INTRODUCTION

The purpose of this report is to describe phase I and II archaeological investigations of the proposed Whitten Road bridge replacement project. The project is located in northern New Castle County, Delaware, (Figure 1) and includes approximately 2000 feet of right-of-way, (Figure 2). The field work and report preparation took place in the late fall of 1984.

Overviews of the regional environmental setting, the regional prehistory and the regional history are presented below.

Environmental Setting

The Whitten Road project area is located in the Delaware High Coastal Plain. The summary of its environmental setting presented below is abstracted from Custer (1984:25).

Located between the Fall Line and the Smyrna River, the High Coastal Plain represents the southeastern extension of the very coarse glacial deposits of the Columbia sediments. In many areas these coarse deposits resisted erosion, creating a rolling topography with up to 16 meters (50 feet) of elevation difference between the headlands bordering the larger streams and the adjacent floodplain marshes. Such a setting exists in the study area with an elevation of approximately 5 meters (16 feet). These elevation differences are great enough to significantly influence seasonal differences in plant communities (Braun 1967, 246-47). Water courses tend to be deeply incised and are lined by a veneer of relatively recent sediments that is thin along the upper reaches of drainages and thickens moving toward their mouths. Most streams are tidal and the saltwater/freshwater mix

allows for a wide range of resources. Soils include a variety of well-drained and swampy settings that are distributed in a mosaic pattern across the region.

The environments of the regions around the study area have changed dramatically over the past 15,000 years (Custer 1984:30-37). However, given the active nature of the adjacent Christina River and the poorly drained conditions in its floodplain, the project area would have been characterized by a swampy deciduous floodplain forest composed of hydrophytic species for most of the past 15,000 years. A deciduous gallery forest probably covered most of the adjacent headlands over the same time period. Although the morphology of the stream channel would have changed through time, it probably always carried water and supported some kind of swampy woodland within its frequent floodplain. In sum, the environments of the project area would have been attractive for human habitation throughout the prehistoric and historic periods, with its flowing fresh water, well drained headlands, game-attractive swamp, and abundant cobble deposits for the manufacturing of stone tools.

Regional Prehistory

The prehistoric archaeological record of northern New Castle County area can be divided into four blocks of time: The Paleo-Indian Period (ca. 12,000 B.C. - 6500 B.C.), The Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000), and the Woodland II Period (A.D. 1000 - A.D. 1650). A fifth time period, the Contact period, may also be considered and includes the time period from A.D. 1650 to A.D. 1750, the approximate date of the final Indian habitation of northern

Delaware in anything resembling their pre-European Contact form. Each of these periods is described below and the descriptions are summarized from Custer (1984).

Paleo-Indian Period (12,000 B.C. - 6500 B.C.) - The Paleo-Indian Period encompasses the time period of the final disappearance of Pleistocene glacial conditions from Eastern North America and the establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to the cold, and alternately wet and dry, conditions at the end of the Pleistocene and the beginning of the Holocene. This adaptation was primarily based on hunting and gathering, with hunting providing a large portion of the diet. Hunted animals may have included now extinct megafauna and moose. A mosaic of deciduous, boreal, and grassland environments would have provided a large number of productive habitats for these game animals throughout Delaware, and watering areas would have been particularly good hunting settings.

Tool kits of the people who lived at this time were oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials has been noted in the stone tool kits and careful resharpening and maintenance of tools was common. A lifestyle of movement among the game attractive environments has been hypothesized with the social organizations being based upon single and multiple family bands. Throughout the 5500 year time span of the period, the basic settlement structure remained relatively constant with some modifications being seen as Holocene environments appeared at the

end of the Paleo-Indian Period.

Numerous Paleo-Indian sites are noted for northern Delaware including hunting and processing sites near Hockessin and adjacent to the Wilmington Medical Center (Custer, Catts and Bachman 1982), possible quarry sites near Iron Hill, and isolated point finds.

Archaic Period (6500 B.C. - 3000 B.C.) - The Archaic Period is characterized by a series of adaptations to the newly emerged full Holocene environments. These environments differed from earlier ones and were dominated by mesic forests of oak and hemlock. A reduction in open grasslands in the face of warm and wet conditions caused the extinction of many of the grazing animals hunted during Paleo-Indian times; however, browsing species such as deer flourished. Sea level rise was also associated with the beginning of the Holocene Period in northern Delaware. The major effect of the sea level rise was to raise the local water table, which helped to create a number of large swamps, such as Churchmans Marsh. Adaptations changed from the hunting focus of the Paleo-Indians to a more generalized foraging pattern in which plant food resources would have played a more important role. Large swamp settings such as Churchmans Marsh supported large base camps as indicated by the remains at the Clyde Farm Site. A number of small procurement sites in favorable hunting and gathering locales are also known in northern Delaware.

Tool kits were more generalized than earlier Paleo-Indian tool kits and showed a wider array of plant processing tools such as grinding stones, mortars, and pestles. A mobile lifestyle was

probably common with a wide range of resources and settings utilized on a seasonal basis. A shifting band-level organization which saw the waxing and waning of group size in relation to resource availability is evident.

Woodland I Period (3000 B.C. - A.D. 1000) - The Woodland I Period can be correlated with a dramatic change in local climates and environments that seems to have been a part of events occurring throughout the Middle Atlantic region. A pronounced warm and dry period set in and lasted from ca. 3000 B.C. to 1000 B.C. Mesic forests were replaced by xeric forests of oak and hickory, and grasslands again became common. Some interior streams dried up, but the overall effect of the environmental changes was an alteration of the environment, not a degradation. Continued sea level rise also made many areas of the Delaware River and Bay shore the sites of large brackish water marshes which were expecially high in productivity. The major changes in environment and resource distributions caused a radical shift in adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and estuarine swamp/marsh areas. Large base camps with fairly large numbers of people are evident in many areas of northern New Castle County such as the Delaware Park Site, the Clyde Farm Site, the Crane Hook Site, and the Naamans Creek Site, These sites supported many more people than previous base camp sites and may have been occupied on nearly a year-round basis. The overall tendency was toward a more sedentary lifestyle.

The overall tool kits show some minor variations as well as

some major additions from previous Archaic tool kits. Plant processing tools became increasingly common and seem to indicate an intensive harvesting of wild plant foods that may have approached the efficiency of horticulture by the end of the Woodland I Period. Chipped stone tools changed little from the preceding Archaic Period; however, more broad-bladed knife-like processing tools became prevalent. Also, the presence of a number of non-local lithic raw materials indicates that trade and exchange systems with other groups were beginning to develop. The addition of stone, and then ceramic, containers is also seen. These items allowed more efficient cooking of certain types of food and may also have functioned as storage for surplus food resources. Storage pits and house features during this period are also known from the Delaware Park Site and the Clyde Farm Site. Social organizations also seem to have undergone radical changes during this period. With the onset of relatively sedentary lifestyles and intensified food production, which might have produced occasional surpluses, incipient ranked societies may have begun to develop, as indicated by the presence of extensive trade and exchange and some caching of special artifact forms. By the end of the Woodland I Period a relatively sedentary lifestyle existed in northern Delaware.

