INTRODUCTION

The purpose of this report is to describe the Phase I archaeological survey of the Chesapeake and Delaware Canal (C & D Canal), bridge replacement section, Odessa Segment, of the U.S. 13 Relief Route in New Castle County, Delaware. Figure 1 illustrates the entire 46 mile Proposed Right-of-Way changes from the Dover Air Force Base to Tybouts Corner. A 6.4 mile section of the Proposed Right-of-Way which begins at Scott's Run on the southern end of the section, and extends north to the southern end of relocated Delaware Route 7 at Tybouts Corner, was surveyed during the months of May-July 1988 by the University of Delaware Center for Archaeological Research (UDCAR) for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA) for compliance under section 106 of the National Historic Preservation Act. The section of the Proposed Right-of-Way contained within the project limits north of Red Lion Creek was not tested because it is contained within the Tybouts Corner toxic waste dump, a high priority site on the Federal Superfund cleanup list. A portion of the Proposed Right-of-Way was realigned and surveyed after the original survey was conducted. The purpose of this survey was to locate and identify archaeological sites which would be affected by the Proposed Relief Route. At the conclusion of the fieldwork a total of 12 prehistoric and historic site loci had been identified within this 6.4 mile segment of Proposed Right-of-Way and Phase II cultural resource investigations have been recommended for nine of these sites. Figure 2 illustrates the C & D Canal section of the Proposed Right-of-Way with its study parcels, major roads,

FIGURE 1

Proposed U.S. 13 Relief Route, Tybouts Corner to Dover Air Force Base

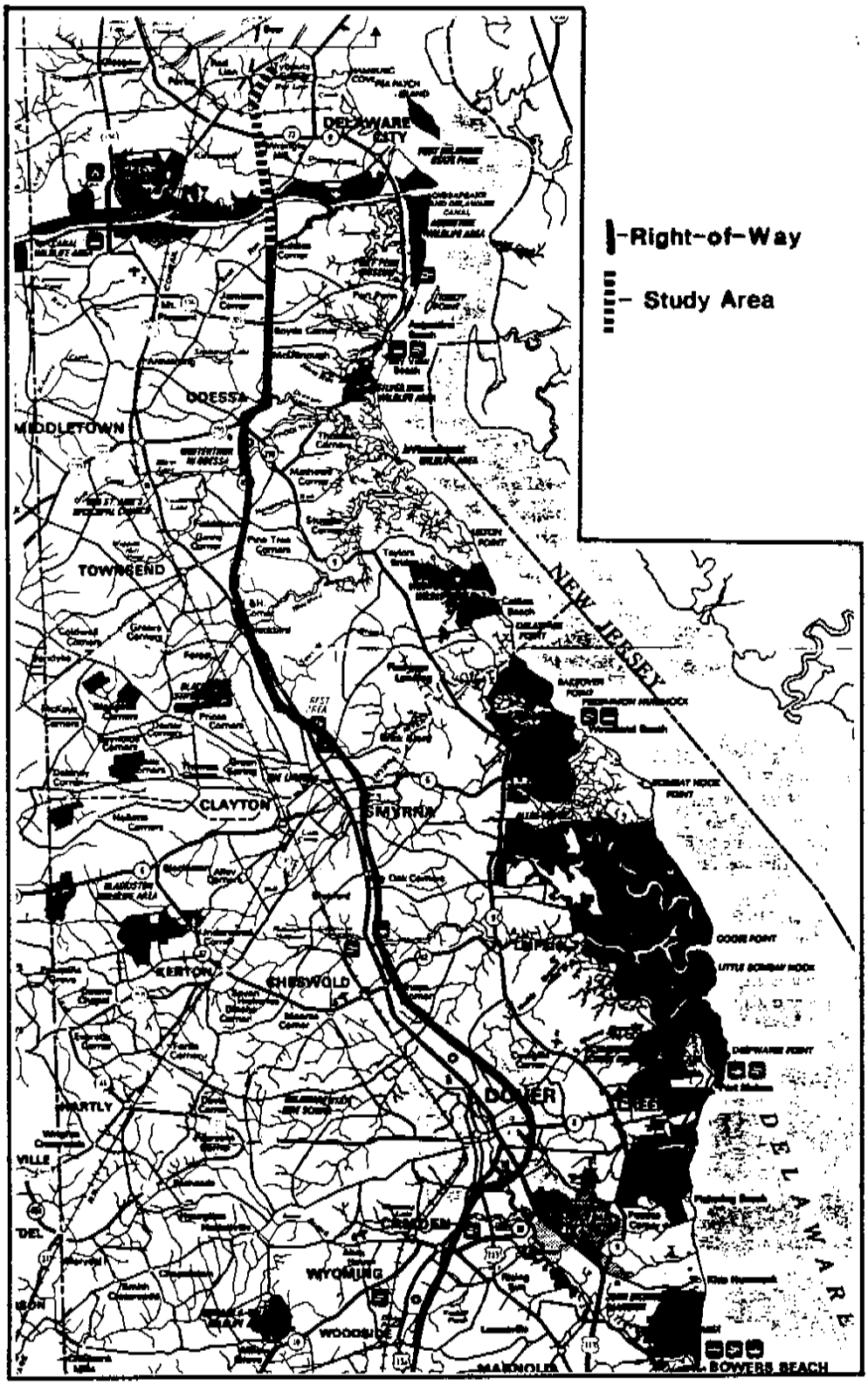
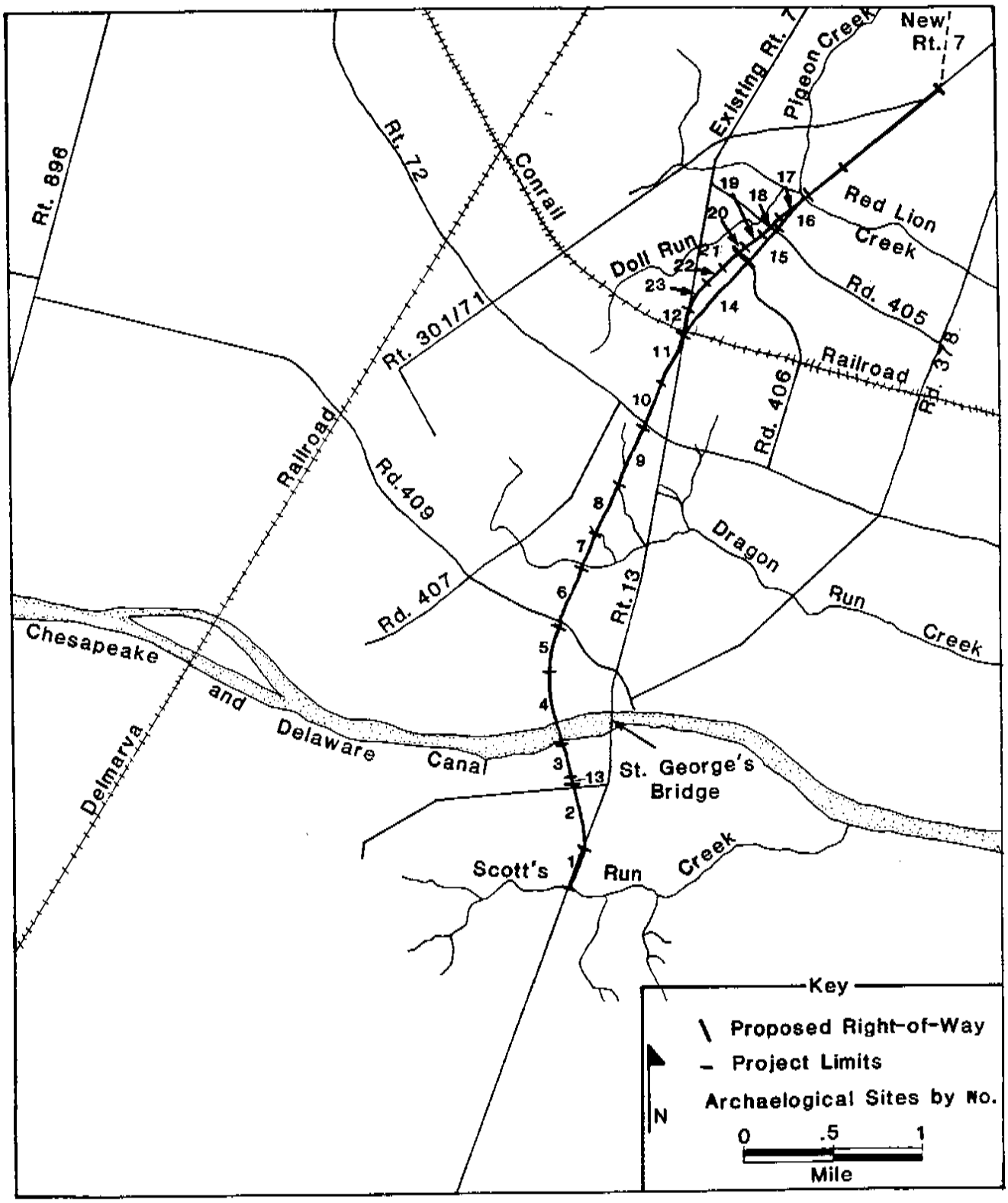


