LONG ISLAND CITY REZONING PRELIMINARY ARCHAEOLOGICAL ASSESSMENT

Prepared For:

Allee, King, Rosen & Fleming, Inc.
117 East 29th Street
New York, NY 10016-8022

Prepared By: 593

Historical Perspectives, Inc.
P.O. Box 3037
Westport, CT 06880

LONG ISLAND CITY REZONING
PRELIMINARY ARCHAEOLOGICAL ASSESSMENT

March 27, 2000

Authors:

Betsy Kearns, RPA
Cece Saunders, RPA
Faline Schneiderman-Fox, RPA

EXECUTIVE SUMMARY

The Department of City Planning (DCP) proposes several broad zoning actions in downtown Long Island City (Figure 1). The rezoning is subject to City Environmental Quality Review (CEQR). DCP has determined that this action may potentially create significant adverse environmental impacts - including impacts on archaeological resources - and is preparing a Draft Environmental Impact Statement (DEIS) for the project. As part of the DEIS, this preliminary archaeological assessment was completed by Historical Perspectives, Inc. (HPI). Sites where redevelopment may cause subsurface impacts through excavations were assessed for their archaeological potential (Figure 2). The goal of the assessment was to determine the likelihood that potential archaeological resources have survived the destructive forces of modern development and the associated infrastructure system.

The history of prior disturbance was established through a review of cartographic sources available at various repositories. Historical maps and atlases were compared for early and later land use, topography, historical events, and documented subsurface disturbance episodes. Early maps helped to provide an account of land-use modifications and episodes of construction over the course of the last two centuries. Twentieth century insurance maps were reviewed to track specific development episodes which may have caused subsurface impacts.

Prehistoric sites previously identified in the immediate area and predevelopment topography strongly indicate that the project area was occupied prehistorically, and that the occupation would have been extensive enough to allow for archaeological visibility.[1] Typically, excavations for basements and footings cause impacts great enough to destroy archaeological integrity. It is assumed that where subsurface disturbance greater or equal to five feet below the current grade is documented, prehistoric archaeological potential no longer exists. However, where recorded disturbance is less than five feet below grade, then there may be the potential for prehistoric resources to exist.

Historic period research indicated that the project area once hosted the former hamlet of Dutch Kills, bounded on the north by 41st Avenue, on the south by 42nd Road, on the west by 27th Street, and on the east by the railyard complex at Sunnyside. Within this area were three farm complexes, a tavern/store, and at least one recorded cemetery on Block 264 near the intersection of West (Barn) