INTRODUCTION

The purpose of this report is to describe the Phase I and II archaeological investigations of the project area for the proposed replacement of Bridges Nos. 17 and 18 on Road 221 (Beaver Valley Road). The project area is located in extreme northern New Castle County, Delaware (Figure 1), and includes approximately 560 feet of right-of-way (Figure 2). The fieldwork and report preparation took place between May 1986 and December 1986. The survey work was undertaken by the University of Delaware Center for Archaeological Research for the Delaware Department of Transportation and the Federal Highway Administration under Section 106 of the National Historic Preservation Act to evaluate the effects of the proposed replacement of Bridges Nos. 17 and 18 on significant, or potentially significant, cultural resources as defined by the National Register of Historic Places (36 CFR 60). The built environment of standing structures is not considered in this report.

Appreciation for their help, information, interest, and support is extended to all the residents of the Beaver Valley area. Special thanks and recognition are offered to the following people:

Mr. Tony Bowden
Mr. and Mrs. Dougherty
Mr. William Derickson
Mrs. Margaret Hanson
Mr. Albert Mayer
Mr. Rocky Mensack
Mr. Richard Rhoads
Mr. Philip Rhoads
Mr. Newlin Wood
Mr. Paul Vernon

FIGURE 1

Study Area Location

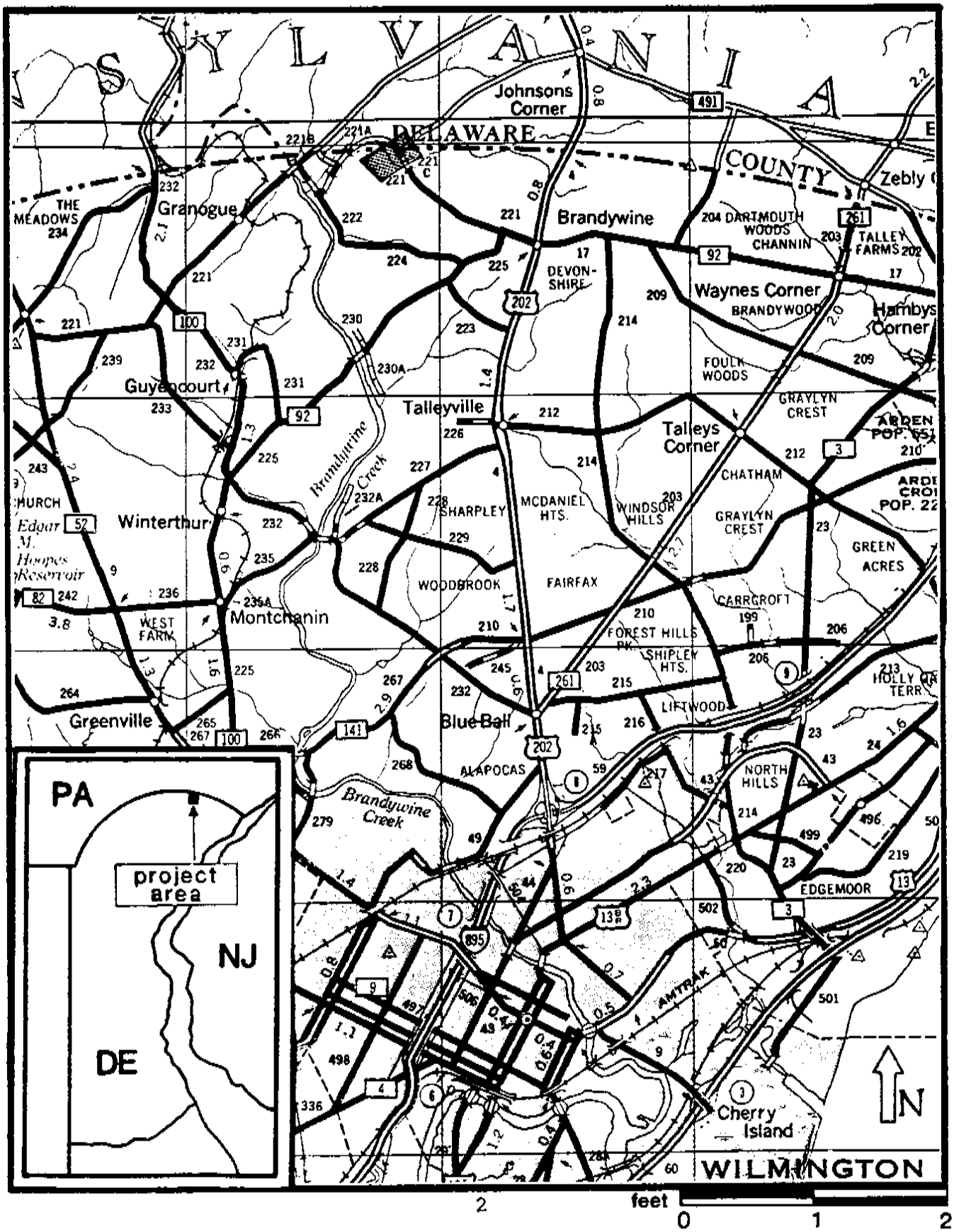
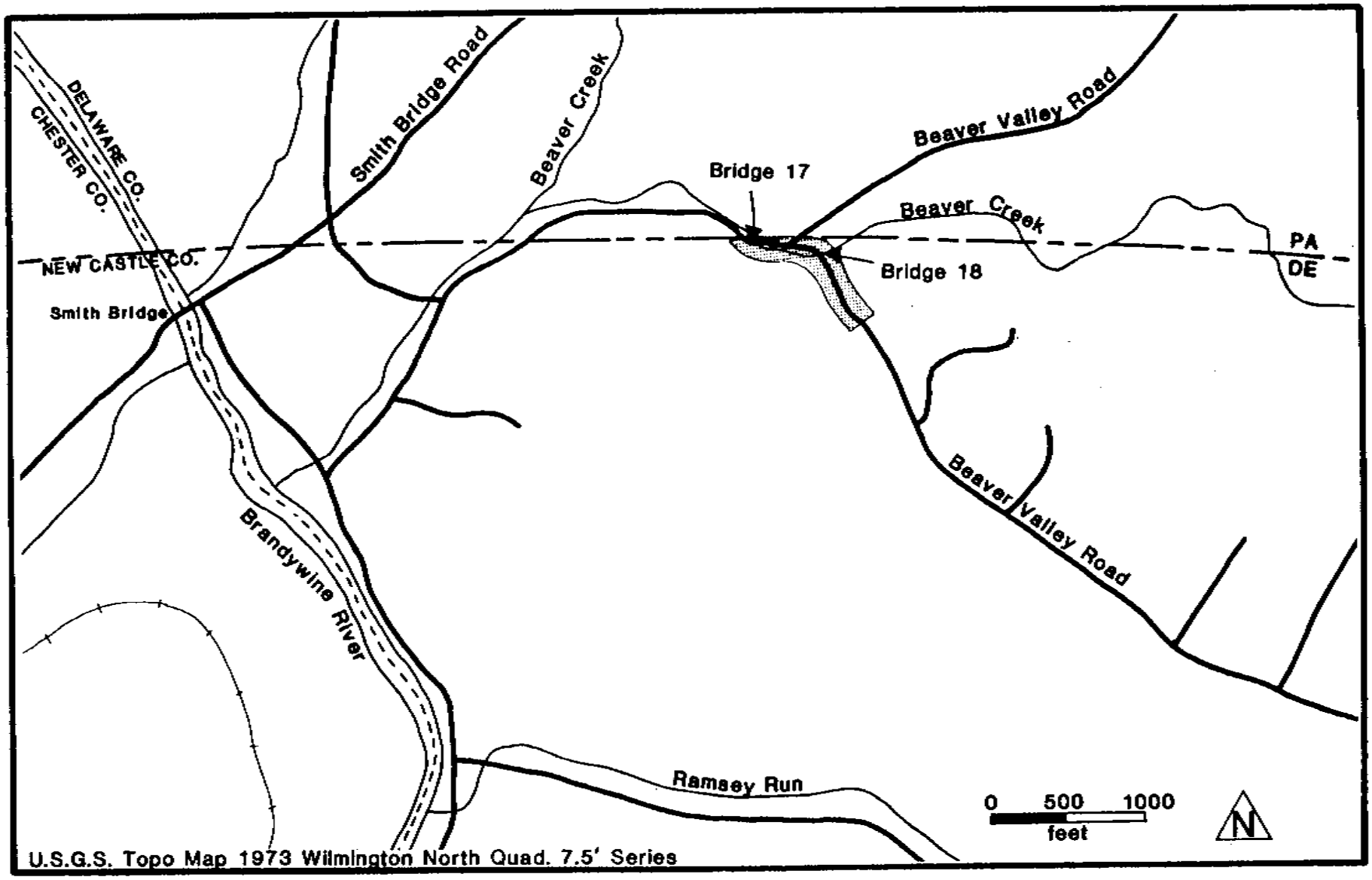


FIGURE 2

Project Area



ENVIRONMENTAL SETTING

The Beaver Valley project area is located in the Piedmont Uplands and the summary of the local environmental setting presented below is abstracted from the work of Custer (1984:23-25) and Custer and DeSantis (1985).

The Piedmont Uplands of Delaware represent the northernmost portion of the Delmarva Peninsula and are characterized by a diversified relief dissected by narrow and deep stream valleys with isolated knolls rising above the general upland level (Spoljaric 1967:3). Thornbury (1965:88) notes that within the Piedmont Uplands there are no large tributaries of the older incised river systems, the Susquehanna and the Delaware. Rather, there are a number of smaller, lower order drainage systems. Some large floodplains can be found along some of the higher order streams such as the White Clay Creek and the Brandywine, Elk, and Northeast Rivers. However, these settings are uncommon. Elevation differences of up to 82 meters (270 feet) can be found between small floodplains of the numerous drainages and the tops of the adjacent knolls, and these elevation differences are sufficient to cause changes in tree community distribution (Braun 1967:192-194). Soils of the Piedmont Uplands can generally be characterized as well-drained with some poorly-drained areas in floodplains and upland flats.

The Beaver Valley project area is approximately 0.2 miles long and extends from the vicinity of the Pennsylvania-Delaware state line south approximately 1000 feet to a point immediately north of Heather Hill Farms (Figure 2). The project area is

centered on two bridges, DelDOT Bridges Nos. 17 and 18 (N-4282) (Plate 1), which are to be replaced by the Department of Transportation. The southern terminus of the project area is approximately 250 feet above sea level. Within the project area, the ground surface descends to an elevation of approximately 210 feet at Beaver Creek near the northern teminus of the project area. Beaver Creek flows swiftly through the project area and is a perennial stream fed by a number of springs. The drop in the gradient of Beaver Creek from the project area to the Brandywine River, which is approximately 0.6 miles to the west, is approximately 20 feet and this gradient and the stream's steady flow have allowed the development of a number of successful mills in the area.

Prominent soil types in the project area are the Glenelg-Chester-Manor and Neshaminy-Aldino-Watchung associations which are medium textured soils formed over micaceous crystalline rocks and dark colored gabbroic rocks (Mathews and Lavoie 1970: 2-3, 7-8). The area is presently well-wooded with numerous small pastures and fallow fields and has has been preserved as a wildlife refuge by Woodlawn Trustees, the present owners of most of the area.

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

PLATE 1

Beaver Valley Road, Looking North
Towards DelDot Bridge #18

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) and Custer and DeSantis (1986).

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 northern Delaware, and watering areas, such as the Mill Creek floodplain and the Hockessin Valley swamps in the study area, 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 has been noted 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 adjacent to the study area near Hockessin (Custer and DeSantis 1985) 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, which is located approximately 5km south of the study area. 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 at

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 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 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.

Woodland I 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 (Stewart, Hummer, and Custer 1986). 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 participate 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.

REGIONAL HISTORY

It is important to consider the historic sites and

archaeological remains of Beaver Valley from a regional context in order to assess their significance. A discussion of the regional history, provided below, includes a summary of the chronological development of the Beaver Valley area. More detailed histories of specific sites will be included in the Phase I and II Survey Results section. Sources for this regional history include previous DelDOT reports (Coleman et al. 1983, 1984, 1985, Catts et al. 1986, Beidleman et al. 1986), New Castle County Deeds (hereafter cited NCD), Orphans Court and Probate records, Brandywine Hundred Tax Assessments (1738-1901), Road Petitions, oral interviews, contemporary newspapers and county histories (Scharf 1888, Ashmead 1884, Wiley 1894, Conrad 1908), historic maps, and secondary works on the history of Delaware and the Middle Atlantic region, Hoffecker (1973, 1977), Weslager (1961, 1967, personal communication 1987), Lemon (1972), Reed (1947), Bausman (1941) and Munroe (1954, 1978, 1984).

The earliest historic settlement in what is now Delaware was a whaling station and agricultural community established by the Dutch West India Company in 1630 near the present town of Lewes. However, this post was destroyed by the 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 and this venture was financed by the Swedish government. Although the land was claimed by the Dutch, it was little used and was unsettled when the Swedes arrived. By 1654 a small village, Christianaham, existed behind the fort, and approximately 400 Swedish, Finnish, and Dutch settlers resided in the area.

In the mid-1650s the uneasy coexistence between the Swedes and the Dutch 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. The Swedes captured the fort in 1654 and renamed it Fort Trinity. In 1655 the Dutch recaptured the fort. 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 by the Duke of York essentially gave economic and political control of the Delaware region to Philadelphia, the new seat of government.

By 1683 the cultivated areas of the region consisted of the three Lower Counties -- New Castle, Kent, and Sussex, in addition to three Pennsylvania counties -- Philadelphia, Buckingham (Bucks), and Chester. The total population of all six counties in 1683 has been estimated to have been about four thousand people (Myers 1912:239). In New Castle County, five tax districts, called Hundreds, had already been established by 1687. Brandywine Hundred, in which Beaver Valley is located, was one of these first five. The settlement pattern for this early period was one of dispersed farmsteads located along the Delaware and its tributaries, where good agricultural land and easy access to water tansportation could be found. These larger tributaries included the Christiana, Brandywine, and Naamans Creek.

William Penn was formally granted possession of Pennsylvania by Charles II in 1681. In October 1682, after arriving in

America, Penn took possession of New Castle and the Three Lower Counties, including all of modern Delaware. Penn settled his possessions by granting tracts and parcels of land directly to settlers. He usually granted to families, with the average size tract being about 500 acres (Myers 1912:53). Larger tracts, however, were not unknown. The lands around Beaver Valley, including all of Brandywine Hundred and parts of Delaware County, were included in one such large tract, Rockland Manor, which was created by Penn in 1682. In 1699, two thousand acres of this tract, including all of Beaver Valley, were sold to the Pennsylvania Land Company, a London-based land speculation company. A resurvey of Rockland Manor in 1712 found that the entire tract contained approximately 60,000 acres, of which approximately 4,120 acres were in Delaware (NCD T-1-216). In 1722 William Hicklen purchased 180 acres of Rockland Manor from Tobias Collete, Daniel Quare, Henry Gouldy, survivors of the original members of the Pennsylvania Land Company (NCD G-1-387, 388). Hicklen's parcel included most of Beaver Valley and all of the study area.

Brandywine Hundred and New Castle County were part of a broader regional economy that was centered in Philadelphia. By the last quarter of the seventeenth century, Philadelphia was the dominant figure in the economy of the lower Delaware Valley and New Castle County was part of Philadelphia's agricultural and commercial hinterland. Farmers in this region sent their grains to local milling centers and from there, flour and bread were shipped to Philadelphia for export to the West Indies, other American colonies, and Europe. The farmers of New Castle County

quickly adapted to this market system of agriculture and it is estimated that over one-half of the farmers in New Castle County were situated within eight miles, or approximately a half-day's journey, of a mill or shipping wharf.

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 more easily grown and had ready markets. Once farmers realized that wheat was a profitable commodity, they began to shift from a subsistence to a market oriented agriculture. Corn was also grown, but in general was not as popular as wheat in this early period. The transportation of grains to milling sites supported an extensive coastal trade employing shallops and other small, shallow draft boats. These milling sites were among the earliest manufacturing complexes in the region. One such early milling and transshipment center was Naaman's Creek Landing along the upper reaches of the western most branch of Naaman's Creek. According to the earliest road petitions for Beaver Valley Road, this site was used by a number of farmers in northern Brandywine and the Beaver Valley area during the eighteenth century.

Settlement in northern New Castle County during the eighteenth century continued much as it had in the previous century. As the transportation network improved, colonists began to move farther inland away from the navigable rivers and streams. Agriculturally productive areas were settled first, but as the population began to grow, more marginal areas were also occupied.

The median size of land warrants granted in 1735 in New Castle and Kent counties was between 200 and 300 acres, with the typical grant close to 200 acres (Penna. Archives 1891:193-202). This trend towards smaller average holdings as compared to seventeenth century grants was due to a tendency for the large tracts to be divided and subdivided by sale and inheritance. Lemon (1972) substantiates this trend in noting that by 1750 it appears that the density of rural settlement in southeastern Pennsylvania and northern New Castle County was approximately five households per square mile.

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. A four field system of crop rotation was also commonly used. Farming was the most important occupation for the vast majority of the area's population. Wheat remained the primary crop, followed by corn, barley, oats, and garden vegetables. In many areas, generations of repeated tillage had begun to exhaust the soil. Thus, agricultural practices in New Castle County followed an extensive, rather than an intensive, use of the land (Lemon 1972:179).

The importance of the land and animals to the settlers in the area, even in the first half of the eighteenth century, is revealed by the hiring of a ranger for Rockland Manor. Richard Sanderson, the "Ranger of Rockland Manor," was given "full authority and power to range, oversee, and take care of all timber, trees and woods" by the proprietors, John, Thomas, and Richard Penn. Sanderson was also to retrieve all horses, cattle,

and stray animals. His payment for successful cases was one-third of any lumber, horses, or strays recovered, with the exception of cattle (NCD K-1-287).

The road network in north-central New Castle County improved considerably over the course of the eighteenth century due both to population growth and prospering interregional trade. By 1750, 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. Prior to the Revolutionary War, there were probably four main thoroughfares in the study area: The Old Wilmington Road, the road from Ockesson Meeting House to Cuckoldstown (established in the 1730's), the Kemblesville Road, running from Chester County to Corner Ketch, and the Limestone Road (present day Route 7).

Both the methods and routes of transportation underwent substantial changes in New Castle County as first turnpikes, then canals, and finally railroads were introduced. The most significant canal built on Delaware was the Chesapeake and Delaware Canal, completed in 1829. Throughout the nineteenth century, improved transportation was the key to urban, agricultural, and industrial development. The first successful turnpike in Delaware, and the one that is most important to the history and development of the study area, was the Newport and Gap Turnpike, begun in 1808.

The first documented reference to Beaver Valley Road is a 1751 road petition. The petitioners wanted access to the Concord Pike, and ultimately, to the milling and shipping facilities at Naaman's Creek. This petition asks that the road, called

Naaman's Creek Road, be laid out "as Near the first Laying out as Possible" supporting Scharf's (1888:904) claim that Beaver Valley/Naaman's Creek Road existed before 1751 and possibly in the seventeenth century. Evidently the road was constructed, at least in part, after the 1751 alignment for a number of later petitions from 1796-1798 ask the General Court to change the course of the road and adjust damage costs.

Between 1796 and 1799, Beaver Valley/Naaman's Creek Road was reviewed and resurveyed three times (New Castle County Road Petitions). The 1751 alignment through the study area (William Hicklen's property, Figure 3), however, remained undisputed and unchanged. The last petition presented to the Court of General Sessions in May 1799, called somewhat testily the "Re-Re-Review" by the judges, includes the signatures of 70 inhabitants of Brandywine Hundred who would benefit from the road. William Hicklen's son William and grandson Joshua were among the petitioners. The importance of Philadelphia in the area's economy can be seen in the petitioner's description of the needed Naaman's Creek Road as "the road extending from Chandler's Run (Beaver Creek) to the Philadelphia Road (Concord Pike) to Naaman's Creek Landing" (New Castle County Levy Court, Miscellaneous Road Papers). Thus, by 1751, and certainly by 1799, Beaver Valley Road/Naaman's Creek Road was complete from Beaver Creek (Chandler's Run) at the state line to the Concord Pike and from there to Naaman's Creek Landing (Figure 4). The relationship of Beaver Valley/Naaman's Creek Road to other roads in the area can be seen in Heald's 1820 map of the roads of New Castle County (Figure 5).

FIGURE 3

1751 Alignment of Beaver Valley/Naaman's Creek Road

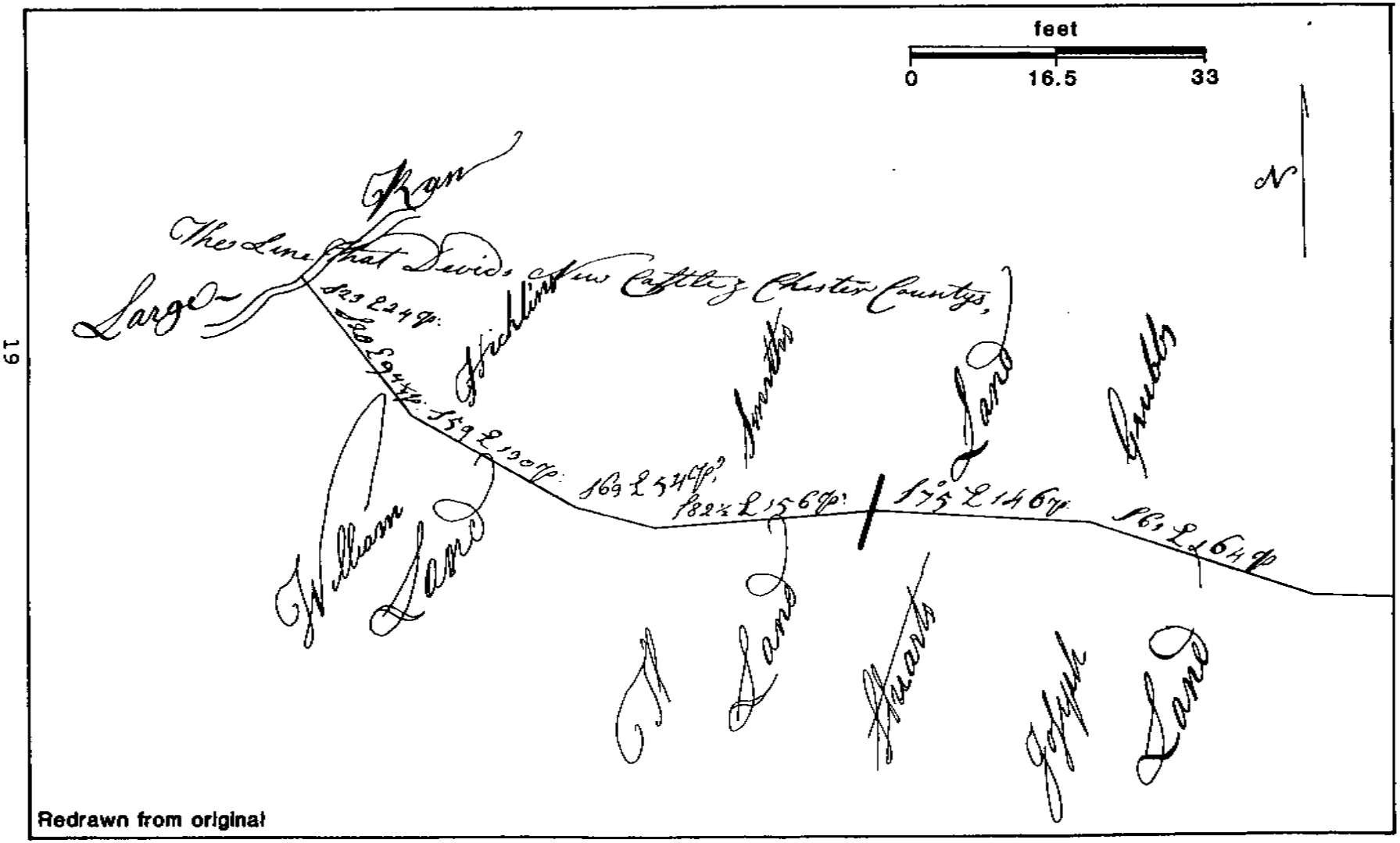


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FIGURE 4

1799 Alignment of Beaver Valley/Naaman's Creek Road

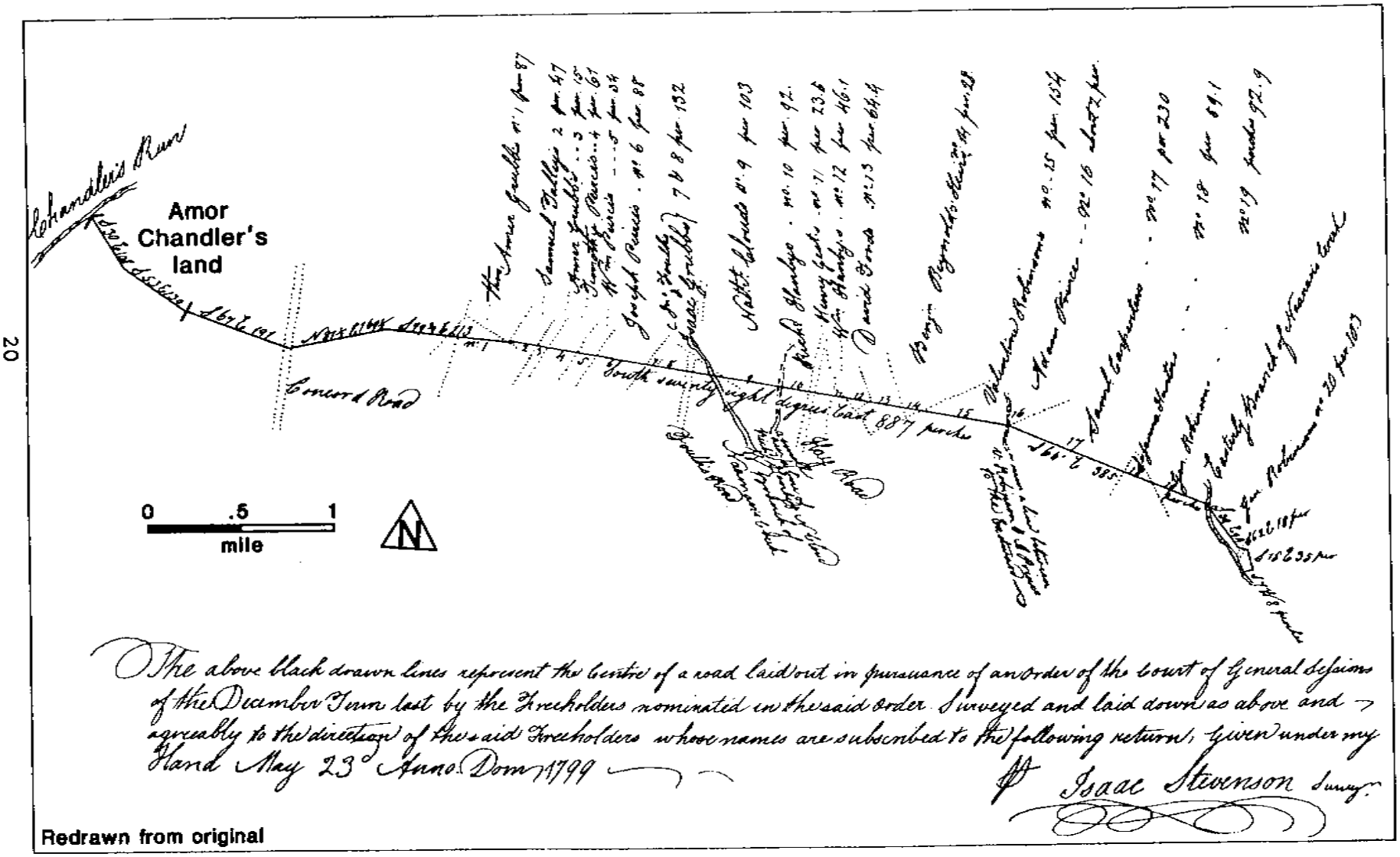

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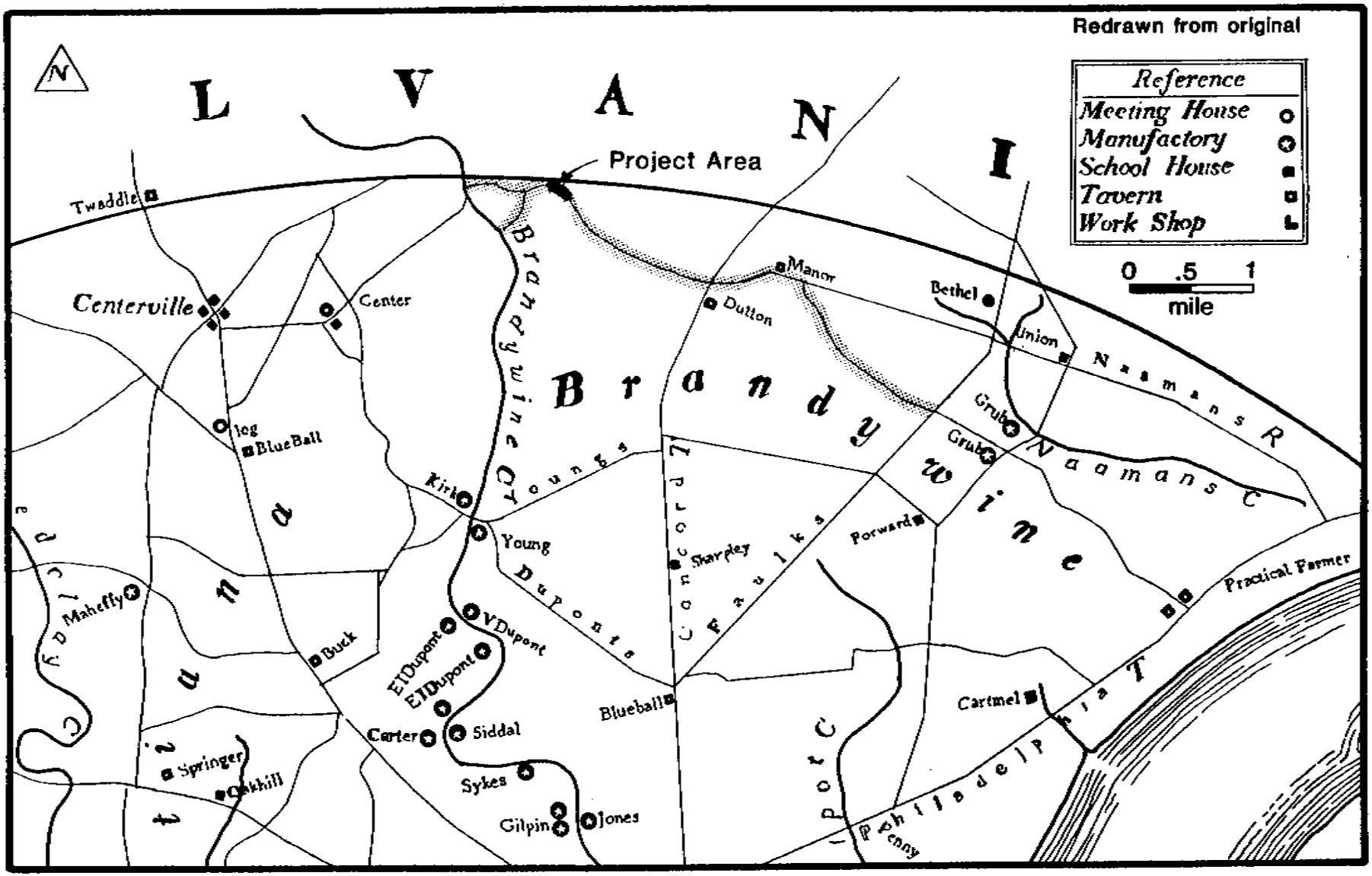
FIGURE 5

Detail of Henry Heald's 1820 Roads of New Castle County, Showing BV/NC Road



In northern Delaware the nineteenth century was marked by rapid industrial and urban growth, population expansion, and was accompanied by a noticeable decline in the number of farmers. The rapid growth of the population during the early decades of the century forced many new farmers in the Middle Atlantic region to clear land of poor or marginal quality. Poor farming practices, continued largely unchanged from the previous century, also contributed to the decline in agricultural production. Another significant factor in the first decades of the century was the collapse of inflated wheat prices after the end of the Napoleonic Wars. Because of these factors, many farmers in Delaware at this time were hard pressed to turn a profit from their farmsteads. The result was an outmigration of a large portion of the population during the 1810s-1830s to better lands to the west, particularly in the Ohio River Valley. Tax Assessment records for Brandywine Hundred show a number of people, particularly young men, leaving the area at this time. Hancock (1947:374) notes that between 1810 and 1840 the population of Delaware remained stationary, despite a favorable birthrate and only increased after 1840.

The loss of jobs related to agriculture in the first decades of the nineteenth century 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 occured over the first half of

the nineteenth century and by 1869 were well established.

The Beaver Valley area, however seems to have fared much better than other areas of Delaware during the early nineteenth century. In 1735 William Hicklen and his wife Dinah sold the 180 acre parcel they had purchased from the Pennsylvania Land Company to their son William (NCD X-1-210). William, the father, died in 1772. Evidently William, the son, received a substantial and prosperous farm from his father. In 1781 William Hicklen of Brandywine Hundred was assessed 26 pounds in taxes. By way of comparison, two other farmers in the area, Francis and Joseph Day, were assessed 5 and 12 pounds respectively. By the turn of the century, William Hicklen (Jr.) had amassed a substantial estate. In a will dated 25 August 1801, William Hicklen gave to his wife Susanna a substantial amount of furniture and, until she remarried, a "good hackney," a cow, and a yearly allowance of 100 lbs. of "good pork and as much beef," 8 bu. each of wheat and corn, 5 lbs. of wool, and 12 lbs. of flax. To his eldest son, John, Hicklen gave the largest part of his plantation and part use of the cellar, smoke house, oven, apple kiln, draw-well, and clothes-press.

William Hicklen (junior) died shortly after his will was made in 1801. An inventory of his estate in November 1801 valued his personal possessions at nearly 850 pounds sterling. In 1812 John Hicklen sold 90 acres of property to Amor Chandler, a farmer (NCD Q-8-40). In 1813 Hicklen sold an additional 26 acres to Amor Chandler (NCD Q-8-40). These two parcels included all of the study area and marked the beginning of the Chandler family in Beaver Valley. Amor Chandler and his descendants, most notably

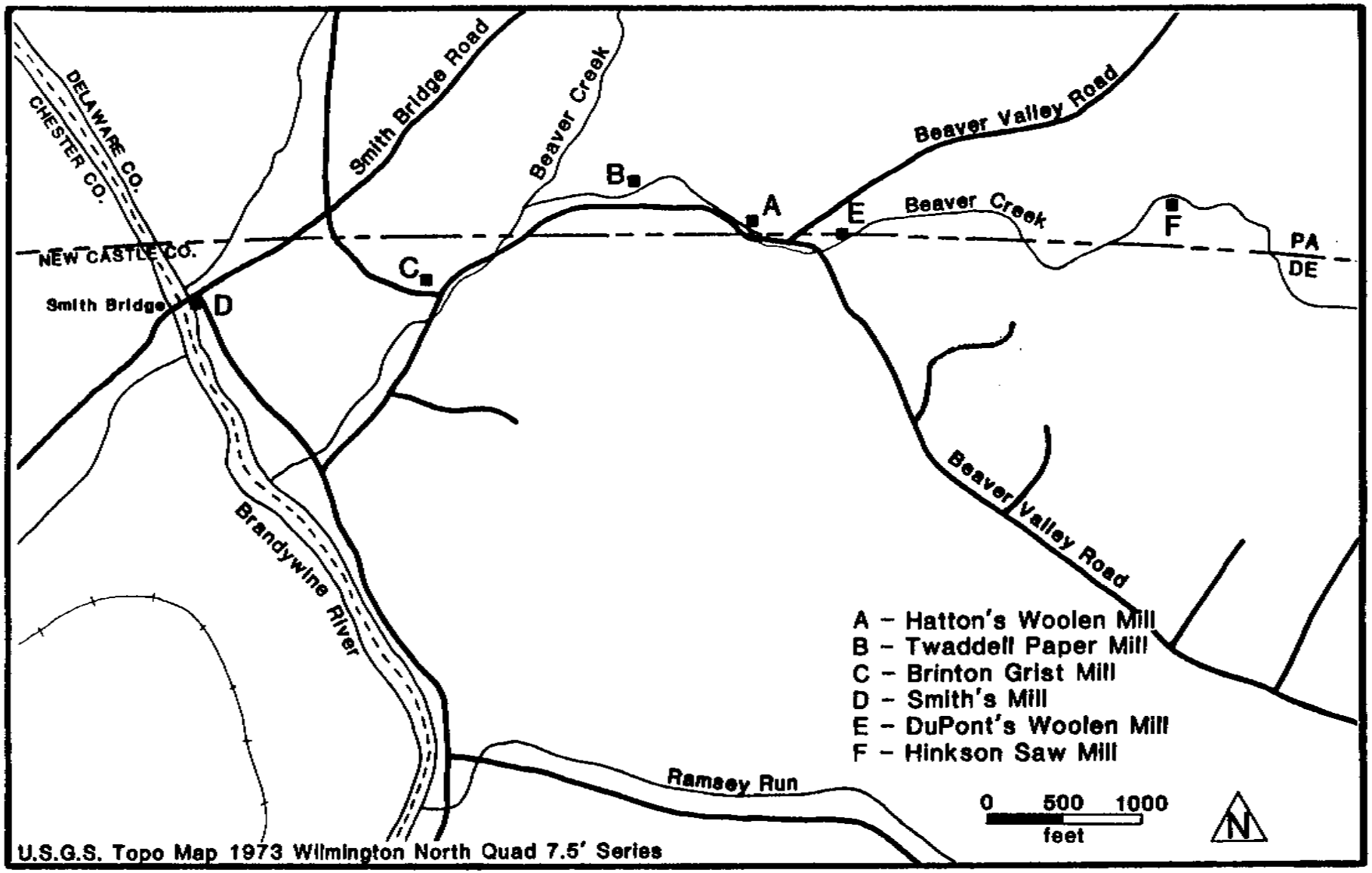
his sons Jehu and Amor H., settled in Beaver Valley, which became known locally as Chandler's Hollow. Beaver Valley, or Chandler's Hollow, was the center of a small, but relatively prosperous milling and farming community during most of the nineteenth century. According to an 1826 report of the Delaware Commission on Manufactures, Beaver Creek was well suited for milling with a fall of approximately 8-9 foot drop available over its course to the Brandywine.

During the nineteenth century at least 6 different mill sites were occupied along Beaver Creek (Figure 6, Mill Sites A-F). Conrad (1908:456) notes that although the water power furnished by Beaver Creek gave the locality a great importance in the first half of the nineteenth century, the "furious freshets to which this precipitous little stream is subject" repeatedly caused much damage and signalled the inconsistency of flow that was to help close most of the mills by the last quarter of the century.