FIGURE 2

U.S. 13 Relief Route, Chesapeake and Delaware Canal Section, Odessa Segment, with Study Parcel Numbers, Major Roads, and Water Courses



and water courses.

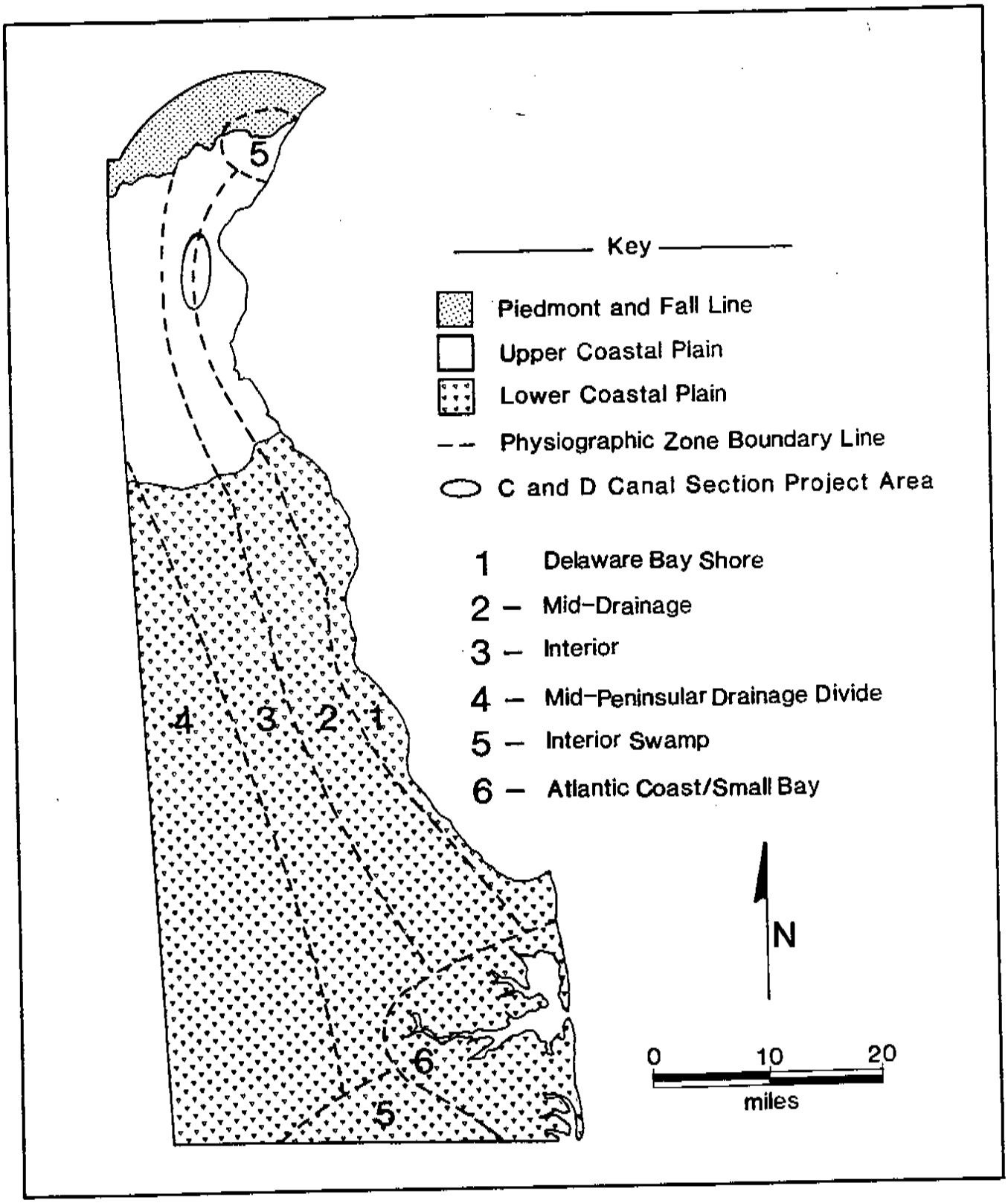
ENVIRONMENTAL SETTING

In order to understand the regional prehistory of the present study it is first necessary to review the region's environments through time. The present study area is located in Delaware's High Coastal Plain. For the study of the prehistoric and historic resources of the region, a number of varied environmental zones are recognized in the High Coastal Plain (Figure 3). Each of these zones is described below and the descriptions are derived from the work of Custer (1984), and abstracted from Custer and Bachman (1986).

High Coastal Plain. Located between the Fall Line and the Smyrna River, the High Coastal Plain represents the southeastern extension of the coarse gravels of the Pleistocene (Columbia) sediments in Delaware (Jordan 1964:40). A rolling topography is present and elevation differences range up to 16 meters (50 feet) from the headlands bordering high order streams and adjacent floodplain marshes. These differences are sufficient to cause differential distributions of plant and animal species (Braun 1967:246-247). Watercourses are deeply incised and are lined by a veneer of relatively recent sediments that is thin along the upper reaches of the drainages and thickens moving toward their mouths (Kraft et al. 1976:13). Most streams are not tidal and the freshwater/saltwater mix allows for a wide range of resources. Soils include a variety of well-drained and poorly drained settings that are distributed in a mosaic pattern across the region.

FIGURE 3

Physiographic Zones



Within the High Coastal Plain there are a number of smaller environmental zones. These additional sources of environmental variability are generally distributed in broad belts parallel to the Delaware River and Bay shore. Each is described below and depicted in Figure 3.

Mid-Peninsular Drainage Divide. Representing the "spine" of the Delmarva Peninsula, this area is defined by the stretch of low, rolling topography that separates the headwaters of streams that drain into the Delaware River from streams that drain into the Chesapeake Bay. Elevation differences are slight and flowing surface water is restricted to the low order headwaters of the larger streams and rivers. Additional water sources of this zone include a number of swamps that have formed in areas of poorly drained soils surrounded by sand ridges. Bay/basin features, known locally as "whale-wallows", represent another water source in this area. Geomorphological evidence indicates that they were formed during the Pleistocene and many seem to have held water, at least seasonally, ever since (Rasmussen 1958:82). The combination of headwater drainages, swampy areas, and bay/basin features with interspersed well-drained areas creates a mosaic of edaphic settings.

Delaware Shore. Included in the Delaware Shore zone are the remnant terraces of the Delaware River as well as the various tidal marshes that fringe the Delaware River and the Delaware Bay. These marshes are found throughout the area and often extend well up the drainages from the river and bay shore. Soils in the area are generally poorly drained; however, pockets of well-drained soils in the areas of higher elevation may be found.

Only the eastern edges of the project area are included in this zone.

Mid-Drainage. The Mid-Drainage zone is located between the Delaware Shore and Mid-Peninsular Drainage Divide zones and includes the majority of the study area. The modern tidal limit along the drainages marks the center of this zone and the major drainages and their tributaries are fresh throughout the inland portion of the zone. Some tidal marshes and poorly drained floodplains are found along the major drainages. Well-drained soils are found on upper terraces of the drainages and on isolated headlands between the major drainages and their tributaries. The extensive combination of brackish and freshwater resources makes this zone one of the richest in Delaware for hunters and gatherers.

It should be noted that locations of these zones have not remained constant since the end of the Pleistocene because some zones have been subjected to extensive landscape modification. The most important factor in this landscape modification is post-Pleistocene sea level rise. Kraft et al. (1976) note that sea level has been rising along the Atlantic Coast for the past 12,000 years and this sea level rise has transformed the Delaware River of 10,000 B.C. into the current drowned estuary. Many old land surfaces have become submerged and the configuration of the Delaware River and Bay have changed dramatically. In terms of the study area, these effects would be most prevalent in the eastern half of the Mid-Drainage zone and the River Shore zone. During the past 4,000 years, the rate of sea level rise has

decreased thus the rate of shoreline degradation has also decreased. Thus the environmental zones discussed above have remained relatively constant for that time period. The important point to make is that the Proposed Right-of-Way lies in an area of overlapping zones which increases its value to prehistoric peoples as a resource procurement area.

