

BACKGROUND RESEARCH

PREVIOUS INVESTIGATIONS

Numerous studies have been conducted on Wilmington’s industrial development, in particular along the Christina River. Wilmington’s waterfront and its heavy industries have been extensively researched and written about. The industrial context in this report relies primarily on Carol E. Hoffecker’s book, *Wilmington, Delaware: Portrait of an Industrial City, 1830-1910* (1974) and Stuart Paul Dixon’s *The Wilmington Waterfront Analysis Intensive Level Architectural Survey* (1992).

A number of studies have been conducted of the area, including city planning documents and technical studies conducted under Section 106 of the NHPA and for NEPA compliance. The prior studies are listed in Table 3, and include architectural studies as well as terrestrial and submerged archaeological investigations. A Site Specific Assessment of the study area, focusing on potential contaminated soils, also provided important information on historical land use patterns (Brightfields, Inc. 2009).

Table 3: Previous Studies

DESCRIPTION	REFERENCE
Archaeological investigations at Wilmington Boulevard	Klein and Garrow 1983
City plan for historic archaeological resources	Guerrant 1983
City plan for archaeological resources	Goodwin 1986
City operational plan for archaeological resources	Goodwin 1987
Block-by-block archaeological analysis of the waterfront	Bromberg 1988
Management plan for Delaware’s historic archaeological resources	De Cunzo and Catts 1990
Intensive level architectural survey of the waterfront	Dixon 1992
Archaeological identification for the Christina River Pedestrian Walkway	MAAR 1998
Market to Orange Street archaeological district NRHP evaluation	Thomas 1999a
Harlan & Hollingsworth shipyard site NRHP evaluation	Thomas 1999b
Submerged archaeological survey for the Riverwalk Project	Cox 1999
Site Specific Assessment: Christiana River Bridge	Brightfields, Inc. 2009
Cultural resources survey of South Market Street	Zug-Gilbert et al. 2011

Note: studies are listed in chronological order, the oldest first.

The studies of particular relevance to the project include the following.

- City planning documents for archaeological resources (Goodwin 1986, 1987; Guerrant 1983), prepared for the City of Wilmington’s Office of Planning.

Wilmington began planning for the management of archaeological resources with Alice Guerrant’s study in 1983. The document provides a history of the development of Wilmington and describes anticipated archaeological resources for each developmental period and theme. Guerrant mapped the growth of the city, delimiting where resources from each chronological

period are likely to be found. South Wilmington, including the APE, is within the areas discussed as having high potential for early settlement (1630 to 1730). The Christina and Brandywine rivers were focal points of settlement during that era; however, presumably the early settlement would be on high ground, not marshland. Guerrant's maps of high-potential areas for later periods of history were limited to the formal city boundaries and do not extend to the entire APE.

In the planning document Guerrant also addressed the historic significance of archaeological resource types. For the period of early settlement (1630 to 1730), she concluded that farmsteads and roads were of low significance, and mills would be of moderate significance. Highly significant resources during the period would include certain graveyards, and political and military structures. For the two later historic periods, Guerrant considered waterfront-area markets to be of high significance, and the waterfront-area manufacturing sites to be of moderate significance (Guerrant 1983:80).

Finally, Guerrant described and mapped the overall archaeological potential in the city. Her analysis, however, focused on the historical core area of the city and does not extend sufficiently south to include the APE.

The planning documents prepared by Conrad Goodwin (1986, 1987) were elaborations of Guerrant's earlier work. Goodwin (1986) established a broader historic context for Wilmington, expanding the temporal range to include prehistory and more of the twentieth century, with a more fine-grained chronology that defined 19 temporal/thematic units. As was the case with Guerrant's study, Goodwin's maps do not include the current APE, as the city limits did not encompass the APE until some time in the 1980s. Goodwin mapped high ground on the northwest bank of the Christina River as having high potential for prehistoric sites, in addition to other areas more removed from the APE. The mapped prehistoric high-potential areas do not include the APE. Maps for the historic era are identical or nearly identical to Guerrant's study. Goodwin did revise high-potential areas for the period from 1630 to 1730 to exclude the APE and other nearby marshland along the Christina River. Goodwin's analysis of late nineteenth-century settlement and industry shows a high-potential area near the APE for the post-1875 period.

- Block-By-Block Archaeological Analysis of the Waterfront (Bromberg 1988). prepared for the City of Wilmington's Office of Planning.

Bromberg's block-by-block analysis document was prepared as the second volume in the series that includes Conrad Goodwin's Volume I (1986) and Volume III (1987). Bromberg presents an overview of the prehistory and history of the waterfront area and then traces the developmental history of each of the city's planning blocks (approximately 375 blocks in all).

The western part of the APE is just south of Block 695. Reviewing the development of the block, Bromberg (1988:167) states that most of the area was marshland until the middle of the nineteenth century. Harlan & Hollingsworth shipbuilders were located on the northern portion of the block, and they gradually expended to the south. A stream known as Clements Run drained into the Christina River through Block 695; this creek was eventually channelized and moved underground. Bromberg concludes her analysis of Block 695 by stating that the area has

potential for prehistoric sites as well as mercantile and industrial sites (1988:177). Mill Creek and the industrial plants north and south of its mouth were not discussed by Bromberg because the city's corporate limits did not include this area in the 1980s.

The eastern part of the APE is in planning Blocks 895, 896, and 897. Bromberg (1988:235) states that the area was marshland until the middle of the nineteenth century. She states that an organization known as the Christiana River Improvement Company conducted widespread filling of marshes in the mid-1800s. She found no evidence of structures on these three blocks until 1901, when a building stood on Block 896. Development of the area was almost entirely during the twentieth century. Bromberg (1988:235) concludes by stating that prehistoric potential of these blocks is low because of marshy conditions, and that post-1880 phases of Wilmington's history are of generally low significance.

- *The Wilmington Waterfront Analysis Intensive Level Architectural Survey* (Dixon 1992), prepared for the City of Wilmington's Office of Planning.

Dixon's study was referenced for a general historic context of the development of Wilmington's industrial waterfront. Although the focus of his study is outside the immediate study area, the overall industrial development of Wilmington is related to the development of properties along the west side of the Christina River in the project area.

- Archaeological identification for the Christina River Pedestrian Walkway (MAAR 1998), prepared for EDIS Company, Inc., Wilmington.

Ron Thomas of MAAR Associates directed archaeological studies for the Christina River Pedestrian Walkway in 1997 and 1998. The project was a pedestrian walkway along the northern/western bank of the Christina River. The archaeological work was conducted in multiple sections. One section ran from Poplar Street to Market Street and was reported in May 1998 (MAAR 1998). Another section ran from Market Street to Harlan Boulevard/Justison Street, and a third ran south through the APE to the Peterson Wildlife Refuge. Mr. Thomas died in January 2004, and his reports for the second and third sections of the walkway project were not completed. Some documentation of the findings of the second section are included in National Register of Historic Places (NRHP) nominations (Thomas 1999a and b) (below).

The area investigated for the walkway project was narrow (approximately 50 feet wide) and linear. Mechanical trenches were used for resource identification. In the section from Poplar Street to Market Street, the survey found widespread in-filling that was thought to date to the last half of the nineteenth century. Twelve features were encountered in the trenches, all traces of urban waterfront facilities (piers, concrete pads and footers, and utility lines/trenches). The features were not considered archaeologically significant.

- Market to Orange Street archaeological district NRHP evaluation (Thomas 1999a), prepared for EDIS Company, Inc., Wilmington.

The NRHP nomination form for the Market to Orange Street archaeological district outlines historical development of a section of the waterfront along with the archaeological findings of

the overlapping Christina River Pedestrian Walkway project. Phase I and II investigations identified waterfront facilities (boat slip, dock, road bed, rail spurs, piers, and shoring), features associated with a tannery, the remains of an industrial building (a railroad freight house), and the remains of a lumber yard. Some domestic features were also encountered, including a barrel privy and a domestic midden. The area was nominated as an archaeological district and recommended as eligible for the NRHP under Criterion D. The district boundary is on the south side of Water Street, bounded to the east by Market Street, to the west by Orange Street, and to the south by the Christina River. The district is in the Christina River Bridge study area but outside the APE.

- Harlan & Hollingsworth shipyard site NRHP evaluation (Thomas 1999b), prepared for EDIS Company, Inc., Wilmington.

This document describes the historical development of the Harlan & Hollingsworth shipyard and the archaeological findings in the area associated with the Christina River Pedestrian Walkway project. The site was designated Site 7-NC-E-162, and Phase I and II investigations were conducted, which identified an array of shipyard features, including launch ways, boat slips, a dock, piers, and rail spurs. The site was recommended as eligible for the NRHP under Criterion D. The archaeological site is bounded to the northeast by Tatnall Street and extends along the riverfront southwest to Harlan Boulevard. The site extends in from the shoreline a variable distance, with the maximum approximately 130 feet. The site is in the Christina River Bridge study area but outside the APE.

- Submerged archaeological survey for the Riverwalk Project (Cox 1999), prepared for Rummel, Klepper, and Kahl, LLP, Baltimore.

A submerged resource survey was conducted by Dolan Research for the Christina River Pedestrian Walkway project. The investigation included a remote sensing survey of the northern/western side of the Christina River, from roughly Harlan Boulevard in the north, to a point south of the Shipyard Shops. Through SONAR detection, Dolan Research identified the remains of an iron-hull steamboat, *The State of Pennsylvania* (N-4018). The presence of the steamboat had been known for some time; it was listed in the NRHP in 1979. *The State of Pennsylvania* was a passenger steamship built in 1923 for the Wilson Line (a Wilmington-based steamship company) that was abandoned in this location after foundering in 1970. It was subsequently stripped down to the waterline by salvagers. It has also reportedly been impacted by USACE dredging. The remains of the boat are located by the foot of Madison Street, outside the APE. No other submerged resources were identified in this survey.

- *Site Specific Assessment Report Christiana Bridge, Wilmington, Delaware* (Brightfields, Inc. 2009), prepared by Brightfields, Inc., Wilmington.

This study was conducted for the Christina River Bridge project and explored the hazardous waste potential of sites in a concentrated area at the location of the proposed bridge crossing. The report was helpful for its use of historical mapping and background research on properties along the riverfront in the study area.

- *Cultural Resource Evaluation on South Market Street Safety Improvement Project and Christiana River Bridge Project* (Zug-Gilbert et al. 2011), prepared by Archaeological and Historical Consultants, Centre Hall, Pennsylvania.

This study, presently in draft form, was conducted in part for the Christina River Bridge project and in part for proposed traffic improvements along South Market Street. The report specifically addresses architectural resources along South Market Street in the study area. The study particularly explores twentieth-century commercial growth along South Market Street and was helpful in developing and understanding the archaeological potential on the eastern side of the Christina River in the study area and the APE.

KNOWN ARCHAEOLOGICAL SITES

There are no previously recorded archaeological sites in the APE. The larger study area includes the remains of *The State of Pennsylvania* (N-4018), recorded with the DESHPO as a historic structure and listed in the NRHP. The shipwreck is located by the foot of Madison Street on the west bank of the Christina River.

Few prehistoric archaeological sites have been documented in Wilmington. A major prehistoric site was noted in the Crane Hook area by the Marine Terminal, and isolated finds have been noted by Front Street and Second Street, and along Wilmington Boulevard (Goodwin 1986:46). Occasionally more substantial assemblages have been recovered in Wilmington, but they are often representative mostly of disturbed contexts (e.g., LeeDecker et al. 1990). Near the study area, south of Wilmington along U.S. Route 13, the Hessler Site (7NC-E-130) was documented; the site contained prehistoric artifacts of unknown age (Bedell 1999). The site is approximately 2,700 feet south of the study area on the southeastern side of the Christina River.

REGIONAL PREHISTORY

The prehistory of the region is commonly divided into four chronological periods: Paleoindian (circa 18,000 to 6500 BC), Archaic (6500 to 3000 BC), Woodland I (3000 to 1000 BC), and Woodland II (1000 BC to AD 1650). The periods mark cultural development from largely nomadic hunter-gatherers during the Paleoindian period to fairly sedentary villagers in the Woodland II period. A fifth time period, the Contact period (1524 to 1750), can also be considered, as the history of native peoples during the time of initial European colonization.

Delaware prehistory has been detailed by Jay Custer (1984, 1989), and the summary below is largely abstracted from his work.