Woodland II Period (A.D. 1000 - A.D. 1650) - In many areas of the Middle Atlantic, the Woodland II Period is marked by the appearance of agricultural food production systems; however, settlements of the Woodland I Period, especially the large base camps, were also occupied during the Woodland II Period and very few changes in basic lifestyles and artifact assemblages are

evident. Intensive plant utilization and hunting remained the major subsistence activities up to European Contact. Similarly, no major changes are seen in social organization for the Woodland II Period of northern Delaware.

Contact Period (A.D. 1650 - A.D. 1750) - The contact period is an enigmatic period of the archaeological record of northern Delaware which began with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because few Native American archaeological sites that clearly date to this period have yet been discovered in Delaware, although numerous Contact Period sites are evident in southeastern Pennsylvania. It seems clear that Native American groups of Delaware did not paricipate in much interaction with Europeans and were under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area except for a few remnant groups.

The well-drained surfaces of the uplands within the study area, coupled with the proximity to surface water would have made the study area attractive to prehistoric peoples for all of the time periods noted above. However, only smaller procurement sites, staging sites, or small base camp sites are expected for the study area due to the absence of incoming tributary streams of the Christina in the study area.

Regional History

The first historic settlement in what is now Delaware was a

whaling station established by the Dutch West India Company in 1630 near the present town of Lewes. However, this post was destroyed by Indians in 1631 and no settlement in that area was attempted again until 1659. A Swedish colony was established in 1638 at Fort Christina, near the present site of Wilmington, by the New Sweden Company. Although the land was claimed by the Dutch, it was little used and was unsettled when the Swedes arrived. By 1654 a small village, Christinahamm, existed behind the fort, and approximately 400 Swedish, Finnish, and Dutch settlers resided in the area.

In 1655, the uneasy coexistence between the Swedes and Dutch was abruptly ended when the Dutch seized control of New Sweden. Dutch Fort Casimir, established in 1651, and the town of New Amstel (modern New Castle) became the economic and commercial center for the lower Delaware Valley. Ownership of the Delaware region changed hands again in 1664, when the English took control of all Dutch possessions in the New World. In 1682, the granting of proprietary rights to William Penn and his representatives gave economic and political control of the Delaware region to Philadelphia, the new seat of government.

The settlement pattern for this early period was one of dispersed farmsteads located along the Delaware and its tributaries, such as the Christina, Appoquinimink, Brandywine, White Clay and Red Clay, where the land possessed good agricultural qualities. The Swedish and Dutch settlers had pushed their settlement far up the valley of the Christina toward the Elk River. The town of Christina Bridge, so named because it was the crossing place of that river, was established by about

1660 at the head of navigation of the Christina.

By 1683 the cultivated areas of the region consisted of the three lower counties, New Castle, Kent, and Sussex, and three Pennsylvania counties, Philadelphia, Buckingham (Bucks), and Chester. The total population of all six of these counties in 1683 has been estimated to have been about four thousand people. In New Castle County five tax districts, called Hundreds, had already been established by 1687. With the growth of the population, four more hundreds were created in 1710, with White Clay Creek Hundred being one of these.

With the exception of the port towns of Philadelphia and New Castle, there were no other major commercial or social centers in the area. The small hamlets that were established were situated on the major transportation routes of the period, almost always on a navigable river or stream. Few were located inland, for the road network was almost nonexistent. An exception to this was "Ogle's Town", which was located along the road to the Elk River as early as 1679. The villages of Christina Bridge and Cantwell's Bridge (present-day Odessa) were the only hamlets of any size in the area and both were located on major rivers and roads.

In the New Castle County region, water transportation was the major mode of travel and commerce in the late seventeenth century. Most of the farmstead tracts and land grants had frontage on a stream or water course to ensure that communication and the moving of produce to local markets could be accomplished. In a country that was heavily wooded with a mixture of oaks,

walnut, hickory, chestnut, and maple, water travel was the easiest, safest, and most effective means of transport. Overland travel was extremely difficult, because the roads were few and very poor. Even the road from New Castle to Christina Bridge, probably the area's major overland transportation route, was in horrible condition. Generally, the roads in the area were simply intra-regional connectors to the coastal towns.

Swedish settlers to the region grew rye and barley on their farms, but these grains were quickly replaced by wheat when it was found that wheat could be grown more easily. More importantly, it was realized that it was a marketable commodity, and the farmers and settlers in the area soon shifted from a subsistence-oriented to market-oriented agriculture. Wheat, and to a lesser extent corn, were grown and then shipped by water to local milling sites. The transportation of grains to milling sites supported an extensive coastwide trade employing shallops or other similar boats. These milling sites were among the earliest manufacturing complexes in the region.

Settlement in New Castle County during the 18th century continued much as it had in the previous century. In the Philadelphia region, there was a large influx of immigrants between 1725 and 1755, particularly Scotch-Irish, most of whom were indentured servants. As the transportation network improved, colonists began to move inland away from the navigable rivers and streams. Good, productive land was settled first, but as the population began to grow, marginal property was also occupied. The size of farms in New Castle County ranged between 100 and 200 acres, indicating a decline in size from the

seventeenth century. This was due to a tendency for the large grants and tracts to be divided and subdivided by sale and inheritance.

In regards to urbanization, Lemon (1967) has divided the eighteenth century in the Philadelphia region into three periods of growth. The first period, from 1700 to 1729, was one of urban stagnancy after the initial rapid growth of the seventeenth century. However hamlets - unplanned towns that sprang up at crossroads and around taverns, ferries, and mills - did begin to appear at this time. Ogletown is a fine example of the eighteenth century hamlet in New Castle County and was located at a crossroads on a major transportation route. The second period of urbanization that Lemon recognizes, 1730 to 1765, saw a renewal of town growth based on internal trade. Towns such as Newport, Cuckholdstown (modern Stanton), and Newark were chartered and prospered during this period. Christina Bridge, stagnating since the 1680's, saw growth and prosperity as a major grain trans-shipment port for produce coming from the Upper Chesapeake Bay area.

Wilmington was by far the largest urban center in New Castle County that developed in this period. Chartered in 1739, Wilmington soon became a port of entry and a post town, and was an important link in the Philadelphia trading network. Of special significance to the city's location was its proximity to the Brandywine Mills. Wilmington was thus a receiving center for local and regional farm produce, brought by water from Christina, Stanton, and Newport, and shipped up the Delaware to

Philadelphia.

Lemon's third period of urban development, 1766-1800, was marked by less noticeable town growth which paralleled more erratic economic patterns. Little growth in the towns of New Castle County took place during this period. However, an increase in population and land tenancy was noted (Lemon 1972:216).

The conditions of roads in New Castle County improved considerably over the course of the eighteenth century, but in some locations they were unsatisfactory even by contemporary standards. Most improvement was due to both population growth and interregional trade. By mid-century, the roadbeds of many of the area's present-day state roads (Routes 4,7,and 273; portions of Pennsylvania's Route 896) were already established.

Farming in the eighteenth century in New Castle County continued to be a system of mixed husbandry, combining the cultivation of grains with the raising of livestock. Farming was the most important occupation for between 80 and 90 percent of the area's population. Wheat remained as the primary grain produced, followed by rye, corn, barley, oats, and garden vegetables. In many areas, generations of repeated tillage had begun to exhaust the soil. Agricultural practices in New Castle County followed an extensive, rather than an intensive, use of the land (Lemon 1972:169).

Delaware's manufacturing capacity in this century began to become realized. During the 18th century the iron industry, lumber products, and grain milling enterprises continued to grow and prosper. New industries were started that engaged in the

preparation of snuff from tobacco, the production of salt from brines in lower Delaware, and the rudimentary beginnings of the textile industry. By the end of the century Delaware was one of the leading manufacturing states and Wilmington and its environs constituted one of America's leading industrial areas.

In the northern Delaware area, the nineteenth century was marked by rapid industrial and urban growth and population expansion, and was accompanied by a noticeable decline in the number of people engaged in agriculture. The rapid growth of the population during the early decades of the century forced many new farmers in the Middle Atlantic area to clear and farm lands of poor or marginal quality. Many of these farmers were hard pressed to turn a profit from their farmsteads, and this resulted in an outmigration of a large portion of the population during the 1820s and 1830s to better lands to the west particularly in the Ohio River Valley. The loss of jobs related to agriculture was partly offset by the development of new sources of income and employment, particularly in urban and industrial contexts. Thus, much of the surplus population that had in previous centuries been farm laborers, tenants, or unemployed, moved into urban and industrial centers where jobs were more plentiful. These trends occurred over the first half of the nineteenth century, and by 1860 were well established.

Urbanization in New Castle County during the first quater of the century was closely tied to transportation routes and agricultural and industrial production. However, most of the towns of importance in the eighteenth century, which were settled

because of their location on major transportation arteries, remained major marketing, milling and shipping centers for only a brief period into the nineteenth century.

In the first half of the nineteenth century, methods and routes of transportation underwent substantial changes in New Castle County, as first turnpikes, then canals, and finally railroads were introduced. Throughout the century, improved transportation was the key to urban, agricultural, and industrial development.

The most significant canal built in Delaware was the Chesapeake and Delaware Canal, completed in 1829. Originally planned to connect the Elk and Christina Rivers, it was later constructed across the peninsula below New Castle, just north of Reedy Island. The canal was expected to bring wealth and prosperity to the communities of northern Delaware, and in fact, two new towns were constructed, Delaware City and Chesapeake City, at the termini of the Canal. Instead of widespread prosperity, however, the canal contributed to the economic decline of Christina, Newport, Stanton, and New Castle, as goods previously shipped overland across the peninsula could now be sent more cheaply by water. Even Chesapeake City and Delaware City were disappointed in their expected economic boom, and growth in these towns was slow. Only Wilmington, fast becoming an important regional industrial town, benefited from the Canal. Although not the original purpose of its construction, the Canal also came to serve as a border between two distinct socio-cultural sections of Delaware: the industrial/commercial area of northern New Castle County, and the agrarian communities of

southern New Castle, Kent, and Sussex Counties. The Canal would continue to serve in this borderline function throughout the remainder of the century, and does so today.

Railroads came to New Castle County in the 1830's. The first line, the New Castle and French Town Railroad, was constructed in 1832 as a direct result of the opening of the Chesapeake and Delaware Canal, and was an effort to compete with that transportation route. In 1838, the Philadelphia, Wilmington, and Baltimore Railroad was completed, and quickly became the major transportation route across the peninsula. Throughout the remainder of the century, rail lines continued to be built in northern New Castle County, such as the Baltimore and Ohio, the Wilmington and New Castle, and the Wilmington and Western railroads. As noted previously, the towns of Newark, Stanton, and Newport benefited from their proximity to these railroads, staving off the economic stagnation and decline that were experienced by Christina, Ogletown, and Glasgow.

New Castle County continued to be predominately agricultural throughout the nineteenth century. At the start of the nineteenth century, however, agriculture in New Castle County was in a dismal situation. Farming practices continued much as they had during the previous century with the use of the four field system of cropping, wheat the dominant crop, the infrequent use of fertilizers, and the large number of tenant farmers working the land. Production was, on the whole, quite low during the first quarter of the century. The revival of the New Castle County Agricultural Society in 1818, one of the first such

organizations in the nation, encouraged farmers in the use of improved drainage techniques, fertilizers, and machinery. With these developments, New Castle County was on its way to becoming one of the finest agricultural counties in the United States by 1860. Fertilization, farm machinery, and improved drainage were helpful in this agricultural success, but the county's rich natural resources, its fine transportation network, and the proximity of cities were advantages with which other areas, particularly Kent and Sussex Counties, found it difficult to compete.

Tenant farming, which had been quite common in the eighteenth century, became even more prevalent during the nineteenth century. Large land owners, having acquired much of their holdings during the hard times of the 1820's and 1830's, leased their lands to tenants. Most land owners were white farmers, while some tenants and farm laborers, particularly in Kent and Sussex Counties, were black. In other cases, the tenant was a member of the land owner's family, as was the situation with the Robert Ferguson farm (Coleman et al. 1983). By 1900 over 50% of all the farmers in Delaware were tenants or share croppers. Tenancy remained a dominant farming practice into the twentieth century.

Regional development during the nineteenth century was much more complex than in the previous decades, primarily due to the great strides in industrialization, urbanization, and transportation that were part of the Industrial Revolution. The first half of the century witnesses a noticeable decline in Philadelphia's economic influence over the region, caused

Baltimore's rise, the competition for markets between the two cities, and a drop in the consumption by foreign markets of Philadelphia's agricultural produce. The area responded by diversifying its agricultural production, but primarily it devoted increasingly more of its resources to manufacturing.

Much of the reemergence and success of both industry and agriculture in Delaware can be attributed to improved transportation facilities beginning in the 1830's. The linking of Wilmington by railroad with Baltimore and Philadelphia in 1837 provided not only Wilmington, but also its hinterland, with excellent markets both for the purchase of raw materials and the sale of finished products. Contained within this hinterland was also a sizable population of skilled mechanics and machinists who were able to perform the skilled labor required by the new technologies. This combination of good transportation, a large labor pool, and a ready supply of raw materials allowed industry in northern New Castle County to grow and diversify very rapidly into the 20th century.

An analysis of historic maps for the project area (Rea and Price - 1849; Beer's Atlas - 1868, and Baist's Atlas - 1893) did not reveal the presence of any known structures in the project area. However, the adjacent Whitten house does appear and seems to date from early in the 19th century. Given the location of the project area away from the main house, no historic cultural resources were expected within the study area.

RESEARCH METHODS

The objectives of the current investigation were to

determine the significance of any cultural resources in the project area and to determine whether or not significant cultural resources would be adversely affected or destroyed by the bridge replacement and road allignment. Consultation of Department of Transportation Specification and Construction maps (Figure 2) indicated that the proposed alignment would divert road 346 west of its existing location at a distance of approximately 155 feet south of the Christina River. The ROW would then proceed in a northwestwardly direction for approximately 430 feet before re-joining the existing roadway, thus crossing the Christina and adjacent floodplain before ascending a gradual, but significant, slope across a fallow field.

The planned research strategy included the excavation of nine one-meter-square test units in the frequent floodplain of the Christina and across the gradual rise in order to discern the soil stratigraphy and to test for buried cultural horizons (Figure 3). Also, a controlled surface collection of the fallow field was undertaken to define artifact types and their respective distributions and densities. This in turn led to the final aspect of the research strategy which involved the subsurface testing of the fallow field in order to determine the presence or absence of intact remains below the plow zone.

RESULTS

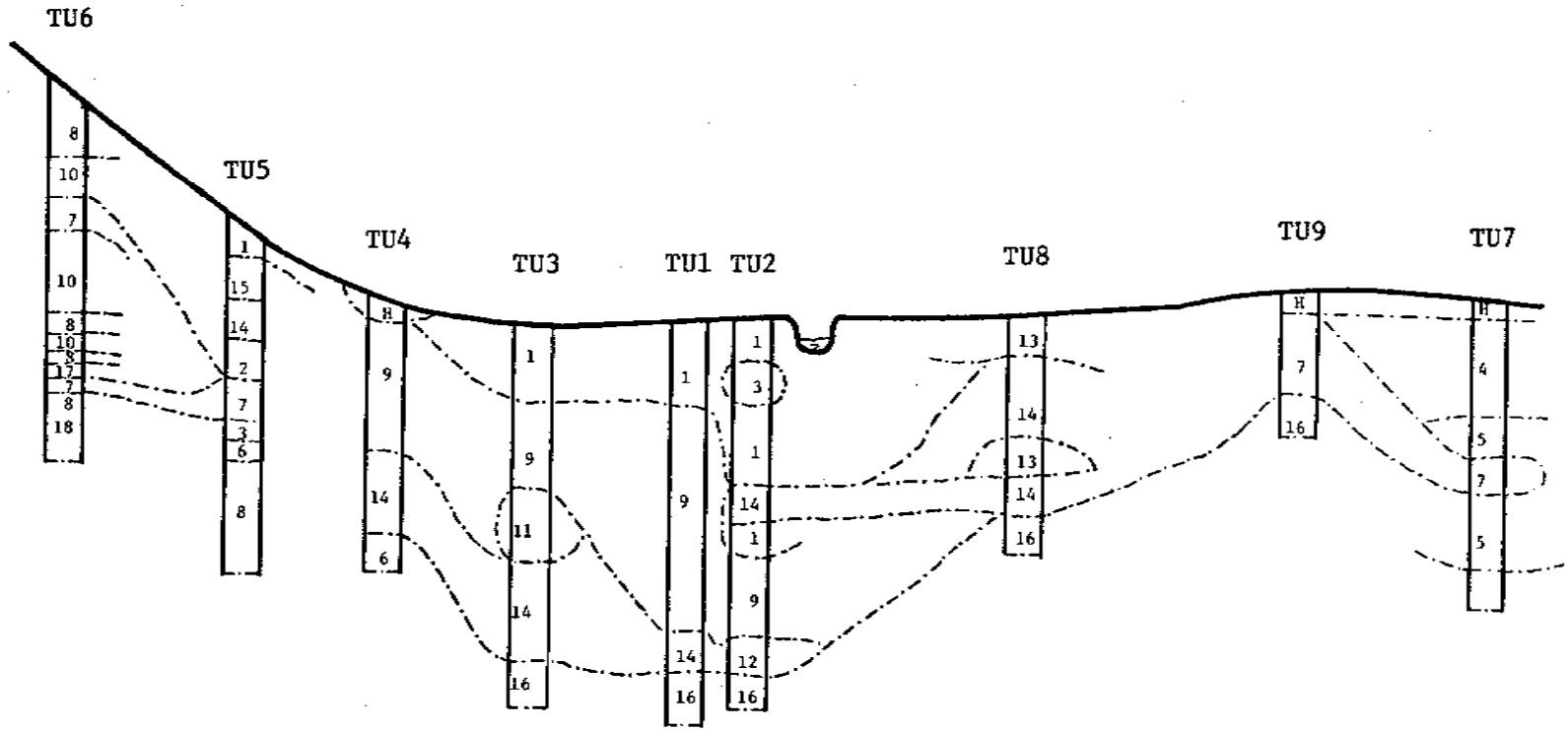
All test units were located in the proposed ROW within the floodplain and at intervals along the gradually rising slope to the edge of the fallow field (Figure 3). None yielded artifacts

or cultural features in good context. Test units 1,2, and 3 were placed on the floodplain north of the Christina, and test unit 8 was located on the floodplain south of the river. No artifacts were recovered and the stratigraphy exposed in these units consisted of sterile silty alluvial deposits underlain by silty clay loams and dense, well-developed clayey soils. Figure 4 shows a composite profile and soil descriptions are noted in Appendix I.

Test units 4,5,and 6 were placed at 20-meter intervals on the gradual slope from its base to the edge of the fallow field (Figure 3). Test unit 4 consisted of levels of silty loam and silty clay with occasional gneiss fragments observed to a depth of 70 centimeters. These soils were then underlain by a denser clay similar to that encountered on the floodplain. Test unit 5 revealed levels of silty and sandy loams with gravels and pebbles and occasional water-tumbled brick fragments to a depth of 60 centimeters. One quartz flake was also found in this context. These deposits were underlain by sterile clayey soil. Test unit 6 also consisted of sandy loams with gravels with some modern glass and water-tumbled brick fragments underlain by dense, well-developed clay mixed with cobbles. These soil profiles were interpreted as colluvial slope wash underlain by intact and much older soils, which are too old to contain buried cultural materials.

Test units 7 and 9 were located south of the Christina and consisted of a thin humus level containing modern glass and ceramic fragments overlying sandy soils with gravels, cobbles, and modern asphalt fragments to a depth of 60 centimeters.

Figure 4: STRATIGRAPHIC CROSS SECTION



VERTICAL EXAGGERATION
OF SLOPE: 10x

VERTICAL EXAGGERATION
OF TEST UNIT DEPTH: 50x

HORIZONTAL EXAGGERATION
OF TEST UNIT WIDTH: 5x

0 10 20 30 40M

H - humus; very dark brown loam
1 - light brown, brown, dark brown, orange-brown silty loams
2 - light brown silty loam with gravels
3 - orange, brown sandy silts
4 - orange-brown sandy silt with gravels and cobbles
5 - red-brown sandy silt with lenses of orange sand, brown silt, gray clay and gravels
6 - red-orange silty sand
7 - coarse red-brown, yellow-brown sandy loams with gravels and sand and clay lenses
8 - coarse yellow-brown, orange, red sands with gravels
9 - light brown, brown, orange-brown, yellow-brown silty clay loams
10 - brown sandy clay loam with gravels
11 - light brown sandy clay loam
12 - brown-tan clayey silt
13 - brown silty clay with lenses of red, yellow clays
14 - brown-tan, tan-orange silty clays
15 - tan silty clay with FeO_2 stains
16 - gray silty clay
17 - fine red sandy clay
18 - red clay with gravels

Pronounced disturbance of these soils is indicated. At 70 centimeters from the surface well-developed gray clay with iron staining was encountered. A series of what appear to be bulldozed spoil piles indicate modern construction disturbance of the soils south of the Christina River.

To summarize at this point, test excavations revealed alluvial and colluvial sedimentation and heavily eroded soils overlying ancient, better developed clayey soils. Past plowing of the sloping surfaces north of the area to be tested has likely accelerated erosion. Marked changes in the location and morphology of the Christina River within the floodplain have destroyed the context in this area. No buried cultural horizons were encountered nor were any _in situ_ artifacts. The combination of erosion and modern disturbance has destroyed any archaeological sites in the floodplain and slope areas.

Upon completion of the test excavations, the fallow field was plowed and disced for the purpose of controlled surface collection. An initial reconnaissance was carried out to see if artifacts were present and to discern the limits of any surface concentrations. Artifacts were observed and the site was given the designation 7NC-D-100 by the SHPO. Once the site limits were defined, Department of Transportation surveyor's stakes marking the proposed ROW were used as a datum for a base line projecting across the length of the field (Figure 5). The area extending from the southern edge of the field to the berm 90 meters to the north was gridded off in a series of 83 ten meter squares. From the berm of the slope the base line was extended north for approximately 150 meters to the northern edge of the field, and

the remainder of the field was gridded off into 6 fifty meter blocks. Surface collection revealed prehistoric and historic artifacts distributed across virtually the entire field. The distribution of artifacts from each component was used to determine site limits. Appendix II lists the data used to develop artifact distribution maps. Distribution maps were prepared using the Golden Software computerized mapping programs TOPO, SURF, and QGRID.

The distribution of prehistoric materials is shown in Figure 6. There were not enough artifacts to justify mapping separate artifact classes. The only discrete concentrations are located along the terrace edge and are probably the result of erosion. The exposure of Pleistocene gravels in the plowzone precludes the possibility of buried materials as has been demonstrated by research on other DELDOT projects (Bachman and Custer 1982). The 66 prehistoric artifacts recovered included 32 flakes, 24 fire-cracked rocks, 5 early stage bifaces, 3 heavily re-sharpened bifaces, and 2 flake tools. In terms of specific lithic materials, quartz occurred with the greatest frequency with smaller quantities of quartzite and chert present. Single artifacts of jasper and chalcedony were also found (Table 1). The presence of cortex on approximately 25% of the flakes and early stage bifaces indicates that cobble reduction was taking place. However, the absence of large amounts of debitage and broken bifaces characteristic of numerous cobble reduction sites in northern Delaware (Custer et al. 1981) and elsewhere in the Middle Altantic region indicates that this was not a major cobble reduction station. Indeed, the low number of artifacts recovered

TABLE 1: SUMMARY OF PREHISTORIC ARTIFACTS FROM SURFACE COLLECTION

CATALOGUE SUMMARY SITE: 7NC-D-100 (Whitten Road)

LOCATION: Surface

CHIPPED STONE ARTIFACTS

	QUARTZ	QUARTZITE	CHERT	JASPER	CHALCEDONY	TOTAL
FLAKES (cortex)	20(3)	7(4)	4(2)	1(1)		32(10)
FLAKE TOOLS (cortex)	1				1(1)	2(1)
EARLY STAGE BIFACES (cortex)	3(1)	1(1)	1(1)			5(3)
BIFACE FRAGMENTS	1		1			2
LATE ARCHAIC WOODLAND I	2(1)					2(1)
TOTAL	27(5)	8(5)	6(3)	1(1)	1(1)	43(15)

CERAMICS
2 Hell Island pottery sherds

FIRE CRACKED ROCK
count: 24

is indicative of a very ephemeral occupation. The two projectile points recovered include a corner-notched and a basally notched point, both of quartz (Plate 1). These points date to the Woodland I time period (ca. 3000 B.C. - A.D. 1000.) This prehistoric component is similar to other sites in the adjacent Piedmont uplands which contain few artifacts and are located on sloping surfaces above surface water (Custer and Wallace 1982). Therefore, it is contended that the prehistoric component of 7NC-D-100 represents a very ephemeral procurement site.

The number of historic artifacts recovered indicates a much more substantial occupation of the site in historic times. Although the 442 artifacts were found throughout the field, a large concentration of surface artifacts was observed in several ten meter squares in a relatively flat area in the vicinity of the southwest corner of the field. Figure 7 shows the distribution of all historic artifacts, and the tightly clustered concentration in the southwest corner of the site is clearly indicated. All of the artifacts in this concentration were domestic artifacts, predominately ceramic sherds with some olive green wine bottle fragments, kaolin pipe fragments, and brick fragments. Of particular interest was the occurrence of ceramics diagnostic of the late-eighteenth and early nineteenth centuries including "scratch blue" white salt glaze stoneware, creamware, and pearlware (Plate 2). Appendix III provides a listing of all historic artifacts.

Two additional and smaller concentrations may also be noted in Figure 7: one on the southern edge of the collection area, and one on the northern edge. Plotting of architecture and

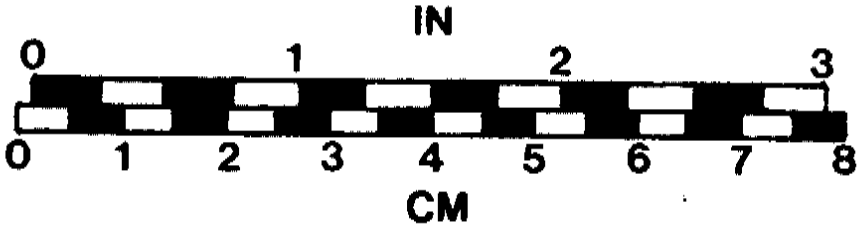
KEY FOR PLATE 1

Top - Hell Island Pottery

Bottom - Notched Points

Plate 1:

7NC-D-100 PREHISTORIC ARTIFACTS

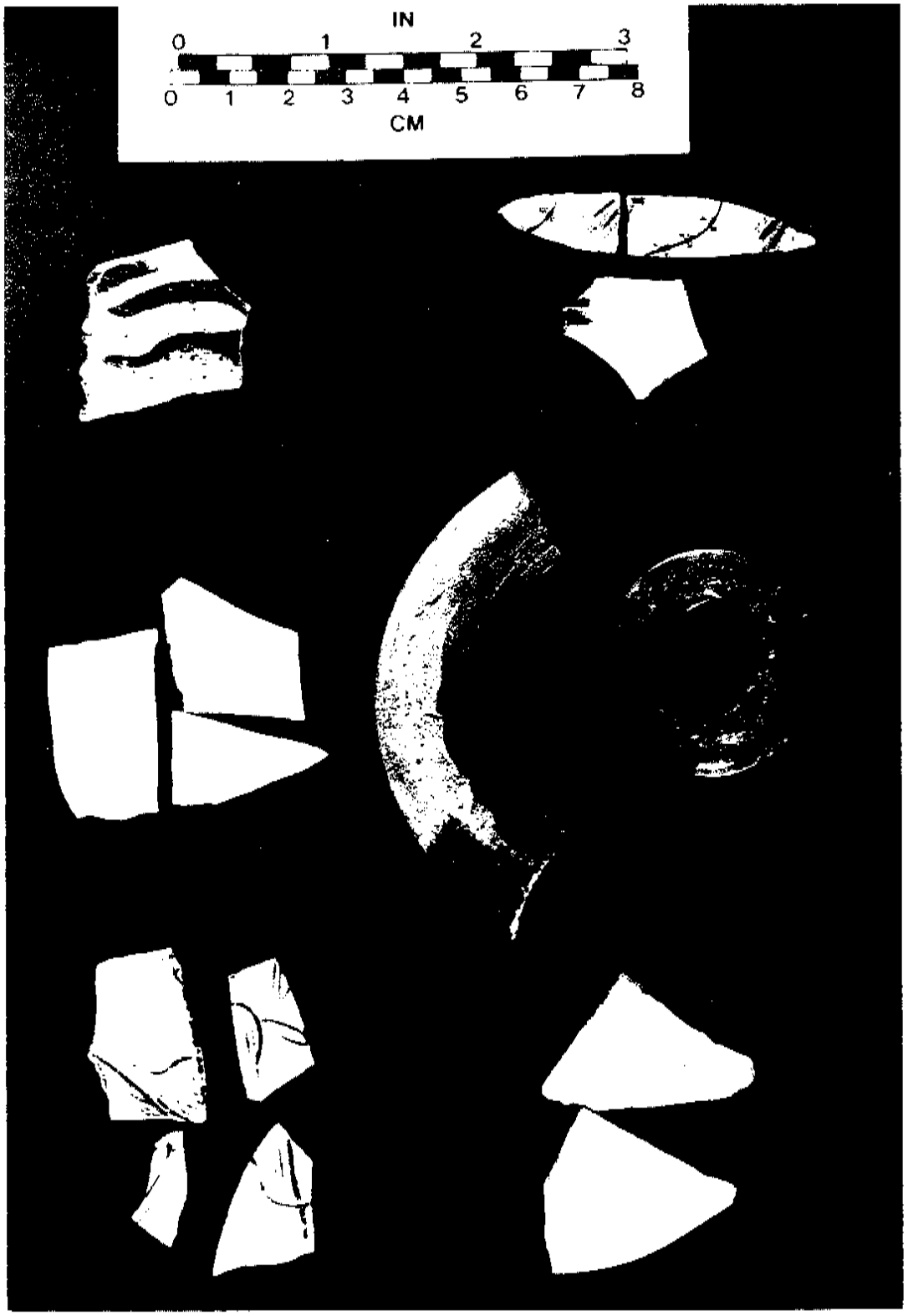


KEY FOR PLATE 2

Top row: (left to right) 1 red earthenware rimsherd decorated with combed slip; 1 blue feather-edged pearlware rimsherd; 2 hand-painted pearlware body fragments. Center: 3 white salt glaze stoneware tea cup basal sherds; 1 gray salt-glaze cobalt decorated stoneware mug or tankard handle fragment; 1 wine bottle fragment with applied lip. Bottom: 4 "scratch blue" white salt glaze stoneware body sherds; 2 creamware body sherds.

Plate 2:

7NC-D-100 HISTORIC ARTIFACTS



kitchen groups (South 1979) of artifacts (Figures 8 and 9) reveals that the southern edge concentration is composed of both kitchen group and architecture group artifacts. It is suggested here that the northern secondary concentration is primarily 20th century construction materials associated with an adjacent commercial structure. The southern secondary concentration is located along the edge of the bluff and is probably the result of natural erosion of the site and transportation of artifacts in slope wash. All of these artifact concentrations are within the proposed ROW. The final aspect of the research strategy involved the stripping of approximately 30 centimeters of plow zone, in a small area of unit N40W40 which had the highest frequency of historic materials in the surface collection. The goal was to determine whether or not any intact subsurface features were present. N40W40 was first quartered into four 5-meter squares and the initial excavation was of the southern half of the northeast quad, an area 5 meters long and 2.5 meters wide. At the easternmost limit of this unit an edge of a dark brown intrusion into the subsoil containing some brick and carbon flecking was encountered. A portion of another, smaller oval intrusion was also revealed . To determine the extent of these remains, a portion of the northwest quad of unit N40W30 encompassing an area 3.75 meters wide and 2.5 meters long was stripped of the plow zone as was a 1.25 meter square in the northern half of the northeast quad of unit N40W40. Portions of three more intrusions into the subsoil were identified and mapped (Figure 10, Plate 3) and all contained historic materials including bone and several sherds of "scratch blue" white salt

Figure 8:

KITCHEN GROUP

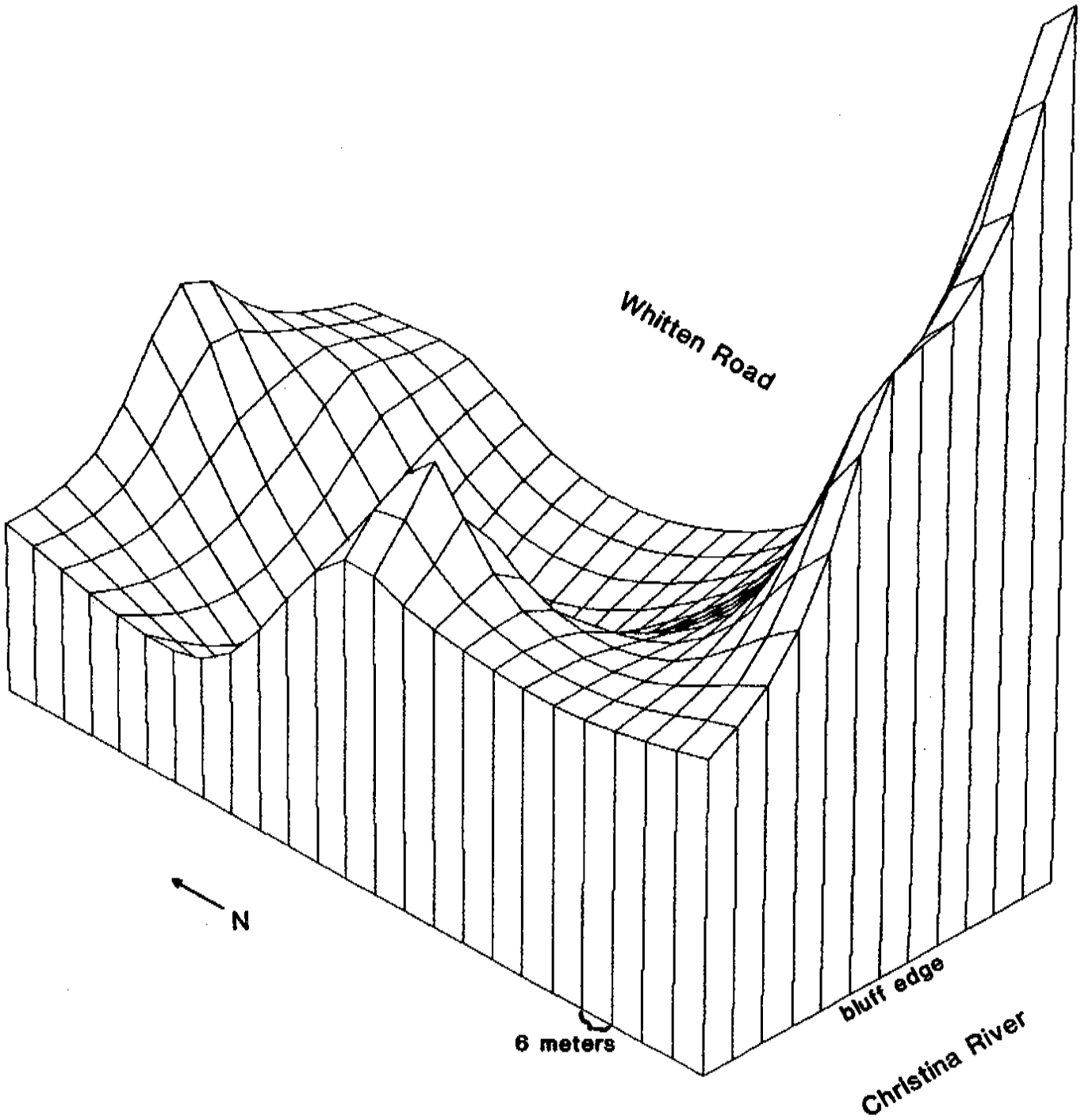


Figure 9:

ARCHITECTURE GROUP

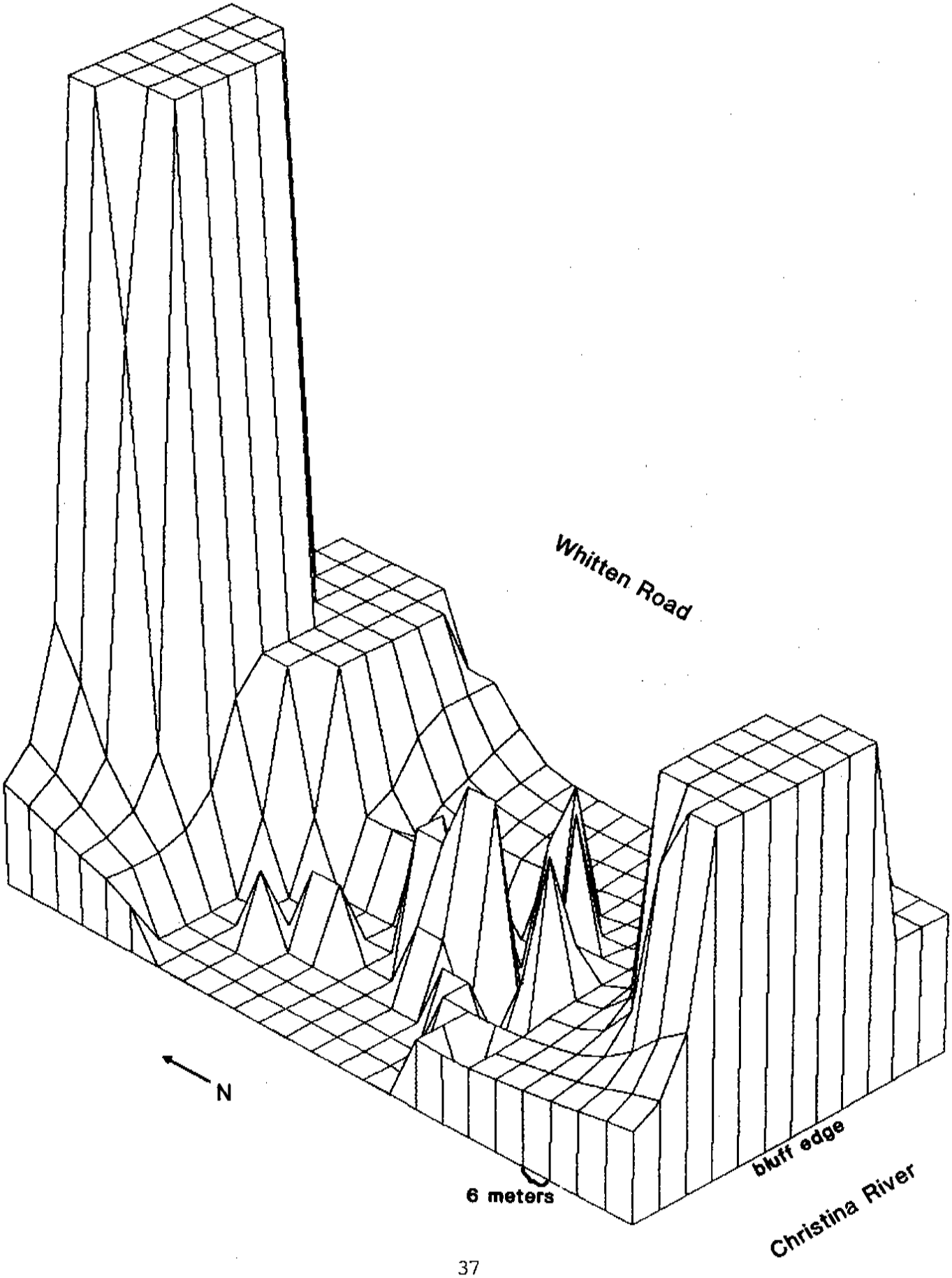


Plate 3:

7NC-D-100 HISTORIC FEATURE AREA

glaze stoneware, ca. 1740-1775. In addition, 13 shovel tests were excavated adjacent to the main excavation, 3 of which, each north of the main excavation, came down on dark brown fill similar to that found in the exposed intrusions, rather than the coarse orange subsoil. Auger testing indicated that of these intrusions, only the two small oval stains, possible postmolds, had a depth of more than 10 centimeters. However, no evidence of post hole features associated with these oval intrusions was apparent. One of the larger intrusions contained both historic materials and small prehistoric potsherds and fire-cracked rocks at the plow zone/subsoil interface. One of these, a Hell Island sherd, falls chronologically into the Woodland I period, ca. 700 B.C. to 400 B.C. along with the two "diagnostic" bifaces recovered during surface collection. Its association with much later historic materials in an intrusion below the plow zone raises the possibility that an earlier prehistoric feature was intruded by a later historic one resulting in this mixing of artifacts. It is also possible that some of the shallow intrusions may have been subject to heavy erosion. After the discovery of the intact historic features at 7NC-D-100, additional archival work was undertaken. The Whitten Road site's historic component is located in a region of Delaware that included relatively intensive settlement in the 18th century. The tract of land containing the site was an area of New Castle County originally patented in the late 17th century and is within 2.5 miles of the Christina Historic District, a prosperous 17th and 18th century shipping and portage point on the Upper Eastern Shore. Two additional 18th century inter-regional centers for

transportation and communication, Ogletown and Stanton, are also in the immediate area. Structures which may be associated with the historic features at 7NC-D-100 do not appear on any of the published 19th century maps of the New Castle County and White Clay Creek Hundred area, such as Rea and Price (1849), Beer's Atlas (1868), and Baist's Atlas (1893). An Orphan's Court case in 1853 provided a survey plot of the property and showed no structure located at the present site of 7NC-D-100. Therefore, by the middle of the 19th century there was no extant structure on the site of 7NC-D-100 and the main residence for the farm had been moved to the location of the extant Whitten House. Further archival research beginning with Coward Haman, owner of the property prior to 1953, will be required to pinpoint the beginning and end date of the site's occupation and also the chronological and functional relationship of 7NC-D-100 to the extant Whitten House.

INTERPRETATIONS AND CONCLUSIONS

The nine 1-meter-square test units excavated in the frequent floodplain and slope portions of the study area produced no artifacts although a controlled surface collection did produce historic and prehistoric artifacts. The prehistoric artifacts are indicative of a very ephemerally occupied procurement site dating to Woodland I times. The prehistoric component can be viewed as representative of occasional forays around a fixed critical resource (surface water) by wandering groups, with a limited set of activities occurring including occasional tool manufacture from local cobble deposits. The small size of the

site and its heavy disturbance by natural erosion lead us to conclude that the prehistoric component is not eligible for nomination to the National Register of Historic Places.

Subsurface historic features containing domestic artifacts and brick concentrations and the clustered historic artifacts in the surface collection, indicate the presence of a probable house site during the late eighteenth-early nineteenth century period within the ROW. Some of these features may be partly disturbed while others appear to be intact. The various features at 7NC-D-100 may be similar to various sub-cellar features documented at similarly-dates sites in Virginia (Kelso 1984:67,75,105,106 119, 125). Because no similar undisturbed historic sites of this period in northern Delaware have been studied and because the historic components of site 7NC-D-100 have good context, it is concluded here that significant data can be gained from the study of this site and it is therefore eligible for nomination to the National Register of Historic Places. The significant data which 7NC-D-100 are likely to yield include information on the architecture, material culture, and lifeways of the early settlement period in northren Delaware. From a regional perspective, these data are significant because they can be compared to data from similar sites which have been excavated in southern Delaware (Thomas 1983) and the Maryland and Virginia Tidewater (Kelso 1984). From a local perspective, the data from 7NC-D-100 will complement previous DelDOT-funded archaeological and archival research in northern Delaware with respect to the topics of settlement patterning and community organization,

argicultural and economic history, and socio-economic change over time. Appendix IV provides a formal determination-of-eligibility for the site.

Site 7NC-D-100 is located within and adjacent to the proposed ROW for the Whitten Road bridge replacement. As such, the proposed project will have both direct and indirect adverse effects (as per 36 CFR 800.3(b)) upon 7NC-D-100. For the portion of the site directly within the proposed ROW, the grading and excavation of the ROW will destroy the sub-surface features themselves as well as disturbing the plow zone artifact distributions. For the portion of the site directly adjacent to the ROW, equipment traffic and any other ground disturbance will directly affect the surface distribution. While not as important as the sub-surface features, the surface and plow zone artifact distribution are significant data, nonetheless. The tight spatial cluster of historic artifacts near the features (Figure 7) shows that plowing and erosion have not completely distrubed the context of these artifacts. Therefore, the spatial distribution of plow zone and surface artifacts will provide useful data on activity areas within the site. Indirect effects of the project on the portions of the site adjacent to the ROW include soil compaction from equipment traffic and disturbance of surface and sub-surface artifact distributions by the increased runoff and erosion that will result from regrading and equipment traffic.

The preferred alternative for mitigation of the adverse effects of the project is data recovery because a data recovery project, such as the one described in Appendix V will recover all

of the previously-noted significant data from the site. Data recovery is preferred to alternatives such as no-build and redesign because it is less costly. Also, the no-build alternative is not feasible due to local traffic volume and the re-design alternative is not feasible due to problems with utilities in the Christina River floodplain. Preservation-in-place is not a feasible alternative because of the fragile nature of the site.

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