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PHASE I ARCHAEOLOGICAL INVESTIGATION

ARBUTUS AVENUE SEWER PROJECT

STATEN ISLAND, NEW YORK

Capital Project No. 759/760/762

97 DEP026R

Prepared for:

JRC CONSTRUCTION CORPORATION
675 Line Road
Aberdeen, New Jersey 07747

Prepared by:

THE LOUIS BERGER GROUP, INC.
120 Halsted Street
East Orange, New Jersey 07019

June 2001

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I. INTRODUCTION

The Louis Berger Group, Inc. (Berger), conducted a Phase I archaeological survey of four areas along Arbutus Creek in Staten Island, where sanitary and storm sewers were to be installed by JRC Construction Corporation. The goal of the investigation was to determine if archaeological resources would be impacted as a result of these utility installations.

The project area is located in the Princes Bay section of Staten Island and is close to Arbutus Lake, formerly known as Latourettes Pond (Figure 1). The project area extends along Arbutus Avenue from Hylan Boulevard and north to Amboy Road and then north to Lexa Place at Bennett Avenue (Figure 2). Four areas were identified that contained the potential for intact archaeological deposits. Archaeological testing focused on three areas identified by the New York City Department of Environmental Protection (DEP) as having archaeological sensitivity (JRC Construction Corporation 2001). Area 1 referred to the area encompassed by BMP AC-1, located at Bennet Pond, at the intersection of Lexa Place and Bennett Avenue; Area 2 was the area at the southern end of Phillip Avenue at the location of BMP AC-3; Area 3 was the western end of Billou Street where BMP AC-9 is to be constructed; and Area 4 was the future location of BMP AC-4 along the western banks of the existing channelized Arbutus Creek.

Background research was conducted at the New York Public Library and the Staten Island Institute of Arts and Sciences (SIIAS) and included examination of historic maps and archaeological studies. The prehistoric and historic background sections of this report relied heavily on research findings derived from a previous sewer installation projects conducted in Staten Island (Berger 1994, 1995, 1997). The determination of archaeological sensitivity was made by the New York City DEP and is consistent with the *Archaeological Evaluation and Sensitivity Assessment of Staten Island, New York* that was prepared for the Landmarks Preservation Commission (LPC) (Boesch 1994).

The Phase IB archaeological investigation followed the guidelines established by the New York City LPC and city regulations governing the protection of the cultural environment (CEQRA). The project was conducted under the overall supervision of Ms. Susan Grzybowski, Assistant Director/Senior Archaeologist of Berger's Cultural Resource Group, and Gerard Scharfenberger, a ROPA-certified archaeologist. Mr. Zachary Davis served as the Principal Investigator for this project and was the principal author of the report. Field testing was conducted by Mr. Rick Vernay under Mr. Davis' direction. The report was written by Mr. Davis and the graphics were prepared by Mr. Victor Reynolds and Mr. Davis.

TITLE: FIGURE 1 - PROJECT AREA IN SOUTHERN STATEN ISLAND

SOURCE: USGS 7.5 MINUTE SERIES ARTHUR KILL, NY-NJ 1966 (PHOTOREVISED 1981)

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N W E S

TITLE: FIGURE 2 - PROJECT AREA AND AREAS OF ARCHAEOLOGICAL SENSITIVITY INVESTIGATED

SOURCE: DIGITAL ORTHOPHOTO FROM http://www.nysgis.state.ny.us

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II. PREHISTORIC CONTEXT

A. ENVIRONMENTAL SETTING

Staten Island is within the Atlantic Coastal Lowland physiographic province and is geographically related to New Jersey from which it is separated by the Kill Van Kull and the Arthur Kill waterways (Skinner 1909). The bedrock consists of Serpentine and Stockton sandstone of the Triassic period, which forms the hills at the core of the island; one of these, Todt Hill, is at 410 feet above sea level, the highest point not only in New York City, but along the entire Atlantic coastline south of Massachusetts (Schuberth 1968:98, 249).

Surface features and landforms are mainly the result of continental glaciation which deposited unsorted and unstratified sediments, part of the Harbor Hill terminal moraine that extends from Pennsylvania east through Perth Amboy, New Jersey, across Staten Island and Long Island to Cape Cod, Massachusetts (Schuberth 1968:184-186, 249). Soils in the project area were formed in glacial till and the related outwash sediments.

The project area is located along the course of the now channelized Arbutus Creek, which flows southward into Arbutus Lake, located immediately south of Hylan Boulevard. Arbutus Lake is a fresh water lake situated approximately 400 feet from the south shore of Staten Island. Vegetation in the project area consists of freshwater wetland species along the creek and woodland communities on better-drained soils. Elevations in the project area generally average around 40 to 50 feet above sea level, increasing to the north of the project area.

When Native Americans first inhabited the New York City area, sea levels may have been 300 feet lower than at present, which would have caused the Atlantic shore to regress approximately 60 to 90 miles from its current position (Kraft 1977). By 5,000 BP (Before Present), the sea level had risen to just 30 feet below its present level, and it continued to rise to a point some 14 feet below the present level by 2,000 BP. Therefore, over the course of human occupation, the environment changed from an upland and inland location of oak/pine forest and grasses into a coastal lowland zone (Silver 1984:5).

B. PREHISTORIC OVERVIEW

Three major periods are commonly used to describe the prehistoric cultures of New York–Paleoindian, Archaic, and Woodland. The earliest recognized aboriginal occupation of New York dates to the Paleoindian period (11,000-9000 BP), which is characterized by the use of distinctive fluted lanceolate points. The location of known Paleoindian sites suggests a preference for high, well-drained ground, located near streams or wetlands, offering vantage points for observing game. Port Mobil, a Paleoindian site located on the western shores of Staten Island, dates to circa 10,000 BP, and was interpreted as a small, resource-procurement/hunting encampment (Eisenberg 1978; Funk 1977). The artifact assemblage from the site includes fluted points, unfluted trianguloid points, scrapers, knives, borers, and gravers. It is probable that many Paleoindian sites were situated on what is now the continental shelf, which has been submerged as a result of rising sea levels since the retreat of the Wisconsin glacier (Edwards and Merrill 1977).

Paleoindian economy may have centered on the hunting of game. Although other economic activities, such as the gathering of plant foods, may have been equally important (Roosevelt et al. 1996), they have left little or no trace in the archaeological record. Lithic technological considerations may have also contributed to Paleoindian landscape settlement patterns. Goodyear (1989) suggests that high-quality cryptocrystalline materials (i.e., chert, jasper, and chalcedony) were the materials most commonly used to manufacture fluted lanceolate projectile points. He suggests that Paleoindians used high-quality lithic materials when producing fluted points because of the predictable manner in which these materials fractured, thereby decreasing the possibility of catastrophic fractures occurring as a result of internal (and hidden) flaws, typically present in low-quality lithic materials. This dominance of high-quality lithic materials suggests that Paleoindians sought out high-quality materials, a hypothesis that is supported by the presence of high-quality lithic materials derived from great distances (up to 300 kilometers) at Paleoindian sites. However, recent geoarchaeological surveys have challenged this assumption by identifying local sources for Paleoindian lithic material (LaPorta 1994; Moeller 1999). These recent studies suggest that Paleoindians were occasionally manufacturing fluted projectile points on local and poorer quality lithic materials. was dominated by game hunting, an adaptation to the open-forest environments and to the colder climate of the time.

Climatic warming during the Holocene led to sea level rise and changes in drainage patterns as well as vegetation; by 8500 BP, oak and hemlock forests replaced the predominantly pine forests of the area. The ecological changes brought about by the warmer Holocene climates subsequently encouraged population migrations and the development of the new subsistence strategies which characterize the Archaic period (9000-3000 BP). Compared with the Paleoindian period, a wider variety of artifact types was used during the Archaic. This suggests that a greater diversity of subsistence and technological activities was pursued, although hunting still appears to have been the major focus.