Paleoindian Period (circa 18,000 to 6500 BC)

The earliest occupation of the eastern woodlands was by Paleoindian groups who may have entered the region around 18,000 BC. The earliest occupation, known as Pre-Clovis, is not well known but has been documented at Meadowcroft Rockshelter in Pennsylvania (Adovasio et al. 1980), and in Maryland at the Miles Point Site (Lowery 2007; Lowery et al. 2010). Pre-Clovis occupations in the region have also been documented in Virginia, at the Cactus Hill Site (McAvoy et al. 1997; Wagner and McAvoy 2004). No Pre-Clovis sites have yet been identified

in Delaware. The body of evidence on Pre-Clovis sites suggests that the culture featured small group encampments and a diverse diet, with a toolkit featuring stone blades and nearly triangular lanceolate projectile points.

Later occupants of the region, known as the Clovis culture, date to circa 11,000 BC and are represented by numerous finds in Delaware. The Clovis culture arrived at a time of abrupt climate change toward the end of the last ice age. Clovis sites appear to have been focused on well-drained landforms near major streams and inland swamps. Other highly productive habitats were also exploited by Clovis groups; group movement may have centered on sources of high-quality stone for tool making. The Clovis diet included Pleistocene megafauna, such as mastodon and mammoth, but the hunting emphasis was likely on deer, elk, and perhaps caribou. Fish, berries, and other fruits were also parts of the Paleoindian diet. The diagnostic artifact of Clovis culture is the basally fluted lanceolate Clovis point; typically associated tools include scrapers and graters for working hides and bones.

With the onset of the Holocene, spruce-dominated boreal vegetation was replaced by the northward expansion of deciduous forests, and large mammals migrated to new ranges or were driven to extinction. An abrupt cold period, known as the Younger Dryas stadial, occurred between 10,800 and 9,500 BC (Wah 2003), triggering a number of environmental changes. This rapid environmental change is coeval with the end of the Clovis culture.

After 9500 BC the lifeways of native people underwent minor changes. A hunting focus continued, but megafauna species either became extinct or migrated north, necessitating changes in hunting behaviors. Sites from 9500 to 6500 BC are more numerous than earlier sites and are more dispersed. Clovis points disappear from site assemblages and are replaced by a diverse set of corner-notched and side-notched point types. The Fall Zone and the Piedmont show particularly noticeable increases in site frequencies during the terminal portion of the Paleoindian period.

Archaic Period (6500 to 3000 BC)

The beginning of the Archaic period roughly corresponds to the Hypsithermal, a climatic episode marked by rising temperatures, decreasing precipitation, and the development of more seasonally variable climate. An oak-hemlock-hickory forest dominated the region, and deer became the dominant large mammal.

The growing population changed its subsistence-settlement patterns. Sites are larger and more numerous, and a more diverse toolkit implies a broader range of subsistence activities than in the Paleoindian period. During the Archaic period sites begin to appear in locations that had been previously ignored, such as interior ridgetops; however, base camps were still located primarily in the floodplains of major drainages and around wetlands. The appearance of new tool types specifically designed for woodworking, seed grinding, and nut cracking (e.g., axes and adzes, mauls, grinding slabs, and nutting stones) and the location of sites in previously unused areas indicate an increasing reliance on gathered plants for food and other necessities.

Woodland I Period (3000 BC to AD 1000)

During the Woodland I period indigenous groups continued to increase their use of gathered plants, particularly tree mast, for food and other needs. Fish and shellfish were also very important to subsistence during this period. Wetland resources were commonly exploited. The number of sites and settings for sites continued to expand, and on the floodplains of major waterways villages and hamlets evolved to sites of nearly year-round occupation. At some sites in Delaware, there are signs of the emergence of stratified societies and engagement in extensive exchange networks.

Woodland I sites are marked by a suite of narrow-bladed projectile points that accompanied adaptations for exploiting hardwood trees and sylvan resources. Assemblages include a high frequency of grooved axes, adzes, celts, gouges, and grinding stones. Broad-bladed projectile points appeared during the period and are found most commonly on floodplain sites. Although broadspear points are sometimes found in ritual mortuary contexts, they were apparently utilitarian objects, as shown by occasional breakage and edge attrition (Custer 1991).

A noteworthy development during the period is the use of carved soapstone (steatite) bowls. Soapstone was quarried during this period in the Piedmont of Virginia, Maryland, and Pennsylvania. Vessels were apparently carved at the quarries and transported in finished form, probably by canoe (Dent 1995:182-184). Soapstone pots were clearly used for cooking, but it is not yet known what foods they were used to process (fish, meat, seeds, tubers, or nuts). Soapstone vessels are found on sites dating to circa 1700 to 800 BC (Sassaman 1999, 2006).

Production of ceramics began in the region beginning circa 1200 BC. The earliest vessels imitated the form of flat-bottomed soapstone pots and were tempered with bits of soapstone and other rock (Stewart 1998). These earliest ceramic ware types are known as Marcey Creek and Vinette I, and found throughout the Middle Atlantic region and into New York State.

Exchange networks developed during this period, linking local tribes to groups to the north, south, and west. Tools made from non-local stone are found in many Woodland I assemblages. Elaborate burials have been found in Delaware dating from around 500 BC to AD 1, with mortuary objects showing links to the Adena and Hopewell cultures in the Ohio Valley. Lithic materials shifted to higher-quality stone and stone from non-local sources circa 500 BC (Stewart 1989, 1992). This shift in pattern of stone use is seen as additional evidence of the development of regional trade networks.

Custer has defined prehistoric complexes based on the co-occurrences of certain artifacts and features on sites in similar locations. The Clyde Farm, Black Rock (also known as Wolfe Neck), Carey, and Delaware Park complexes have been defined for the Woodland I period in the Fall Zone. The complexes are temporally sequential to one another, with the Clyde Farm Complex encompassing the period from 3000 BC to approximately 1000 BC. The Clyde Farm Complex is marked by broadspear projectile points, steatite vessels, and Hell Island ceramic wares. The Black Rock Complex encompasses the period from 1000 to circa 500 BC, and is marked by Wolfe Neck or Vinette I ware types, and Rossville projectile point types. The Carey Complex extends from 500 BC to AD 1. The Carey Complex is marked by increased oyster use, Fox

Creek projectile points, and shell-tempered ceramics. The Delaware Park Complex extends from AD 1 to 1000, and is marked by base camps with large storage features. Hell Island ceramics and Jacks Reef projectile points are also markers of the Delaware Park Complex.

Woodland II Period (AD 1000 to 1650)

The Woodland II period began around AD 1000 as Indian groups began living in hamlets and villages and practiced agriculture. At around AD 1000, maize horticulture was adopted by many people, but reliance on maize was variable from group to group. It has been speculated that wild rice, *chenopodium*, and other wild plants played a bigger role than maize in local diets. Diets continued to include fish, shellfish, deer, and turkey. Sites are typically located in floodplains of higher-order streams and adjacent to high-yield agricultural soils.

In some parts of Delaware, a dramatic increase in the number of sites coincides with the Woodland II period. Larger sites are commonly on tidal creeks that feed into the Delaware River, with smaller resource extraction sites in a wide variety of environmental settings. The Fall Zone and eastern Piedmont may have been used seasonally as part of the settlement round of groups based on the Coastal Plain (Stewart 1992).

During the Woodland II period regional exchange networks largely ended. Indigenous societies may have fragmented. Prior to AD 1200/1300, settlements were not stockaded (fortified), suggesting that there were minimal inter- and intra-group hostilities (Stewart 1993). At around AD 1200 to 1300, throughout the Middle Atlantic region, population density increased, nucleated settlements and stockaded villages were established, and there is evidence of population movement and displacement (Stewart 1993).

After AD 1200/1300, ranked societies emerged, which developed into the complex tribes and chiefdoms encountered by the Europeans in the late sixteenth and early seventeenth centuries.

One cultural complex has been defined for the Woodland II in the Fall Zone: the Minguannan Complex. This complex is marked by sand-, grit-, or crushed quartz-tempered ceramics that may have incised or cord-impressed surface treatments.

Contact Period (AD 1524 to 1750)

Indigenous communities were disrupted and frequently in flux throughout the Delaware River basin after European colonization began. Diseases brought by the Europeans ravaged Indian settlements. Warfare and eviction from lands destroyed many other Indian communities. The Indian-Colonist relationship ebbed and flowed, with periods of intermittent conflict and warfare.

The initial European exploration of the Delaware Bay may have taken place in 1524 by Giovanni da Verrazano, although the account of his explorations is not universally accepted. More concerted exploration and settlement began in 1609 with Henry Hudson's exploration of the Delaware Bay and River. Hudson sailed for the Dutch, who built an outpost near Lewes ("Zwaanendael") in 1631. Samuel Argall, an Englishman, explored the Delaware in 1610, but most British settlement came in the middle of the seventeenth century.

Swedish settlements were established in early seventeenth-century Delaware. In 1638 Fort Christina was built by the Swedes at the confluence of the Christina and Brandywine rivers, in what would later become Wilmington. Swedish settlement grew along both sides of the Delaware River in the middle of the seventeenth century.

The lower Delaware River and the Delaware Bay were home to several related Indian groups, known collectively to Europeans as “the Delaware Indians”; they called themselves the ‘Leni-Lenape’ or the “Lenape.” The Lenape had three principal tribes: the Munsee, who lived in the middle and upper reaches of the Delaware River; the Unalachtigo, who may have lived in the Lehigh Valley of Pennsylvania; and the Unami, who lived on the lower section of the Delaware River and the Bay, including the Wilmington area (Kraft 2001). The Lenape traded with Swedish and Dutch colonists and were on generally peaceful terms with both colonial powers.

As recorded by Europeans, Lenape settlement types included stockaded villages, open longhouse villages, and also smaller houses at hunting and fishing camps (Goddard 1978). Bands would congregate during the agricultural season and split into small family units during the winter. Indians along the lower section of the Brandywine River are known to have been Unami-speaking Lenape; they were often referred to as “Brandywine Indians” (Weslager 1972).

The Lenape’s rivals were the Susquehannocks, who were located principally in south-central Pennsylvania along the Susquehanna River. The Susquehannocks also controlled the upper parts of the Brandywine drainage. The Susquehannocks waged war against the Lenape between 1630 and 1635, eventually defeating the Lenape and making them their subjects. The Brandywine Indians came to be on generally friendly terms with the Susquehannocks later in the seventeenth century, when they saw a mutual enemy in the British.

The Brandywine Indians may have never practiced much agriculture beyond cash cropping during the middle of the seventeenth century, and they may not have had substantial villages during any period of their history (Becker 1989). Population estimates for the Lenape during the Contact Period have been quite varied.

The Dutch and Swedes competed for control of the Delaware River basin during the first two quarters of the seventeenth century. The Dutch tried to assert control of the area by erecting Fort Nassau on the eastern side of the Delaware River in 1623. The Swedish governor subsequently built a fort on the western bank of the river in the Philadelphia area, and Fort Christina in the Wilmington area. In 1651 the Dutch governor built Fort Casmir, located in what is today Newcastle. Violence erupted between the Dutch and Swedes in 1655, and the Dutch emerged in control of “New Netherlands.” Dutch hegemony was short-lived, however, as the English took control of the colony in 1664. The lands eventually came under the control of William Penn and the Pennsylvania colonial government.

Many Indians chose to leave the Delaware Valley starting in the 1660s, moving north to New York and eventually Ontario, and west to Oklahoma. The Indian-colonial fur trade was on the wane in this period, and there was increasing tension between the Indians and colonists for land. In addition, the Lenape, who had been struck by a devastating outbreak of smallpox circa 1635, were struck by another smallpox outbreak in 1661, weakening their communities. There are

accounts of Lenape emigrating from Delaware between approximately 1660 and 1750; some chose to remain in Delaware and become part of colonial society. The Lenape of the Wilmington area, the Brandywine Indians, remained on their lands until circa 1729, moving north at that time to join the refugee communities of the Seneca-Susquehannock (Weslager 1972).