The C & D Canal section of the Relief Route is defined by two easterly flowing streams. The southern boundary of the section is Scott's Run Creek which drains into the C & D Canal. The northern boundary of this section is at the southern end on relocated Delaware Route 7 at Tybouts Corner which drains into the Delaware Bay. The Proposed Right-of-Way crosses one other named east-west tributary of the Delaware Bay, Dragon Run Creek. In addition, a smaller named tributary of Red Lion Creek, Doll Run Creek, flows roughly parallel to existing Route 13 from the intersection of Route 7 and Route 13 to Red Lion Creek. Several unnamed tributaries of these streams as well as several ephemeral drainages are also transversed by the Right-of-Way. Swampy and poorly-drained areas are found adjacent to the major streams.

Soils present in the project area are grouped within the Matapeake-Sassafras association (Matthews and Lavoie 1970). Matapeake silt loams are the dominant soil type from the C & D Canal to the southern end of the Project Area. Matapeake silt loams tend to be less dominant in the remainder of the Project Area with Sassafras sandy loams being relatively evenly interspersed. Most of these soils are well drained and badly eroded. Along the stream drainages, some poorly drained soils are present and the interface of the well drained and poorly

drained soils are the most likely locations for prehistoric sites.

MODERN ENVIRONMENTAL SETTING

Land use in the Project Area has remained primarily agricultural since the arrival of the Europeans and the colonization of the region. The majority of the Project Area is still in agricultural use from the intersection of existing Route 7 and Route 13 to the southern end of the Project Area with the exception of the residential development in the St. George's Bridge area. The area west of Route 13, and from the Route 7 and Route 13 intersection to the north end of the Project Area is largely residential. Within this segment, two areas of one parcel have been used for borrow fill, and another parcel is currently being cultivated. East of Route 13 from the above mentioned intersection to the north end of the Project Area, land-use is all agricultural in various stages of use and/or abandonment. Approximately one mile to the east of the Project Area on its northern end lies the sprawling Texaco USA refinery, which has substantially altered the culture history, topography, and general ambience of this section of the county. The Project Area itself has not been as significantly altered by increased development as have adjacent nearby regions and other portions of the Route 13 Relief Route.

REGIONAL PREHISTORY

This summary of the regional prehistory is abstracted from Custer (1984), Custer and Bachman (1986), and Bachman, Grettler,

and Custer (1988). The prehistoric archaeological record of the Delaware Coastal Plain can be divided into four large 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, from A.D. 1650 to A.D. 1750, marks the final phase of occupation by Native American groups of Delaware in anything resembling their pre-European Contact form. Each of these periods is described below.

Paleo-Indian Period (12,000 B.C. - 6500 B.C.) - The Paleo-Indian Period encompasses both the final retreat of Pleistocene glacial conditions from Eastern North America and the subsequent 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. Paleo-Indians relied on a hunting and gathering adaptation in which animal food resources comprised a major 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 in northern Delaware and watering areas would have been particularly good hunting settings.

Tool kits of Paleo-Indian groups were oriented toward the procurement and processing of hunted animal resources. A preference for high quality lithic materials is apparent in the flaked stone tool kits and careful resharpening and maintenance

of tools was common. A mobile lifestyle in which groups focused on game-attractive environments is hypothesized with a social organization consisting of single and multiple family bands. Throughout the 5500 year time span of the period, this basic adaptation remains essentially uniform, although some adjustments occur with the appearance of Holocene conditions in the latter part of the Paleo-Indian Period.

Custer (1986) has summarized the site types and associated settings for the Paleo-Indian Period in Delaware. Quarry, quarry reduction stations, base camps, base camp maintenance stations, outlying hunting sites, and isolated point finds were defined. None of these have been recognized in the Project Area to date. There are no large cobble outcrops located within the Project Area, and thus it is unlikely that quarry reduction stations occur. Since base camps often occur in close proximity to quarries during this time period, this site type is probably absent also. Low stream order and the lack of sites with good southern exposure may be additional negative factors for the formation of base camps. The proximity of the Project Area to the Delaware Chalcedony Complex (Custer, Ward, and Watson 1986) means base camp maintenance stations, outlying hunting sites, and isolated point finds may occur. These most likely would be small sites, measuring just a fraction of a hectare, and would be expected in a variety of upland settings and low terraces adjacent to poorly drained areas. Since there are no known sites from the Project Area representing this time period, any Paleo-Indian site would be of value.

Archaic Period (6500 B.C. - 3000 B.C.) - The Archaic Period is characterized by an adaptation to the newly emerged full Holocene environments of Delaware. 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 is also associated with the beginning of the Holocene in Delaware. The major effect of the sea level rise would have been to raise the local water table, which helped create a number of large interior swamps. Adaptations changed from the hunting focus of the Paleo-Indian Period to a generalized foraging pattern in which plant food resources played a more important role. Large swamp settings apparently supported large base camps, but none are known from the Study Area. A number of small procurement sites in favorable hunting and gathering locals such as bay/basin features are known from Delaware's Coastal Plain.

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. Known sites include large base camps such as the Clyde Farm Site in northern Delaware and smaller processing sites located at a variety of locations and environmental settings. There are no excavated Archaic Period

sites from the state and all of the known sites are represented by surface collections. There are no sites from this period within the Project Area. From sites in surrounding states, Custer (1986) has identified three site types for this period of Delaware prehistory: macro-band base camp, micro-band base camp, and procurement site. The most common site settings for the macro-band base camps are large interior swamps and terraces along major rivers. Neither of these are present in the Project Area and thus this site type is not expected. Micro-band base camps and procurement sites may be present as these sites are known to occur on terraces along lower order streams and in proximity to hunting areas and lithic outcrops. Some of these types of sites may occur along lower order streams like Scott Run, Dragon Creek, St. Georges Creek (drainage now occupied by the C & D Canal), Doll Run, and Red Lion Creek. Since there are no recorded sites from this time period from the Project Area, and there are no excavated sites from the state, any site found during the Phase I survey is likely to be considered significant.

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 seem to be part of events occurring throughout the Middle Atlantic region. A pronounced warm and dry period set in and lasts 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; however, the overall effect of the environmental change is an alteration of the environment, not a degradation. Continued sea level rise and a reduction in its rate also made many areas of

the Delaware River and Bay shore the sites of large brackish water marshes which are especially high in productivity. The major changes in environment and resource distributions caused a radical shift in adaptations for prehistoric groups. Important areas for settlements include the major river floodplains and estuarine swamp areas. Large base camps with fairly large numbers of people are evident in many settings in the Delaware Coastal Plain, such as the Barker's Landing, Coverdale, Hell Island, and Robbins Farm Sites. These sites seem to have supported many more people that previous base camp sites and may have been occupied on a year-round basis. The overall tendency is toward a more sedentary lifestyle.

Woodland I tool kits show some minor variations as well as some major additions from previous Archaic tool kits. Plant processing tools become increasingly common, indicating intensive harvesting of wild plant foods that may have approached the efficiency of agriculture by the end of the Woodland I Period. Chipped stone tool assemblages changed little from the preceding Archaic Period, save for the introduction of broad-blade, knife-like processing tools. The addition of stone, and then ceramic vessels is also seen. These items enabled more efficient cooking of certain foods and may also have functioned as storage containers for surplus plant foods. Storage pits and house features are also known for Northern Delaware during this period from sites such as Clyde Farm and Delaware Park.

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 began to develop as indicated by the presence of 1) extensive trade and exchange in lithic materials for tools as well as non-utilitarian artifacts, 2) caching of special artifact forms, and 3) utilization of artifacts manufactured from exotic raw materials. The data from cemeteries of the Delmarva Adena Complex (ca. 500 B.C. to A.D. 0), such as the Frederica Site and the St. Jones Site (Thomas 1976), indicate that certain individuals had special status in these societies and the existence of a simple ranked social organization is hypothesized. Similar data from the Island Field Site show that these organizations lasted up until A.D. 1000, although they may not have always been present throughout all of the Woodland I Period. In any event, by the end of the Woodland I Period a relatively sedentary lifestyle is evident in Delaware's Coastal Plain. It should also be noted that the greatest number of archaeological sites in the Project Area date to the Woodland I Period and the Mid-Drainage zone is the focus of most of the important sites of this period.

Four Woodland I cultural complexes have been identified for the High Coastal Plain of northern New Castle County (Custer 1984). These four and their approximate date ranges are Clyde Farm (3000 B.C.- 500 B.C.), Wolfe Neck (500 B.C.- A.D. 0), Carey (A.D. 0 - A.D. 600), and Delaware Park (A.D. 600 - A.D. 1000). Clyde Farm Complex macro-band base camps are large sites located in major riverine floodplains, along developing estuarine marshes, and in poorly drained areas in the Piedmont. The

Project Area contains none of these settings and it is unlikely that any large base camps would occur. Micro-band base camps are likely to occur in outlying areas adjacent to specialized resource locations and procurement sites are likely to occur a short distance from these campsites (Custer 1986:85). Other than these general descriptions about site size and location, little specific information is available which would differentiate between the two site types for this time period. A micro-band base camp, 7NC-E-11, lies well east of the Project Area along the north bank of Red Lion Creek and a second micro-band base camp, 7NC-E-2 (Indians Mound Site) is located about one-half mile west of the Project Area near the village of Red Lion. A Clyde Farm procurement site, 7NC-G-1, west of the Snapp property (Parcel 3), has been identified adjacent to the Project Area. Two other Woodland I procurement sites, 7NC-G-19 and 7NC-G-30, which have not been associated with any cultural complex, are located east of the Project Area along the south bank of the C & D Canal (former channel of St. Georges Creek). It is likely that both micro-band base camps and procurement sites occur in the Project Area and since neither one is well defined for this complex, the excavation of either type would be beneficial.

During Wolfe Neck times, there is a decrease in the use of rhyolite and argillite for stone tool manufacture, suggesting there is a decrease in the importance of these materials. The implication is that old trade networks and the concomitant exchange of information are reduced during this period. A Wolfe Neck macro-band base camp site may shed some light upon this problem. Otherwise, Wolfe Neck habitation and procurement sites

and settlement locations appear to be similar to those of the preceding Clyde Farm Complex. No Wolfe Neck Complex sites appear in or adjacent to the Project Area, although there are some poorly known Woodland I sites in nearby drainages which could contain Wolfe Neck components.

The Carey Complex component in northern Delaware has been best expressed at the Clyde Farm Site (7NC-E-6) and at the Delaware Park Site (7NC-E-41). These large macro-band base camps contain storage features (indicating a reliance upon the harvesting of plant foods) and house pits, and the complex is distributed throughout Delaware at this time. A heavy dependence upon fish and shellfish is observed by Custer (1984:131). Carey Complex sites in the Project Area would most likely take the form of micro-band base camps and procurement sites associated with the larger base camps noted above. The Delaware Park Complex is characterized by a similar settlement pattern and adaptation and once again only micro-band base camp and procurement sites would be expected within the Proposed Right-of-Way. There are no Carey or Delaware Park Complex sites within or adjacent to the Proposed Right-of-Way.

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 agriculture food production systems; however, in the Delaware Coastal Plain there are no clear indications of such a shift. Some of the 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

overall artifact assemblages are evident. Intensive plant utilization and hunting remained the major subsistence activities up to European Contact. There is some evidence, nonetheless, of an increasing reliance on plant foods and coastal resources throughout the Woodland II Period in the Study Area. Social organization changes are evidenced by a collapse of the trade and exchange networks and the end of the appearance of elaborate cemeteries.

Custer (1986) notes that the data quality for the Woodland I period for this area is poor. Only two sites from the period occur near the Project Area: 7NC-E-12 (site function unknown) and 7NC-G-30, a procurement site. Any macroband base camp in the area would likely express a prehistoric utilization of several of the environmental zones discussed above and a microband base camp would be used for a localized resource exploitation activity. The excavation of either of these site types would serve to verify this hypothesis.

Contact Period (A.D. 1650 - A.D. 1750) - The Contact Period is an enigmatic period of the archaeological record of Delaware which begins with the arrival of the first substantial numbers of Europeans in Delaware. The time period is enigmatic because no Native American archaeological sites that clearly date to this period have yet been discovered in Delaware. A number of sites from the Contact Period are known in surrounding areas such as southeastern Pennsylvania, nonetheless. It seems clear that Native American groups of Delaware did not participate in much interaction with Europeans and were under the domination of the Susquehannock Indians of southern Lancaster County,

Pennsylvania. Thus, the discovery of any sites in the project area would be beneficial to our understanding of this period. The Contact Period ends with the virtual extinction of Native American lifeways in the Middle Atlantic area except for a few remnant groups.

REGIONAL HISTORY

This overview is abstracted from Munroe (1978), Hoffecker (1973, 1977), Weslager (1961, 1967), Lemon (1972), Hancock (1932), and Custer and Bachman (1986). A more detailed historical overview of the general Route 13 corridor is provided in the Phase I/II Research Plan (Custer, Bachman, and Grettler 1987). The earliest colonial settlement in Delaware was the Dutch settlement of Zwaanendael which was established as a whaling colony near present-day Lewes in 1629. The settlement was short-lived as the early colonists were massacred by local Indians in 1632. It was not until 1661, when a Mennonite colony was formed that a permanent settlement was established at Lewes. Further north, the Swedes established Fort Christina in 1638 at the confluence of the Brandywine and Christina Rivers in what is now part of Wilmington. The small colony grew and within a few years a fort, church, and small farming community appeared and formed the nucleus for the first permanent European settlement in Delaware. This community contested the earlier Dutch settlements further north in the Delaware Valley.

Dutch colonial interests continued and in 1651 Fort Casimir was established near modern New Castle. Conflicts between the Dutch and the Swedes escalated to military conflict, as both

groups infringed on the colonial interests of the other. The Dutch were ascendant and they appropriated the Swedish colonies. Fort Casimir was renamed Fort Trinity, and New Amstel, a farming and trading settlement, arose nearby. The Dutch claims included all land from the Christina River to Bombay Hook by the early 1660s, including a portion of the study area. British hegemony of the region began in 1664 when Sir Robert Carr seized the Dutch colonies and, assumed possession for James, Duke of York and Albany. Anglicizing the new colony was a slow and gradual process. The transfer of authority from Dutch to British hands was peaceful with existing land ownership, trading privileges and political structure maintained by the new leadership. The Swedish, Finnish, and Dutch colonists remained and new immigrants of those nationalities, as well as English and Scotch-Irish, supplemented the growing population to form a multi-ethnic community.

In 1682, William Penn was granted proprietary rights over Pennsylvania and the Lower Three Counties which included the city of New Castle, the land within a 12-mile radius of the New Castle courthouse, and the land on the west bank of the Delaware Bay (including all of modern Delaware). Conflicts soon developed between the pacifist Quakers of Pennsylvania and the colonists of the Three Lower Counties, and these led to the establishment of separate governmental bodies and relative autonomy for the southern colonists. However, economic ties continued to link Penn's factionalized colony. The Penn family's claims to interest in the colony were finally relinquished just prior to the American Revolution.

The early Dutch and Swedish pattern of settlement with closely spaced villages along the Delaware River was gradually replaced by the English colonial settlement pattern of scattered farmsteads along emerging transpeninsular roads. This pattern of scattered settlement was encouraged by economic factors. For example, Philadelphia mercantile interests required increasing numbers of marketable foodstuffs for local and export markets and land speculators parceled huge tracts of productive farmland obtained from Penn. Philadelphia's emerging economic influence during the 18th century caused a shift in agricultural activities in Delaware from subsistence to market-oriented crops.

The waterways were important to transportation and commerce as early roads were limited in number and of poor condition. The few existing roads led to landings on rivers and the Delaware Bay where produce and goods were shipped by cheaper, and more efficient, water transport. Some of these locations are included in the Study Area. The Delaware River - Delaware Bay served as a major focus of water transportation because the majority of Delaware's streams flow eastward to these water bodies. For this reason the large port city of Philadelphia, and to a lesser extent Wilmington and New Castle, exerted major commercial influence on the Delaware counties throughout the 18th century and later. Wilmington, New Castle, and Lewes were also ports for ocean-going vessels involved in export trade. Overland transport was limited to a few major roads, such as the 18th century post road connecting Philadelphia - Wilmington - New Castle - Odessa - Middletown - Dover - Lewes with a western branch at Milford

linking it to the Chesapeake Bay. Small secondary roads and paths interconnected the numerous villages and hamlets and are common within the Study Area.