Differences in tool assemblages, projectile point types, and preferred lithic materials characterize the Early, Middle, and Late Archaic subperiods (Coe 1964; Ritchie 1980). Early Archaic sites identified on Staten Island include the Old Place Site, the Ward's Point Site, and the Richmond Hill Site, all of which have produced Kirk components dated circa 7260 to 8250 BP; the Richmond Hill Site also contained a Palmer component that may be associated with a radiocarbon date of 9360 BP (Ritchie and Funk 1971, 1973:38-39).

With the exception of several Kanawha and LeCroy-like points from the Ward's Point Site (Jacobson 1980:56), Middle Archaic remains are rare on Staten Island. This is possibly the result of unclear typological definitions for this period. In contrast, Late Archaic sites are relatively common and are characteristically located along tidal inlets, coves, and bays. Site setting and content suggest that marine resources were important to Late Archaic subsistence, a trend related to the stabilization of coastal environments (Edwards and Merrill 1977).

The Terminal Archaic or Transitional period (3000-2700 BP) is characterized by distinctive technologies that included production of soapstone vessels and a variety of broad-bladed projectile point types. The appearance of soapstone or steatite vessels and artifacts during this period provides evidence of interregional trade and also suggests increased residential stability, since stone bowls are items not easily transportable from site to site. Terminal Archaic remains on Staten Island also have been found in association with shell middens, which represent an intensification of coastal-oriented economies.

The Woodland period (2700 BP to European Contact) is identified by the manufacture and use of ceramics. This period is divided into three subperiods–Early, Middle, and Late–that are characterized by distinctive projectile point types and ceramic styles. The earliest ceramics found in coastal New York are grit-tempered wares similar to Vinette I. Middle Woodland ceramics include shell-tempered wares with cord and net impressions, and Late Woodland ceramics include various collared vessels with incised, dentate, and cordmarked decoration. The Woodland period is also associated with horticulture; the earliest evidence of domesticated plants occurs in the Middle Woodland.

At the time of European contact, Staten Island was occupied by the Munsee, a group of the Algonquian-speaking Lenape, also called the Delaware Indians, who lived in what is now eastern Pennsylvania, New Jersey, and southern New York. The Native populations maintained loosely structured, autonomous bands that resided in small dispersed settlements. The territories of the various Native groups that have been distinguished linguistically are uncertain, partly due to the lack of fixed "tribal" boundaries. Increased contact with European traders and settlers resulted in the breakdown of traditions and increased reliance on European goods in exchange for land and furs (Goddard 1978; Kraft 1986).

C. SENSITIVITY ASSESSMENT

The *Archaeological Evaluation and Sensitivity Assessment of Staten Island, New York* by Eugene Boesch (1994) lists the following criteria to assess prehistoric archaeological sensitivity: (1) proximity of known sites or surface artifacts from the immediate vicinity; (2) freshwater source nearby; (3) proximity of marsh, shoreline, river or stream mouth, or ridge; (4) high ground overlooking water with slopes less than 30 percent; and (5) well-drained soil. According to this model (Boesch 1994), the project area is considered to have a high sensitivity because it is situated near Arbutus Creek and associated wetlands, and is in proximity to previously recorded sites.

Records at the New York State Museum and the New York State Office of Parks, Recreation and Historic Preservation list twelve (12) prehistoric sites within a 1-mile radius of the project area (Table 1, Figure 3). Four sites (Holdridge Ave., Arbutus Ave., Huguenot Ave., and Holten Ave. Sites) were identified through a Cultural Resource Survey for sewer line installation in the early 1980s (Pickman and Yamin 1984). These four sites, located along Hylan Boulevard, uncovered low densities of prehistoric material in shovel test pits. Artifacts recovered included fire cracked rock and chert flake and core fragments. The recovered artifacts could not be assigned to a specific cultural period.

The remaining sites were previously identified by early surveys of Richmond County, primarily through the work of Alanson Skinner in the early parts of the 20th century (Skinner 1909). Skinner's summary of the Lenapé occupation of Staten Island provided a comprehensive synthesis of the various collections distributed across the island. Five of the earlier surveyed sites, located along the southern shore of Staten Island, are within one mile of the project area (Salwen 1967). Most of these sites contain small scatters of stone tools and shell middens, occasionally with faunal remains. These sites on the shore were not excavated according to today's modern standards, but they still indicate the high potential for archaeological deposits along the southern edge of Staten Island.

To the north, two earlier surveyed sites and one site identified through a cultural resource survey are within one mile of the project area. Again, the earlier surveyed sites are recorded as scatters of prehistoric remains while the recently identified site is interpreted as a midden (Jacobson & Regensburg 1980). Although these three sites are not located right on the shore, they are still located close enough to water sources and well drained soils, indicating a high degree of sensitivity for prehistoric archaeological resources in this area of Staten Island.

TABLE 1 - PREHISTORIC SITES WITHIN ONE MILE OF THE PROJECT AREA

	SITE NAME	NYSM No.	OTHER SITE DESIGNATION	SOURCES	DESCRIPTION
1	Holdridge Ave Site	None	A085-01-0011	Pickman & Yamin 1984	Two test pits with prehistoric material
2	Arbutus Ave Site	None	A085-01-0012	Pickman & Yamin 1984	Eight test pits with prehistoric material
3	Huguenot Ave Site	None	A085-01-0014	Pickman & Yamin 1984	Three test pits with prehistoric material
4	Holten Ave Site	None	A085-01-0015	Pickman & Yamin 1984	Three test pits with prehistoric material
5	Wolfes Pond	736	STD-12-3:A.S. Area 16	Skinner 1909	Shell middens, surface finds from 1898, small shell heaps
6	No name given	4601	ACP-Rich-11	Parker 1922	Early relics and "camp"
7	No name given	4610	ACP-Rich-20A	Parker 1922	Shell midden, campsite, pottery, and deer bone
8	No name given	4621	ACP-Rich	Parker 1922	Traces of occupation
9	No name given	4622	ACP-Rich	Parker 1922	Camp site
10	New Site 2	5702		Jacobson & Regensburg 1980	Shell midden
11	No name given	7264	ACP-Rich-20B	Skinner 1909	Shell midden
12	No name given	8226	ACP-Rich-13B	Parker 1922	Traces of occupation, "relics" at Woodrow Road and Sandy Brook

TITLE: FIGURE 3 - PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES WITHIN A ONE MILE RADIUS OF THE PROJECT AREA

SOURCE: USGS 7.5 MINUTE SERIES ARTHUR KILL, NY-NJ 1966 (PHOTOREVISED 1981)

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III. HISTORICAL OVERVIEW

The project area is located in the area between Princes Bay and Annadale, Staten Island. Arbutus Lake, originally known as La Tourette's Lake, and the Arbutus Creek are the major physio-geographic features in this area of Staten Island.

From 1621 to 1664, Staten Island was part of the Province of New Netherland (Figure 4). The province was administered by the Dutch West India Company, under whose jurisdiction the island received its name. The Native American population resisted Dutch settlement, culminating in the Peach War of 1655, which vastly depopulated the island. In 1662, a handful of dwellings and a small blockhouse were erected on a site above lower New York Bay, a short distance south and west of the high ground at The Narrows. This settlement, known as Oude Dorp (Old Town), consisted chiefly of Dutch and French colonists from the Palatinate.

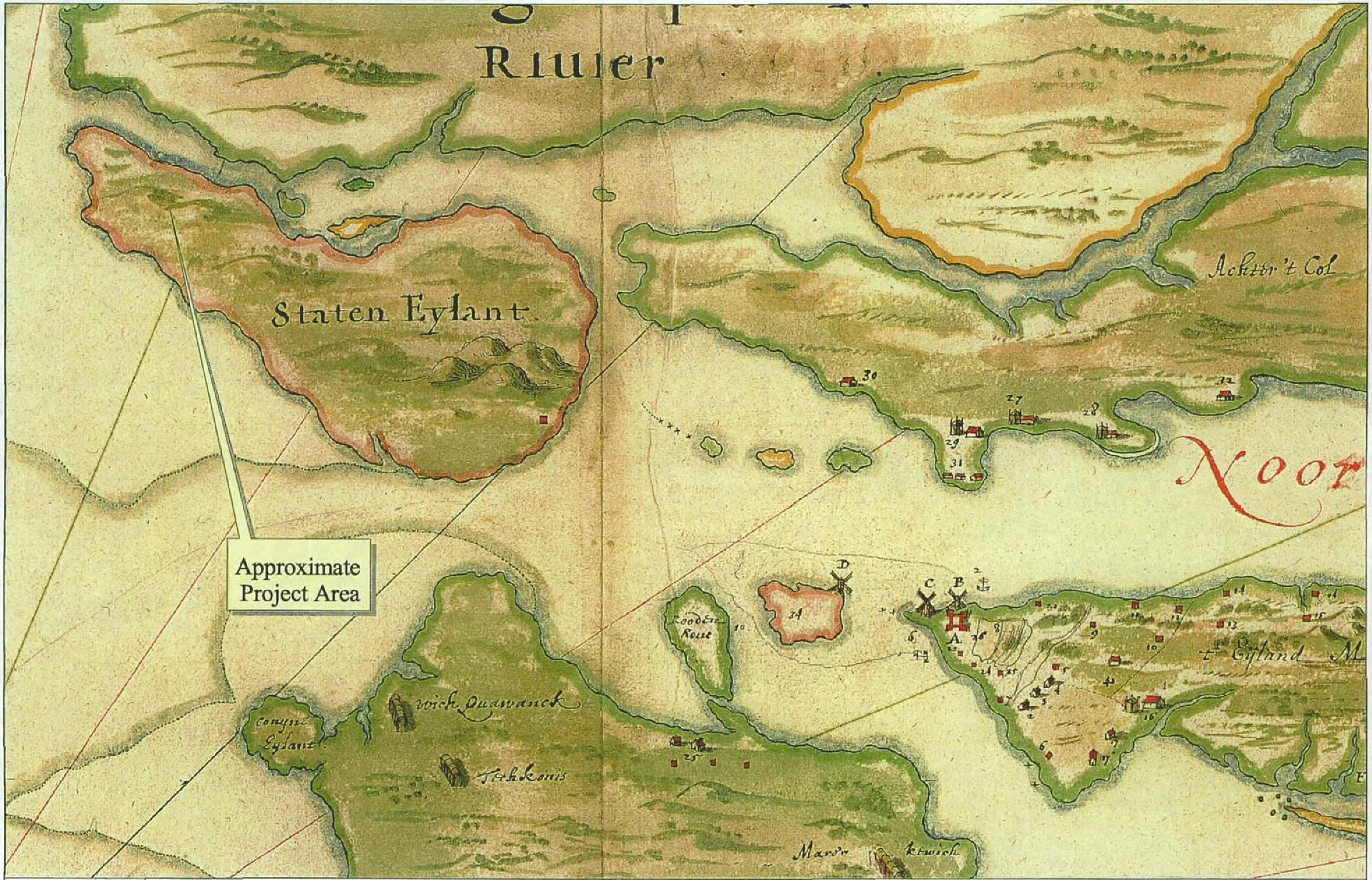
In 1664, New Netherland, including Staten Island, was taken over by Great Britain. The last Native American claims to Staten Island were extinguished in 1670, and in 1683 the island was organized as the County of Richmond. Settlement continued under the British, with significant numbers of Huguenots arriving in the last years of the seventeenth century. By the mid-eighteenth century, Staten Island's population was a mix of people of Dutch, French, Belgian, and English descent (Berger 1985:11).

The countryside surrounding the project area was first settled in the late 17th century when Richard Hall purchased land here in 1680 (Leng & Davis 1930:903). At the time, the area was known as Huguenot, named for the large number of French Huguenots settling in the lower reaches of Staten Island. In the 19th century, the area was referred to as Bloomingview (Leng & Davis 1896).

During the Revolutionary War, a few roads were established in this area, though for the most part, this section of Staten Island remained sparsely inhabited (Figure 5). For the most part, the area was a wooded area with houses along Amboy Road and a few houses along the shore. At the time of the Revolution, Arbutus Lake was known as La Tourettes Lake due to the presence of two members of the La Tourette family in this section of Staten Island. Arbutus Lake at this time was connected to the Raritan Bay, indicating the lake did not support fresh-water species.

Through the 19th century, the project area was similarly sparsely inhabited (Figure 6). By 1844, Arbutus Lake remained connected to the Ratitan bay, but by a stream and not directly emptying into salt water. It is probable that the lake was less saline by this time. Several houses are located along Amboy Road, forming the small community of Bloomingview.

By the late 19th century, a road linked Amboy Road with the shore (Figure 7). This road was known as Broadway and was the precursor to the modern Arbutus Road. Additionally, the Staten Island Railroad was completed and a rail stop was established nearby at Princes Bay. Bloomingview developed at a much slower pace than the surrounding villages of Annadale and Princes Bay. Land ownership maps confirm the sparse settlement of this area. The Beers 1874 map indicates several



TITLE:
FIGURE 4 - STATEN ISLAND AND THE LOWER HUDSON BAY IN 1639

SOURCE:	DATE:	CLIENT:
VINCKEBOONS 1639	JUNE 2001	JRC CONSTRUCTION

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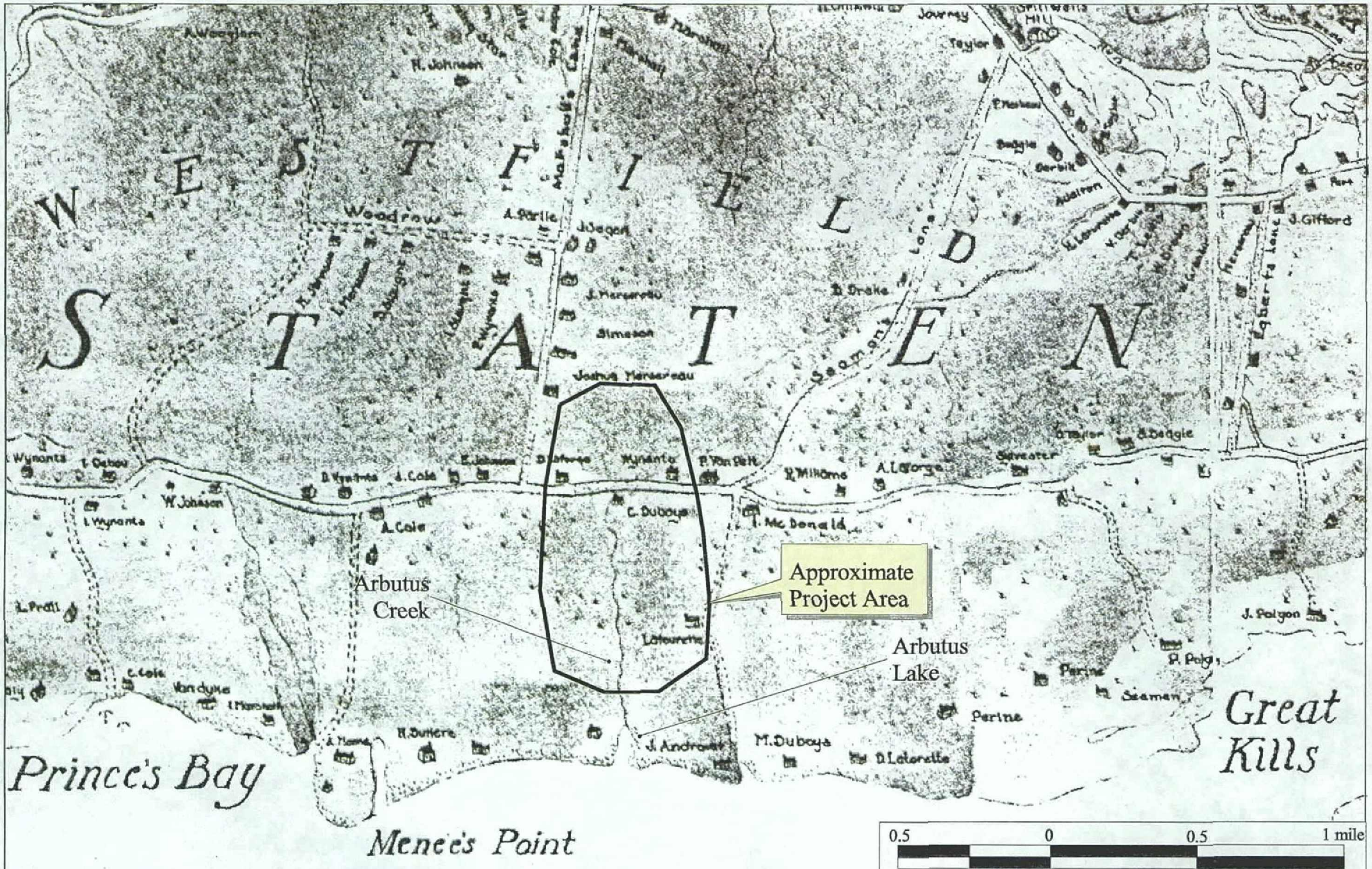

TITLE: FIGURE 5 - VICINITY OF THE PROJECT AREA DURING THE REVOLUTIONARY WAR, 1775-1783

SOURCE: MCMILLEN 1933	DATE: JUNE 2001	CLIENT: JRC CONSTRUCTION

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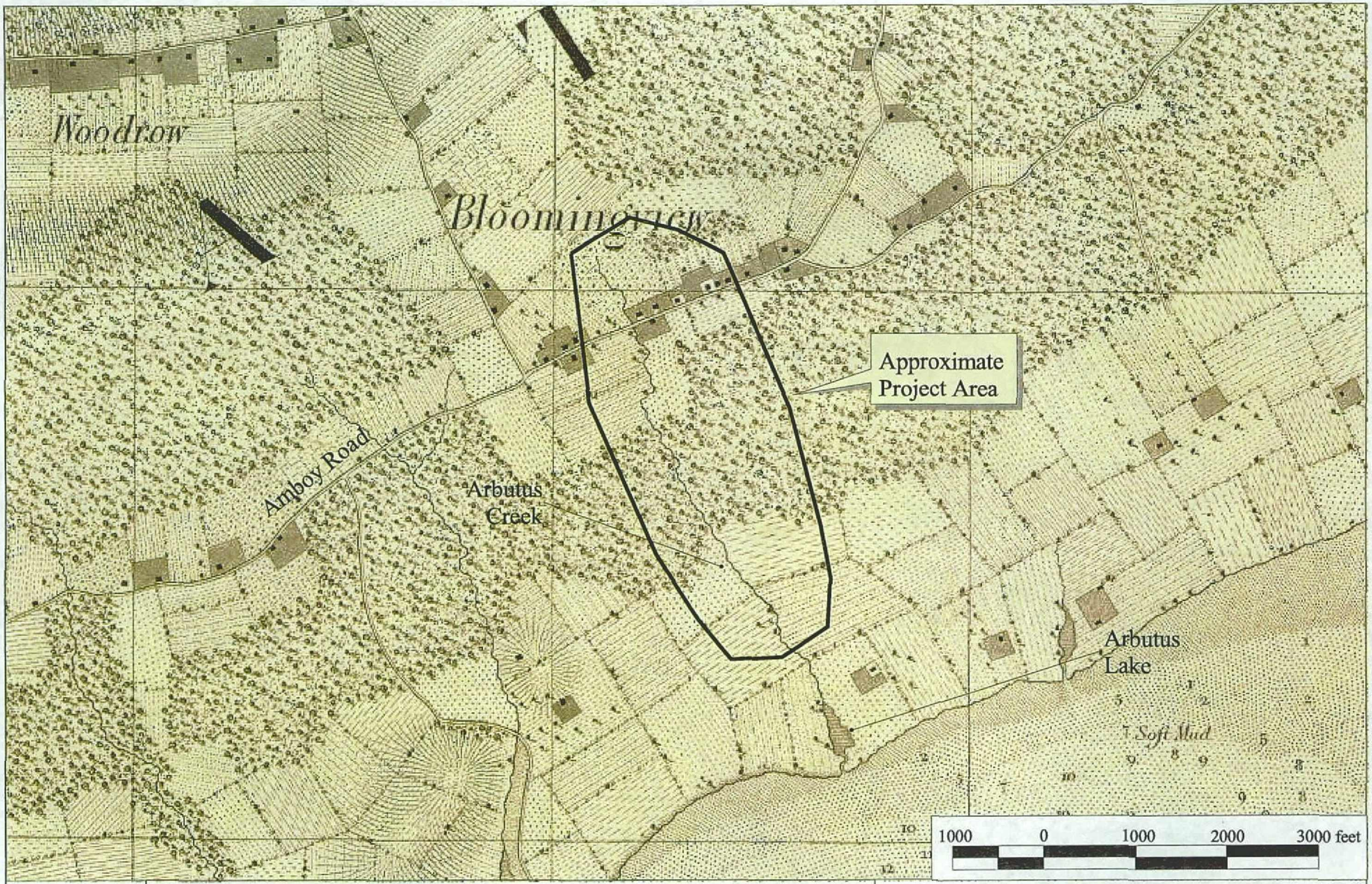

