber bottle glass								
Unit 19, Feature 4								
complete flake	quartz	white	part cortex	decortication	cobble bifacially worked	47.84	27.06	13.58
complete flake	quartzite	gray	part cortex	primary	bipolar, cobble	58.67	45.87	12.66
complete flake	chert	gray	no cortex	thinning		19.86	17.64	5.13
flake fragment	chert	gray	no cortex	thinning		19.13	12.26	3.55
complete flake	limonite	brown	no cortex	thinning		39.09	37.66	7.95
complete flake	limonite	brown	no cortex	thinning		22.16	22.11	2.62
Unit 20, Stratum A								
complete flake	chert	black	cortical	decortication	pebble	8.09	8.76	1.88
complete flake	chert	gray	part cortex	primary	retouched, half moon scalar on 1	19.96	13.81	6.95

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
					margin			
flake fragment	jasper	red	no cortex	thinning	thermal treatment	7.91	15.69	4.18
1 window glass								
2 brick (23.3 grams)								
Unit 21, Stratum A								
1 lt. green tint bottle lip; crown cap finish								
1 brick (0.2 grams)								
1 coal (0.6 grams)								
Unit 22, Stratum A								
flake fragment	quart	white	no cortex	thinning		13.16	15.66	5.17
complete flake	quartzite	tan	part cortex	primary	bipolar, cobble	53.75	49.24	20.14
complete flake	jasper	brown	no cortex	shaping		10.68	7.97	1.95
complete flake	jasper	brown	no cortex	shaping		7.36	8.72	1.48
spall	jasper	red	cortical			8.49	7.25	1.99
1 whiteware								
1 colorless bottle glass								
1 amber bottle glass								
1 brick (0.2 grams)								
Unit 23, Stratum A								
broken flake	jasper	brown	no cortex	shaping		6.33	6.45	0.85
1 FCR	quartzite				18.6 grams			
Unit 24, Stratum A								
flake fragment	jasper	red	no cortex	thinning	thermal treatment	8.03	10.18	3.08
1 aboriginal sherd					0.7 grams			
Unit 25, Stratum A								
broken flake	quartz	white	no cortex	thinning		10.47	11.24	3.69
debris	jasper	gray-red	cortical		pebble	19.29	11.11	7.98
complete flake	chert	black	no cortex	shaping		13.69	8.20	1.39
possible core hammerstone	chert	black	part cortex		cobble 245.5 grams	31.26	25.45	10.93
Unit 26, Stratum A								
complete flake	chert	gray	cortical	decortication	pebble	28.28	15.79	6.68
1 window glass								
1 brick (0.4 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 27, Stratum A								
complete flake	jasper	red	part cortex	primary	bipolar, pebble	17.93	10.37	4.15
debris	jasper	red	cortical		pebble	13.49	14.19	3.57
1 creamware								
2 window glass								
1 coal (1.0 grams)								
Unit 28, Stratum A								
1 brick (0.4 grams)								
Unit 29, Stratum A								
complete flake	jasper	red	no cortex	shaping		6.41	6.29	1.02
debris	jasper	red	no cortex		thermal treatment	13.86	9.15	6.57
1 colorless bottle glass								
1 brick (3.3 grams)								
Unit 30, Stratum A								
complete flake	quartz	tan	cortical	decortication	cobble	29.63	27.86	10.30
complete flake	quartz	white	no cortex	primary		23.60	25.42	10.46
broken flake	quartz	white	no cortex	thinning	utilized, large deep scalar on 1 margin (48)	21.86	25.43	6.07
flake fragment	quartz	white	no cortex	primary		20.67	21.67	8.01
flake fragment	quartz	white	no cortex	thinning		10.63	9.93	3.66
complete flake	jasper	brown	cortical	decortication	pebble	13.57	10.76	2.43
complete flake	jasper	brown	no cortex	thinning		17.52	12.51	2.55
3 FCR	quartzite				178.6 grams			
1 whiteware; blue transferprint								
2 window glass								
Unit 30, Feature 5 east ½								
broken cobble	quartzite	gray	cortical			29.40	23.93	18.28
Unit 31, Stratum A								
complete flake	quartz	white	no cortex	shaping		7.47	9.81	2.34
flake fragment	quartz	clear	no cortex	thinning		8.24	7.18	2.83
flake fragment	quartz	white	no cortex	shaping		6.12	8.89	2.22
complete flake	jasper	brown	cortical	decortication	cobble	19.91	15.18	3.41
complete flake	jasper	brown	part cortex	primary		15.09	19.61	4.31
complete flake	jasper	red	no cortex	thinning		11.39	7.17	1.78
complete flake	jasper	red	no cortex	shaping		8.52	8.52	1.38
flake fragment	jasper	red	no cortex	thinning	thermal treatment	12.56	14.55	3.79
flake fragment	jasper	red	no cortex	thinning	thermal treatment	8.02	12.13	2.83

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
spall	jasper	red	cortical		thermal treatment	8.95	10.52	2.42
broken flake	chalcedony	brown	part cortex	primary		26.41	24.99	14.11
complete flake	limonite	black	no cortex	shaping		7.85	7.67	1.66
<u>Unit 32, Stratum A</u>								
flake fragment	jasper	red	no cortex	thinning	thermal treatment	10.35	8.02	3.19
1 wire nail fragment								
<u>Unit 33, Stratum A</u>								
complete flake	quartzite	gray	no cortex	shaping		11.74	9.62	1.72
complete flake	jasper	brown	no cortex	shaping		6.26	6.83	0.78
broken flake	jasper	brown	no cortex	thinning		17.68	16.06	3.87
debris	jasper	brown	part cortex			23.10	15.44	8.96
broken pebble	jasper	red	cortical		thermal treatment	12.40	10.47	5.60
complete flake	chert	black	no cortex	shaping		10.80	8.60	1.86
flake fragment	chert	black	no cortex	thinning		13.55	18.51	3.37
complete flake	chalcedony	gray	no cortex	shaping		7.52	7.96	1.08
1 FCR	quartzite				84.4 grams			
2 aboriginal sherd								
1 window glass								
<u>Unit 33, Feature 6</u>								
2 FCR	quartzite				224.0 grams			
<u>Unit 34, Stratum A</u>								
complete flake	jasper	brown	cortical	decortication	pebble	6.46	8.98	2.53
complete flake	jasper	brown	cortical	decortication	pebble	8.96	11.30	2.36
flake fragment	jasper	red	no cortex	shaping		11.15	5.39	1.23
1 brick (0.3 grams)								
1 coal (11.9 grams)								
<u>Unit 35, Stratum A</u>								
medial point fragment	quartz	pink	no cortex			21.15	22.11	6.94
flake fragment	quartzite	gray	no cortex	thinning		26.90	25.80	8.33
core	quartzite	gray	part cortex		multi-directional	47.05	42.09	30.14
middle stage lateral biface fragment	quartzite	gray	no cortex			51.95	28.90	17.28
1 redware; manganese glaze								
1 window glass								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 36, Stratum A								
complete flake	quartz	clear	no cortex	shaping		7.29	7.89	2.22
1 redware; manganese glaze								
Unit 36, Stratum B								
flake fragment	jasper	red	cortical	decortication	pebble, thermal treatment	9.46	8.26	2.18
complete flake	chert	black	no cortex	shaping		8.13	5.73	1.82
1 redware; manganese glaze								
3 window glass								
2 brick (0.3 grams)								
Unit 39, Stratum A								
complete flake	jasper	brown	cortical	decortication		10.52	10.12	1.49
complete flake	jasper	brown	no cortex	shaping		13.02	9.73	2.45
complete flake	jasper	brown	no cortex	shaping		8.92	7.32	0.79
FCR	quartzite				28.2 grams			
Unit 40, Stratum A								
complete flake	jasper	red	no cortex	shaping		8.11	5.65	2.45
broken flake	jasper	brown	part cortex	thinning	eraillure scar, pebble	20.25	13.23	3.72
1 whiteware								
Unit 41, Stratum A								
spall	jasper	red	cortical			9.96	9.27	2.48
1 tin glazed earthenware								
Unit 42, Stratum A								
1 oyster								
Unit 43, Stratum B								
1 window glass								
Unit 44, Stratum A								
complete flake	jasper	brown	no cortex	shaping		6.94	6.75	0.94
flake fragment	jasper	red	cortical	decortication		11.97	8.89	1.88
flake fragment	jasper	brown	cortical	decortication		7.23	6.64	1.33
flake fragment	jasper	red	no cortex	thinning		7.29	10.20	3.57
debris	jasper	brown	part cortex		cobble	24.03	36.71	19.38
debris	jasper	red	part cortex			14.33	11.74	7.91
debris	jasper	red	cortical		pebble	10.23	7.37	3.73

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
broken cobble	jasper	brown	cortical			43.24	41.98	18.25
1 redware; lead glaze								
1 window glass								
1 unidentifiable nail fragment								
3 coal (1.3 grams)								
<u>Unit 45, Stratum A</u>								
flake fragment	chert	gray	cortical	decortication	spall?	17.92	16.55	5.03
1 brick (0.2 grams)					thermal treatment			
<u>Unit 46, Stratum A</u>								
complete flake	jasper	brown	no cortex	shaping		8.70	10.07	1.81
flake fragment	jasper	brown	cortical	decortication		6.21	9.17	2.51
1 redware; manganese glaze								
1 creamware								
1 olive green bottle glass								
<u>Unit 47, Stratum A</u>								
complete flake	jasper	brown	part cortex	primary	pebble	10.75	13.61	3.96
flake fragment	jasper	brown	part cortex	primary	cobble	25.32	17.16	11.05
flake fragment	jasper	red	no cortex	shaping		6.52	6.31	2.22
debris	jasper	brown	cortical		pebble	13.22	12.41	7.15
debris	chalcedony	brown	part cortex		pebble	8.90	10.03	5.25
1 creamware								
<u>Unit 48, Stratum A</u>								
flake fragment	chert	black	no cortex	shaping		8.92	6.86	2.04
spall	jasper	red	part cortex		thermal treatment	9.02	6.84	2.01
3 brick (3.7 grams)								
<u>Unit 49, Stratum A</u>								
broken flake	jasper	brown	cortical	decortication	pebble	5.81	9.61	2.33
debris	jasper	red	cortical		thermal treatment, pebble	14.40	15.12	4.38
debris	jasper	red	cortical		thermal treatment, pebble	13.03	10.09	5.47
debris	jasper	red	cortical		thermal treatment, pebble	12.24	6.09	5.39

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
spall	jasper	brown	no cortex		thermal treatment	7.96	9.51	1.88
4 brick (15.8 grams)								
<u>Unit 50, Stratum A</u>								
complete flake	jasper	brown-black	no cortex	shaping	eraillure scar	12.55	8.40	1.26
complete flake	jasper	red	no cortex	shaping		8.47	7.04	0.82
broken flake	jasper	brown	part cortex	primary		7.35	4.71	2.26
debris	jasper	brown	part cortex		scraper? utilized, small stepped scalar on 1 margin, pebble	27.54	19.51	9.06
7 brick (32.6 grams)								
1 coal (3.8 grams)								
<u>Unit 51, Stratum A</u>								
broken flake	jasper	brown	no cortex	shaping		7.90	7.24	1.49
1 redware; lead glaze								
4 brick (23.2 grams)								
1 coal (0.5 grams)								
<u>Unit 52, Stratum B</u>								
complete flake	jasper	brown	part cortex	primary	pebble	7.84	8.41	2.55
flake fragment	chert	gray	no cortex	thinning		10.58	7.22	3.35
1 amber bottle glass								
1 colorless bottle glass								
1 brick (01 grams)								
1 sytrofoam								
1 coal (0.4 grams)								
<u>Unit 55, Stratum A</u>								
1 mortar (3.8 grams)								
1 coal (1.8 grams)								
<u>Unit 57, Stratum A</u>								
1 brick (0.7 grams)								
<u>Unit 58, Stratum A</u>								
1 pearlware								
1 brick (0.2 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 60, Stratum A								
1 redware; manganese glaze								
1 pearlware								
1 brick (1.1 grams)								
1 coal (0.2 grams)								
Unit 61, Stratum A								
complete flake	jasper	brown	no cortex	shaping	eraillure scar	9.99	7.97	1.45
1 pearlware								
3 cellophane								
2 coal (0.3 grams)								
2 coal ash/cinder (5.9 grams)								
Unit 62, Stratum A								
1 redware; eroded								
1 pearlware								
1 coal (0.4 grams)								
Unit 64, Stratum A								
1 redware; manganese glaze								
2 pearlware								
1 pearlware; blue painted								
1 brick (83.1 grams)								
1 cinder (2.7 grams)								
Unit 65, Stratum A								
1 redware; lead glaze								
1 redware; manganese glaze								
1 yellowware								
3 pearlware								
1 pearlware; polychrome								
2 whiteware; blue transferprint								
2 bone/tooth								
3 brick (7.5 grams)								
1 window glass								
6 coal (7.0 grams)								
Unit 66, Stratum A								
complete flake	quartzite	white	cortical	decortication		17.13	11.83	3.11
3 pearlware								
1 pearlware; blue decorated								
1 brick (0.1 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 steel nut/bolt/washer								
1 cinder/slag (0.4 grams)								
<u>Unit 67, Stratum A</u>								
3 redware; manganese glaze								
3 pearlware								
1 unidentifiable nail fragment								
<u>Unit 68, Stratum A</u>								
complete flake	quartzite	red	no cortex	shaping		7.19	8.37	1.05
flake fragment	jasper	red	cortical	decortication	thermal treatment	10.09	12.01	3.69
1 redware; lead glaze								
3 redware; eroded								
3 pearlware								
1 unidentifiable nail fragment								
5 brick (9.4 grams)								
11 coal (9.6 grams)								
<u>Unit 69, Stratum A</u>								
debris	jasper	brown	cortical		utilized, large deep scalar on 1 margin, pebble	20.85	18.94	12.04
debris	jasper	red	part cortex		thermal treatment	19.32	9.68	8.95
2 redware; manganese glaze								
1 redware; eroded								
2 pearlware								
2 pearlware; blue painted								
1 pearlware; polychrome								
1 pearlware; blue shell								
1 window glass; ribbed								
1 brick (9.6 grams)								
13 coal (22.8 grams)								
<u>Unit 70, Stratum A</u>								
broken flake	jasper	brown	cortical	decortication	pebble	18.62	26.20	3.96
1 redware; clear lead glaze								
1 c.c. ware								
1 semi-porcelain cup base								
1 oyster shell								
3 brick (9.6 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 71, Stratum A								
complete flake	jasper	brown	part cortex	primary		10.56	8.92	2.35
broken flake	jasper	red	no cortex	shaping	thermal treatment, utilized, half moon scalar on 1 margin	9.56	7.08	1.72

1 refined redware; lead glaze
2 redware; manganese glaze
2 redware; eroded
5 pearlware
1 colorless bottle glass
1 window glass
6 brick (6.8 grams)
3 coal (1.0 grams)

Unit 72, Stratum A
1 yellowware; annular
2 pearlware
1 brick (0.5 grams)
2 coal (9.8 grams)

Unit 73, Stratum A

flake fragment	jasper	tan	no cortex	thinning		9.99	10.67	3.84
flake fragment	chert	gray	no cortex	thinning	thermal treatment	9.70	17.20	5.11

1 redware; lead glaze
3 redware; eroded
1 pearlware
1 whiteware
1 whiteware; banded/annular
1 colorless bottle glass
1 cut nail fragment
4 brick (41.1 grams)
18 coal (12.5 grams)
3 cinder (9.7 grams)

Unit 74, Stratum A

complete flake	jasper	brown	no cortex	thinning		14.61	15.34	3.20
flake fragment	jasper	red	no cortex	thinning	thermal treatment	11.94	7.43	3.48

1 redware; manganese
1 redware; eroded

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 chinese porcelain								
1 pearlware								
1 whiteware; red transferprint								
1 oyster								
1 window glass								
1 cut nail fragment; L-head?								
5 brick (7.0 grams)								
2 styrofoam cup fragments								
31 coal/cinder (40.3 grams)								
<u>Unit 75, Stratum A</u>								
1 redware; eroded								
1 white stoneware rim								
1 pearlware								
3 brick (4.1 grams)								
1 wrought nail fragment								
1 kaolin pipe bowl fragment								
1 styrofoam								
17 coal (20.1 grams)								
<u>Unit 76, Stratum A</u>								
complete flake	chert	gray	part cortex	shaping	pebble	8.87	9.51	3.12
1 whiteware								
1 brick (0.9 grams)								
8 coal (11.2 grams)								
<u>Unit 77, Stratum A</u>								
1 whiteware								
1 amber bottle glass								
1 wire nail fragment								
3 brick (4.0 grams)								
5 coal (6.8 grams)								
<u>Unit 78, Stratum A</u>								
spall	jasper	red	cortical		thermal treatment	7.44	10.43	2.08
1 redware; eroded								
1 whiteware								
1 semi-porcelain								
1 colorless bottle glass								
1 window glass								
1 brick								
1 coal (8.5 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 79, Stratum A								
1 redware; lead glaze								
1 colorless bottle glass								
3 brick (2.6 grams)								
1 styrofoam								
8 coal (5.1 grams)								
Unit 80, Stratum A								
complete flake	jasper	red	no cortex	shaping		4.41	9.14	1.74
flake fragment	jasper	red	cortical	decortication	pebble	7.02	8.26	1.87
debris	jasper	red	part cortex			10.36	18.34	6.83
debris	jasper	brown	cortical		cobble	24.00	25.80	15.41
1 redware; slip								
3 redware; eroded								
1 lt. green tint bottle glass								
2 brick (2.4 grams								
5 coal/cinder (4.4 grams)								
Unit 81, Stratum A								
debris	jasper	red	part cortex		thermal treatment pebble	7.56	12.01	2.52
1 redware; eroded								
1 lt. green tint bottle base; Owens scar								
1 aluminum beer can fragment; Budweiser								
1 light bulb glass								
4 coal (6.5 grams)								
Unit 82, Stratum A								
1 whiteware								
1 whiteware; red painted line								
1 styrofoam								
1 coal (3.2 grams)								
Unit 83, Stratum A								
1 redware; eroded								
2 brick (2.7 grams)								
1 cut nail fragment								
1 plastic cup lid fragment								
Unit 84, Stratum A								
complete flake	jasper	red	cortical	decortication		16.58	13.85	3.55

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
flake fragment	jasper	red	part cortex	primary		17.53	12.76	5.25
flake fragment	jasper	brown	no cortex	thinning		12.18	13.42	3.17
flake fragment	chert	black	no cortex	thinning		9.78	8.81	1.55
complete flake	limonite	brown	no cortex	thinning		21.12	19.60	7.77
1 window glass								
1 wire nail fragment								
2 brick (15.2 grams)								
Unit 85, Stratum A								
complete flake	quartz	white	no cortex	thinning		15.53	13.40	4.12
complete flake	jasper	brown	no cortex	shaping		11.21	8.30	1.86
flake fragment	jasper	brown	part cortex	primary		9.53	12.66	3.90
flake fragment	jasper	brown	no cortex	thinning		9.82	10.83	1.52
flake fragment	jasper	red	no cortex	shaping	thermal treatment	5.87	7.91	1.02
debris	jasper	red	cortical		thermal treatment	11.11	11.63	3.26
complete flake	chert	gray	no cortex	thinning		14.40	14.22	2.21
complete flake	limonite	brown	no cortex	shaping		12.62	10.54	2.30
flake fragment	limonite	brown	no cortex	thinning		10.54	10.06	3.27
1 redware; lead glaze ext. / slip int.								
1 cut nail fragment								
2 brick (1.3 grams)								
Unit 86, Stratum A								
flake fragment	quartz	pink	no cortex	thinning		10.74	14.95	7.50
flake fragment	quartz	clear	no cortex	shaping		8.42	10.98	3.18
complete flake	quartzite	white	no cortex	thinning		27.72	37.81	10.24
complete flake	jasper	pink	cortical	decortication		15.29	8.69	2.75
complete flake	jasper	brown	cortical	decortication		12.19	10.16	1.83
complete flake	jasper	red	part cortex	decortication	pebble	6.72	11.38	3.04
complete flake	jasper	red	no cortex	thinning	thermal treatment	14.14	18.94	5.52
complete flake	jasper	brown	no cortex	shaping		8.29	7.51	1.58
flake fragment	jasper	red	cortical	decortication	pebble	11.21	12.33	5.12
broken pebble	jasper	red	cortical			15.07	12.84	8.50
complete flake	chert	white	no cortex	thinning	utilized, small shallow scalar on 1 margin	15.22	16.93	4.35
complete flake	limonite	brown	no cortex	shaping		11.48	17.86	2.51
flake fragment	limonite	brown	no cortex	thinning		12.92	18.81	6.30
2 FCR	quartzite				41.6 grams			
1 redware; lead glaze								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 wire nail fragment								
5 brick (44.9 grams)								
1 cellophane wrapper fragment								
1 coal ash (0.3 grams)								
Unit 87, Stratum A								
other: spall	jasper	red	cortical		thermal treatment	12.19	11.65	3.14
flake fragment	chert	gray	no cortex	thinning		11.19	9.02	2.32
complete flake	limonite	brown	no cortex	thinning	utilized, large shallow scalar on 1 margin	17.62	27.22	5.40
complete flake	limonite	brown	no cortex	shaping		14.70	14.27	2.39
flake fragment	limonite	brown	no cortex	shaping		15.98	16.24	2.26
1 Coca-Cola bottle glass; skirted								
2 wire nail fragments								
2 brick (1.3 grams)								
1 kaolin pipe stem								
1 coal (0.7 grams)								
Unit 88, Stratum A								
debris	jasper	brown	cortical		retouched, cobble	51.31	31.47	8.23
flake fragment	chert	gray	cortical	decortication	pebble	10.52	13.42	3.08
complete flake	limonite	brown	no cortex	thinning		29.12	25.83	4.19
1 window glass								
1 coal (1.9 grams)								
Unit 89, Stratum A								
flake fragment	quartz	white	no cortex	thinning		15.99	17.35	4.32
broken flake	chert	black	part cortex	primary	eraillure scar, cobble	33.71	23.85	6.08
broken pebble	chert	gray	part cortex		pebble	15.57	10.58	3.76
complete flake	limonite	brown	no cortex	thinning		17.50	15.05	5.18
broken flake	limonite	brown	no cortex	thinning		20.39	21.84	5.17
flake fragment	limonite	brown	part cortex	primary		14.82	27.73	5.48
flake fragment	limonite	brown	no cortex	shaping		7.58	11.57	1.80
2 brick (7.8 grams)								
2 coal ash (1.9 grams)								
Unit 89, Stratum B								
broken flake	jasper	red	no cortex	thinning		13.34	10.97	2.44

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 90, Stratum A								
late stage biface	rhyolite	gray	no cortex		retouched, scraper?	42.76	27.33	9.62
1 lt. green tint vial glass								
3 window glass								
1 wire nail fragment								
2 brick (14.8 grams)								
1 white metal button back; applied shank								
1 coal (0.3 grams)								
Unit 91, Stratum A								
broken flake	quartz	white	no cortex	shaping		10.06	11.00	2.58
complete flake	limonite	brown	no cortex	thinning		21.46	38.91	7.98
broken flake	limonite	brown	part cortex	primary		23.72	29.69	8.53
Unit 92, Stratum A								
complete flake	quartz	white	no cortex	shaping		8.71	9.11	3.04
debris	quartz	white	no cortex			15.47	13.69	8.68
flake fragment	quartzite	red	no cortex	primary	utilized, large deep scalar on 1 margin	35.70	45.07	12.21
flake fragment	quartzite	white	no cortex	shaping		8.66	10.26	2.56
debris	quartzite	gray	part cortex			29.31	24.11	15.06
complete flake	jasper	brown	no cortex	shaping		9.56	8.82	2.22
flake fragment	jasper	red	no cortex	thinning	thermal treatment	7.76	9.34	1.85
broken pebble	jasper	red	cortical		thermal treatment	15.34	19.31	10.11
distal biface fragment	jasper	brown	no cortex		tip, serrated	11.90	9.62	2.92
complete flake	limonite	brown	no cortex	thinning		14.92	12.25	3.83
broken flake	limonite	brown	no cortex	shaping		8.04	8.90	1.60
1 amber bottle glass								
2 brick (0.7 grams)								
1 coal (0.7 grams)								
Unit 93, Stratum A								
broken flake	limonite	brown	no cortex	thinning		18.22	21.66	3.43
1 brick (0.7 grams)								
1 coal (1.0 grams)								
Unit 94, Stratum A								
complete flake	quartz	white	no cortex			20.32	19.00	5.74

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 redware; manganese glaze								
1 brick (5.6 grams)								
<u>Unit 95, Stratum A</u>								
1 wire nail fragment								
<u>Unit 96, Stratum A</u>								
broken flake	quartzite	red	no cortex	primary	utilized, large shallow scalar on 1 margin	40.07	40.40	10.16
broken flake	jasper	brown	no cortex	thinning		11.67	10.50	1.69
complete flake	chert	black	no cortex	shaping		10.43	6.78	1.80
1 FCR	quartzite				10.8 grams			
1 redware; manganese glaze								
<u>Feature 6, East ½, north portion</u>								
complete flake	quartzite	tan	cortical	primary	pebble	29.45	26.44	10.32
complete flake	jasper	brown	no cortex	shaping		8.84	9.15	2.14
complete flake	chert	gray-red	no cortex	thinning		16.37	14.34	3.18
complete flake	chert	gray-red	no cortex	thinning		16.68	15.78	2.36
broken flake	limonite	brown	no cortex	thinning		8.99	13.60	2.21
flake fragment	limonite	brown	no cortex	shaping		7.85	8.19	1.42
1 FCR	quartzite				5.9 grams			
<u>Feature 6, East ½, south portion</u>								
complete flake	quartz	white	no cortex	shaping		7.86	6.22	1.96
complete flake	jasper	tan	no cortex	shaping		10.66	8.11	1.64
complete flake	jasper	tan	no cortex	shaping		10.51	6.55	2.21
complete flake	jasper	red	no cortex	shaping		9.52	7.22	1.34
complete flake	limonite	brown	no cortex	shaping		10.35	9.30	1.42
flake fragment	limonite	brown	part cortex	primary	eraillure scar	12.50	20.87	3.78
8 FCR					1594.3 grams			
<u>Feature 6, West ½, north portion</u>								
complete flake	quartz	white	no cortex	shaping		8,75	9.03	2.24
complete flake	quartzite	tan	part cortex	thinning		13.58	16.25	4.11
flake fragment	quartzite	pink	part cortex	decortication		9.27	11.74	3.08
flake fragment	quartzite	pink	part cortex	primary	cobble	38.33	43.96	12.63
complete flake	jasper	red	cortical	decortication	pebble	8.14	8.70	3.74
complete flake	jasper	brown	cortical	decortication	pebble	10.64	10.37	3.26
complete flake	jasper	brown	no cortex	shaping	eraillure scar	11.04	11.03	2.14

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	jasper	brown	no cortex	shaping		8.49	11.01	2.20
early stage biface	jasper	brown	no cortex			67.41	37.00	21.64
complete flake	chert	black	cortical	decortication	pebble	10.14	10.20	2.09
<u>Feature 6, West ½, south portion</u>								
complete flake	quartz	white	no cortex	shaping		8.27	7.83	2.43
complete flake	quartz	white	no cortex	shaping		11.34	6.97	2.12
flake fragment	quartzite	tan	cortical	decortication		19.02	20.42	4.75
complete flake	limonite	brown	no cortex	thinning		19.42	14.10	3.80
complete flake	limonite	brown	no cortex	shaping		11.19	11.11	1.63
broken flake	limonite	brown	no cortex	shaping		12.92	12.35	3.24
hammerstone								
1 aboriginal sherd								
25 FCR					8939.2 grams			
1 wire nail fragment								

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<u>Unit 2, Stratum A</u>								
complete flake	chert	black	no cortex	shaping	utilized, half moon scalar on 1 margin	12.44	12.85	1.59
1 aboriginal sherd; burned								
1 coal (0.2 grams)								
<u>Unit 3, Stratum A</u>								
flake fragment	chert	pink	cortical	decortication	pebble	12.56	11.64	3.27
2 aqua jar glass								
2 oyster shell; fossilized								
<u>Unit 4, Stratum A</u>								
complete flake	quartzite	white	no cortex	thinning		12.62	12.15	2.98
complete flake	quartzite	black	part cortex	primary	bipolar	32.27	24.92	7.76
complete flake	jasper	brown	no cortex	thinning		20.34	21.34	4.73
flake fragment	jasper	red	no cortex	thinning	thermal treatment	11.20	8.19	2.56
debris	jasper	red	cortical		thermal treatment	8.68	10.99	3.32
flake fragment	chert	black	no cortex	shaping		6.02	9.06	1.70
1 FCR	quartzite				174.2 grams			
1 redware; greenish lead glaze								
1 white stoneware; salt glaze								
3 brick (4.0 grams)								
<u>Unit 5, Stratum A</u>								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
flake fragment	jasper	red	cortical	decortication	pebble thermal treatment	7.53	12.89	2.16
complete flake	chert	gray	no cortex	shaping		5.62	6.05	2.29
complete flake	chert	black	no cortex	shaping		9.99	11.25	1.95
1 aboriginal sherd								
1 redware; mottle lead glaze								
1 wrought nail; rosehead								
2 brick (0.7 grams)								
<u>Unit 7, Stratum A</u>								
debris	quartz	tan	cortical			74.28	40.19	19.06
complete flake	jasper	red	no cortex	shaping	eraillure scar	8.23	7.03	1.06
point	limonite	brown	no cortex			38.83	24.08	8.29
flake fragment	chert	black	part cortex	primary		22.94	11.11	4.74
1 FCR	quartzite				141.9 grams			
1 redware; lead glaze								
2 redware; manganese glaze								
1 whiteware; banded								
2 brick (0.8 grams)								
<u>Unit 8, Stratum A</u>								
complete flake	jasper	brown	part cortex	decortication		9.93	8.02	1.94
complete flake	jasper	red	no cortex	shaping	thermal treatment	9.13	7.54	1.77
complete flake	jasper	red	no cortex	shaping		6.93	7.76	0.83
flake fragment	jasper	red	part cortex	primary	pebble, thermal treatment	10.74	7.63	2.30
complete flake	chert	gray	part cortex	thinning		9.16	13.12	2.75
1 oyster; fossilized								
<u>Unit 10, Stratum A</u>								
flake fragment	jasper	red	no cortex	thinning		8.89	11.93	1.44
1 oyster; fossilized								
4 coal (2.7 grams)								
<u>Unit 11, Stratum A</u>								
complete flake	quartz	white	part cortex	primary	pebble	11.23	10.16	4.68
complete flake	jasper	brown	part cortex	primary	pebble	7.72	9.54	1.19
complete flake	jasper	red	no cortex	shaping		7.51	8.08	0.90
core	jasper	tan	cortical		multi-directional, possible early stage biface	84.11	52.82	31.37
complete flake	chert	gray	cortical	decortication	cobble	12.87	12.98	1.37
complete flake	chert	gray	part cortex	primary	pebble	8.52	11.01	2.62
broken flake	chert	white	no cortex	thinning		13.14	15.11	2.39

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 FCR	quartzite				86.4 grams, retouched			
1 coal (2.1 grams)								
Unit 12, Stratum A								
complete flake	quartz	tan	no cortex	shaping		11.20	12.57	3.28
complete flake	jasper	brown	no cortex	shaping		16.12	8.58	1.00
broken flake	jasper	red	no cortex	shaping		7.17	6.48	0.53
debris	jasper	red	part cortex		pebble, thermal treatment	7.04	8.07	4.12
complete flake	chert	gray	no cortex	shaping		10.71	6.02	2.39
flake fragment	chert	gray	no cortex	thinning		7.71	8.40	3.40
1 redware; lead glaze								
1 coal (0.3 grams)								
Unit 13, Stratum A								
complete flake	jasper	brown	no cortex	thinning		14.02	11.86	2.20
complete flake	jasper	brown	no cortex	shaping		9.60	8.67	1.82
complete flake	jasper	brown	no cortex	shaping		9.91	8.76	1.64
complete flake	jasper	brown	no cortex	shaping		7.21	6.32	1.46
flake fragment	jasper	red	no cortex	shaping		8.86	9.61	2.04
flake fragment	jasper	red	no cortex	thinning		6.77	6.29	2.52
spall	jasper	red	cortical		pebble, thermal treatment	7.65	9.86	1.89
complete flake	chert	gray	no cortex	shaping		9.56	8.23	1.77
complete flake	chert	black	no cortex	shaping		9.09	12.42	2.38
complete flake	chert	gray	no cortex	shaping		8.29	8.87	1.67
complete flake	chert	gray	no cortex	shaping		7.70	7.62	1.22
broken flake	chert	gray	no cortex	shaping		9.95	10.33	2.13
flake fragment	chert	black	no cortex	shaping		7.60	6.53	2.17
1 redware; eroded								
1 olive green bottle glass								
1 window glass; melted								
1 cut nail fragment								
1 brick (3.5 grams)								
1 coal (0.2 grams)								
Unit 13, Feature 1								
1 FCR	quartzite				37.5 grams			
Unit 14, Stratum A								
complete flake	quartz	tan	cortical	decortication	cobble	37.62	41.60	12.20
complete flake	quartzite	black	cortical	decortication		23.25	28.08	6.94

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	jasper	brown	cortical	decortication	pebble	17.99	14.29	5.67
medial biface fragment	chert	gray	no cortex			15.44	14.37	6.99
3 FCR	sandstone				232.9 grams			
1 redware; manganese glaze								
1 brick (0.3 grams)								
<u>Unit 15, Stratum A</u>								
flake fragment	jasper	red	no cortex	thinning	thermal treatment	10.24	13.69	3.20
complete flake	chert	gray	cortical	decortication	pebble	10.49	11.52	5.94
1 cut nail fragment								
1 coal (0.2 grams)								
<u>Unit 17, Stratum A</u>								
flake fragment	quartz	tan	no cortex	shaping		7.44	7.21	1.48
complete flake	jasper	red	no cortex	shaping		7.57	7.20	1.82
flake fragment	jasper	red	no cortex	shaping	thermal treatment	6.80	7.15	1.02
1 creamware marley								
<u>Unit 18, Stratum A</u>								
core	quartzite	pink-white	no cortex		uni-directional	40.22	44.55	17.66
broken pebble	jasper	brown	cortical			38.74	29.79	10.42
3 redware; manganese glaze								
1 jackfield								
<u>Unit 19, Stratum A</u>								
flake fragment	quartz	white	no cortex	shaping		6.78	8.76	1.31
broken flake	quartzite	gray	no cortex	thinning		14.37	8.66	4.26
flake fragment	quartzite	gray	part cortex	primary	cuesta-quartzite like	32.71	25.75	14.99
complete flake	jasper	tan	no cortex	thinning		12.46	9.39	2.57
complete flake	jasper	red	no cortex	shaping		10.18	7.39	1.73
flake fragment	jasper	red	cortical	decortication	pebble	24.69	24.03	5.06
flake fragment	jasper	red	no cortex	shaping		8.09	8.26	1.48
debris	jasper	brown	cortical		cobble	40.47	15.14	15.16
complete flake	limonite	brown	no cortex	shaping		11.73	12.75	2.03
possible groundstone fragment								
3 redware; manganese								
2 redware; eroded								
1 oyster; fossilized								
1 wire nail fragment								
2 brick (6.5 grams)								
1 metal tool fragment; scissor tip?								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 19, Stratum B								
hammerstone								
Unit 20, Stratum A								
flake fragment	quartz	white	no cortex	thinning		12.83	12.30	4.58
debris	quartz	white	no cortex			32.02	17.88	16.78
broken flake	quartzite	pink	no cortex	primary	utilized, large deep scalar on 1 margin	26.67	20.65	8.78
broken flake	quartzite	gray	no cortex	thinning		15.65	18.32	5.78
complete flake	jasper	red	no cortex	shaping		7.25	13.55	2.08
complete flake	jasper	red	no cortex	shaping	thermal treatment	9.12	9.71	2.58
complete flake	jasper	red	no cortex	shaping	thermal treatment	8.82	6.99	2.23
flake fragment	jasper	brown	cortical	decortication	pebble	10.25	8.63	3.16
flake fragment	jasper	brown	part cortex	primary	pebble	13.80	11.71	2.93
flake fragment	jasper	brown	no cortex	primary		18.19	18.35	7.26
debris	jasper	brown	cortical		pebble	18.97	15.96	12.48
debris	jasper	red	cortical		pebble, thermal treatment	12.31	13.42	9.62
debris	jasper	red	cortical		pebble, thermal treatment	13.52	7.27	6.98
complete flake	chert	black	cortical	decortication		18.39	19.44	4.63
broken flake	chert	gray	no cortex	shaping		6.00	11.52	2.27
3 FCR	sandstone				133.6 grams			
4 redware; manganese glaze								
1 redware; eroded slip trail								
1 brown stoneware rim								
1 oyster; fossilized								
1 shark tooth								
1 coal (3.2 grams)								
2 cinder/ash (1.6 grams)								
Unit 21, Stratum A								
complete flake	quartz	pink	cortical	decortication	cobble	41.35	38.98	15.39
complete flake	quartz	white	cortical	decortication	pebble	9.44	6.89	1.51
complete flake	quartzite	gray	no cortex	primary	retouched	47.20	38.52	24.10
broken flake	quartzite	gray	no cortex	thinning		13.34	20.05	3.19
complete flake	jasper	red	no cortex	thinning		13.66	8.83	5.75
broken flake	chert	gray	no cortex	shaping		5.81	9.16	1.37
1 FCR	quartzite				20.1 grams			
2 redware; eroded								
1 creamware								
1 window glass								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
2 brick; 1 glazed (274.5 grams)								
8 coal (10.3 grams)								
2 oyster; fossilized								
Unit 22, Stratum A								
flake fragment	quartz	red	no cortex	thinning		11.75	10.57	3.77
spall	jasper	brown	cortical		thermal treatment	10.51	9.52	1.58
flake fragment	chert	black	cortical	decortication		29.23	13.21	2.79
1 redware; slip								
1 redware; lead								
2 creamware								
6 brick (4.3 grams)								
4 coal (2.0 grams)								
Unit 23, Stratum A								
end scraper	chert	black	part cortex		retouched, cobble	23.12	18.84	7.98
1 FCR	jasper				10.7 grams			
2 window glass								
1 cut nail fragment								
2 coal (5.0 grams)								
Unit 24, Stratum A								
flake fragment	quartzite	tan	part cortex	primary		17.28	19.06	9.13
complete flake	jasper	brown	no cortex	thinning		14.44	10.78	2.07
broken flake	jasper	brown	no cortex	shaping		9.01	10.88	2.34
complete flake	chert	gray	no cortex	shaping		8.16	6.04	1.54
2 redware; manganese glaze								
1 whiteware; blue sponged								
1 window glass								
2 brick (1.0 grams)								
1 coal (6.3 grams)								
Unit 25, Stratum A								
complete flake	chert	gray	no cortex	shaping	eraillure scar	8.22	6.35	1.03
broken flake	chert	black	no cortex	shaping		9.26	10.52	2.16
flake fragment	chert	black	no cortex	shaping		7.72	6.46	1.58
1 whiteware								
2 window glass								
1 strap metal; blade?								
15 coal (19.9 grams)								
Unit 26, Stratum A								
complete flake	jasper	brown	part cortex	thinning		11.82	11.34	3.39
spall	jasper	red	cortical		thermal treatment	11.99	9.90	2.02

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)

1 redware; clear lead glaze
2 redware; lead glaze
1 redware; manganese glaze
1 lt. green tint bottle glass; vial?
5 brick; 1 glazed (11.6 grams)
4 window glass
1 spike / chisel tip fragment
27 coal (33.9 grams)

Unit 27, Stratum A

complete flake	quartz	white	no cortex	shaping		9.52	9.20	2.85
complete flake	quartz	white	no cortex	shaping		10.50	8.95	2.34
flake fragment	quartz	white	no cortex	thinning		14.34	18.14	10.28
complete flake	quartzite	pink-gray	no cortex	thinning	internal inclusion	33.58	28.56	9.06
flake fragment	quartzite	pink	cortical	decortication		18.82	24.20	10.42
complete flake	jasper	brown	no cortex	thinning		15.08	10.68	2.65
complete flake	jasper	brown	no cortex	shaping		11.36	9.39	2.88
complete flake	jasper	brown	no cortex	shaping		8.24	8.90	1.12
complete flake	jasper	brown	no cortex	shaping		8.32	8.57	1.86
complete flake	jasper	brown	no cortex	shaping		11.95	8.84	1.63
complete flake	jasper	brown	no cortex	shaping		12.04	6.19	1.36
flake fragment	jasper	brown	no cortex	thinning		11.51	13.54	4.93
spall	jasper	red	no cortex		thermal treatment	7.77	11.16	2.29
broken flake	rhyolite	gray-red	no cortex	thinning		10.80	14.13	4.95

1 redware; lead glaze
2 redware; eroded
1 redware rim; slip trailed, crimped edge
1 jackfield
1 creamware
2 window glass
4 brick (77.9 grams)
4 coal (5.8 grams)
1 oyster; fossilized

Unit 28, Stratum A

1 redware; lead glaze
1 window glass
1 coal (6.6 grams)

Unit 29, Stratum A

broken flake	quartz	white	no cortex	thinning		14.16	12.70	4.12
complete flake	quartzite	pink-gray	no cortex	thinning		20.84	19.69	3.36

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	jasper	red	cortical	decortication	pebble, thermal treatment	8.71	6.83	2.21
complete flake	jasper	brown	cortical	primary		13.51	10.77	3.04
complete flake	jasper	brown	no cortex	thinning		10.96	6.86	1.90
broken flake	jasper	pink	no cortex	shaping		4.01	7.18	1.25
flake fragment	jasper	brown	cortical	decortication		12.92	15.85	7.13
flake fragment	jasper	brown	no cortex	thinning		23.72	24.87	7.66
debris	jasper	brown	cortical		cobble	27.22	15.19	10.57
broken cobble	jasper	brown	cortical		cobble	27.47	26.09	20.10
flake fragment	chert	gray-white	part cortex	thinning	thermal treatment	12.31	13.71	3.73
broken flake	limonite	black	no cortex	thinning		10.33	10.72	3.62

possible groundstone fragment
2 redware; lead glaze
1 horseshoe fragment
1 rivet / snap
1 oyster; fossilized

Unit 30, Stratum A

flake fragment	quartz	white	no cortex	thinning		11.56	10.91	2.87
complete flake	jasper	red	no cortex	shaping	thermal treatment	7.47	6.86	1.34
flake fragment	jasper	brown	no cortex	shaping		9.94	8.09	2.39
1 FCR	quartzite				1.3 grams			

3 redware; lead glaze
1 whiteware
2 brick (0.8 grams)
4 coal (1.7 grams)

Unit 31, Stratum A

complete flake	jasper	brown	cortical	decortication	cobble utilized, small shallow scalar on 1 margin	24.08	35.96	13.50
flake fragment	jasper	red	no cortex	thinning	thermal treatment	8.81	14.60	2.78
flake fragment	chert	black	cortical	decortication		19.04	19.70	5.02

petrified wood
1 redware/brick (0.1 grams)
1 porcelain

Unit 32, Stratum A

complete flake	jasper	red	cortical	decortication	pebble, thermal treatment	6.78	7.91	2.69
complete flake	jasper	red	no cortex	shaping	thermal treatment	7.75	6.71	3.13
flake fragment	jasper	red	part cortex	primary	thermal treatment	9.46	11.80	3.36

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
flake fragment	rhyolite	gray	no cortex	thinning		8.50	8.06	2.23
broken flake	chalcedony	gray	no cortex	shaping	(crushed)	7.36	10.51	2.01
1 cut nail								
1 horseshoe fragment								
Unit 33, Stratum A								
flake fragment	quartz	tan	cortical	decortication		11.37	9.88	3.62
complete flake	chert	black	no cortex	shaping		7.59	9.27	1.48
flake fragment	chert	gray	cortical	decortication	pebble	11.49	14.84	6.92
1 FCR	sandstone							
1 creamware								
2 coal (4.4 grams)								
Unit 34, Stratum A								
complete flake	quartzite	tan	cortical	decortication		9.54	7.50	2.10
complete flake	jasper	red	cortical	decortication	pebble, thermal treatment	7.46	11.89	2.30
complete flake	jasper	brown	part cortex	primary	pebble	10.25	8.61	3.54
complete flake	jasper	brown	no cortex	shaping		7.12	6.23	1.61
broken cobble	jasper	brown	cortical			46.74	27.08	8.51
complete flake	limonite	brown	no cortex	thinning		18.40	23.60	5.45
2 FCR	quartzite				40.5 grams			
1 redware; slip trailed								
1 redware; manganese glaze								
1 redware; eroded								
2 brick (2.1 grams)								
1 window glass								
1 coal (0.8 grams)								
Unit 35, Stratum A								
complete flake	jasper	brown	cortical	decortication	pebble	13.26	10.14	2.99
flake fragment	jasper	red	cortical	decortication	pebble, thermal treatment	7.03	9.99	2.51
broken flake	chert	black	no cortex	shaping		7.40	9.84	1.18
1 coal (0.9 grams)								
Unit 36, Stratum A								
complete flake	quartz	white-tan	no cortex	primary		34.94	20.46	7.82
complete flake	jasper	red	cortical	decortication	pebble, thermal treatment	8.22	9.41	3.54

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
flake fragment	jasper	red	no cortex	thinning	utilized, small shallow deep on 1 margin	20.31	21.38	5.85

2 white stoneware; scratch blue (x-mend)
1 coal (1.3 grams)

Unit 37, Stratum A

complete flake	jasper	brown	cortical	decortication	pebble	14.93	6.26	3.20
complete flake	jasper	brown	no cortex	shaping		10.01	11.91	2.29
complete flake	chert	black	no cortex	shaping	utilized, half moon scalar on 1 margin	11.09	9.74	2.89
flake fragment	chert	black	no cortex	thinning		11.39	8.96	2.17
complete flake	chalcedony	gray	no cortex	shaping		11.77	12.06	1.55

1 whiteware rim
1 brick (7.2 grams)
3 window glass
10 coal (13.4 grams)

Unit 38, Stratum A

flake fragment	quartz	white	no cortex	thinning	from biface	10.13	13.92	4.14
late stage biface	quartz	white	no cortex			36.21	20.95	11.02
flake fragment	quartzite	gray	no cortex	shaping		7.30	8.35	1.50
complete flake	jasper	brown	no cortex	thinning		8.74	11.48	4.11
complete flake	jasper	brown	no cortex	shaping		8.70	5.84	2.29
complete flake	jasper	brown	no cortex	shaping		9.90	10.72	2.06
broken flake	jasper	brown	no cortex	thinning	eraillure scar	15.53	16.18	2.26
flake fragment	jasper	red	no cortex	primary	thermal treatment	19.03	15.13	8.40
flake fragment	jasper	gray-red	no cortex	thinning	thermal treatment	24.40	22.26	6.55
flake fragment	jasper	red	no cortex	thinning		6.84	11.97	2.51
complete flake	chert	gray	no cortex	shaping		9.82	8.99	1.44
flake fragment	chert	black	no cortex	thinning		12.10	8.97	2.37
flake fragment	chert	black	no cortex	shaping		10.11	12.32	2.22
broken flake	chalcedony	black	no cortex	thinning		14.46	11.41	3.49

2 redware; manganese glaze
2 creamware
1 whiteware
1 lt. green tint bottle glass
2 window glass
2 brick (1.4 grams)

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
3 coal (2.0 grams)								
Unit 39, Stratum A								
debris	quartz	pink-clear	no cortex			26.29	14.95	13.56
flake fragment	quartzite	tan	cortical	decortication	cobble	10.63	17.69	3.02
complete flake	jasper	brown	no cortex	thinning		11.65	8.98	4.11
complete flake	jasper	brown	no cortex	shaping		11.63	11.89	2.79
spall	jasper	red	cortical		pebble, thermal treatment	12.28	10.44	3.10
1 redware; lead glaze								
1 redware; eroded								
1 creamware base								
1 aqua panel bottle; embossed								
1 brick (1.1 grams)								
1 window glass								
2 coal (1.5 grams)								
1 oyster; fossilized								
Unit 40, Stratum A								
complete flake	jasper	red	no cortex	thinning		17.30	19.99	6.88
complete flake	jasper	brown	no cortex	shaping		14.26	12.98	2.88
broken flake	jasper	brown	no cortex	shaping		7.51	7.42	0.95
complete flake	chert	black	cortical	decortication		10.25	8.51	2.82
complete flake	chert	black	no cortex	shaping		10.06	9.38	1.48
complete flake	chert	black	no cortex	shaping		7.99	8.34	2.19
complete flake	chert	black	no cortex	shaping		6.84	8.21	1.82
broken flake	chert	black	no cortex	thinning		13.60	13.95	4.78
complete flake	chalcedony	gray	no cortex	shaping		8.62	8.12	1.19
1 whiteware								
1 whiteware; polychrome								
1 brick (0.8 grams)								
3 coal (0.8 grams)								
Unit 41, Stratum A								
complete flake	jasper	brown	no cortex	shaping		6.88	6.87	1.05
complete flake	chert	gray	no cortex	shaping		6.85	7.04	1.05
complete flake	chert	gray	no cortex	shaping		6.68	5.49	0.66
flake fragment	chert	black	cortical	decortication		9.10	10.66	2.41
flake fragment	chert	gray	no cortex	shaping		13.35	10.52	3.16
1 coal (5.4 grams)								

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
Unit 42, Stratum A								
complete flake	jasper	brown	cortical	decortication	pebble	11.53	12.45	3.62
complete flake	jasper	brown	no cortex	shaping		9.72	8.98	1.48
broken flake	jasper	brown	part cortex	primary		24.28	19.72	6.18
flake fragment	jasper	brown	no cortex	thinning		12.99	7.84	2.38
complete flake	chert	black	no cortex	thinning	utilized, microscopic scalar on 1 margin	19.74	23.07	3.98
complete flake	chert	black	no cortex	thinning		16.14	16.17	2.49
1 brick (3.9 grams)								
Unit 43, Stratum A								
complete flake	jasper	brown	cortical	decortication	cobble	23.51	21.73	7.26
					utilized, microscopic scalar on 1 margin			
2 whiteware								
1 window glass								
1 lamp chimney glass								
1 coal (0.8 grams)								
Unit 44, Stratum A								
complete flake	quartz	white	no cortex	shaping		10.28	8.45	2.00
complete flake	jasper	brown	no cortex	shaping		8.84	9.39	2.38
flake fragment	jasper	brown	no cortex	thinning		8.19	8.07	2.46
complete flake	chert	white	part cortex	primary	utilized, large shallow scalar on 2 margins	19.27	16.86	5.60
complete flake	chert	black	no cortex	shaping		8.80	9.04	3.04
1 FCR	quartzite				0.6 grams			
1 colorless bottle glass								
2 coal (0.4 grams)								
Unit 45, Stratum A								
complete flake	quartz	white	no cortex	thinning		15.56	11.79	4.07
middle stage biface	jasper	brown	part cortex		from flake	33.29	27.94	7.47
pebble	jasper	red	part cortex		thermal treatment	10.66	9.87	4.07
complete flake	chert	black	no cortex	shaping		11.56	8.57	1.99

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1 FCR	quartzite				67.3 grams			
2 whiteware								
1 colorless bottle glass								
1 brick (5.9 grams)								
<u>Unit 46, Stratum A</u>								
complete flake	quartz	white	no cortex	thinning		18.76	17.21	5.20
complete flake	jasper	red	no cortex	shaping	eraillure scar	7.90	9.22	2.21
broken flake	jasper	tan	cortical	decorticat ion	pebble	12.03	13.57	4.15
complete flake	chert	gray	no cortex	thinning	(broken in field)	14.98	12.88	1.75
complete flake	chert	black	no cortex	shaping		9.78	11.87	2.83
1 colorless bottle glass								
<u>Unit 47, Stratum A</u>								
flake fragment	quartz	tan	no cortex	thinning		12.69	13.04	3.00
complete flake	jasper	brown	part cortex	thinning	pebble	18.55	18.77	4.22
complete flake	jasper	brown	part cortex	thinning	pebble	12.77	13.86	3.25
spall	jasper	red	cortical		thermal treatment	11.17	11.44	2.95
complete flake	chalcedony	gray	no cortex	shaping	eraillure scar	12.36	9.68	2.25
1 brick (2.7 grams)								
<u>Unit 48, Stratum A</u>								
flake fragment	quartz	white	no cortex	shaping		8.77	9.19	2.74
complete flake	jasper	brown	cortical	decortication		16.25	13.61	4.25
complete flake	jasper	brown	no cortex	thinning		18.47	11.54	3.51
complete flake	jasper	brown	no cortex	shaping		13.90	13.14	2.63
complete flake	jasper	red	no cortex	shaping		10.84	12.54	2.69
complete flake	jasper	brown	no cortex	shaping		10.16	6.86	1.95
flake fragment	jasper	brown	cortical	decortication	cobble	16.64	26.09	8.32
complete flake	chert	black	no cortex	thinning	utilized, large deep scalar on 1 margin	12.76	22.68	4.48
complete flake	chert	black	no cortex	shaping		8.78	8.15	0.77
debris	chert	gray	part cortex			40.45	27.90	18.82
1 lt. green tint bottle glass								
2 brick (0.5 grams)								
<u>Unit 49, Stratum A</u>								
biface fragment	quartz	white	no cortex			30.66	4.67	8.01

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	chert	black	no cortex	thinning	utilized, half moon scalar on 1 margin	37.43	17.70	5.68
2 whiteware								
1 cut nail fragment								
1 brick (1.8 grams)								
2 coal (3.4 grams)								
<u>Unit 50, Stratum A</u>								
complete flake	jasper	brown	cortical	decortication	pebble	20.37	26.71	7.61
complete flake	jasper		no cortex	thinning	eraillure scar	10.36	11.40	3.02
complete flake	jasper	brown	no cortex	thinning	(broken)	16.19	9.79	1.50
complete flake	jasper	brown	no cortex	shaping		8.71	8.68	1.69
broken flake	jasper	brown	cortical	decortication		14.31	13.54	3.09
flake fragment	jasper	red	no cortex	thinning		8.05	13.17	3.75
complete flake	chert	gray	cortical	decortication	pebble	21.32	11.28	3.82
complete flake	chert	gray	cortical	decortication		11.74	14.93	4.01
lateral biface	chert	gray	no cortex			25.72	17.66	2.35
hammerstone								
1 cut nail fragment								
1 brick (0.2 grams)								
5 coal (18.1 grams)								
<u>Unit 51, Stratum A</u>								
complete flake	quartz	clear	no cortex	shaping		8.35	8.98	1.79
complete flake	chert	black	part cortex	primary		13.37	13.95	2.99
flake fragment	chalcedony	gray	no cortex	shaping		8.91	7.80	1.06
1 c.c. ware								
2 whiteware; 1 base								
<u>Unit 52, Stratum A</u>								
complete flake	quartz	white	no cortex	thinning		30.18	23.09	8.58
complete flake	quartz	white	no cortex	shaping		11.79	7.85	2.81
complete flake	chert	black	no cortex	shaping		10.19	7.95	1.53
<u>Unit 53, Stratum A</u>								
complete flake	quartz	tan-white	part cortex	primary		37.42	43.16	10.78
complete flake	jasper	brown	part cortex	decortication	pebble	9.89	12.09	3.84
complete flake	jasper	red	no cortex	shaping		9.53	10.17	1.74
complete flake	chert	gray	no cortex	shaping		8.62	6.39	0.85

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
broken flake	chert	black	part cortex	primary	pebble	11.21	12.42	3.38
1 FCR	quartz				14.0 grams			
2 coal (4.2 grams)								
<u>Unit 54, Stratum A</u>								
broken flake	quartz	white-pink	part cortex	decortication	pebble	8.02	9.43	2.01
complete flake	jasper	brown	no cortex	shaping		8.11	9.15	1.71
complete flake	jasper	brown	no cortex	shaping		9.85	11.09	3.35
complete flake	jasper	brown	no cortex	shaping		11.43	9.06	2.61
flake fragment	jasper	pink	no cortex	thinning		22.08	16.33	3.65
complete flake	chert	white	cortical	decortication	pebble	15.70	23.16	7.10
broken flake	chert	gray	no cortex	thinning		7.27	13.49	2.64
flake fragment	chert	gray	no cortex	shaping		6.57	9.56	1.37
1 whiteware plate footring								
1 cut nail fragment								
<u>Unit 55, Stratum A</u>								
complete flake	quartz	tan	no cortex	primary	utilized, microscopic scalar on 1 margin	30.59	38.33	10.28
complete flake	quartz	tan	no cortex	thinning		19.56	15.46	6.56
broken flake	jasper	red	no cortex	thinning	thermal treatment	6.87	9.71	2.05
flake fragment	jasper	red	no cortex	shaping		6.32	7.67	0.86
debris	jasper	red	part cortex		thermal treatment	8.42	9.98	3.03
spall	jasper	red	part cortex		thermal treatment	14.82	18.57	3.53
flake fragment	chert	gray	part cortex	primary	pebble	11.37	21.67	4.43
1 redware; clear lead glaze								
1 c.c. ware								
1 oyster								
1 window glass								
2 brick (1.6 grams)								
1 plastic								
1 coal ash (4.5 grams)								
<u>Unit 56, Stratum A</u>								
debris	quartz	tan	part cortex			60.06	35.87	16.82
complete flake	chert	gray	no cortex	shaping		13.10	15.01	2.80
complete flake	chert	black	no cortex	shaping	thermal treatment	9.46	8.41	1.81
flake fragment	chert	black	no cortex	shaping	thermal treatment	9.66	8.30	1.94

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
1	redware; slip trailed							
1	colorless bottle glass							
1	window glass							
1	brick (0.3 grams)							
1	cut nail fragment							
31	coal (45.1 grams)							
1	oyster; fossilized							
<u>Unit 57, Stratum A</u>								
flake fragment	quartzite	pink	no cortex	thinning		12.11	9.17	6.11
complete flake	jasper	red	no cortex	thinning	thermal treatment	10.41	6.98	3.99
flake fragment	jasper	brown	part cortex	shaping	pebble	6.86	7.96	2.45
debris	jasper	red	part cortex		pebble thermal treatment	13.03	8.43	5.19
debris	jasper	brown	part cortex		pebble	14.02	9.74	8.63
complete flake	chert	black	no cortex	thinning		12.82	11.17	5.35
1	redware; manganese glaze							
2	window glass							
5	coal (10.6 grams)							
1	coal ash (1.2 grams)							
6	oyster; fossilized, with cinder							
<u>Unit 58, Stratum A</u>								
flake fragment	quartz	tan	no cortex	thinning	early stage medial biface fragment?	17.05	24.04	10.88
flake fragment	quartz	white	no cortex	thinning		10.02	7.63	3.32
complete flake	jasper	red	cortical	decortication	pebble thermal treatment	8.02	8.47	2.57
complete flake	jasper	brown	no cortex	thinning		13.41	6.78	1.61
broken flake	jasper	brown	no cortex	thinning		12.26	12.66	3.26
flake fragment	jasper	red	no cortex	thinning	thermal treatment	10.39	7.18	1.79
flake fragment	jasper	tan	no cortex	shaping		6.79	7.08	1.26
spall	jasper	red	no cortex		thermal treatment	8.40	8.12	2.46
complete flake	chert	gray	no cortex	shaping		12.24	10.60	1.83
complete flake	chert	black	no cortex	shaping		10.64	8.39	1.99
flake fragment	chert	black	no cortex	thinning		14.10	12.82	3.29
1 FCR	quartzite				3.3 grams			
2	redware; eroded							
1	pearlware; blue painted							
2	window glass							
1	brick (0.3 grams)							

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
4 coal (24.0 grams)								
1 oyster; fossilized								
<u>Unit 59, Stratum A</u>								
complete flake	quartz	white	no cortex	thinning		13.50	12.58	3.46
complete flake	quartz	white	no cortex	shaping		7.77	7.63	2.72
broken flake	quartz	white	no cortex	thinning		11.31	11.63	6.05
debris	quartz	white	no cortex			15.60	18.57	12.68
complete flake	jasper	red	cortical	decortication		17.01	17.03	5.27
complete flake	jasper	red	cortical	decortication	pebble	9.27	9.19	1.43
complete flake	jasper	brown	no cortex	thinning		14.52	9.77	2.30
complete flake	jasper	brown	no cortex	shaping	pebble	9.13	7.38	2.85
late stage biface	jasper	brown	no cortex		drill ?	56.26	23.22	9.60
complete flake	chert	gray	part cortex	thinning		24.25	17.20	4.61
broken flake	chert	black	no cortex	shaping		12.59	11.21	1.91
1 redware; eroded								
1 creamware								
1 window glass								
6 brick (16.7 grams)								
8 coal (9.3 grams)								
5 oyster; fossilized								
<u>Unit 60, Stratum A</u>								
complete flake	quartz	white	cortical	decortication	cobble	13.71	9.58	3.97
complete flake	quartz	tan	no cortex	thinning		13.23	10.09	3.98
debris	quartz	white	no cortex			9.25	6.95	4.19
complete flake	quartzite	gray	cortical	decortication	pebble	9.41	8.03	1.79
flake fragment	quartzite	gray	no cortex	thinning	cuesta-quartzite like	13.69	10.12	3.94
core	quartzite	pink	no cortex			45.04	44.45	28.25
complete flake	jasper	brown	cortical	decortication	pebble	19.18	12.91	4.52
complete flake	jasper	red	cortical	decortication	thermal treatment	18.11	9.86	3.84
complete flake	jasper	red	no cortex	thinning		10.83	8.40	3.26
complete flake	jasper	brown	no cortex	shaping		11.29	12.02	2.05
complete flake	jasper	pink	no cortex	shaping		10.17	9.50	1.91
flake fragment	jasper	red	cortical	decortication	pebble	13.43	15.38	5.62
flake fragment	jasper	red	no cortex	thinning	thermal treatment	10.97	11.63	2.40
debris	jasper	red	no cortex			11.45	9.47	7.70
broken pebble	jasper	red	cortical		thermal treatment	19.03	10.40	6.69

Artifact	Material	Color	Cortex	Feature	Comment	Length (mm)	Width (mm)	Thick (mm)
complete flake	chert	black	no cortex	thinning		9.36	8.17	5.15
complete flake	chert	black	no cortex	shaping		9.11	9.66	1.92
complete flake	chert	gray	no cortex	shaping		7.93	9.30	2.86
complete flake	chert	gray-pink	no cortex	shaping		6.92	8.45	1.59
flake fragment	chert	black	no cortex	shaping		8.56	8.26	2.29
4 FCR	quartzite				34.6 grams			

2 redware; manganese glaze
6 brick (9.9 grams)
1 coal (1.4 grams)
1 oyster; fossilized

Unit 61, Stratum A

flake fragment	quartz	tan	cortical	decortication	cobble utilized, microscopic scalar on 1 margin	12.87	25.57	11.42
complete flake	jasper	brown	no cortex	shaping		10.11	8.31	1.09
broken flake	jasper	brown	cortical	decortication		13.57	10.22	2.63
flake fragment	jasper	brown	cortical	decortication		14.30	13.15	4.23
debris	jasper	red	part cortex		thermal treatment	23.92	26.03	9.56
complete flake	chert	gray	no cortex	shaping		9.16	8.56	1.53
broken flake	chert	black	cortical	decortication		11.17	12.41	4.89
3 FCR	quartzite				160.7 grams			

1 redware; clear lead glaze
2 brick (2.3 grams)
1 cut nail fragment
1 oyster; fossilized
5 coal (7.7 grams)
1 oyster; fossilized

APPENDIX C

GEOMORPHOLOGY REPORT

Geomorphological Evaluation – Margaret Sams, Inc.

New Castle County, Delaware
U.S. 301
Churchtown #4 Prehistoric/Historic Site (7NC-F-155)
CHRS, Inc.
June 29, 2011

Overview

The project area is within the Atlantic Coastal Plain Physiographic Province (USGS 2010), on an upland hillside of gentle slope. The sediments composing the Coastal Plain landforms consist of fine to coarse sands, often containing and/or layered with gravels and cobbles. These sediments were deposited by a combination of past and present wave and flow action of water along shorelines, within tidal basins and bays, and at the mouths of rivers emptying into the marine environment. The *Geologic Map of New Castle County, Delaware* (Ramsey 2005) identifies the specific Coastal Plain deposits within this portion of the state as the Columbia sediments. These sediments consist of coarse quartz sands and gravels within a bed of variable depth (generally less than 50 feet) which thickens to the southeast (Delaware Geological Survey and the University of Delaware 2011). Gravels and cobbles composed of sandstone, siltstone, and shale from the Ridge and Valley Physiographic Province, and pegmatite, micaceous schist, and amphibolite from the Piedmont Physiographic Province are present within the Columbia sediments, indicating a genesis from fluvial glacial outwash sediments deposited during the Lower, or early Pleistocene Epoch (Ramsey 2005).

According to the online *Web Soil Survey* (USDA Natural Resources Conservation Service 2005), the soil occurring within the project area is the Reybold silt loam, 2 to 5 percent slopes. This well drained and pedogenically well developed soil is forming in silty aeolian sediments underlain by sandy and loamy fluvio-marine deposits. The silty veneer of the Reybold soil typically varies in depth from 30 to 114 cm (12 to 45 in). This soil occurs on flats and interfluves (uplands between drainage valleys), and carries no risk of flooding or ponding. The Reybold is within the Ultisol soil order, which includes well developed soils that have been deeply weathered and leached of most basic (chemically) components such as calcium and magnesium. The soil profile typically consists of a plowed surface horizon and well weathered upper subsoil within the silty aeolian veneer (Ap-Bt1-Bt2 horizons), underlain by the more sandy and lesser developed fluvio-marine sediments (2BC-2C1-2C2 horizons). The parent material discontinuity between the upper aeolian mantle and the lower sandy sediments is indicated in the horizon notation by an increase in the horizon numeral prefix from 1 to 2 (the number "1" is assumed and not written).

After deposition and exposure, the coarse fluvio-marine sediments of the Reybold soil were covered with silts and fine sands carried by wind (aeolian sediments, or loess). These stacked materials then remained relatively undisturbed, without additional deposition or erosion of sediment over the surface, for a significant amount of time for the well-expressed argillic horizons (Bt1, Bt2) to form within the subsoil. This degree of pedogenic development is most typically noted in soils which have been weathering *in situ* as a relatively undisturbed profile for at least the entire

Holocene Epoch (Birkeland 1999; Schaetzl and Anderson 2005). A weak subsoil (2BC) is present within the lower sandy sediments, which are deeper in the profile and less exposed to weathering.

Methodology

The landform of the project area was visually inspected, and the soil profiles of five test units (Test Units 5, 18, 53, 48, and 24) excavated within the project area were examined and described according to the methods and nomenclature prescribed by the USDA Natural Resources Conservation Service (Schoeneberger, et al. 2002). The soil profile descriptions are included with this report.

Results and conclusions

The soil profiles viewed within the five test units were each of well developed soils forming in a silty veneer over coarse sandy and gravelly deposits, with variations in the thicknesses and depths of several of the soil horizons. The discontinuity between the upper aeolian silt mantle and the lower fluvio-marine sediments was clearly observable in all units. Small amounts of fine gravel from below have been introduced into the silty aeolian mantle from long-term bioturbation from roots and small animals. A well developed argillic horizon was present in the subsoil of all of the profiles, indicating that long-term *in situ* weathering of the soils over this stable landform has occurred, at least throughout the entire Holocene Epoch. The silty aeolian veneer ranged in depth from 58 to 72 cm (23 to 28 in) within Test Units 5, 18, 48, and 24, and contained the plow zone and one or two argillic horizons. The fluvio-marine sediments, buried by the thick veneer, exhibited less pedogenic development due to a deeper position in the profile and less exposure to weathering. In Test Unit 53, however, the aeolian sediments were only 20 cm (8 in) thick, and were entirely contained within the plow zone. Two argillic horizons were noted within the upper portions of the underlying fluvio-marine sediments, which were not as deeply buried and were therefore exposed to significant weathering processes. The presence of this thinner veneer along with the long-term pedogenic development of the upper portion of the fluvio-marine sediments indicate that the initial distribution of wind-blown silt was irregular, and most likely within subtle “dune” formations which thickened upslope. Test Unit 53 lies at the southeast corner of the project area, at the lowest elevation point. Slopes rose to the west and to the north from the southeast corner.

Some degree of soil erosion has most likely occurred after the initial deforestation and agricultural use of the project area, but does not appear to have been extreme within any portion of the project area.

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SOIL PROFILE
Test Unit 5

Date: May 26, 2011 **County**: New Castle County, Delaware
Soil Description By: M.G. Sams, CPSS **Project Location:** U.S. 301; Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Horizon/Depth	SOIL COLOR		Texture	Structure	Consistence	Boundary	Comments
	Matrix	Redox					
Ap/0-29 cm (0-11 in)	10YR 3/3 dark brown		silt loam, with 2% fine gravels	moderate medium granular	friable	abrupt, smooth	
Bt1/29-51 cm (11-20 in)	10YR 4/6 dark yellowish brown		clay loam, with 3 to 5% fine gravels	moderate medium subangular blocky	friable	gradual, smooth	medium, continuous 7.5YR 4/4 brown clay films, and 10YR 4/3 brown worm casts
Bt2/51-68 cm (20-27 in)	7.5YR 4/6 strong brown		clay loam, with 3 to 5% fine gravels	weak medium subangular blocky	friable	abrupt, smooth	thin, patchy 7.5YR 4/4 brown clay films
2C1/68-92 cm (27-36 in)	7.5YR 5/6 strong brown		gravelly loamy sand, with 20% gravels	very weak medium blocky	very friable	clear, smooth	top of fluvio-marine sediments
2C2g/92 cm+ (36 in+)	10YR 5/2 grayish brown	many: 10YR 5/1 gray 10YR 4/6 dark yellowish brown	very gravelly sandy clay loam, with 50% gravels	massive	firm		

Additional Notes: Upland hillside of very low slope; well developed, silty aeolian deposits (Ap-Bt1-Bt2 horizons) overlying gravelly and sandy fluvio-marine sediments (2C1-2C2 horizons).

Margaret Sams Consulting
Geomorphology – Soil Science

SOIL PROFILE
Test Unit 53

Date: May 26, 2011 **County**: New Castle County, Delaware
Soil Description By: M.G. Sams, CPSS **Project Location:** U.S. 301; Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Horizon/Depth	SOIL COLOR		Texture	Structure	Consistence	Boundary	Comments
	Matrix	Redox					
Ap/0-20 cm (0-8 in)	10YR 4/3 brown		silt loam, with 2% fine gravels	moderate medium granular	friable	abrupt, smooth	
2Bt1/20-44 cm (8-17 in)	7.5YR 5/6 strong brown		clay loam, with 10 to 15% gravels	weak medium subangular blocky	friable	gradual, smooth	top of fluvio-marine sediments medium, patchy 7.5YR 5/6 strong brown clay films
2Bt2/44-70 cm (17-28 in)	7.5YR 5/6 strong brown		sandy clay loam, with 15 to 25% gravels and cobbles	very weak medium subangular blocky	very friable	abrupt, smooth	thin, patchy 7.5YR 5/6 strong brown clay films
2C/70-90 cm+ (28-35 in+)	7.5YR 4/6 strong brown		gravels and cobbles in a sandy matrix				

Additional Notes: Upland hillside of very low slope; silty aeolian deposits (Ap horizon) overlying gravelly and sandy fluvio-marine sediments (2Bt1-2Bt2-2C horizons).

Margaret Sams Consulting
Geomorphology – Soil Science

SOIL PROFILE
Test Unit 48

Date: May 26, 2011 **County**: New Castle County, Delaware
Soil Description By: M.G. Sams, CPSS **Project Location:** U.S. 301; Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Horizon/Depth	SOIL COLOR		Texture	Structure	Consistence	Boundary	Comments
	Matrix	Redox					
Ap/0-22 cm (0-9 in)	10YR 4/3 brown		silt loam, with 2% fine gravels	moderate medium granular	friable	abrupt, smooth	
Bt1/22-52 cm (9-20 in)	10YR 4/6 dark yellowish brown		clay loam, with 3 to 5% fine gravels	moderate medium subangular blocky	friable	gradual, smooth	medium, continuous 7.5YR 4/4 brown clay films
Bt2/52-72 cm (20-28 in)	7.5YR 4/6 strong brown, 7.5YR 5/1 gray at base		clay loam, with 3 to 5% fine gravels	weak medium subangular blocky	friable	abrupt, smooth	thin, patchy 7.5YR 4/4 brown clay films gleyed at base of horizon
2C/72-97 cm+ (27-36 in+)	7.5YR 5/6 strong brown		gravelly loamy sand, with 25% gravels	very weak medium blocky	very friable	clear, smooth	top of fluviomarine sediments

Additional Notes: Upland hillside of very low slope; well developed, silty aeolian deposits (Ap-Bt1-Bt2 horizons) overlying gravelly and sandy fluvio-marine sediments (2C horizon).

Margaret Sams Consulting
Geomorphology – Soil Science

SOIL PROFILE
Test Unit 24

Date: May 26, 2011 **County**: New Castle County, Delaware
Soil Description By: M.G. Sams, CPSS **Project Location:** U.S. 301; Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Horizon/Depth	SOIL COLOR		Texture	Structure	Consistence	Boundary	Comments
	Matrix	Redox					
Ap/0-15 cm (0-6 in)	10YR 4/3 dark brown		silt loam	moderate medium granular	friable	abrupt, smooth	
Bt1/15-47 cm (6-19 in)	10YR 4/4 dark yellowish brown		heavy silt loam	moderate medium subangular blocky	friable	gradual, smooth	medium, patchy 10YR 4/3 brown clay films, and worm casts
Bt2/47-61 cm (19-24 in)	10YR 4/4 brown		clay loam	weak medium subangular blocky	friable	abrupt, smooth	thin, patchy 10YR 4/3 brown clay films
2C/61-96 cm+ (24-38 in+)	7.5YR 5/6 strong brown		gravelly loamy sand, with 25% gravels	very weak medium blocky	very friable	clear, smooth	top of fluviomarine sediments

Additional Notes: Upland hillside of very low slope; well developed, silty aeolian deposits (Ap-Bt1-Bt2 horizons) overlying gravelly and sandy fluvio-marine sediments (2C horizon).

Margaret Sams Consulting
Geomorphology – Soil Science

SOIL PROFILE
Test Unit 18

Date: May 26, 2011 **County**: New Castle County, Delaware
Soil Description By: M.G. Sams, CPSS **Project Location:** U.S. 301; Churchtown #4 Prehistoric/Historic Site (7NC-F-155)

Horizon/Depth	SOIL COLOR		Texture	Structure	Consistence	Boundary	Comments
	Matrix	Redox					
Ap/0-28 cm (0-11 in)	10YR 3/3 dark brown		silt loam	moderate medium granular	friable	abrupt, smooth	
Bt/28-58 cm (11-23 in)	10YR 4/4 brown		clay loam, with 3 to 5% fine gravels	moderate medium subangular blocky	friable	gradual, smooth	medium, continuous 7.5YR 4/4 brown clay films, and 10YR 4/3 brown worm casts
2C/58 cm+ (23 in+)	7.5YR 5/6 strong brown		gravelly loamy sand, with 20% gravels	very weak medium blocky	very friable	clear, smooth	top of fluviomarine sediments

Additional Notes: Upland hillside of very low slope; well developed, silty aeolian deposits (Ap-Bt horizons) overlying gravelly and sandy fluvio-marine sediments (2C horizon).

Margaret Sams Consulting
Geomorphology – Soil Science

APPENDIX D

FLOATATION ANALYSIS REPORT

FLOTATION RECORD

SAMPLE PROVENIENCE:	PROJECT CODE: **DELDOT08**
Site: **7NC-F-118**	date floated: **1-3-12**
STP: Unit: **8** Stratum: level:	initials: **CC**
Feature: **2** cmbs: date: **3-11-11**	General Matrix Composition: **sandy loam** **5 % tiny pebbles** **517.3 grams**

HEAVY FRACTION

Wood Charcoal Y / **N** Weight _____

Lithic Artifacts: **none**

artifact	material	color	cortex	features	length	width	thick	util	mar	plat	ter

Seeds: **none**

Identification	Common Name	Count	Weight	Carbonized

Bone:

carbonized?

Other:

LIGHT FRACTION

Wood Charcoal **Y** / N Weight 0.1 grams

Identification	Common Name	Count	Weight	Carbonized
Hedeoma pulegioides	american false pennyroyal	8	< 0.1 g	Y

Bone:

carbonized?

Other:

Comments:

Flotation Record

SAMPLE PROVENIENCE:	PROJECT CODE: **DELDOT08**
Site: **7NC-F-118**	date floated: **1-9-12**
STP: Unit: **19** Stratum: level:	initials: **CC**
Feature: **4** cmbs: date: **3-8-11**	General Matrix Composition:

high clay content (used calgon)
3 % tiny pebbles
1248.7 grams

HEAVY FRACTION

Wood Charcoal **Y** / N Weight 0.1 grams (39)

Lithic Artifacts:

artifact	material	color	cortex	features	length	width	thick	util	mar	plat	ter
complete flake	quartz	white	no cortex	retouch	2.38	1.71	0.54			9	1
flake fragment	quartz	white	no cortex	shaping	7.37	9.53	1.69				1
complete flake	jasper	yellow	no cortex	retouch	1.78	1.88	0.41			9	1
complete flake	jasper	brown	no cortex	retouch	3.01	3.98	0.22			8	1

Seeds: **none**

Identification	Common Name	Count	Weight	Carbonized

Bone:
carbonized?
Other:

LIGHT FRACTION

Wood Charcoal **Y** / N Weight < 0.1 grams (6)

Identification	Common Name	Count	Weight	Carbonized
Amaranthus sp.	pigweed	18	< 0.1 g	N
Hedeoma pulegioides	american false pennyroyal	66	0.1 g	Y
Muhlenbergia schreberi	nimblewill	1	< 0.1 g	Y
Mollugo verticillata	carpetweed	4	< 0.1 g	N

Bone:

carbonized?

Other:

Comments:

Flotation Record

SAMPLE PROVENIENCE:	PROJECT CODE: **DELDOT08**
Site: **7NC-F-118**	date floated: **1-3-12**
STP: Unit: Stratum: level:	initials: **CC**
Feature: **6 W ½ south portion** date: **5-25-11**	General Matrix Composition: **sandy loam** **3 % tiny pebbles** **2450.1 grams**

HEAVY FRACTION

Wood Charcoal **Y** / N Weight < 0.1 grams (5)

Lithic Artifacts

artifact	material	color	cortex	features	length	width	thick	util	mar	plat	ter
flake fragment	quartz	white	no cortex	shaping	4.56	6.62	1.61				1

Seeds: **none**

Identification	Common Name	Count	Weight	Carbonized

Bone:

carbonized?

Other:

LIGHT FRACTION

Wood Charcoal **Y** / N Weight 0.2 grams (139)

Identification	Common Name	Count	Weight	Carbonized
Amaranthus sp.	pigweed	12	< 0.1 g	3=Y / 9=N
Hedeoma pulegioides	american false pennyroyal	144	0.1 g	Y
Muhlenbergia schreberi	nimblewill	1	< 0.1 g	Y
Vicia hirsuta	tiny vetch	2	< 0.1 g	Y
Trifolium sp. (repens?)	clover (white?)	1	< 0.1 g	Y

Bone:

carbonized?

Other:

Comments:

lots of root fibers

Flotation Record

SAMPLE PROVENIENCE:	PROJECT CODE: **DELDOT08**
Site: **7NC-F-118**	date floated: **1-9-12**
STP: Unit: Stratum: level:	initials: **CC**
Feature: **6 W ½ north portion** date: **5-25-11**	General Matrix Composition: **sandy loam** **2 % tiny pebbles** **3211.4 grams**

HEAVY FRACTION

Wood Charcoal **Y** / N Weight ___0.4 grams_(76) __

Lithic Artifacts

artifact	material	color	cortex	features	length	width	thick	util	mar	plat	ter
complete flake	quartz	clear	no cortex	retouch	3.43	3.84	1.82			9	1
complete flake	quartz	white	no cortex	retouch	4.20	1.59	0.70			9	1
broken flake	quartz	white	no cortex	retouch	3.29	3.04	0.81			9	
complete flake	jasper	red	no cortex	shaping	6.61	6.20	2.26			8	1
flake fragment	jasper	brown	no cortex	retouch	3.81	5.03	0.82				1
flake fragment	jasper	red	no cortex	retouch	1.84	2.43	0.19				1
broken flake	chert	black	no cortex	shaping	8.78	4.88	0.83			12	

Seeds: **none**

Identification	Common Name	Count	Weight	Carbonized

Bone:

carbonized?

Other:

LIGHT FRACTION

Wood Charcoal **Y** / N Weight < 0.1 grams (16)

Identification	Common Name	Count	Weight	Carbonized
Amaranthus sp.	pigweed	4	< 0.1 g	N
Hedeoma pulegioides	american false pennyroyal	52	< 0.1 g	Y
Muhlenbergia schreberi	nimblewill	2	< 0.1 g	Y
Vicia hirsuta	tiny vetch	4	< 0.1 g	Y

Bone:

carbonized?