By the middle of the 18th century population increases and commercial expansion stimulated the growth of towns and the development of transportation and industry. During the 1730s successful attempts were made to harness waterpower on the Brandywine and Christina Rivers resulting in the establishment of Wilmington as the foremost milling and shipping center in Delaware. The availability of wheat from the central Mid-Atlantic region, easy and economical transportation, and the proximity of the Philadelphia and New York markets facilitated the commercial rise of the Brandywine mills. During the later part of the 18th century Wilmington's economy focused on shipbuilding, coopering, milling, and import-export trade.

The rise of commerce and industry in Wilmington produced significant effects on the rural areas of New Castle and Kent counties. The technologies utilized in the Brandywine Valley spread to these areas resulting in a extensive network of mills throughout the colony. Millworks in the agrarian areas were frequently multi-functional with water-powered grist, saw and (woolen cloth) fulling operations being performed at different seasons at the same location. The mills primarily produced goods for local markets. At this time, the agrarian Delmarva Peninsula was considered an area of portage between the Chesapeake Bay markets (Annapolis and Baltimore) and the Delaware River and Bay markets (Philadelphia and New York).

The early decades of the 19th century saw the beginning of an agricultural revolution throughout Delaware, most extensively in New Castle County. The first agricultural society in the United States was formed in New Castle County in 1804 with a strong focus on scientific agricultural practices. A number of factors worked in conjunction to establish New Castle County, and Delaware as a whole, as an important agricultural producer. The discovery of marl, a natural fertilizer, during the construction of the Chesapeake and Delaware Canal in the 1820s enhanced the productivity of Delaware agriculture while the opening of the canal encouraged the production of market-oriented crops because produce could be quickly and cheaply transported to markets.

The opening of the Philadelphia, Wilmington and Baltimore Railroad in 1839 provided transportation of northern Delaware produce to the growing eastern markets. The extensive production of market-bound crops developed later in Kent and Sussex counties due to a lack of interior transportation facilities, although produce did move by water from seaport towns. When the Delaware Line extended rail service to Dover and later Seaford in the 1850s, a vast agricultural hinterland was opened and agricultural production for markets increased significantly.

Prior to 1832 Delaware's agricultural products were primarily grains, with fruit and vegetable crops of lesser importance. During the period 1832-1870 Delaware became the center for peach production in the eastern United States. Rich soil, favorable climate and rainfall, excellent transportation facilities, and strategic location near large markets made peach production a lucrative enterprise. Delaware City with its canal

location led Delaware and New Castle county in production until the peach blight of the 1850s. The peach industry was hindered in Kent and Sussex counties until the 1850s due to transportation limitations. Early attempts there failed because producers could not move fruit to market economically. Rail service into the area and the absence of the peach blight in the southern counties made the peach industry economical in the 1850s. By the end of the "peach boom", massive harvests were being shipped by rail and steamship lines to New York where much was readied for resale to the northern states. The peach industry proved profitable for a large number of peach growers, as well as a variety of support industries. Basket factories, canneries, and peach tree nurseries all aided in and reaped the financial rewards of the peach industry. The railroad and steamship lines integral to peach distribution, depended on peach shipment for a large portion of their annual revenue. The construction of "peach houses" of the Italiante architectural style accompanied the influx of money which resulted from the growth of the peach industry and peach houses are common in the Study Area.

Through the 19th century, and into the 20th century, Delaware's agricultural production continued to focus on the perishable products with a decrease in staples. There has been marked increase in milk and poultry production while the levels of fruit and vegetable production were maintained. Cash crops such as tobacco, have been of importance on a small scale in Kent and Sussex counties.

Throughout Delaware's agricultural history farm labor has been a valued commodity. In the colonial period blacks in slavery and white indentured servants were the primary farm laborers. By the mid-18th century white indentured servants were as numerous as black slaves. Slightly less than one-half of the blacks in the state in 1790 were free; however, by 1810, less than one-quarter of blacks were slaves according to federal censuses. Therefore, in the 18th century, free black laborers played an increasing role in farm production. Abolitionist attitudes were strong in Delaware and legislation enacted by Quaker and Methodist leaders restricted the increase of slaveholding, especially in New Castle and Kent counties, by prohibiting the importation and exportation of slaves. Agricultural factors, as well, reduced the profitability of slaveholding and thus a combination of ethical and economic factors were responsible for the increase in the free black population in the state prior to Emancipation and the Civil War.

The patterning and density of settlement in Delaware, and the Study Area specifically, have been strongly influenced by several factors throughout its history, These are: 1) an agrarian economy; 2) the commodity demands of large markets, first Europe and the West Indies, and later domestic commercial-industrial centers, and 3) transportation facilities. The advent of automobile transportation in the 20th century brought about significant improvements in the state road system and opened large tracts of land to productive agriculture. The DuPont Highway constructed in the 1920's linked the northern and southern sections of the state and shifted the agrarian focus of

the southern counties permanently toward non-local markets.

Based upon this historic summary, several kinds of sites can be expected in the project area. Given the predominantly agrarian nature of the history of Red Lion Hundred, nearly all of these sites would have been linked to agriculture or to transportation routes used for the marketing of agricultural products. For the seventeenth century, these points would have been situated along Red Lion, St. Georges, and Dragon Creeks, the major transportation routes of the period. Since sites from this period are extremely rare and are unknown from the Project Area, any sites from this century would be valuable.