TITLE:
FIGURE 6 - VICINITY OF THE PROJECT AREA IN 1844

SOURCE: U.S. COAST SURVEY 1844

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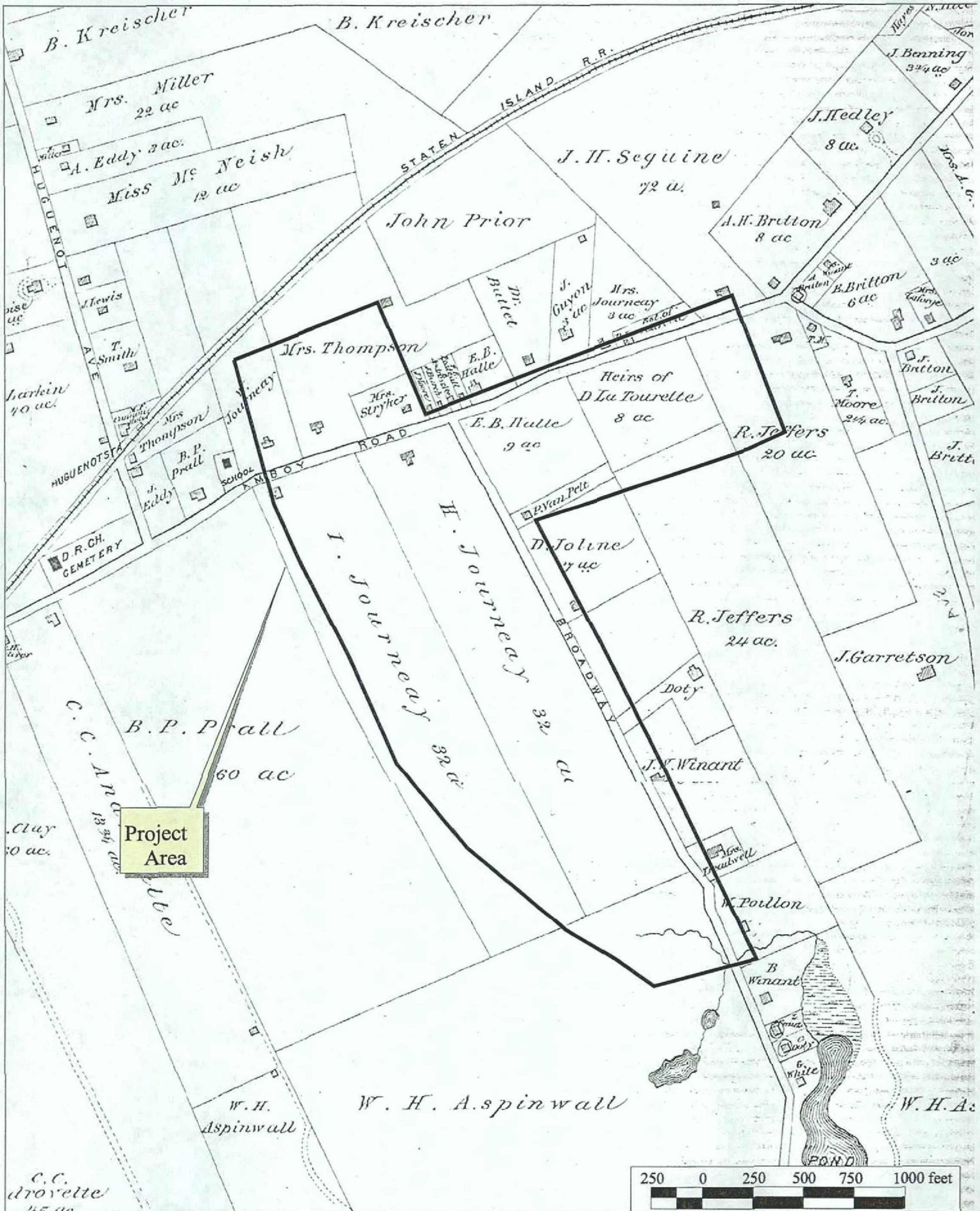

TITLE:
FIGURE 7 - 1874 LAND OWNERSHIP OF THE PROJECT AREA

SOURCE: BEERS 1874	DATE: JUNE 2001	CLIENT: JRC CONSTRUCTION

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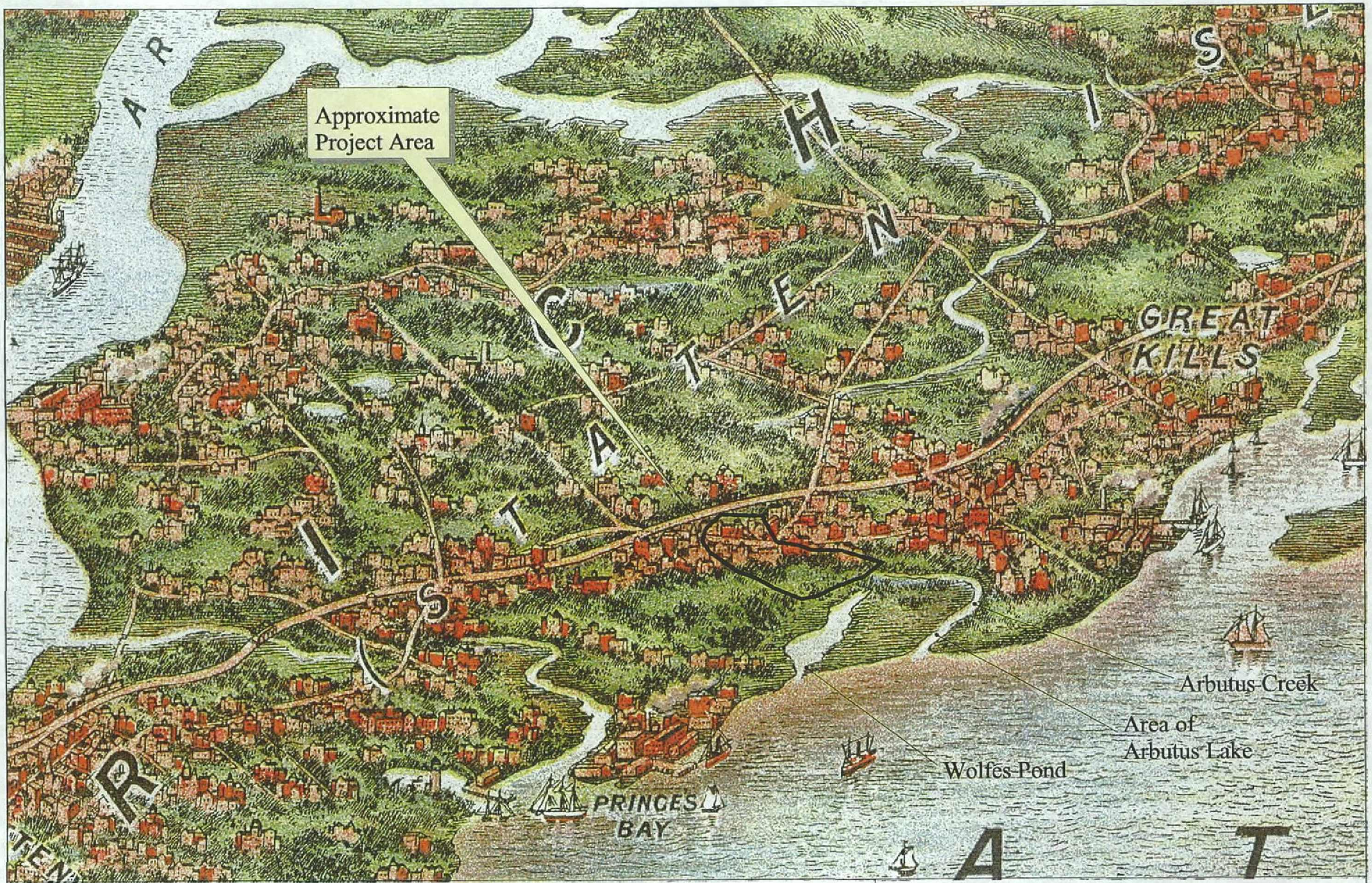
land owners, but just a few control the majority of land here. The Journeay family owned the land encompassing Areas 3 and 4 of the present archaeological investigation. Mrs. Thompson is listed as the landowner of the parcel containing Area 1, and Area 2 is contained within the parcel owned by R. Jeffers (Beers 1874:Section 29). The landscape is little changed by 1887 as indicated by the Beers 1887 atlas (Beers 1887: Section C).

A bird-eye view of the area in the early 20th century reveals an area of increasing settlement along Amboy Road with a few clusters of houses now appearing along the southern shore of Staten Island (Figure 8). Several small villages have sprouted in the area, though the land encompassed by the project area remains relatively unsettled. While some houses are in the project area, the areas investigated for potential archaeological resources do not contain any structures.

The Borough of Richmond Topographical Survey (Borough of Richmond 1911, 1912) is the most accurate map of Staten Island that has ever been made and, as such, is still widely utilized. These maps also indicate the low population density in this part of Staten Island. All sections of the project area subjected to subsurface testing do not possess any evidence for historic houses, structures, or roads. All four areas of archaeological sensitivity do not possess a high potential for historic archaeological deposits. The Borough of Richmond Topographical Survey sheets indicate a relatively undisturbed region of land that holds a high potential for prehistoric archaeological resources.



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TITLE:
FIGURE 8 - BIRDS-EYE VIEW OF SOUTHERN STATEN ISLAND IN 1907

SOURCE: U.S. COAST SURVEY 1844

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IV. FIELD INVESTIGATIONS

A. METHODS AND FIELD RECONNAISSANCE

Archaeological testing was confined to four discrete locations that were identified by the New York City DEP as having a moderate to high sensitivity rating for archaeological resources. The four selected test areas are all in proximity to Arbutus Creek and its associated wetlands, and were presumably undisturbed.

A reconnaissance of the four test areas included a walkover. There were indications that portions of each area were disturbed by activities such as grading and landscaping, refuse dumping, and paving. The walkover indicated that one area was severely disturbed by utilities and was entirely within existing wetlands. This area (Area 2) was excluded from subsurface testing. Stream banks were also examined to evaluate disturbance and look for evidence of archaeological sites. Test excavations were confined to locations within each area that appeared to be relatively undisturbed. Excavations consisted of shovel test probes.

All shovel tests were mapped using a Trimble Pro XR mapping-grade GPS unit. This GPS unit records spatial locations with an accuracy of ±50 centimeters (± 20 inches). Each GPS recorded point requires approximately one minute to record the spatial position of the shovel test. All GPS recorded points will be corrected using in the field real-time correction via a National Geodetic Survey (NGS) continuously operating reference system (CORS). At the end of each day, the GPS collected data will be postprocessed to reduce errors due to atmospheric interference and selective satellite availability. The GPS data points are postprocessed by comparing the field data to a known reference data point tracking the same satellites used to generate the in field data. Postprocessing typically improves the spatial precision for each position by around 50%.

Once all excavated shovel tests are recorded with the GPS and postprocessed, the GPS data will be exported as ArcView GIS (Geographic Information Systems) data files and entered into an already existing GIS database for the Arbutus Avenue Sewer Installation Project. Storing all field data within the GIS database provides quick and immediate access to spatial information on artifactual distribution across the project area. For example, the GIS database can display distribution of different artifact classes over the project area in order to isolate activity specific localities. Additionally, spatial data within the GIS database can be presented graphically to illustrate artifact distribution in relation to several independent variables, such as topography, soil type, viewshed, etc. At the conclusion of the project, the GIS database can be delivered to JRC Construction along with the finished report.

Shovel tests measured approximately 1 foot in diameter and were excavated to depth where sterile subsoil, rock, or water was encountered. All excavated soil was screened through ¼-inch hardware mesh to aid in the recovery of artifacts. Soil profiles were recorded for each excavation using Munsell Soil Color and standard texture classifications. Following the completion of excavation, all shovel tests were backfilled. Modern debris was noted in the field, but not collected. The stratigraphic profiles for all shovel test pits are presented in Appendix A.

B. AREA 1 RESULTS

Area 1 refers to the area at the intersection of Bennet Avenue and Lexa Place (Figure 9). The wetlands to the west of Lexa Place that drain into Arbutus Creek will be modified in the proposed sewer line installation (BMP AC-1). To facilitate construction movements to the wetlands, Bennet Avenue will be extended westward to the existing wetlands along an currently existing drainage channel running to the west (Plate 1).

A total of two shovel tests (A1 and B1) were excavated in Area 1. One test was placed on each side of the drainage (north and south). In both shovel tests, high concentrations of modern fill were encountered. In both shovel tests, rock impasses were encountered that required termination of the excavation. Within the two shovel tests, cultural material was encountered (metal, plastic, modern bottle glass), but all material was determined to be modern (less than 50 years old) and discarded in the field. Three strata were encountered in STP A1. Stratum A, a dark brown(7.5YR 3/2) loam, contained modern bottle glass. This was followed by Stratum B, a brown (7.5YR4/4) sandy loam and then by Stratum C, a dark brown (7.5YR3/4) sandy loam with gravel. The test ended at a rock impasse encountered at 49 centimeters below surface. STP B1, excavated across the drainage channel from A1, encountered two strata. Stratum A, a mottled clay with no consistent soil color, contained plastic. This was followed by Stratum B, a gray brown loamy fill containing metal trash. The makeup of these two strata suggest a high degree of modern disturbance to the area.

In summary, the cultural materials recovered from testing in Area 1 include modern trash, most of mid to late twentieth-century origin. No historic archaeological resources are present. Testing did not locate any evidence of prehistoric remains in this area.

C. AREA 2 RESULTS

Area 2 is the southern end of Philip Avenue, where the termination of BMP AC-3 will run off into the existing wetlands (Figure 9). When this area was field inspected, the entire area to be modified by the sewer line was located within wetlands. Additionally, the area contains a utility pole, indicating the ground has been disturbed (Plate 2). It is unlikely that any intact soils are present here due to the utility installation. Because of the damp and disturbed soils, this area was not subsurface tested and does not require additional archaeological evaluation.

D. AREA 3 RESULTS

Area 3 is located at the western end of Sala Court, a small street west of Arbutus Avenue (Figure 9). Here BMP AC-8 is to be constructed to run sewer lines to Arbutus Creek (Plate 3). A total of four shovel tests were excavated in Area 3 (A1 - A4).

The four shovel tests failed to recover any historic or prehistoric cultural material. STP A1 and A2 both encountered disturbed upper strata to depths of 40 centimeters. Strata encountered by STP A1

TITLE: FIGURE 9 - AREAS 1, 2, AND 3 SUBJECTED TO ARCHAEOLOGICAL INVESTIGATIONS

SOURCE: DIGITAL ORTHOPHOTO FROM http://www.nysgis.state.ny.us

DATE: JUNE 2001

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PLATE 1: Area 1 looking to the west along the drainage channel.

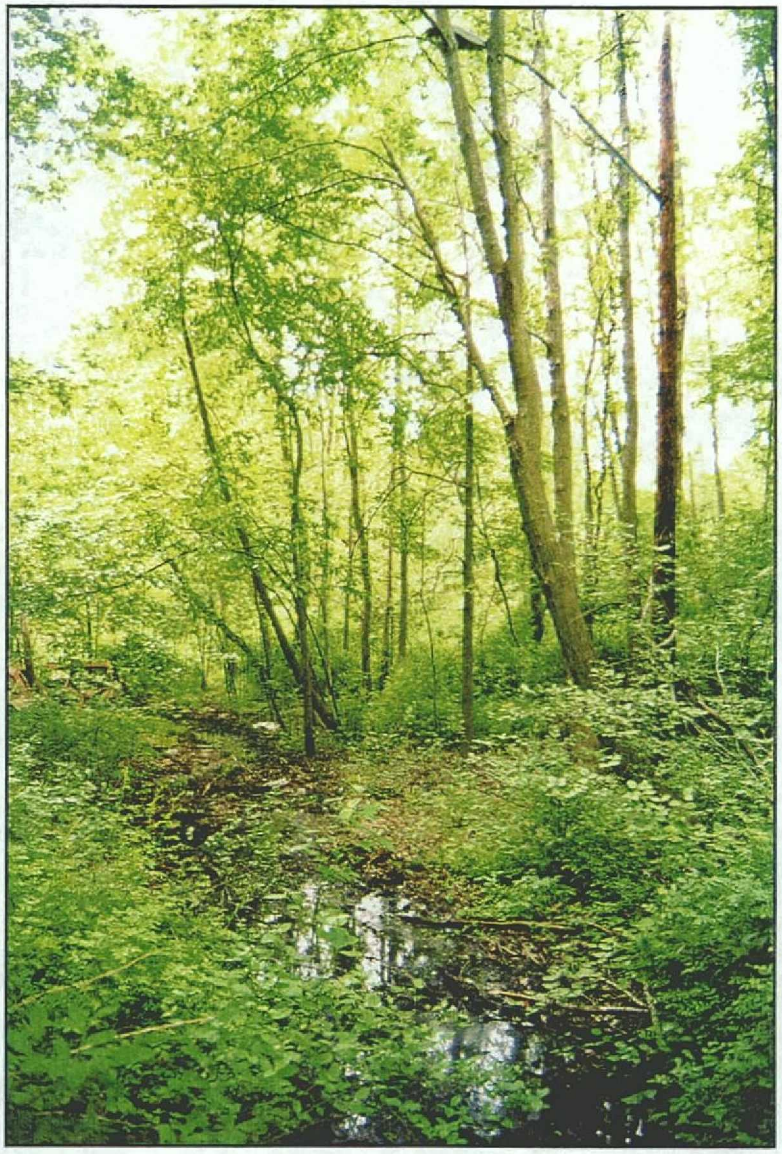


PLATE 2: Area 2 looking to the south along the modern drainage area.