HISTORIC CONTEXT

Exploration and Settlement (circa 1630 to 1730)

Settlement of what is now Wilmington began in 1638 with the establishment of the Swedish colony of Christinaham, which surrounded the present site of Fort Christina Park. The colony, originally consisting of 25 Swedish and Finnish colonists, built a small fort at this location on the Christina River with a small cluster of houses and cultivated fields nearby. The Christinaham colony became the nucleus of small settlement, one of a string of settlements in Delaware established as New Sweden. During the first decade of establishment, the population of the colony remained low at 183 inhabitants, reaching 368 by 1654. In 1655 the Dutch regained control of the area and allowed Fort Christina to fall into ruin. In 1664 the Dutch colonies in Delaware, along with Fort Christina, fell to the British; however, they encouraged the continued settlement of the area by the Swedish, Finnish, and Dutch colonists. The ongoing influence of the Swedish settlers in the Wilmington area is evidenced by the erection of the Old Swede's Church in 1868 near the location of the former Fort Christina. Despite attempts by the Dutch to reclaim its colonies in Delaware in 1673 and 1674, the area remained under the control of the British and settlement of the Wilmington area did not resume until 1731 (Dixon 1992; Guerrant 1983).

In the decades before and after the turn of the eighteenth century, the land between the Brandywine and Christina rivers remained the property of a few farmers. One of the farmers erected a small mill on the southern side of the Brandywine River in the late seventeenth century, which was replaced with a new mill and dam in the 1720s (Guerrant 1983). Settlement of the region was sparse and concentrated along the major waterways (Figure 3).

Intensified and Durable Settlement (circa 1730 to 1770)

The permanent settlement of Wilmington began in 1731 when Thomas Willing purchased land on high ground between the Christina River and Brandywine Creek from his father-in-law, Andrew Justison. Willing laid out the town lots and built the first dwelling at the northwestern corner of Front and Market streets. The settlement had grown to approximately 30 houses by 1736 between what is now Poplar and Tatnall streets and between the Christina River and Seventh Street (Dixon 1992).

The new settlement, initially known as Willingtown, was ideally located near the Fall Zone between the Piedmont and Coastal Plain zones, with a protected harbor in the wide, slow-running Christina River (Coastal), and a natural energy source from the narrow, swift running Brandywine River (Piedmont). Willingtown's location was also advantageous for its transportation potential, in particular the navigation of the Christina River to the Delaware River and beyond, as well as already established land routes (Guerrant 1983).



SOURCE: Herрман 1673

FIGURE 3: Settlement in Lower Delaware River Valley in Late Seventeenth Century

In 1739, with over 600 inhabitants, the settlement was chartered and renamed the Borough of Wilmington. Wilmington's initial growth was inhibited by its proximity to Philadelphia, which dominated not only the mercantile economy of the Delaware River valley but also the social, religious, and political life of the Pennsylvania colony. However, Wilmington was able to thrive because of its geographic location, which provided a strong economic base from milling and shipping (Guerrant 1983:13).

Transformation from Colony to State (circa 1770 to 1830)

Industrial development in Wilmington during the Transformation from Colony to State period included an increased number of mills along the Brandywine and the continuation of shipbuilding and mercantile activities along the Christina brought about by the introduction of improved milling technologies (Dixon 1992).

Wilmington experienced great prosperity between 1780 and 1810 after the American Revolution (1775 to 1783) as a result of the dropping of trade barriers and the rise in the price of flour. Merchants in Wilmington began trading flour directly with the West Indies, setting off the town's first major economic and population growth since the early years of its establishment. Along with the expansion of the Brandywine mills, Wilmington also took advantage of an increased demand for shipping, and several new small-scale manufacturing and craft enterprises were established (Goodwin 1986:13). Wilmington's economic growth is also reflected in its population, which rose from 1,200 in 1785 to more than 5,000 inhabitants in 1820 (Dixon 1992).

Wilmington's prosperity was soon threatened by an overall economic depression and the War of 1812, which interrupted Wilmington's transoceanic shipping. Changes in transportation also endangered the city's existence. Philadelphia merchants, seeking to take advantage of the agricultural wealth of western Pennsylvania, revived the construction a canal that would connect the Delaware River with the Chesapeake Bay. Wilmington residents initially invested in the Chesapeake and Delaware (C&D) Canal as they thought it would terminate at the Christina River; however, a southerly route was chosen, cutting the city off from main trade route across peninsula and ending its monopoly of the portage trade. The impact of the canal is reflected in the stunted growth of Wilmington's population between 1810 and 1835, when it only grew from 4,416 in 1810 to 6,628 in 1830 (Goodwin 1986).

Industrialization and Capitalization (circa 1830 to 1880)

The industrialization and capitalization of Wilmington was propelled by the establishment of the Philadelphia, Wilmington and Baltimore (PW&B) Railroad, in 1835, which traveled south from Philadelphia through Wilmington to Baltimore. When completed in 1837, the railroad paralleled the Delaware River from Philadelphia until a point north of Wilmington, where it traveled south and west along the Christina River toward Maryland. As explained by Hoffecker (1974), "the route chosen for the P W & B, located so close to the navigable Christina River, maximized the railroad's impact on Wilmington's economy because it created a prime industrial site in the narrow strip of land between the tracks and the river." As seen in a map from 1849 (Figure 4), the PW&B railroad ran through the study area following dry land; most of the APE at that time was undeveloped marshland. In subsequent years the marshland was filled by the Christiana



FIGURE 4: Study Area and Vicinity, 1849

SOURCE: Rea and Price 1849

River Improvement Company to spur development. The growth of Wilmington was furthered by the completion of the Wilmington & Northern Railroad (W&N) in 1871, the Delaware and Western Railroad in 1867 (initially the Chester County Railroad, the Wilmington and Western in 1869, and acquired by the Baltimore & Ohio in 1886), and the Baltimore & Ohio (B&O) in 1886.

The arrival of the railroad in Pennsylvania greatly impacted the Wilmington's economy based on grain processing and shipping. The Philadelphia-Columbia Railroad, established in 1833, diverted the city's grain supply from southeastern Pennsylvania to Philadelphia. However, the losses from the grain industry were soon replaced by new manufacturing opportunities made possible by the use of steam power.

Wilmington's location on the Delaware and Christina rivers was the impetus for its success as an independent manufacturing city. By the early nineteenth century Wilmington and its immediate vicinity had become one of the most important sites for water-powered industry in the United States. Mills of varying types, including paper, textile, flour, black powder, and snuff, stood along the Brandywine and also along tributaries of the Christina, the Red Clay and White Clay creeks. The mills generated capital reserves necessary for the industrialization of Wilmington's economy but also attracted skilled laborers who made the expansion of industrial technology possible. Wilmington's industry was also supported by sources of coal and iron ore that became readily available from Philadelphia and northern Pennsylvania by the new canals, railroads, and river barges, which provided inexpensive transportation and daily routes to and from Philadelphia (Hoffecker 1974).

By the Civil War Wilmington hosted a number of industries, including several cotton mills, a match factory, and a fertilizer plant. Shipbuilding, railroad car construction, foundry work, tanning, and carriage construction were the most significant industries in Wilmington by the mid-nineteenth century, and the newly constructed railroad and its proximity to the Christina River allowed the same transportation advantages but on cheaper land than in locations such as New York and Philadelphia. The four largest industrial companies in Wilmington by the end of the Civil War were Harlan & Hollingsworth, Pusey and Jones, the Lobdell Wheel Company, and Jackson & Sharp, all of which were locally owned and involved in railroad equipment manufacturing, among other ventures (Hoffecker 1974).

Although not the largest manufacturing effort in Wilmington, papermaking was in the top 10 leading industries in Wilmington in 1860 and 1880, based on the annual value of products and the number of workers (Hoffecker 1974). Papermaking dropped from the top 10 by the turn of the century, in 1898, but the papermaking industry in Wilmington was still described as the "largest in America" (Clement 1888).

As seen in Figure 5, the Harlan & Hollingsworth plant was located in the study area north of the APE, close to downtown Wilmington (Beers 1868). As also seen on the Beers map, some of the marshland near the APE had been filled, and the Walton, Whann & Co. bone mill had been established.

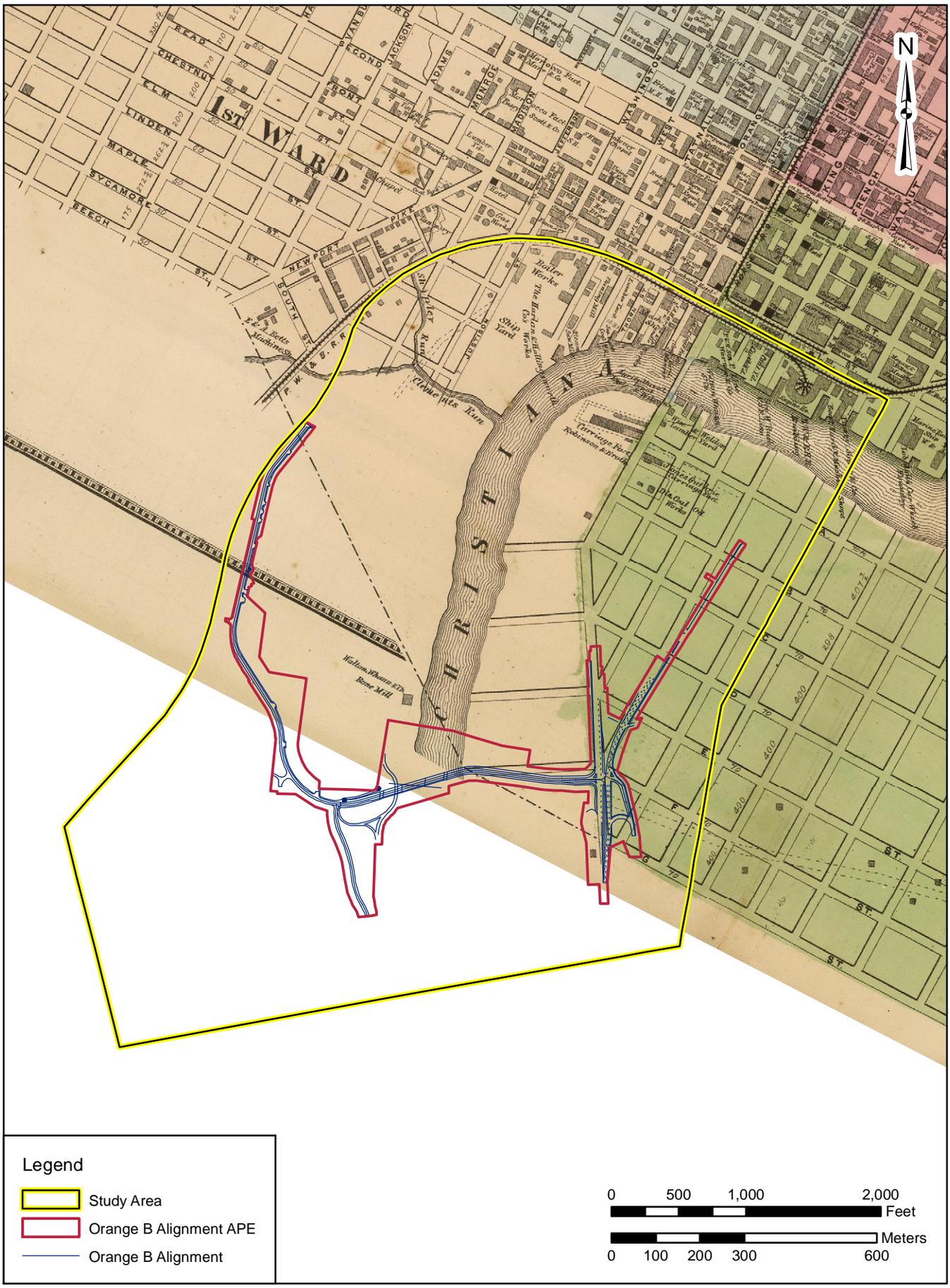


FIGURE 5: Study Area and Vicinity, 1868

SOURCE: Beers 1868

Additional filling of marshland and industrial development near the APE took place in the 1870s and 1880s. By 1881 (Figure 6), Walton, Whann & Co. had expanded their factory toward the APE, and the Jessup & Moore Paper Company had established a mill in the APE. In contrast, the eastern side of the APE remained almost entirely undeveloped.

Urbanization and Suburbanization (circa 1880 to 1940)

Between 1880 and 1900, the population of Wilmington had grown from 42,000 residents to 76,000 (Hoffecker 1974). Urbanization in Wilmington, like most cities at that time, had taxed the city's infrastructure, in particular the water supply and sewage disposal. The lack of proper sewage and water facilities affected residents' health, and the city experienced a rise in cholera and diphtheria in the 1870s and a small pox epidemic in 1881. Although the Wilmington board of trade was particularly concerned about water contamination, it was also alarmed about the effects of sewage in the Christina River. By the end of the nineteenth century, Wilmington's board of trade had focused their efforts on attracting new businesses and believed that improved infrastructure in the city, including parks, sewers, and paved streets, would promote the healthfulness and activeness of Wilmington and would consequently attract new industries (Hoffecker 1974). These concerns led to the dredging of the Christina River beginning in the 1880s and continuing through the early 1900s (Dixon 1992; USACE ca. 1900).

Residential development during the end of the nineteenth century can be seen on maps from 1893 (Figures 7 and 8). Soil from dredging may have been used for as fill dirt along the Christina River, which created more land suitable for development.

Industrial growth in Wilmington continued during the first few decades of Wilmington's Urbanization and Suburbanization period, but by the turn of the twentieth century, Wilmington experienced an economic downturn caused by a variety of factors, including shifting market requirements and the rise of trusts and large holding corporations (Dixon 1992). In 1900 Wilmington boasted 262 manufacturing businesses and 14,498 wage earners. Five years later, the number of businesses had dropped to 247 and wage earners to 13,554 (Hoffecker 1974).

The turn of the twentieth century brought changes to the industrial waterfront along the Christina River as a number of Wilmington's largest and oldest industries suffered because of competition from large trusts with holding companies and financial resources that outnumbered Wilmington manufacturers. The shipbuilding and the railcar industries were particularly hard hit, and many were forced to cease operations or become parts of national corporations. Others shifted their manufacturing efforts to other industries, including the Diamond State Iron Company, established in 1855, which closed its rolling mill on the Christina River in 1904, and Jackson & Sharp's railcar and wooden shipbuilding company, founded in the 1830s, which was purchased by the American Car & Foundry Company of St. Louis shortly after the turn of the century. Pusey and Jones, the large shipbuilding company established in 1848, survived by shifting its shipbuilding efforts to manufacturing paper-making machinery in the early years of the twentieth century. In 1904 the Bethlehem Steel corporation trust took over the Harlan & Hollingsworth Corporation, shipbuilders and railcar manufacturers founded in 1836 (Dixon 1992).

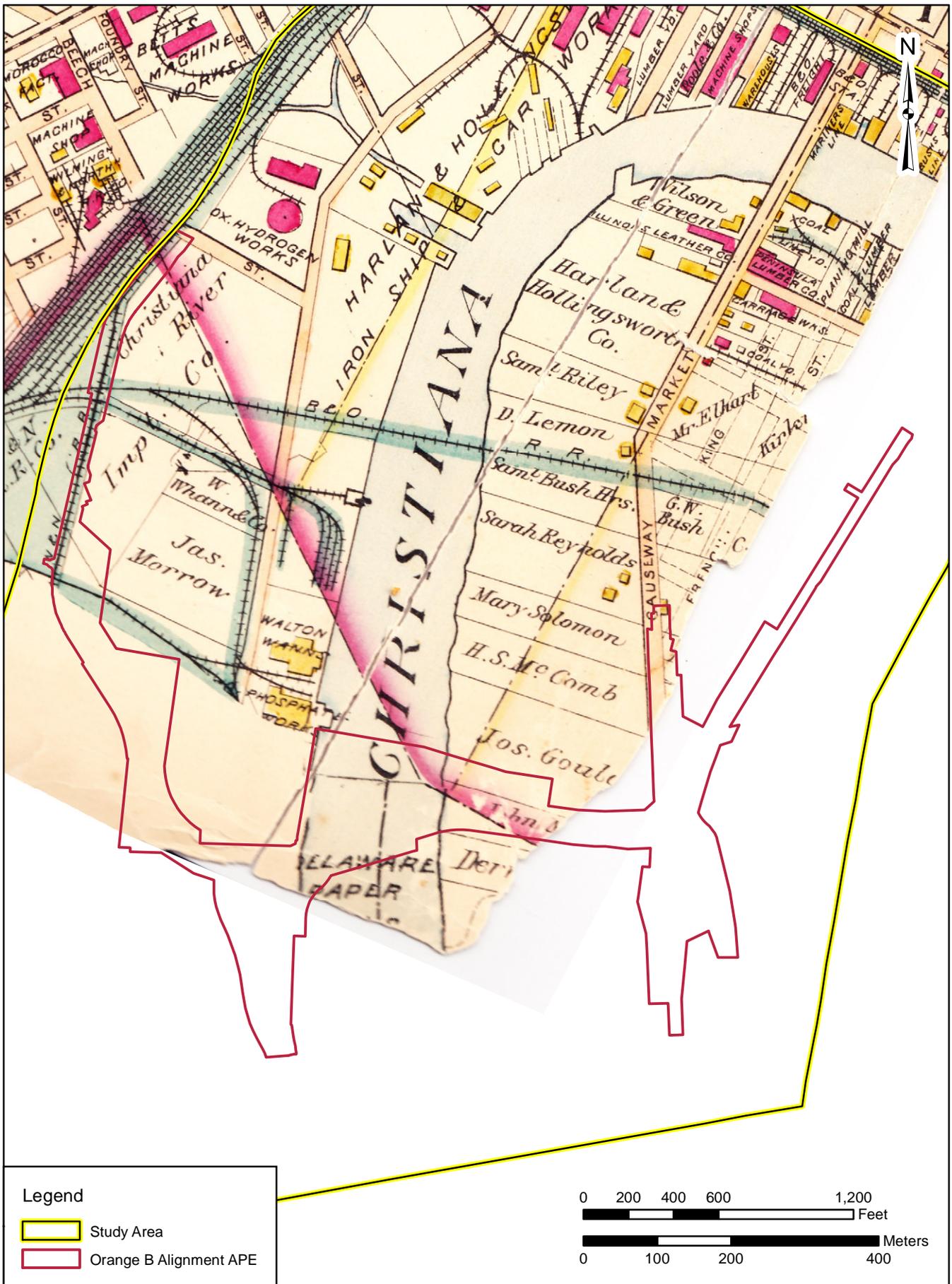


FIGURE 7: Study Area and Vicinity, 1893, Showing Superphosphate Works

SOURCE: Baist 1893

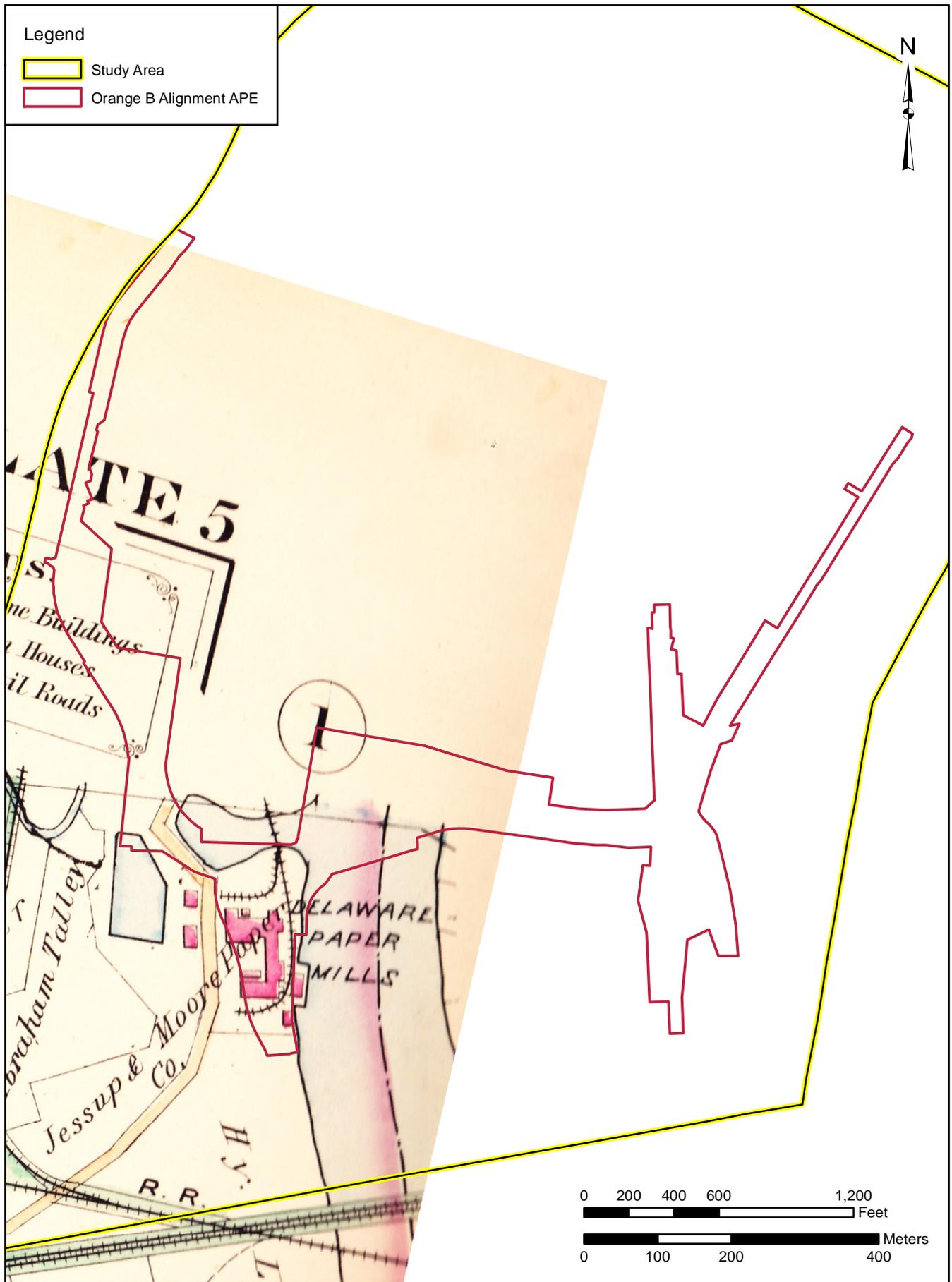


FIGURE 8: Study Area and Vicinity, 1893, Showing Delaware Mills

SOURCE: Baist 1893

While Wilmington's large industries were experiencing a decline, the city's future economic base was unfolding. The largest American producer of gunpowder, the DuPont Powder Company, founded near Wilmington in 1802, moved its headquarters to downtown Wilmington in 1902 after the death of its president, Eugene Du Pont. The move from a location on the Brandywine several miles north of the city was prompted by the company's new leadership, which focused on expanding the company's control of the explosives industry and into related chemical fields. The new 12-story building on Tenth and Market streets housed a centralized staff of 2,500 that would focus on these new efforts. The move downtown had a "momentous effect on Wilmington's development" (Hoffecker 1974:160). After a federal anti-trust suit against DuPont, two new powder companies, Atlas and Hercules, formed and moved their administrative offices to Wilmington. Thus, by 1914 Wilmington had transformed from an industrial city to one of corporate management (Hoffecker 1974).

World War I sparked Wilmington's economy as the shipyards, foundries, tanneries, and munitions plants increased production for the war effort. The shipyards produced freighters used for shipping cargo overseas, and the tanneries produced leather used in ships, passenger rail cars, uniforms, and shoes. DuPont had a government contract as the sole manufacturer of military gunpowder and supplied more the 40 percent of the gunpowder used by Allied forces. This economic upturn was short-lived, however, and after the war ended in 1918, Wilmington's industry entered a decline that continued through the Great Depression until the onset of World War II. Wilmington's workers saw a loss of 15,000 jobs between 1919 and 1921. Both Jackson & Sharp and the Lobdell Car Wheel Company closed in the early 1930s, and the city's largest shipyard, Bethlehem Steel's Harlan Plant, closed its facilities in 1927 after the Dravo Corporation purchased the southern portion of the site. Dravo, a Pittsburgh-based firm, used the site to expand its steel barge and scow manufacturing business. The Harlan Plant continued to produce railroad cars on the northern portion of the site until World War II (Zug-Gilbert et al. 2011).

Suburbanization and Early Ex-Urbanization (1940 to present)

World War II revived Wilmington's economy by reopening several of the city's closed shipbuilding facilities to help with the war effort. During the war Pusey and Jones built tugboats and freighters, the Harlan Plant built landing naval barges and ramps, and Jackson & Sharp produced several types of naval craft, including barges, dredges, drydocks, and tugboats (Zug-Gilbert et al. 2011).

Wilmington's largest wartime producer and employer was the Dravo Corporation. After the December 1941 attack on Pearl Harbor, the company, located on the western side of the Christina River on the former Bethlehem Steel property, built a state-of-the-art assembly plant for high-speed production of specialized naval craft to meet the Navy's wartime needs. Its work force grew from 400 in 1940 to almost 11,000 in 1943. Between 1940 and 1945, the company built 200 ships, including 48 in 1944 alone (Riverfront Wilmington 2011).

After World War II, the shipbuilding industry suffered a major decline, as its wartime effort had supplied the military with a large number of ships that would remain in service for decades. In Wilmington the majority of the manufacturers helping to supply the war closed permanently.

Dravo, whose work force dropped to 126 after the war, was able to survive by shifting its efforts to river transport, including barges and tugboats as well as steel production (ExplorePAHistory 2011).

Wilmington's industries shifted to chemicals and automobiles between 1948 and 1960; however, the new facilities were located outside the city limits, causing both commercial and residential expansion into the neighboring suburbs. DuPont retained its corporate headquarters in downtown Wilmington but had plants in Newport and Edgemoor, an experimental station along the Brandywine, and a technical facility east of Elsmere, all outside the city limits. General Motors opened its first postwar production plant on Wilmington's outskirts near Elsmere in 1947. Suburban expansion brought new residential communities, improved roads, commercial businesses, and other infrastructure improvements in the vicinity of the new facilities. Many of the former industrial buildings along Wilmington's waterfront were subsequently used by smaller businesses for storage and small-scale manufacturing (Zug-Gilbert et al. 2011).

In the later decades of the twentieth century, Wilmington's economy remained based on the chemical industries, small businesses, and corporate headquarters. These businesses required a smaller workforce, resulting in a 16 percent loss in Wilmington's workforce between 1960 and 1970. Continued suburbanization, demographic shifts, and an overall economic depression in the city caused the abandonment, ruin, and demolition of many of Wilmington's nineteenth- and twentieth-century industrial buildings along the waterfront.

During the early 1980s the State of Delaware passed legislation to attract international and finance corporations. Wilmington's economy subsequently improved and more than 60 percent of the Fortune 500 companies established headquarters in Delaware. Wilmington earned the moniker "Corporate Capital of the World" because of the large number of corporate headquarters and international banking firms located in the city, including Bank of America, Chase, Barclays, and ING Direct.

In 1996 Wilmington's former industrial waterfront along the northern side of the Christina River underwent a transformation as a result of a state-funded redevelopment project. Many of the abandoned and dilapidated industrial buildings were demolished or restored for new restaurants, shops, office buildings, theaters, and sports facilities. The Tubman-Garrett Riverfront Park occupies a large portion of the riverfront on the eastern side of the South Market Street Bridge (Zug-Gilbert et al. 2011).

SITE-SPECIFIC HISTORY

Western Side of the Christina River

In the APE the western side of the Christina River remained mostly undeveloped until the last quarter of the nineteenth century. The construction of the PB&W Railroad following the western side of Christina River brought industry to the APE, attracting companies to purchase property between the shoreline and the railroad (Hoffecker 1974). An 1849 map of New Castle County (see Figure 4) illustrates that the western side of the Christina River was marshy; property south of Mill Creek was owned by the Middleburg Marsh Company (Rea and Price 1849). By 1850 a

wharf and several structures had been built along the western side of the Christina River north of the APE, including a sawmill and a rope plant (Blocks 866 and 695) (Bromberg 1988). After the Civil War industry in the vicinity of the APE increased (Beers 1869; see Figure 5). As described in a 1873 article, “After the ponderous establishments near the mouth of the Christine [sic], and neater sorts of industries which can be carried on within the city, we come to notice some of the mills and factories up stream. Many of these are of great antiquity” (Lippincott 1873). One of Wilmington’s largest industrial firms, Harlan & Hollingsworth, expanded along the western side of the Christina River in the later decades of the nineteenth century, north of the APE. By 1886 the Harlan & Hollingsworth plant, which included railcar and shipbuilding activities, occupied over 43 acres and extended along the western side of the Christina River as far south as the B&O Railroad viaduct (Dixon 1992). A road extended along the western side of the Harlan & Hollingsworth property and continued southeast along the river along what is currently South Justison Street (Baist 1893; see Figure 7).

Two of the city’s successful manufacturers established and later enlarged their businesses in the APE between 1860 and 1880. These two companies, the Jessup & Moore Paper Company and the Walton, Whann & Co. Superphosphate Works, are illustrative of Wilmington’s industrial expansion in Wilmington during the latter half of the nineteenth century.

Jessup & Moore Paper Company

The Jessup & Moore Paper Company stood along the shore of the Christina River at what is now the location of an empty storage area located south of the Shipyard Shops in the APE. The origins of the Jessup & Moore Paper Company date to 1843 with the establishment of the company of Jessup & Moore by Augustus E. Jessup and Bloomfield H. Moore. Jessup was from Westfield, Massachusetts, where he had established a paper mill that manufactured banknote paper. Bloomfield Haines Moore was born in Philadelphia in 1819 and in 1842 married Clara Sophia Jessup, Augustine Jessup’s daughter. One year later, Moore joined his father-in-law to create the company of Jessup & Moore (Holtermann 2009).

In 1845 Jessup & Moore purchased the Augustine Mill on the Brandywine River in Wilmington. The mill was originally built to manufacture snuff, and by the time of the purchase by Jessup & Moore, it had been converted to a flour mill. Jessup & Moore subsequently refurbished the mill with the latest machinery to manufacture paper, and upon completion it was the largest paper mill in the United States and the first to produce lithograph map and plate paper. A year after Jessup’s death in 1859, the company purchased the Young Mill, located upstream from the Augustine Mill in Rockland (later known as the Rockland Mill). The Augustine Mill served as the headquarters of the company’s mill operations (Norton and Nelson 1977).

Bloomfield Moore died unexpectedly in 1878 at the age of 59, leaving his entire \$5.5 million estate to his wife Clara and their three children. The majority of his assets included real estate, equipment, and inventory from the unincorporated company of Jessup & Moore. Many competitors assumed that Clara would liquidate the company and sell it off at bargain prices since she already had a considerable fortune from her father. Instead, Clara incorporated the company in 1878 with capital of \$2.5 million (Fowler and Wilcox 2003; Wolf 1898). Clara also appointed their son, Clarence Bloomfield Moore, as president of the Jessup & Moore Paper

Company. Clarence, age 27 at the time of his father's death, received a considerable inheritance and served for 20 years as president of the company. He was a Harvard graduate, a Philadelphia socialite, and a world traveler, and is probably best known for his efforts later in life in the field of archaeology¹. During his tenure as president, Clarence earned millions that would later fund his archaeological endeavors (Fowler and Wilcox 2003).

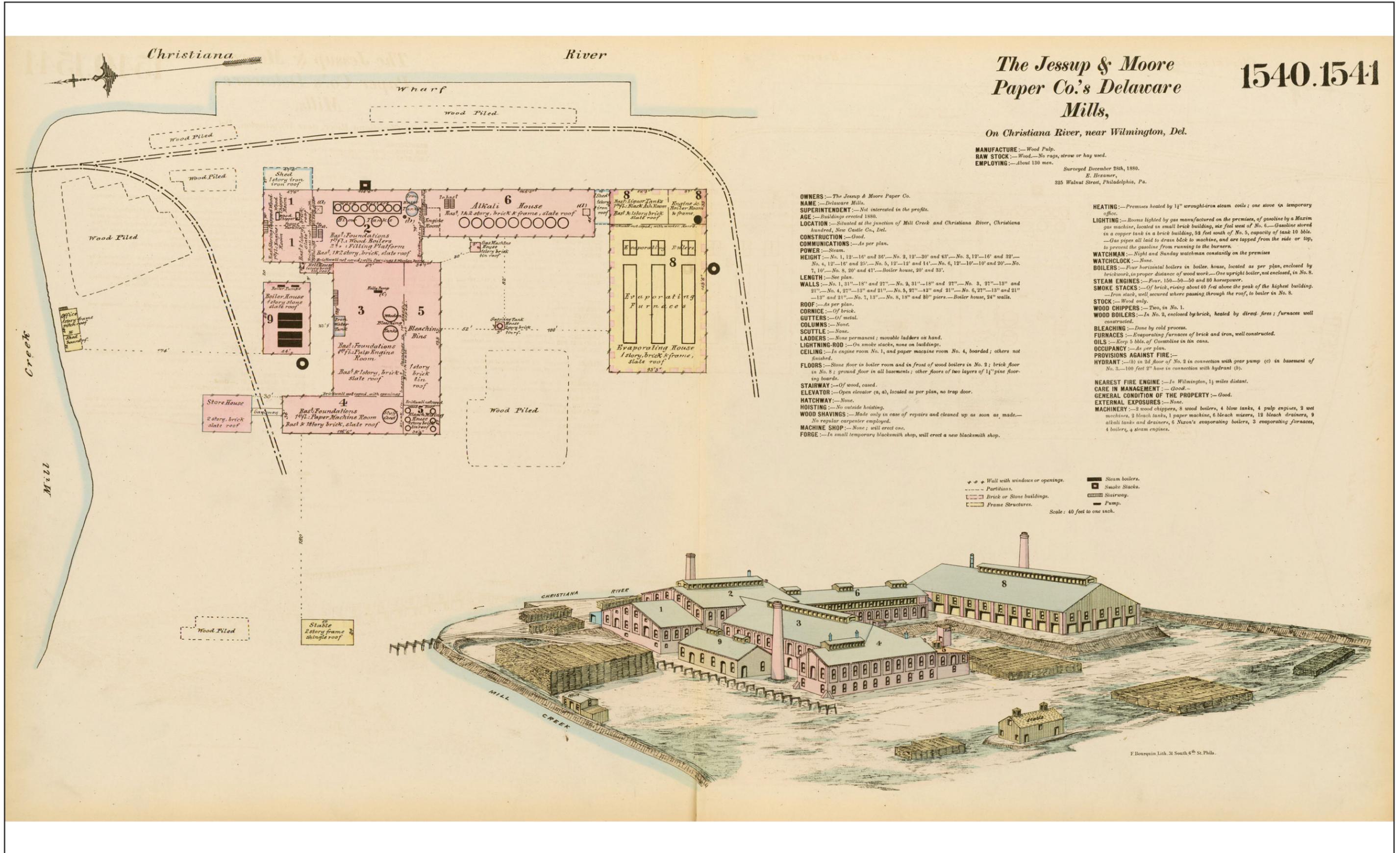
In 1879 the Jessup & Moore Paper Company, now under the leadership of Clarence, purchased land on the west bank of the Christina River at its confluence with Mill Creek as the site of a new pulp mill. The site was located south of and upstream from Wilmington and the Augustine Mill. The buildings for the new pulp mill were constructed in 1880, and the mill began operation in 1881. Known as Delaware Mills, the mill on the Christina River was a soda pulp mill and produced papermaking pulp from wood. At the time of its construction, it was the second of its kind to be built in the United States, the first of which was the American Wood Paper Company in Manayunk, Pennsylvania (Reed and Reed 1947). The mill covered over 71 acres and by 1888 had over 15 buildings with machinery and engines of over 800 horsepower. Delaware Mills produced 24 tons of pulp per day with the help of approximately 130 workers (Clement 1888; Hexamer 1880). With the Augustine Mill, the Rockland Mill, and the Delaware Mills, Jessup & Moore had "one of the largest and best known paper manufactures in the world" by 1898 (Wolf 1898).

An 1880 insurance map of Delaware Mills (Figure 9) illustrates the property as having a series of eight interconnecting buildings adjacent to the shoreline of the Christina River. Additional smaller buildings were located on the property adjacent to the river and Mill Creek, which was located south of the main buildings. Wood piles were located along Mill Creek and the banks of the Christina. A wharf serving the mill extended from the banks of Christina River, allowing large boats to dock and transport supplies and finished products. Railroad tracks crossed Mill Creek from the north and traveled along the eastern and southern sides of the mill complex. A spur traveled along the western side of the complex (Hexamer 1880).

After Clara Moore's death in 1898, Clarence Bloomfield Moore sought to liquidate his family's interest in the paper company. The sale was completed in the summer of 1899, and by 1901 the company was owned by Drexel and Company (Reed and Reed 1947). Although Clarence retired as president of the company, he remained on the board of directors (Fowler and Wilcox 2003). Clarence died in 1936.

A 1923 insurance map illustrates that the Delaware Mills had expanded considerably since its construction in 1880 (Figure 10). All of the original buildings remained, and additional buildings had been constructed on the property, including a new bleach house, boiler houses, a machine

¹ Clarence B. Moore is recognized as one of the grandfathers of southeastern U.S. archaeology. Traveling on the *Gopher*, his flat-bottomed steamboat, Moore excavated more than 850 archaeological sites from 1891 to 1918, mostly Native American burial mounds. His notebooks have been reprinted and are recognized as classics and essential sources for American archaeology: *The Lower Mississippi Valley Expeditions of Clarence Bloomfield Moore*; *The Georgia and South Carolina Coastal Expeditions of Clarence Bloomfield Moore*; *The Southern and Central Alabama Expeditions of Clarence Bloomfield Moore*; *The East Florida Expeditions of Clarence Bloomfield Moore*; *The Moundville Expeditions of Clarence Bloomfield Moore*; *The Tennessee, Green, and Lower Ohio Rivers Expeditions of Clarence Bloomfield Moore*; and *The Louisiana and Arkansas Expeditions of Clarence Bloomfield Moore*.



The Jessup & Moore Paper Co.'s Delaware Mills,

1540.1541

On Christiana River, near Wilmington, Del.

MANUFACTURE:—Wood Pulp.
 RAW STOCK:—Wood.—No rags, straw or hay used.
 EMPLOYING:—About 100 men.
 Surveyed December 28th, 1880.
 E. Hexamer,
 325 Walnut Street, Philadelphia, Pa.

OWNERS:—The Jessup & Moore Paper Co.
NAME:—Delaware Mills.
SUPERINTENDENT:—Not interested in the profits.
AGE:—Buildings erected 1880.
LOCATION:—Situated at the junction of Mill Creek and Christiana River, Christiana Hundred, New Castle Co., Del.
CONSTRUCTION:—Good.
COMMUNICATIONS:—As per plan.
POWER:—Steam.
HEIGHT:—No. 1, 12'-16" and 32'; No. 2, 12'-20' and 43'; No. 3, 12'-16' and 39'; No. 4, 12'-16' and 35'; No. 5, 12'-18' and 14'; No. 6, 12'-10'-10' and 30'; No. 7, 10'-No. 8, 20' and 47';—Boiler house, 20' and 33'.
LENGTH:—See plan.
WALLS:—No. 1, 31"-18" and 27"; No. 2, 31"-18" and 27"; No. 3, 27"-13" and 21"; No. 4, 27"-13" and 21"; No. 5, 27"-13" and 21"; No. 6, 27"-13" and 21";—13" and 21"; No. 7, 13"—No. 8, 18" and 80" piers.—Boiler house, 24" walls.
ROOF:—As per plan.
CORNICE:—Of brick.
GUTTERS:—Of metal.
COLUMNS:—None.
SCUTTLE:—None.
LADDERS:—None permanent; movable ladders on hand.
LIGHTNING-ROD:—On smoke stacks, none on buildings.
CEILING:—In engine room No. 1, and paper machine room No. 4, boarded; others not finished.
FLOORS:—Stone floor in boiler room and in front of wood boilers in No. 2; brick floor in No. 8; ground floor in all basements; other floors of two layers of 1 1/2" pine flooring boards.
STAIRWAY:—Of wood, casted.
ELEVATOR:—Open elevator (a, a), located as per plan, no trap door.
HATCHWAY:—None.
HOISTING:—No outside hoisting.
WOOD SHAVINGS:—Made only in case of repairs and cleaned up as soon as made.—No regular carpenter employed.
MACHINE SHOP:—None; will erect one.
FORGE:—In a small temporary blacksmith shop, will erect a new blacksmith shop.

HEATING:—Premises heated by 1 1/2" wrought-iron steam coils; one stove in temporary office.
LIGHTING:—Rooms lighted by gas manufactured on the premises, of gasoline by a Maxim gas machine, located in small brick building, six feet west of No. 6.—Gasoline stored in a copper tank in a brick building, 53 feet south of No. 5, capacity of tank 10 Mbl.—Gas pipes all laid to drain back to machine, and are tapped from the side or top, to prevent the gasoline from running to the burners.
WATCHMAN:—Night and Sunday watchman constantly on the premises.
WATCHCLOCK:—None.
BOILERS:—Four horizontal boilers in boiler house, located as per plan, enclosed by brickwork, in proper distance of wood work.—One upright boiler, not enclosed, in No. 8.
STEAM ENGINES:—Four, 150—50 and 80 horsepower.
SMOKE STACKS:—Of brick, rising about 40 feet above the peak of the highest building.—Iron stack, well secured where passing through the roof, to boiler in No. 8.
STOCK:—Wood only.
WOOD CHIPPERS:—Two, in No. 1.
WOOD BOILERS:—In No. 2, enclosed by brick, heated by direct fires; furnaces well constructed.
BLEACHING:—Done by cold process.
FURNACES:—Evaporating furnaces of brick and iron, well constructed.
OILS:—Keep 5 Mbl. of Coal-tar in tin cans.
OCCUPANCY:—As per plan.
PROVISIONS AGAINST FIRE:—None.
HYDRANT:—(a) in 2d floor of No. 2 in connection with gear pump (c) in basement of No. 2.—100 feet 2" hose in connection with hydrant (b).

NEAREST FIRE ENGINE:—In Wilmington, 1 1/2 miles distant.
CARE IN MANAGEMENT:—Good.
GENERAL CONDITION OF THE PROPERTY:—Good.
EXTERNAL EXPOSURES:—None.
MACHINERY:—2 wood chippers, 8 wood boilers, 4 blow tanks, 4 pulp engines, 2 wet machines, 2 bleach tanks, 1 paper machine, 6 bleach mixers, 12 bleach drainers, 9 alkali tanks and drainers, 6 Nixon's evaporating boilers, 3 evaporating furnaces, 4 boilers, 4 steam engines.

• • • Wall with windows or openings.
 --- Partitions.
 [] Brick or Stone buildings.
 [] Frame Structures.
 [] Steam boilers.
 [] Smoke Stacks.
 [] Stairway.
 [] Pump.
 Scale: 40 feet to one inch.

FIGURE 9: Jessup & Moore Paper Co. Delaware Mills, 1880

SOURCE: Hexamer 1880

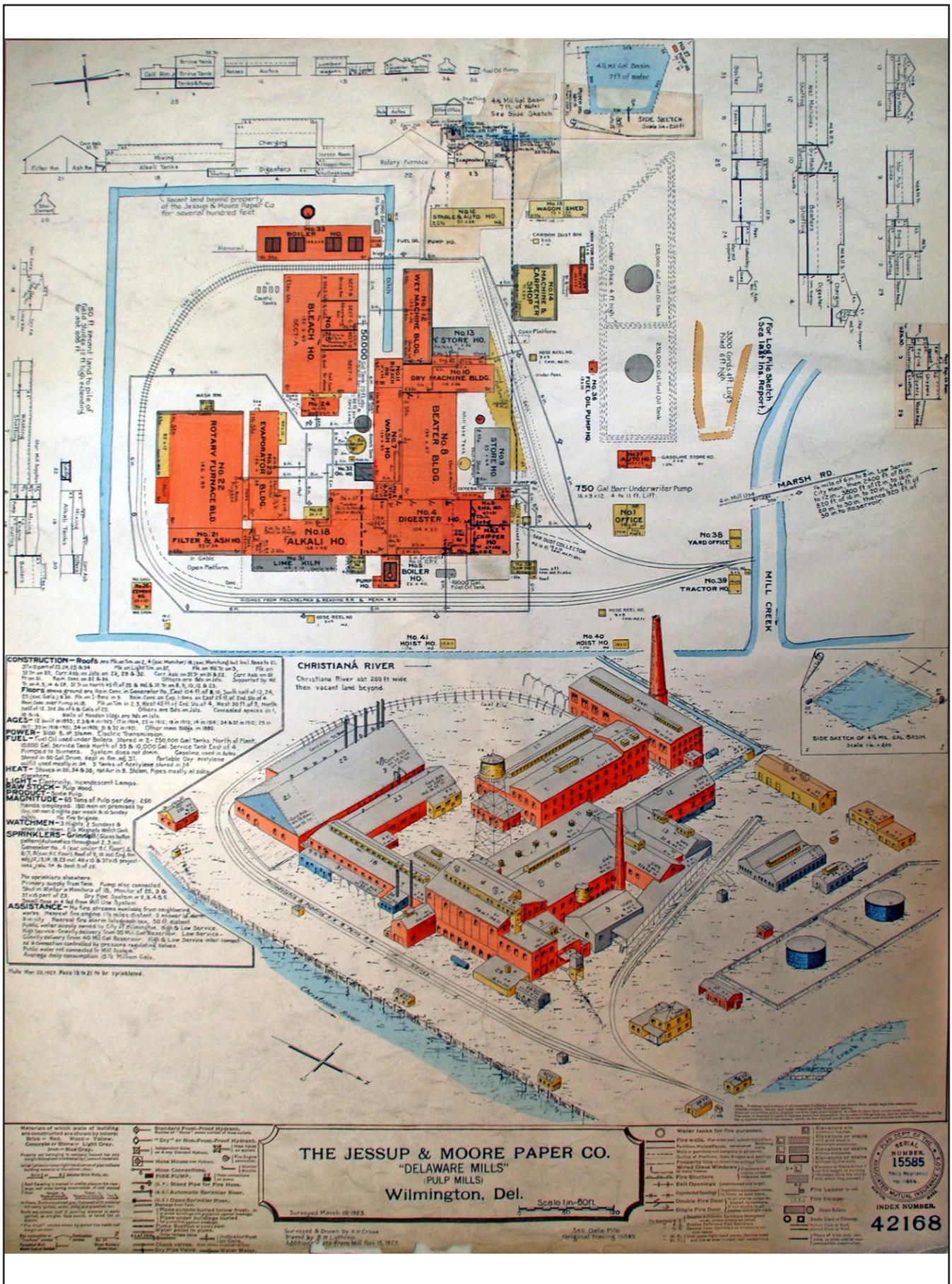


FIGURE 10: Jessup & Moore Paper Co. Delaware Mills, 1923

SOURCE: Cross and Lothrop 1923

and carpenter shop, a wet machine building, oil tanks, and two water towers. West of the main pulp works buildings was a reservoir owned by the company. In 1923 the facility employed 250 workers and produced 65 tons of pulp per day (Cross and Lothrop 1923).

As new pulp mills were built near the Chesapeake Bay, Delaware Mills' source of raw materials, high transportation costs made the mill no longer profitable (Reed and Reed 1947). Although Reed and Reed (1947) states that Delaware Mills was dismantled in 1936, the former pulp works appears on a 1942 topographic map; however, by 1948 the pulp works buildings had been demolished (USGS 1942, 1948).

During World War II the property was owned by the United States Navy as the Wilmington Annex of the Philadelphia Naval Shipyard and by the Dravo Corporation. The former site of the pulp works was used primarily for cranes, and numerous new buildings and structures were located adjacent to the site for shipbuilding purposes (Sanborn 1951). By 1965 the property was under the ownership of the Dravo Corporation and the Hub Marine Industrial Acres Corp. (Sanborn 1965a and b; Wilmington City Directories var.). In 1997 the property was transferred to the Riverfront Development Corporation of Delaware as part of the redevelopment project (New Castle County).