In the eighteenth century, the development of the Philadelphia to Lewes post road, also known as the King's Highway, marked the first substantial north-south route on the Delmarva peninsula. This route, constructed in the 1730s, improved regional transportation and probably stimulated the development of farmland along its length. Crossroads stimulated development at intersections like Wrangle Hill, in the Project Area, and Red Lion, about one-half mile west of it. The village of St. Georges emerged as a transshipment point and a ferry crossing. The Chesapeake and Delaware Canal was completed in 1829 but did not largely alter the agrarian character of the hundred. This pattern was perpetuated into the twentieth century and was only modified with the contsruction of the petrochemical industries at Delaware City in the 1960s. Nearly all of the historic sites one may expect to find in the Project Area would be farmsites reflecting a slow gradual development of the

hundred. Historically, since most of the farm products from the Project Area were grown for market, the growth rate of farming during the 18th, 19th, and 20th centuries would be subject to fluctuations in market conditions and the general health of the economy. The remaining sites would be those at transportation nodes such as crossroads, ferries, or shipping points like St. Georges and Wrangle Hill.

The expected sites can be placed within an historic framework developed in the Delaware Statewide Comprehensive Historic Preservation Plan (Ames, Herman, and Siders 1987). Several historic themes and temporal periods are defined and the data from the Route 13 North survey could be used to better understand specific themes outlined. The predominant contextual theme of Agriculture can be explored for the development of such things as land use and the rate of land clearing, the shift from subsistence/market farming to full market farming, tenant/land owner relationships, and the growth of farming as a science.

The theme of Initial Landscape is poorly understood for Delaware. The documented early settlement took place on the Delaware Bay shore and along the meandering tidal streams leading back from the shore (Hoffecker 1977; Munroe 1984; Scharf 1888; Weslager 1961, 1967; Wise 1980). Most of the settlement took the form of dispersed family farmsteads where the farmhouse was located close to the navigable stream. The lot configuration was in the "long lot" arrangement, where the lots ran perpendicular to the navigable stream and each occupant had frontage on the stream. In the late 17th century, mills and mill dams developed along the courses of the tidal streams but were never the focus

of any concentrated settlement (Wise 1980).

An examination of the plat maps associated with the Penn Warrants and Surveys (University of Delaware microfilm reel no. 86) for the late 17th century shows that within the project area, the Kings Highway had been extended southward from New Castle through St. Georges and Appoquinimy [now Odessa] and connected with several local cart roads, including places like "Jacob Young's Landing" and Head of Elk, Maryland. Dwellings and other buildings are also depicted and frequently labeled with the name of an owner or tenant. The Penn warrants were then examined further to include the period extending up to the mid-18th century. For the entire time span from the 1680s to the mid-18th century, no sites are shown which can be said to be indisputably lying directly within the Proposed Right-of-Way of the Relief Route. However, two sites were noted along the King's Road (approximate Right-of-Way of present U.S. 13) which <u>may</u> be affected by the Relief Route construction. A 1736 plat for the land of Valentine and Isaac Dushene shows a fulling mill located just southeast of the juncture of Scott's Run and the King's Road. No trace of the mill remains today and in any event, it is outside of the present Proposed Right-of-Way and thus unlikely to be affected. A second site was noted lying northwest of St. Georges, on a plantation called "New Utrecht," laid out for Hendrik Vander Burgh in 1683. The plat shows a house occupied by one Robert Seam and it appears to lie somewhere on the present David Meck farm (see Parcel 5 below). A search for this site will be incorporated into the Phase I survey of this parcel.

Seventeenth century sites are virtually unknown archaeologically for this part of the Delmarva and early 18th century sites are also poorly understood. Any kind of site within this time bracket would be useful in testing the assumptions made above.

A third historic context which could be explored is the theme of "Transportation and Communication," which would look at the effects of the nautical and terrestrial transportation systems on the history of the area. The two largest of these of course are the King's Road, in use by the 1680s and now largely subsumed by the present Right-of-Way of U.S. 13, and the C & D Canal, opened in 1829 and extensively enlarged and modified since then. The King's Road was the first major north-south land route and ended several decades of almost total dependence upon water travel. Although the coastal plain streams continued to be important transportation routes, the King's Road helped to promote land travel by serving as an artery connecting smaller local service roads to the small towns along the peninsula. The C & D Canal carried 100,000 tons of cargo in 1837, only 8 years after it opened, and reached its peak in the year 1872, when 1,318,772 tons were transported (Snyder and Guss 1974). Delaware City, Delaware and Chesapeake City, Maryland, the terminus towns at either end of the canal, were not established until its contruction. However, locks were established at Chesapeake City and at St. Georges, Delaware and the King's Highway crossed the canal at St. Georges. These points would have served various capacities during construction of the canal and after its completion, including: housing for construction workers, supply

points for food and equipment needed for construction, housing for lock tenders and mule drivers, stabling for mules, transshipment points for marketable farm products, access points for passengers for coastal packets, the locations of marine supply stores for canal shipping, and support facilites for canal maintenance crews. It is expected that at least some of these features could be recovered archaeologically, although later canal widening and other improvements may have obliterated the sites.

RESEARCH DESIGN AND BACKGROUND RESEARCH

The primary goal of the Phase I survey was the simple location and identification of cultural resources within the Proposed Right-of-Way. Therefore, it is difficult to link the Phase I survey with an explicit research design. However, it is possible to apply some of the general and specific predictive models for the location of prehistoric sites in Delaware's High Coastal Plain. The potential site locations identified by these models can then be the focus of more intensive fieldwork.

Based on numerous studies of prehistoric site distributions in Delaware's High Coastal Plain (Custer 1984; Custer, Bachman, and Grettler 1987; Custer and DeSantis 1986), the areas adjacent to major drainages are the focus of the most intensive and extensive prehistoric settlement. Because there are no such settings in the current study area, large base camp sites are expected to occur only rarely in the Project Area. Nonetheless, the Project Area does cross numerous smaller drainages and these settings may be the locations of prehistoric sites, including