PLATE 3: Area 3 looking to the southwest at the area subjected to subsurface testing. Arbutus Creek in the distance.

were: Stratum A, black (7.5YRR2.5/1) loam fill, disturbed; Stratum B, yellow red (5YR4/6) silt loam fill, disturbed; Stratum C, brown (7.5YR4/3) clayey loam, buried A-horizon; Stratum D, brown (7.5YR4/4) clayey silt, B-horizon. The upper layers have covered over intact natural strata that lack archaeological resources. The profiles for the remaining three STP were similar. In STP A3, the water table was reached at a depth of 65 centimeters. This shovel test was located within 20 meters of Arbutus Creek. The shovel test pits located in Area 3 all contained fine grained soils, either silty or clay loams, as a result of their close proximity to the creek.

In summary, the shovel test pits excavated in Area 3 all failed to uncover any evidence of archaeological resources, both historic or prehistoric.

E. AREA 4 RESULTS

This area is the proposed location for BMP AC-4, an excavated river bed to house the poorly channelized Arbutus Creek. This project begins at Louis Court and runs southward to the point where Arbutus Creek crosses Arbutus Avenue (Figure 10). After a field survey of the area, it was determined that the new creek bed would impact soils with a potential to contain archaeological material. A total of 14 shovel test pits were excavated in this area along the line of the proposed creek bed, spaced at 15 meter intervals.

The shovel tests excavated in this area did not encounter any archaeological resources, and only a single piece of modern bottle glass was encountered in the shovel tests. The fourteen shovel test pits revealed a consistent sequence of soils. Shovel test A5 possessed a typical sequence: Stratum A, a very dark gray (5YR3/1) sandy loam; Stratum B, a brown (7.5YR4/4) silty loam; Stratum C, a dark gray (7.5YR4/1) clayey loam. Farther to the south on the transect, the lowermost stratum encountered contained high concentrations of rounded cobbles. These test pits were located in an old channel of the Arbutus Creek, an area that would not have been attractive for human occupation due to the creek's running water.

For the areas subjected to subsurface testing in Area 3, no evidence of prehistoric or historic archaeology were encountered.

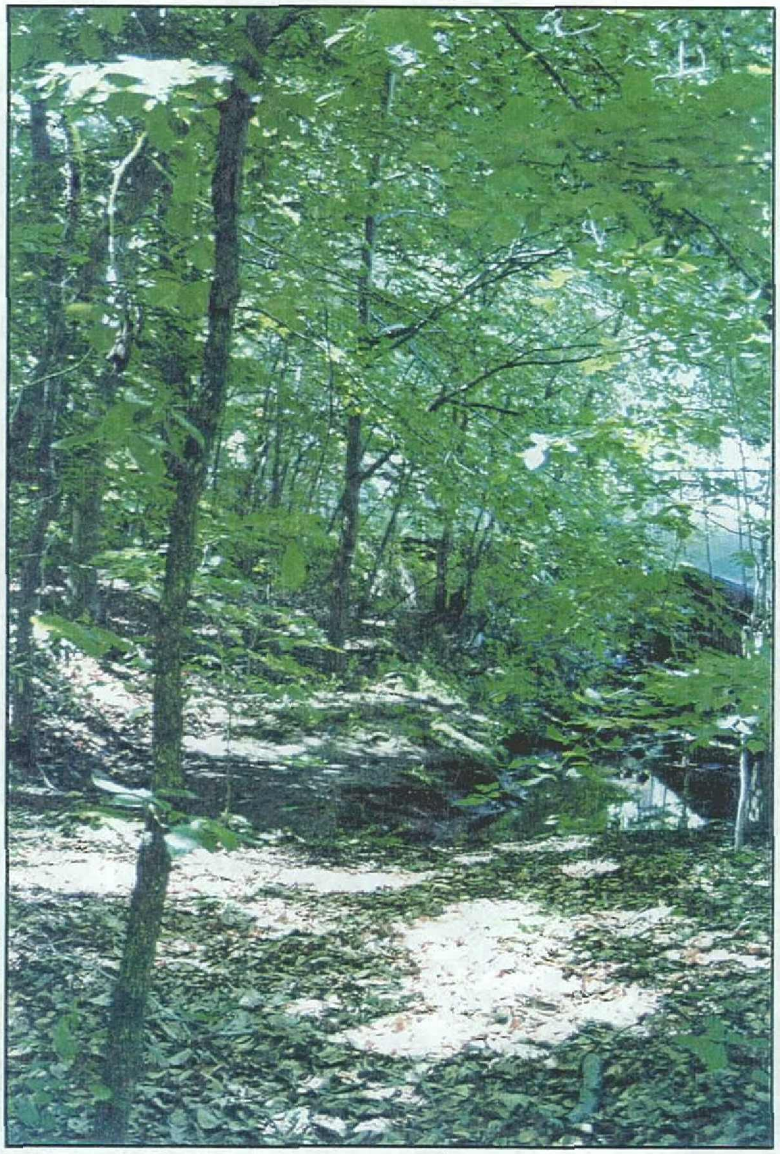
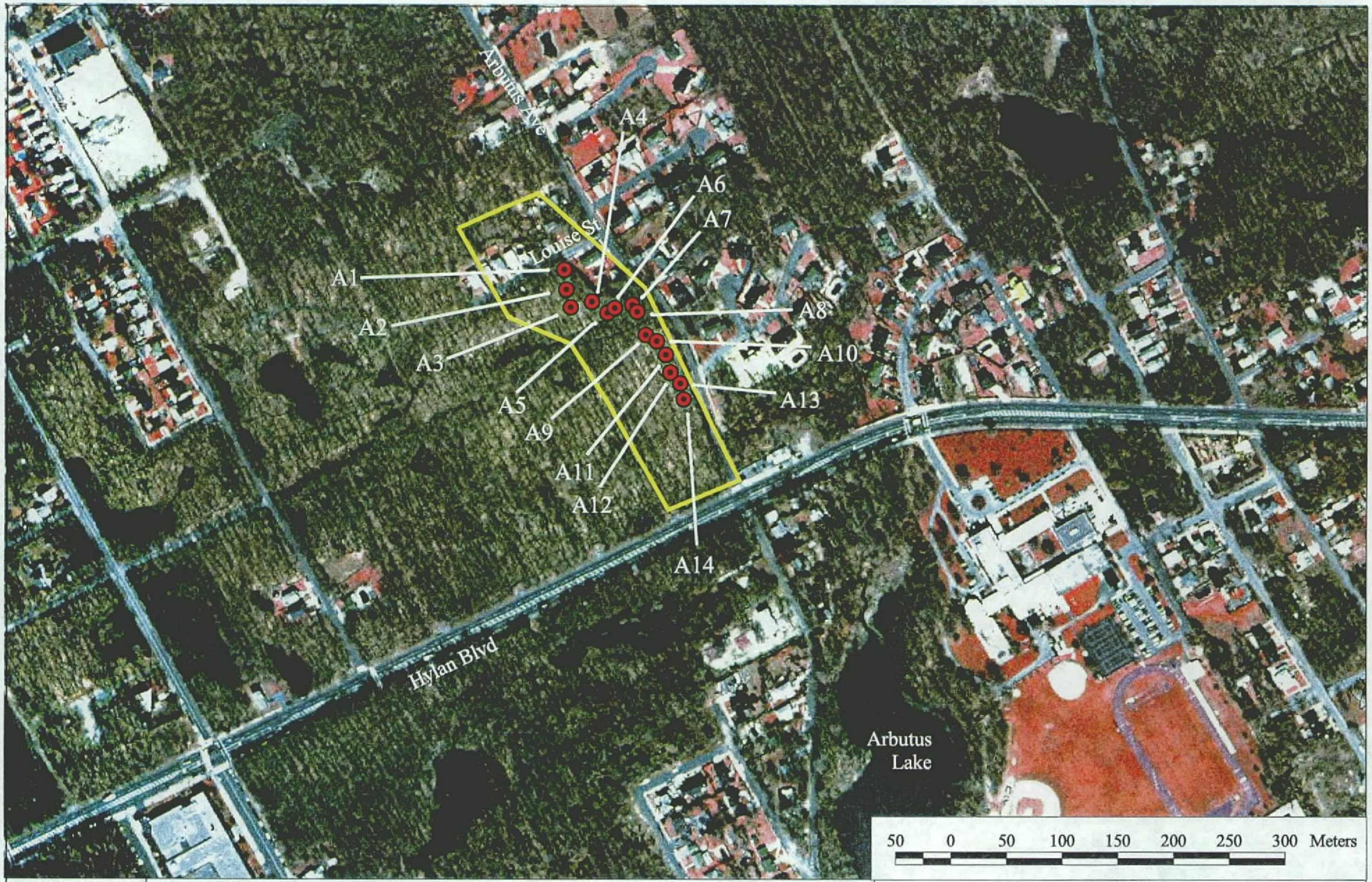