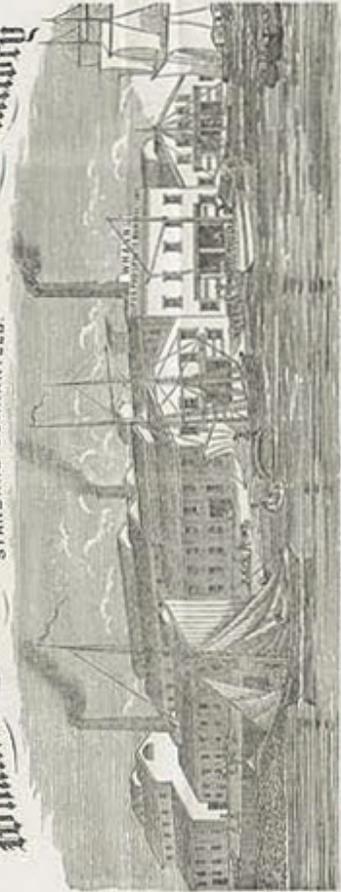
Walton, Whann & Co. Superphosphate Works

A bone mill was established on the western bank of the Christina River south of the Wilmington city limits as early as 1861 with one small building. Between 1865 and 1869, Charles Richardson, Ephraim T. Walton, and Francis N. Buck established the firm of Walton, Whann & Co. Superphosphate Works at that location. The property is illustrated in Beers (1868) as the Walton, Whann & Co. Bone Mill (see Figure 5). By 1870 the phosphate works covered 6 acres, was accessible by water and by railroad, and “vessels as large as 800 tons” accessed the wharves along the waterfront (Edwards 1880:113). North of the property was the D&W (later B&O) Railroad viaduct that crossed the Christina River and the Harland & Hollingsworth property. A spur from the W&N railroad led to the Walton, Whann & Co. Superphosphate Works (Hopkins 1881; see Figure 6).

The company employed as many as 75 men to operate the machinery, some of which was designed and constructed by the firm. A large portion of the sulfur used by the works was imported from Sicily, and bones were supplied from Texas and South America. The company also shipped phosphate rock from company-owned land on the Cooper River in South Carolina (Edwards 1880). The company combined raw bone dissolved in sulfuric acid, guano, salts of potash, and soda to make the fertilizer. Advertisements for the company stated, “No fertilizer has been more uniformly successful in all sections of the County” and “Insures large crops and makes poor land rich and productive” (Lehman & Bolton ca. 1875; Walton, Whann & Co. 1872). In 1873 the business was described as “the revival of the fertility of the South, exhausted by the land-murdering agriculture of slavery” (Lippincott 1873). Figures 11 and 12 illustrate the Walton, Whann & Co. complex in the 1870s.

In 1880 the firm was described as being “one of the best in the city in the extent and value of their transactions” and the proprietors were “all well known for their enterprise, business

Whann's Raw Bone Super-Phosphate Manufactory
 STANDARD GUARANTEED.



WALTON, WHANN & CO. PROPRIETORS,
 WILMINGTON, DELAWARE. Office, 203 WEST FRONT ST.

Whann's
Raw Bone
Super Phosphate,
THE GREAT
FERTILIZER
FOR ALL CROPS.

INSURES
Large Crops
AND MAKES
POOR LAND
RICH
AND
Productive.

Messrs. Ledy & Knustel *Baltimore* *Sept 14* *1872*

Terms Cash.
 "on 4th in order or perhaps with pay bonds"

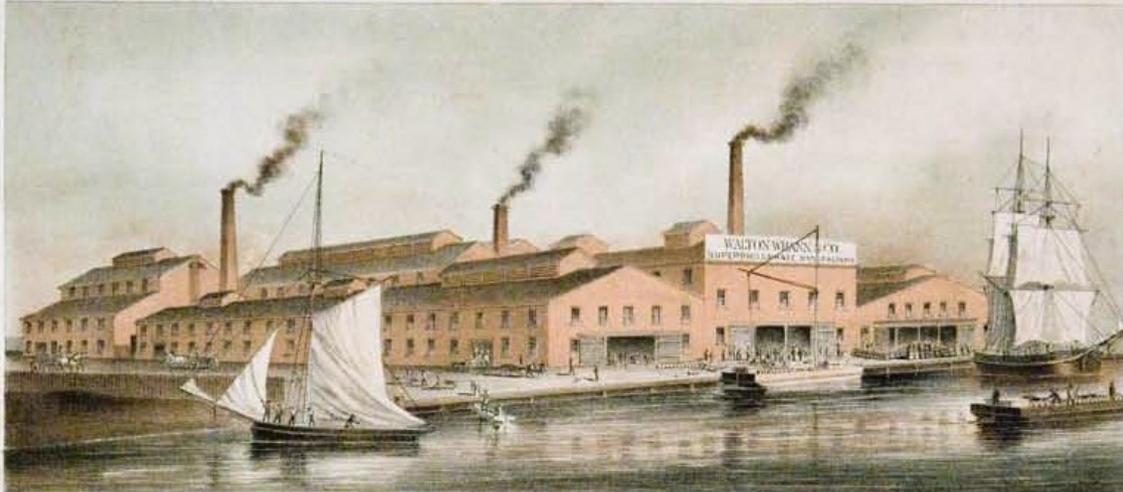
<i>1 Ton Whann Raw Bone Super Phosphate</i>	<i>\$ 50.00</i>
<i>Commission</i>	<i>\$ 7.00</i>
	<i>\$ 43.00</i>

FIGURE 11: Whann's Raw Bone Super-Phosphate Manufactory, 1872

SOURCE: Walton, Whann & Co. 1872

[TRADE MARK PATENTED, NOVEMBER 22d, 1870.]

THE GREAT FERTILIZER.
WHANN'S
RAW BONE
SUPER-PHOSPHATE.



WALTON, WHANN & CO'S WORKS, WILMINGTON, DEL.

The unexampled results of this Great Fertilizer on
COTTON, CORN, WHEAT, TOBACCO,
and all other Crops prove it to be the **BEST** and **CHEAPEST** Manure in
the market. Made of **PURE RAW BONE**, dissolved in **SULPHURIC**
ACID, GUANO, and SALTS OF POTASH and SODA, it contains every
element needed by growing plants. No Fertilizer has been more uniformly
successful in all sections of the Country.

Descriptive Pamphlets mailed free on application.

WALTON, WHANN & CO.

MANUFACTURERS,

203 West Front Street, Wilmington, Del.

57 South Calvert Street, Baltimore, Md.

28 South Wharves, Philadelphia.

Lehman & Bolton, Prs., Phila.

qualifications and liberality” (Edwards 1880:113). The chemical department of the company was overseen by owner Francis N. Buck, a chemist “of large experience and well adapted for the position” (Edwards 1880:113). In 1873 the company had one large building for manufacturing the superphosphate and a smaller storage building, both adjacent to the Christina River. By 1882 the storage building had been substantially enlarged and was used for the storage of acid (Hexamer 1873, 1882).

By 1895 the company was sold and became the Leibig Manufacturing Company. By 1942 the superphosphate works was no longer extant (Wilmington City Directories 1895; USGS 1942). During World War II, as the entire area was redeveloped for shipbuilding efforts, numerous buildings and structures were erected on the former Walton, Whann & Co. property. The property was owned by the Dravo Corporation and the United States Navy, which used a portion of the property as the Wilmington Annex of the Philadelphia Naval Shipyard (Sanborn 1951; USGS 1948). In the 1960s the Dravo Corporation and the Hub Marine Industrial Acres Corp. owned the property, continuing its use for shipbuilding efforts (Sanborn 1965a; Wilmington City Directories var.) (Figure 13). The property was sold in 1997 as part of the riverfront redevelopment efforts, and in 2001 the Shipyard Shops were built on the site (New Castle County 2011).

Eastern Side of the Christina River/South Market Street

Compared to the western side of the Christina River, the eastern side of the Christina River along South Market Street was developed at a slower pace because it did not have the same advantageous location next to the railroad. In addition, the property on the eastern side of the Christina River in the study area remained mostly marshland throughout the middle of the nineteenth century, making it much less desirable (Bromberg 1988).

Historically, Market Street (U.S. Route 13) connected Wilmington to Philadelphia, Dover, and points further south. As early as the Colonial period, several transportation routes traveled north and south along the Delaware Bay and Delaware River, roughly following the current path of U.S. Route 13 (Amott et al 2006:8). The first bridge traversing the Christina River at South Market Street was built in 1808. This wood “turn bridge” was replaced in 1883 by the City of Wilmington with a metal truss swing span bridge (DeIDOT 2005).

Industry had expanded over the southern side of Market Street by the mid-nineteenth century. Beers (1868) illustrates a two carriage factories, a lumber yard, and a coal and oil works on South Market Street in the vicinity of the Market Street Bridge. Development along South Market Street north of the B&O Railroad viaduct increased during the 1870s; however, south of the viaduct, where the road was named the Wilmington Causeway², development was sparse. The Hopkins (1876) map (Figure 14) shows the division of lots along the river and the owners of the property; however, few standing structures existed. Illustrating the marshy condition of the properties, lots were separated by drainage ditches. One structure was located in the APE along South Market Street in 1876.

² The term “causeway” implies that the road was built on a raised berm through the surrounding marsh area.

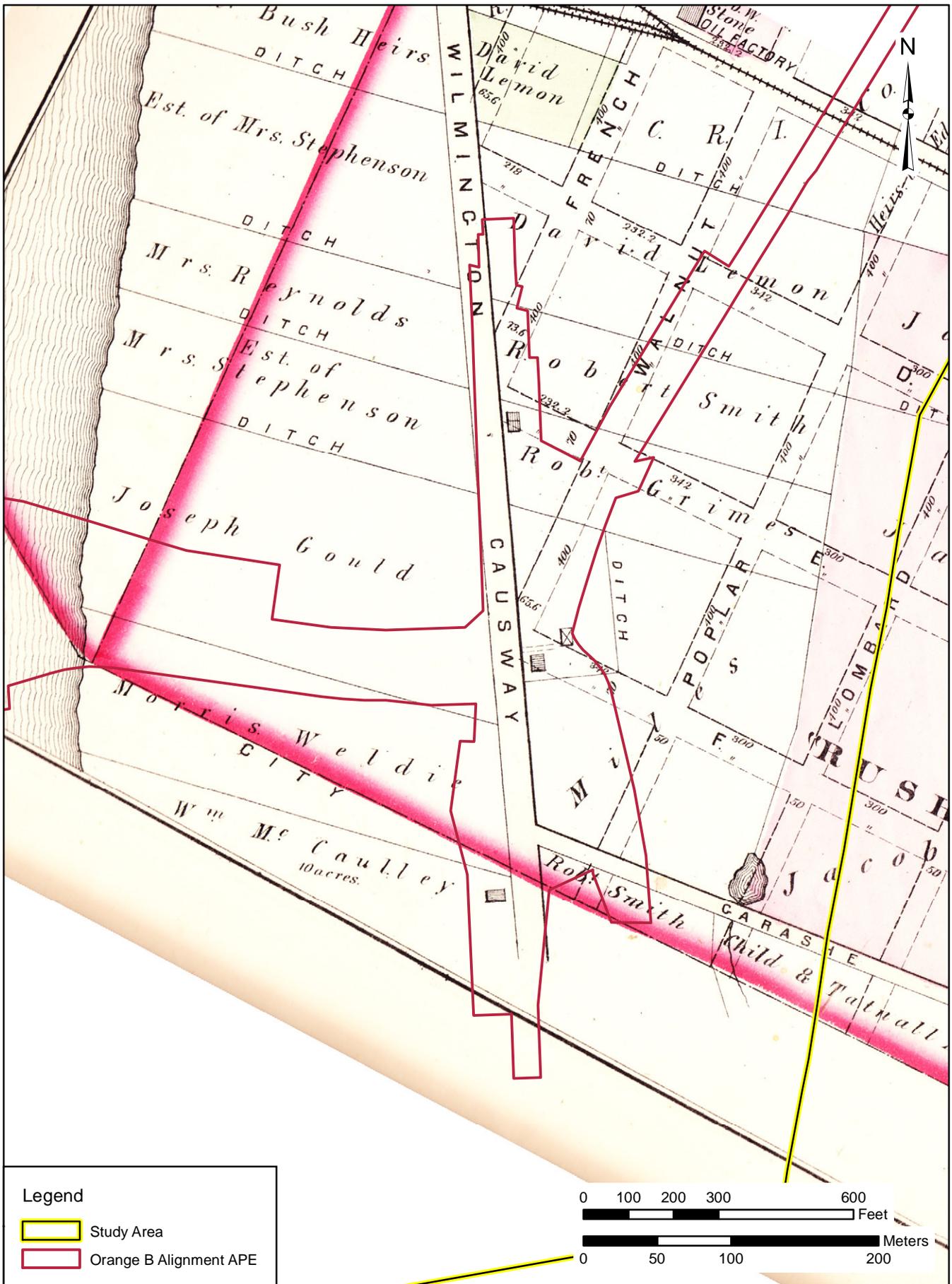


FIGURE 14: Eastern Side of Christina River, Showing Wilmington Causeway, 1876

SOURCE: Hopkins 1876

Although the Christina River Improvement Company conducted widespread filling of marshes along the Christina River in the mid-1800s, a 1906 topographic map (Figure 15) illustrates that the land between South Market Street and the river remained mostly marshland, excepting land immediately adjacent to the raised causeway that carried South Market Street. The map shows a few structures along Market Street, primarily closer to Wilmington proper (Bromberg 1988; USGS 1906). A USACE (1906) map illustrates that a portion of the APE, directly across from the pulp works, was part of the Rogers Estate, which remained undeveloped. The property along the river across from Leibig Chemical Company (formerly Walton, Whann & Co.) was owned by the Delaware Machine Company, the Jackson and Co. foundry, and the McCormick Brothers; however, no structures appear at these locations on 1906 topographic maps (USACE 1906; USGS 1906).

Improvements were made to South Market Street during the 1920s as automobile traffic increased along U.S. Route 13, prompting an increase in commercial development along the corridor. Illustrating the poor condition of the road prior to the improvements, a highway department engineer despairingly wrote in a 1925 annual report, “We do not have anywhere in our system of 504 miles of highways a section of road whose surroundings are less attractive, more disreputable, ill-kept and thoroughly disgusting than the South Market Street Causeway in Wilmington” (Buck 1925:25). The engineer recommended the paving of the street from the Market Street Bridge to the city limits and the construction of sidewalks, curbing, and lighting. He predicted that by making these improvements “the many dump heaps, dilapidated shacks and hovels will be [replaced with] stores, show rooms, garages, and other presentable places of business” (Buck 1925:25). In 1925 construction began on a new bridge crossing the Christina River. Upon the completion of the bridge in 1927, improvements were made to South Market Street in 1928, including drainage, sidewalks, and curbing as recommended in the 1925 annual report (Zug-Gilbert et al. 2011).

The improvements made to South Market Street initially prompted little new development farther south along the corridor. In the early 1920s only a barrel manufacturing company and a meat rendering business were located as far south as the 700 block of South Market Street in the APE, which was just outside the city limits (Wilmington City Directories 1923-1924). By 1940 the meat rendering business had been joined by an auto shop and a mattress company (Wilmington City Directories 1940). A USGS (1942) topographic map illustrates a road extending west from South Market Street in the APE. Remnants of this road are still visible today; however, it does not appear to be in use. The properties adjacent to the road were developed in the 1930s and 1940s as evidenced by a warehouse (1948) at 701 South Market Street and a warehouse (1930), a body shop (1945), and an office building (1942) at 707 South Market Street, which remain extant (New Castle County 2011).

The impact of suburbanization and the rise in automobile ownership is reflected in the business expansion along South Market Street in the 1950s, 1960s, and 1970s. As residents and businesses began to move out of the city, many service-oriented businesses were established on inexpensive and available land on the southern side of the Christina River. Thus, South Market Street quickly became a busy commercial corridor lined with light industries and auto-related businesses (Zug-Gilbert et al. 2011). In the APE businesses located in the 700 and 800 blocks of South Market Street during the 1950s reflected this trend, including several meat rendering

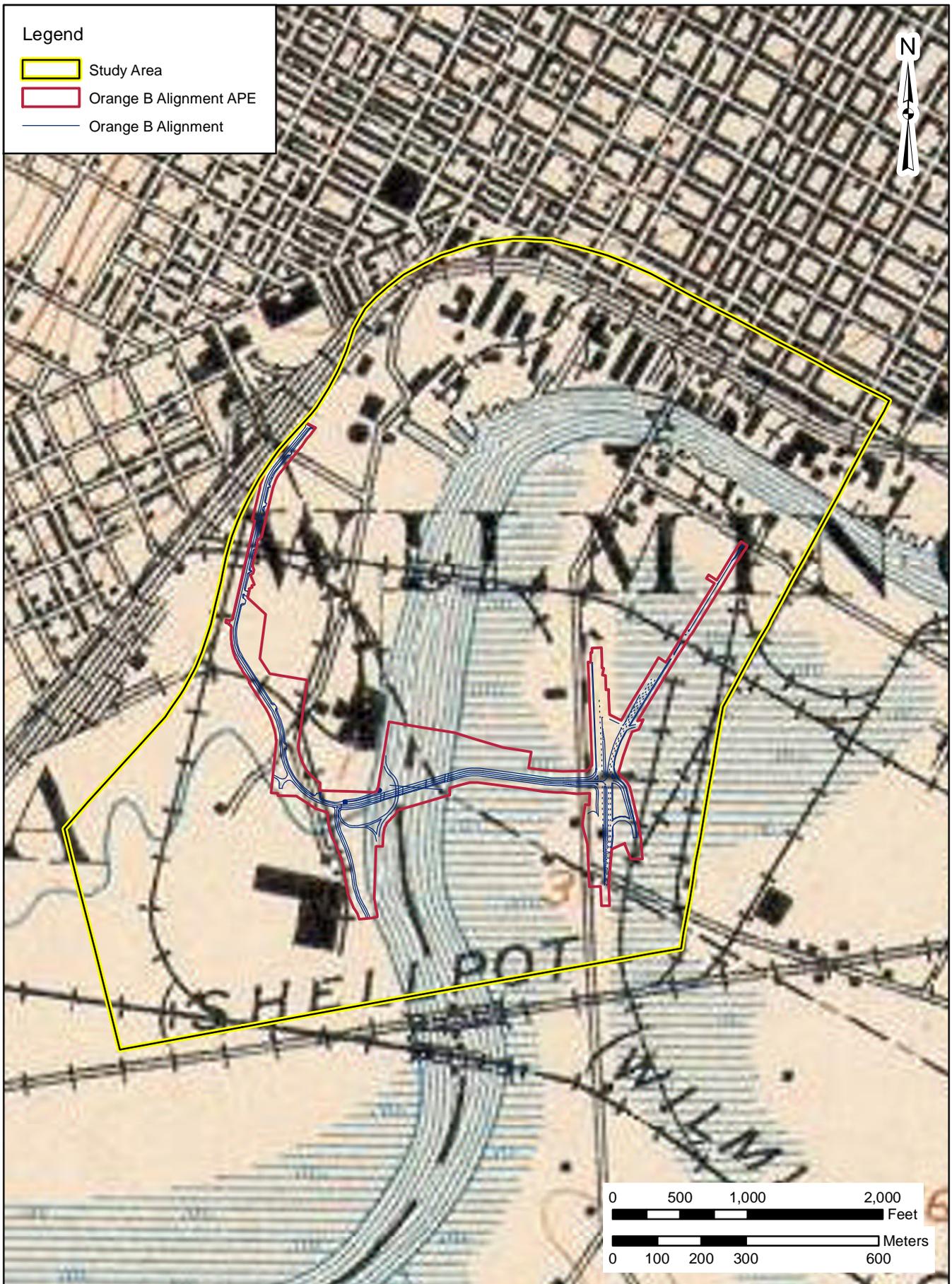


FIGURE 15: Study Area and Vicinity, 1906

SOURCE: USGS 1906

shops, a dry cleaning plant, and auto-related businesses such as gas stations and auto repair and auto parts stores (Wilmington City Directories 1955, 1961, 1965, 1970, 1975; Sanborn 1965b). A steel fabrication plant (ABE Steel) occupied a property along the APE that extends from the river to the intersection of South Market and South Walnut streets (Figure 16).

The growth of Wilmington's suburbs as well as the increase in development along the South Market Street corridor quickly created traffic problems in and out of the city. In 1954 construction on the Walnut Street Bridge commenced, providing an additional crossing of the Christina River east of the Market Street Bridge; on the southern side of the river, Walnut Street continued southwest until its intersection with South Market Street. When the Walnut Street Bridge was completed in 1957, Market Street became a southbound-only route and Walnut Street served as a northbound-only route, easing traffic congestion in and out of the city (Zug-Gilbert et al. 2011).

On the eastern side of South Market Street, 800 South Market Street was developed in 1965, after the extension of South Walnut Street. In the 1980s and 1990s, a road with a cul-de-sac was built south of the intersection of South Market and South Walnut streets that extended west toward the river. The commercial properties built along the road, James Court, were all developed in the 1980s and 1990s (New Castle County 2011). The properties that are in the APE continue to be used for commercial purposes today.

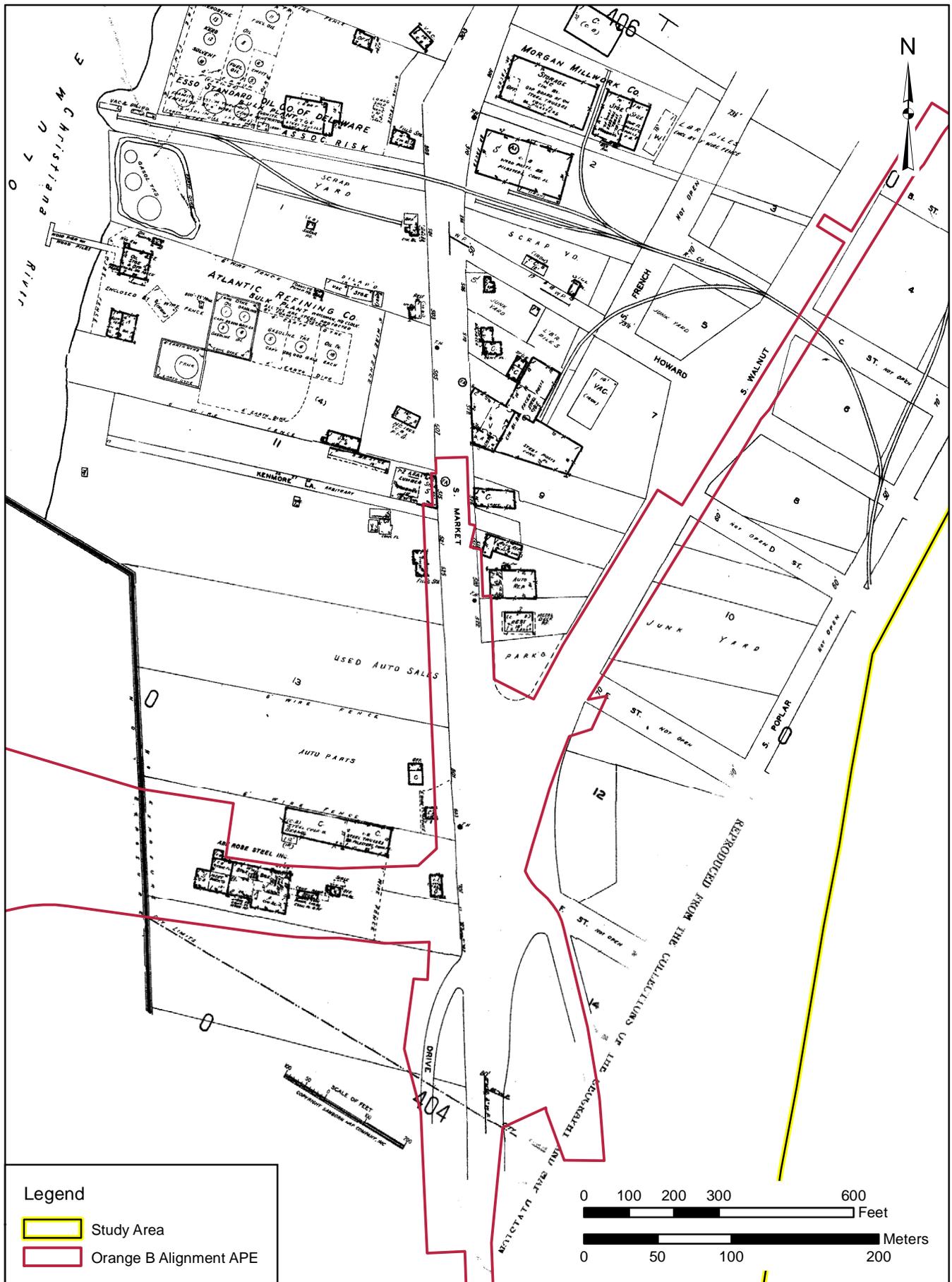


FIGURE 16: Eastern Terminus of APE, 1965

SOURCE: Sanborn 1965B