Although most of the mills along Beaver Creek were located closer to the Brandywine, two mill sites were located near the project area and were important to the history of the area. The first of these two mill sites was that of Sunnydale Paper Mill (Figure 6; Mill Site B). Sunnydale was built in 1811 by John Farra as a woolen mill. Farra then leased the mill to the La Forrest brothers who operated it until it was destroyed by fire in 1824. The mill remained in ruins until 1830 when it was rebuilt as a paper mill. The mill was then occupied by William and John Gilmore for a year when Farra took possession of it and

FIGURE 6

Mill Sites along Beaver Creek



operated it until his death in 1832. Farra's son Daniel took over and operated the paper mill until 1851 when it was again destroyed by fire. Daniel Farra then sold the property to his son-in-law, Francis Tempest, who rebuilt the mill and added steam power. Steam power was important improvement as Beaver Creek did not consistently supply enough water to power the mill (Ashmead 1884:318).

Tempest operated the the mill until 1901 when it was sold to Edwin Garrett. Writing and book papers were made at the mill until sometime around the turn of the century when manila and tissue papers were made. At this time Sunnydale had a 36 inch cylinder continuous length paper machine and two 140 lb. beaters. While Tempest owned and single-handedly operated the mill, production was approximately 1,000 pounds a day (Simmons 1947:494). Garrett enlarged the mill after he acquired it in 1901 and roughly doubled its capacity. Garrett also operated the mill single-handedly until 1922 when he hired L. A. Mayer, a millwright, who ran the mill until it closed in 1930. Sunnydale was dismantled in 1933.

Sunnydale mill received water from two sources: Beaver Creek and from a mill pond on Trout Run further north in Pennsylvania (Figure 6; Mill Site B). That both of these water sources had to be supplemented with steam power points toward one factor in the decline of Beaver Valley as a manufacturing community beginning in the mid-nineteenth century.

Immediately east of Sunnydale mill was the "old Woolen Mill" (Figure 6: Mill Site A). In 1809 Peter Hatton built a fulling mill there and in 1817 he erected a woolen factory and

manufactured flannels, satinets, and other cloth. In 1826 both Hatton's fulling mill and the Sunnydale paper mill were supplied by the same race. In this year, the equipment in Hatton's fulling mill consisted of one pair of stocking and carding machines. In 1843 the Hatton mill was owned by Philip Hizer and was washed away in the same flood as a number of other mills. The property then went to Tempest who used the extra flow to bolster the declining flow from Beaver Creek.

According to Scharf, Hatton's "old woolen mill" was once owned by Stephen Broadbent and used to manufacture Turkish carpets. The building was next occupied by a clover mill and by 1858 was used as a plow factory by William Morrison, Amor Jeffries, and Horace Mousley. The water power was used to operate a trip hammer and the plows were finished at a cooperating factory in Pennsylvania (Scharf 1888:906). By 1875 the building was again a clover mill.

An additional mill site along Beaver Creek in the nineteenth century was another woolen mill located east of Beaver Valley road and south of Beaver Creek (Figure 6; Mill Site E). Charles Dupont built the woolen mill in 1825. Both the mill site east of Tempest's and Dupont's woolen mill received water from Beaver Creek from a common dam east of Dupont's mill. A number of other important mills were located along Beaver Creek in the eighteenth and nineteenth centuries. With the exception of Sunnydale, almost all were defunct by the end of the nineteenth century. Closest to the confluence of Beaver Creek and the Brandywine was Isaac Smith's flour and grist mill (Figure 6; Mill Site D).

Taking all of its power from the Brandywine, Smith's mill was an important milling center beginning in the late eighteenth century. Reflecting this mill's importance, a number of New Castle County road petitions dated betweem 1829 and 1857 ask for better access to the mill from Beaver Valley Road (NCC Road Papers). This mill was purchased by William P. Talley sometime in the nineteenth century and continued to mill flour, although on a much smaller scale, until the last quarter of the nineteenth century (Scharf 1888:907). Another important mill site in Beaver Valley was the grist mill owned by Peter Hatton and later by Joseph Brinton (Figure 6; Mill Site C). Located approximately 1/4 mile west of the project area along Beaver Creek, this grist mill, according to Scharf, was an important "public convenience" in the mid-nineteenth century. All of these mills were defunct and the sites abandoned by the end of the nineteenth century. The Dupont wool mill was destroyed by a flood in 1843 that seriously damaged a number of mills along Beaver Creek, including Hatton's mill.

These mills were an important part of the largely agricultural economy of the Beaver Valley area. In 1879 the population of Beaver Valley, described as a "small post village" in a state directory, was approximately 150 persons. At this time approximately 23 farmers and their families are listed as living in the area. A store and post office and a blacksmith shop along Beaver Valley Road provided goods and services to the mills and the surrounding farming community. In 1879 the store and post office was owned and operated by William E. Butler, who purchased the store from Amor H. Chandler in 1877. Jehu Chandler

owned and operated the blacksmith shop across the road. By 1926 both the store and the blacksmith shop were closed.

The Beaver Valley area has always been predominantly rural in nature, consisting of dispersed homes and shops, agricultural fields or pasturage, and woodlots (Plate 2) and continues to be so today. Most of the area is currently owned by Woodlawn Trustees which has been purchasing large amounts of land in the area since the early twentieth century. All of the late nineteenth century structures have been removed although a number of the earlier stone houses have been restored and are rented by Woodlawn Trustees. The largely wooded areas on both sides of Beaver Creek from Beaver Valley Road west to the Brandywine have been preserved by Woodlawn Trustees as a wildlife refuge.

GENERAL RESEARCH AND FIELD METHODS

Phase I research consisted of two steps: 1) background and archival research, and 2) field reconnaissance. Background and archival research consisted of consultation with the staff of the Delaware Bureau of Archaeology and Historic Preservation (BAHP), review of all inventories of prehistoric and historic cultural resources maintained by the BAHP; review of historic atlases, maps, and secondary works; interviews with local landowners and experts in local history; and review of archival materials such as deeds, tax assessments, probate records, road books and petitions, and other court records. The background research for prehistoric sites included the review of the prehistoric archaeological literature on applicable predictive models (Custer 1983, 1984; Custer and Wallace 1982; Custer and DeSantis 1986;