Other:

Comments:

lots of root fibers

APPENDIX E

RADIOCARBON ANALYSIS REPORT

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Miami, Florida 33155 USA
Tel: 305 667 5167
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Beta@radiocarbon.com
www.radiocarbon.com

Consistent Accuracy . . .
. . . Delivered On-time

Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

January 4, 2012

Dr. Christina Civello
CHRS, Incorporated
451 N. Cannon Avenue
Suite 100B
Lansdale, PA 19446
USA

RE: Radiocarbon Dating Results For Samples DELDOT01 1, DELDOT01 2, DELDOT01 3, DELDOT01 4

Dear Dr. Civello:

Enclosed are the radiocarbon dating results for four samples recently sent to us. They each provided plenty of carbon for accurate measurements and all the analyses proceeded normally. The report sheet also contains the method used, material type, and applied pretreatments and, where applicable, the two-sigma calendar calibration range.

As always, this report has been both mailed and sent electronically. All results (excluding some inappropriate material types) which are less than about 20,000 years BP and more than about ~250 BP include this calendar calibration page (also digitally available in Windows metafile (wmf) format upon request). The calibrations are calculated using the newest (2004) calibration database with references quoted on the bottom of each page. Multiple probability ranges may appear in some cases, due to short-term variations in the atmospheric 14C contents at certain time periods. Examining the calibration graphs will help you understand this phenomenon. Don't hesitate to contact us if you have questions about calibration.

We analyzed these samples on a sole priority basis. No students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analyses. We analyzed them with the combined attention of our entire professional staff.

Information pages are also enclosed with the mailed copy of this report. If you have any specific questions about the analyses, please do not hesitate to contact us.

Thank you for prepaying the analyses. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Darden Hood
Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Dr. Christina Civello

Report Date: 1/4/2012

CHRS, Incorporated

Material Received: 12/13/2011

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 312054 SAMPLE : DELDOT01 1 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 410 to 540 (Cal BP 1540 to 1410)	1640 +/- 30 BP	-27.8 o/oo	1590 +/- 30 BP
Beta - 312055 SAMPLE : DELDOT01 2 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 380 to 440 (Cal BP 1570 to 1510) AND Cal AD 450 to 460 (Cal BP 1500 to 1490) Cal AD 480 to 530 (Cal BP 1470 to 1420)	1620 +/- 30 BP	-24.5 o/oo	1630 +/- 30 BP
Beta - 312056 SAMPLE : DELDOT01 3 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 1450 to 1640 (Cal BP 500 to 310)	370 +/- 30 BP	-27.0 o/oo	340 +/- 30 BP
Beta - 312057 SAMPLE : DELDOT01 4 ANALYSIS : AMS-Standard delivery MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid 2 SIGMA CALIBRATION : Cal AD 380 to 440 (Cal BP 1570 to 1510) AND Cal AD 450 to 460 (Cal BP 1500 to 1490) Cal AD 480 to 530 (Cal BP 1470 to 1420)	1640 +/- 30 BP	-25.5 o/oo	1630 +/- 30 BP

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

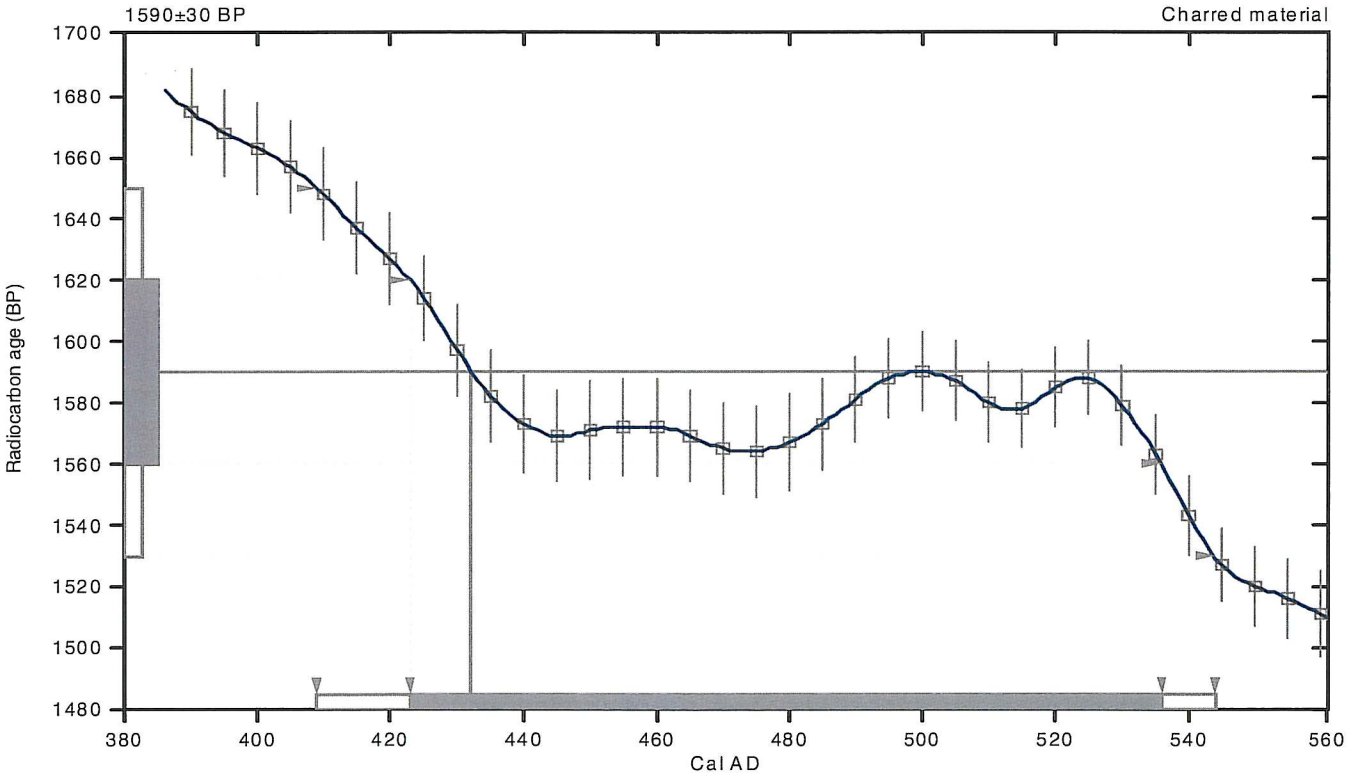
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27.8:lab. mult=1)

Laboratory number:	**Beta-312054**
Conventional radiocarbon age:	**1590±30 BP**
2 Sigma calibrated result: (95% probability)	**Cal AD 410 to 540 (Cal BP 1540 to 1410)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 430 (Cal BP 1520)
1 Sigma calibrated result: (68% probability)	Cal AD 420 to 540 (Cal BP 1530 to 1410)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

Mathematics used for calibration scenario

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

Beta Analytic Radiocarbon Dating Laboratory

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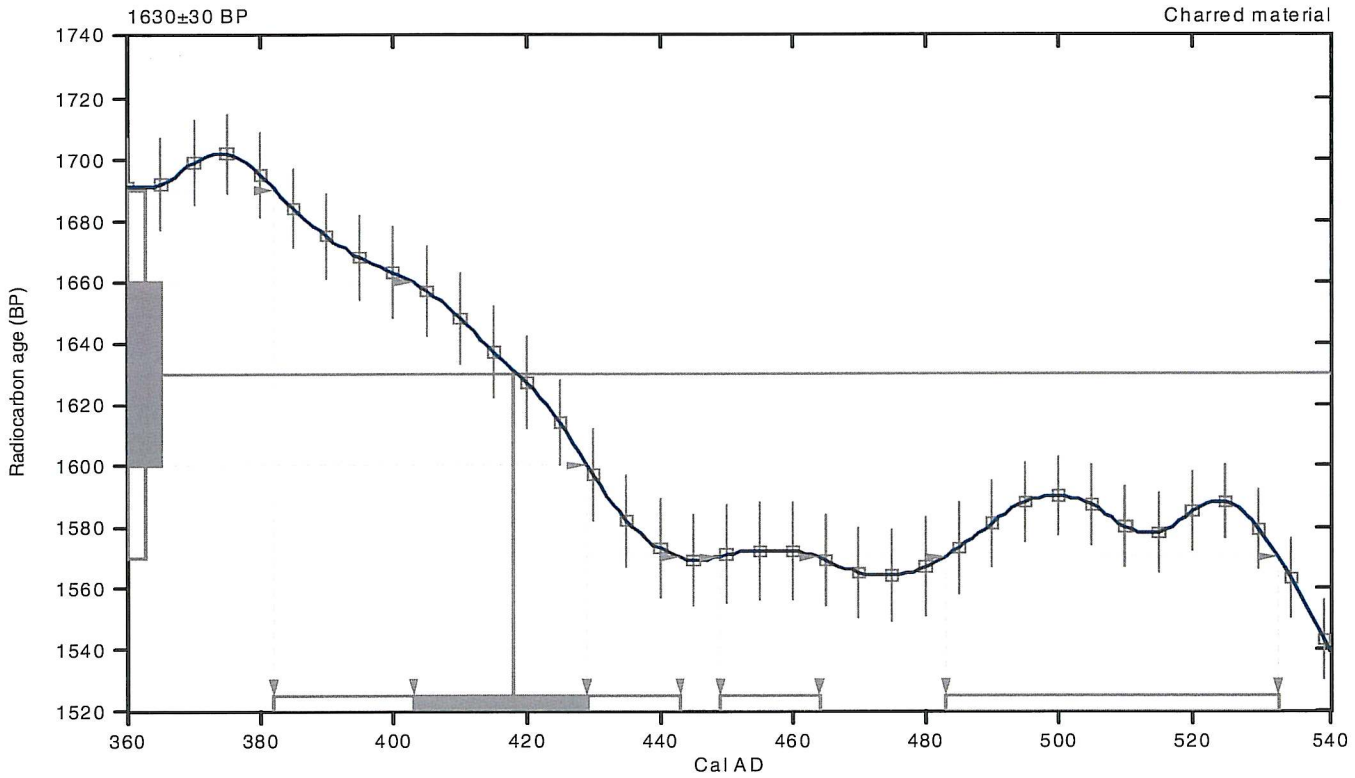
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-24.5:lab. mult=1)

Laboratory number:	**Beta-312055**
Conventional radiocarbon age:	**1630±30 BP**
2 Sigma calibrated results: (95% probability)	**Cal AD 380 to 440 (Cal BP 1570 to 1510) and Cal AD 450 to 460 (Cal BP 1500 to 1490) and Cal AD 480 to 530 (Cal BP 1470 to 1420)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 420 (Cal BP 1530)
1 Sigma calibrated result: (68% probability)	Cal AD 400 to 430 (Cal BP 1550 to 1520)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

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CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-27:lab. mult=1)

Laboratory number: **Beta-312056**

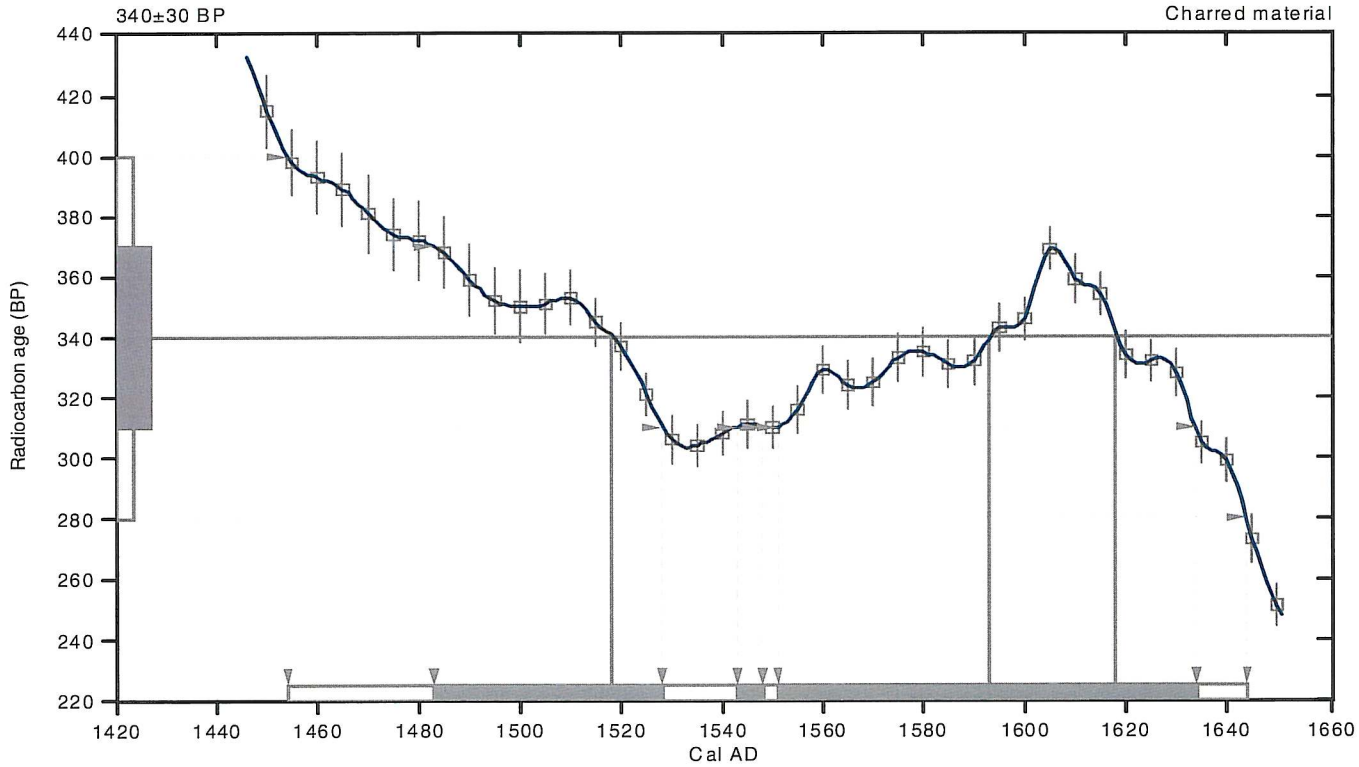
Conventional radiocarbon age: **340±30 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1450 to 1640 (Cal BP 500 to 310)**

Intercept data

Intercepts of radiocarbon age with calibration curve: Cal AD 1520 (Cal BP 430) and
Cal AD 1590 (Cal BP 360) and
Cal AD 1620 (Cal BP 330)

1 Sigma calibrated results: (68% probability) Cal AD 1480 to 1530 (Cal BP 470 to 420) and
Cal AD 1540 to 1550 (Cal BP 410 to 400) and
Cal AD 1550 to 1630 (Cal BP 400 to 320)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

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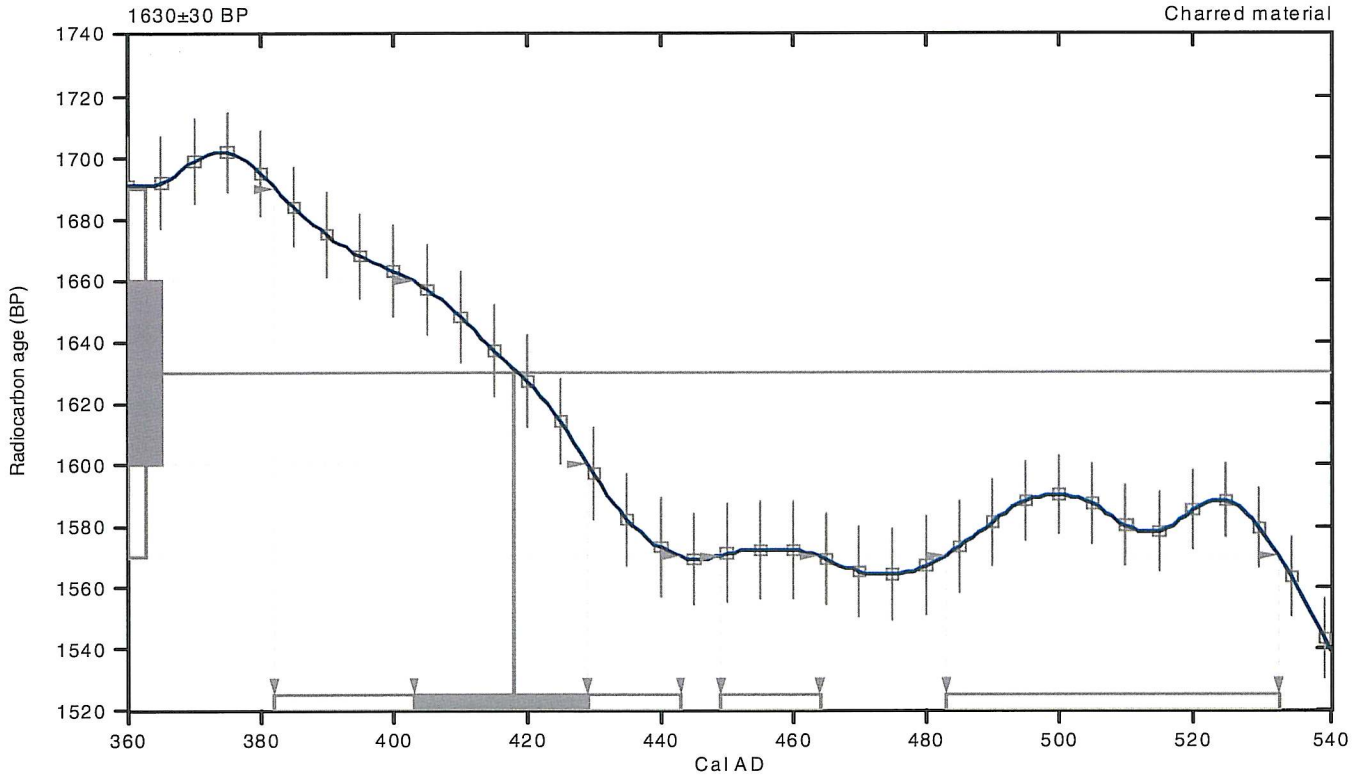
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.5:lab. mult=1)

Laboratory number:	**Beta-312057**
Conventional radiocarbon age:	**1630±30 BP**
2 Sigma calibrated results: (95% probability)	**Cal AD 380 to 440 (Cal BP 1570 to 1510) and Cal AD 450 to 460 (Cal BP 1500 to 1490) and Cal AD 480 to 530 (Cal BP 1470 to 1420)**

Intercept data

Intercept of radiocarbon age with calibration curve:	Cal AD 420 (Cal BP 1530)
1 Sigma calibrated result: (68% probability)	Cal AD 400 to 430 (Cal BP 1550 to 1520)



References:

Database used

INTCAL09

References to INTCAL09 database

Heaton,et.al.,2009, Radiocarbon 51(4):1151-1164, Reimer,et.al, 2009, Radiocarbon 51(4):1111-1150, Stuiver,et.al,1993, Radiocarbon 35(1):137-189, Oeschger,et.al.,1975,Tellus 27:168-192

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The Radiocarbon Laboratory Accredited to ISO-17025 Testing Standards (PJLA Accreditation #59423)

Final Report

The final report is accessed as a PDF via a secure personal directory on our website. UserID and password are initially provided to you, which you can change to values of your choosing (letters and numbers only). A mailed copy is also sent to you including a statement outlining our analytical procedures, a glossary of pretreatment terms, calendar calibration information, and billing documents. In addition to the analytical result, the final report sheet includes the individual analysis method, the delivery basis, the material type and the individual pretreatments applied.

Pretreatment

Pretreatment methods are reported along with each result. All necessary chemical and mechanical pretreatments of the submitted material were applied at the laboratory to isolate the carbon, which may best represent the time event of interest. When interpreting the results, it is important to consider the pretreatments. Some samples cannot be fully pretreated, making their ^{14}C ages more subjective than samples, which can be fully pretreated. Some materials receive no pretreatments. Please look at the pretreatment indicated for each sample and read the pretreatment glossary to understand the implications.

Analysis

Results reported using the AMS technique were derived from reduction of sample carbon (after pretreatment) to graphite (100 %C), along with standards and backgrounds, with subsequent detection in one of two AMS instruments here in our facilities. Results reported using the radiometric technique were analyzed by synthesizing sample carbon (after pretreatment) to benzene (92% C), measuring for ^{14}C content in one of 53 scintillation spectrometers. If the Extended Counting Service was used, the ^{14}C content was measured for a greatly extended period of time.

The Radiocarbon Age and Calendar Calibration

The Conventional ^{14}C Age and related "percent modern carbon" (pMC) is the result after applying $^{13}C/^{12}C$ corrections to account for isotopic fractionation differences between the sample and modern reference. Always cite both this age and the 13C/12C ratio in your reports and papers (as well as the laboratory number). The Conventional Radiocarbon Age is cited with the units "BP" (Before Present). "Present" is defined as AD 1950 for the purposes of radiocarbon dating. Results are reported as pMC for samples containing more ^{14}C than the modern reference standard. pMC results indicate the material was respiring carbon after the advent of thermo-nuclear weapons testing and is less than ~ 60 years old.

Calendar calibrations are included for applicable materials. If calibrations are not included for a result, it means it was too young, too old, or inappropriate for calibration. The calibration database and mathematics used are cited at the bottom of each calibration printout. The most appropriate approximation of age is the "2 sigma calibrated result". Be sure to cite this as well as the calibration database and mathematics used in your reports and papers.

PRETREATMENT GLOSSARY
Standard Pretreatment Protocols at Beta Analytic

Unless otherwise requested by a submitter or discussed in a final date report, the following procedures apply to pretreatment of samples submitted for analysis. This glossary defines the pretreatment methods applied to each result listed on the date report form (e.g. you will see the designation "acid/alkali/acid" listed along with the result for a charcoal sample receiving such pretreatment).

Pretreatment of submitted materials is required to eliminate secondary carbon components. These components, if not eliminated, could result in a radiocarbon date, which is too young or too old. Pretreatment does not ensure that the radiocarbon date will represent the time event of interest. This is determined by the sample integrity. Effects such as the old wood effect, burned intrusive roots, bioturbation, secondary deposition, secondary biogenic activity incorporating recent carbon (bacteria) and the analysis of multiple components of differing age are just some examples of potential problems. The pretreatment philosophy is to reduce the sample to a single component, where possible, to minimize the added subjectivity associated with these types of problems. If you suspect your sample requires special pretreatment considerations be sure to tell the laboratory prior to analysis.

"acid/alkali/acid"

The sample was first gently crushed/dispersed in deionized water. It was then given hot HCI acid washes to eliminate carbonates and alkali washes (NaOH) to remove secondary organic acids. The alkali washes were followed by a final acid rinse to neutralize the solution prior to drying. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of the sample. Each chemical solution was neutralized prior to application of the next. During these serial rinses, mechanical contaminants such as associated sediments and rootlets were eliminated. This type of pretreatment is considered a "full pretreatment". On occasion the report will list the pretreatment as "acid/alkali/acid - insolubles" to specify which fraction of the sample was analyzed. This is done on occasion with sediments (See "acid/alkali/acid - solubles"

Typically applied to: charcoal, wood, some peats, some sediments, and textiles "acid/alkali/acid - solubles"

On occasion the alkali soluble fraction will be analyzed. This is a special case where soil conditions imply that the soluble fraction will provide a more accurate date. It is also used on some occasions to verify the present/absence or degree of contamination present from secondary organic acids. The sample was first pretreated with acid to remove any carbonates and to weaken organic bonds. After the alkali washes (as discussed above) are used, the solution containing the alkali soluble fraction is isolated/filtered and combined with acid. The soluble fraction, which precipitates, is rinsed and dried prior to combustion.

"acid/alkali/acid/cellulose extraction"

Following full acid/alkali/acid pretreatments, the sample is bathed in (sodium chlorite) $NaClO_2$ under very controlled conditions (Ph = 3, temperature = 70 degrees C). This eliminates all components except wood cellulose. It is useful for woods that are either very old or highly contaminated.

Applied to: wood

"acid washes"

Surface area was increased as much a possible. Solid chunks were crushed, fibrous materials were shredded, and sediments were dispersed. Acid (HCI) was applied repeatedly to ensure the absence of carbonates. Chemical concentrations, temperatures, exposure times, and number of repetitions, were applied accordingly with the uniqueness of each sample. The sample was not be subjected to alkali washes to ensure the absence of secondary organic acids for intentional reasons. The most common reason is that the primary carbon is soluble in the alkali. Dating results reflect the total organic content of the analyzed material. Their accuracy depends on the researcher's ability to subjectively eliminate potential contaminants based on contextual facts.

Typically applied to: organic sediments, some peats, small wood or charcoal, special cases

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Calendar Calibration at Beta Analytic

Calibrations of radiocarbon age determinations are applied to convert BP results to calendar years. The short-term difference between the two is caused by fluctuations in the heliomagnetic modulation of the galactic cosmic radiation and, recently, large scale burning of fossil fuels and nuclear devices testing. Geomagnetic variations are the probable cause of longer-term differences.

The parameters used for the corrections have been obtained through precise analyses of hundreds of samples taken from known-age tree rings of oak, sequoia, and fir up to about 10,000 BP. Calibration using tree-rings to about 12,000 BP is still being researched and provides somewhat less precise correlation. Beyond that, up to about 20,000 BP, correlation using a modeled curve determined from U/Th measurements on corals is used. This data is still highly subjective. Calibrations are provided up to about 19,000 years BP using the most recent calibration data available.

The Pretoria Calibration Procedure (Radiocarbon, Vol 35, No.1, 1993, pg 317) program has been chosen for these calendar calibrations. It uses splines through the tree-ring data as calibration curves, which eliminates a large part of the statistical scatter of the actual data points. The spline calibration allows adjustment of the average curve by a quantified closeness-of-fit parameter to the measured data points. A single spline is used for the precise correlation data available back to 9900 BP for terrestrial samples and about 6900 BP for marine samples. Beyond that, splines are taken on the error limits of the correlation curve to account for the lack of precision in the data points.

In describing our calibration curves, the solid bars represent one sigma statistics (68% probability) and the hollow bars represent two sigma statistics (95% probability). Marine carbonate samples that have been corrected for $^{13}C/^{12}C$, have also been corrected for both global and local geographic reservoir effects (as published in Radiocarbon, Volume 35, Number 1, 1993) prior to the calibration. Marine carbonates that have not been corrected for $^{13}C/^{12}C$ are adjusted by an assumed value of 0 %0 in addition to the reservoir corrections. Reservoir corrections for fresh water carbonates are usually unknown and are generally not accounted for in those calibrations. In the absence of measured $^{13}C/^{12}C$ ratios, a typical value of -5 %0 is assumed for freshwater carbonates.

(Caveat: the correlation curve for organic materials assume that the material dated was living for exactly ten years (e.g. a collection of 10 individual tree rings taken from the outer portion of a tree that was cut down to produce the sample in the feature dated). For other materials, the maximum and minimum calibrated age ranges given by the computer program are uncertain. The possibility of an "old wood effect" must also be considered, as well as the potential inclusion of younger or older material in matrix samples. Since these factors are in determinant error in most cases, these calendar calibration results should be used only for illustrative purposes. In the case of carbonates, reservoir correction is theoretical and the local variations are real, highly variable and dependent on provenience. Since imprecision in the correlation data beyond 10,000 years is high, calibrations in this range are likely to change in the future with refinement in the correlation curve. The age ranges and especially the intercept ages generated by the program must be considered as approximations.)