PLATE 4: Area 4 looking to the east at Arbutus Creek and adjacent flood banks.



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TITLE: FIGURE 10 - AREA 4 SUBJECTED TO ARCHAEOLOGICAL INVESTIGATIONS

SOURCE: DIGITAL ORTHOPHOTO FROM http://www.nysgis.state.ny.us	DATE: JUNE 2001	CLIENT: JRC CONSTRUCTION

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V. SUMMARY AND RECOMMENDATIONS

This report presented the results of a Phase I archaeological study associated with sewer construction along Arbutus Avenue in the Princes bay area of Staten Island. Subsurface testing was performed in three undeveloped areas that were considered to have sensitivity for prehistoric resources because of their proximity to Arbutus Creek and several recorded prehistoric sites. The Phase I investigation consisted of limited background research, a reconnaissance survey that consisted of surface inspection, and the excavation of shovel tests in areas that appeared to contain intact soils.

The study revealed that despite the project area containing intact soils, except in Area 1, these soils were almost entirely deposited from the Arbutus Creek. This conclusion follows from the high silt and clay content of the investigated soils. Soils immediately adjacent to wetlands and creeks are poor indicators of historic and prehistoric occupation due to the soil's low porosity, making for a poor living surface. In part, as a result of the high silt content and close proximity to the Arbutus Creek and associated wetlands, no archaeological sites were identified during the subsurface testing of this project. No further archaeological investigations are recommended in the areas tested.

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Appendix A
Arbutus Avenue - Shovel Test Profiles

Area: 1 **Stp No: A1**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-18	7.5YR3/2	loam		X			north side of drainage; glass (discarded)
18-39	7.5YR4/4	sandy loam		X			
39-49	7.5YR3/4	sandy loam	gravel	X			rock impasse

Area: 1 **Stp No: B1**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-23	not recorded	clay		X			south side ofdrainage; highly-mixed clayey fill; many colors; plastic (discarded)
23-33	not recorded	loam		X			loamy fill; highly-mixed fill; metal trash (discarded)

Area: 3 **Stp No: A1**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-19	7.5YR2.5	loam		X			modern artifacts discarded
19-40	5YR4/6	silt loam		X			modern artifacts discarded
40-49	7.5YR4/3	clayey loam		X			A Horizon
40-56	7.5YR4/4	clayey silt		X			B Horizon

Area: 3 **Stp No: A2**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-10	7.5YR2.5/1	loam		X			
10-38	7.5YR4/4	silt		X			
38-50	7.5YR4/4,7.5YR6/2	silt		X			50% mottled

Area: 3 **Stp No: A3**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-6		humus		X			humic layer
6-55	7.5YR4/4	clayey loam		X			
55-65	7.5YR4/6	silty clay loam		X			watertable

Area: 3 **Stp No: A4**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-13	7.5YR4/3	clayey loam		X			on creek bank
13-38	7.5YR4/4	clayey loam		X			
38-53	7.5YR4/3	clayey loam		X			

Area: 4 **Stp No: A1**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-12	5YR3/1	sandy loam		X			
12-38	5YR5/3	loam		X			watertable @ 33cm; impasse due to roots and watertable

Area: 4 **Stp No: A2**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-13	5YR3/2	sandy loam		X			
13-60	7.5YR5/4	sandy loam		X			
60-70	7.5YR5/6,7.5YR6/2	sand	gravel	X			small amount of gravel; mixed soil

Area: 4 **Stp No: A3**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-13	10YR4/2	loam		X			
13-50	7.5YR5/4	sandy loam		X			
50-77	7.5YR5/4,7.5YR5/6	loamy sand	gravel	X			small amount of gravel

Area: 4 **Stp No: A4**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-33	5YR4/4	sandy loam		X			
33-63	7.5YR5/6	loamy sand		X			
63-77	7.5YR6/3,7.5YR5/6	loamy sand		X			watertable

Area: 4 **Stp No: A5**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-10	5YR3/1	sandy loam		X			

Area: 4 **Stp No: A5**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
10-28	7.5YR4/4	silt loam		X			
28-40	7.5YR4/1	clayey loam		X			

Area: 4 **Stp No: A6**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-13	5YR4/4	sandy loam		X			
13-50	7.5YR4/3	silt loam		X			
50-73	7.5YR3/4	sandy loam		X			

Area: 4 **Stp No: A7**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-7	7.5YR2.5/2	sandy loam		X			
7-22	7.5YR4/4,7.5YR3/2	silt loam		X			mixed soil
22-50	7.5YR4/3,7.5YR4/6,7.5YR5/6	loam		X			mixed soil

Area: 4 **Stp No: A8**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-43	2.5YR3/6	silt loam		X			heavy rocks/gravel impasse could likely be fill; some glass (discarded)

Area: 4 **Stp No: A9**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-12	7.5YR2.5/1	sandy loam		X			offset 5m SE to avoid roots
12-43	7.5YR5/4	sandy loam	cobbles	X			40% cobbles, round and sub-angular; rock impasse

Area: 4 **Stp No: A10**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-13	7.5YR2.5/1	silt loam		X			
13-33	7.5YR4/3	sandy loam	cobbles	X			30% round and sub-angular cobbles

Area: 4 **Stp No: A11**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-10	7.5YR2.5/1	silt loam		X			
10-43	7.5YR4/3	sandy loam	cobbles	X			approx. 25% round and sub-angular cobbles

Area: 4 **Stp No: A12**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-21	5YR3/4	loamy sand		X			offset 5m W
21-62	5YR4/6	loamy sand		X			impasse due to high amount of cobbles

Area: 4 **Stp No: A13**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-14	7.5YR3/2	silt loam		X			
14-35	7.5YR4/3	coarse sand		X			
35-52	7.5YR4/3	coarse sand	cobbles	X			glass noted and discarded; heavy cobbles

Area: 4 **Stp No: A14**

Depth (cm)	Munsell	Texture	Coarse	NCM	Pre	Hist	Comments
0-14	7.5YR3/2	silt loam		X			
14-51	7.5YR3/4	loamy sand		X			root impasse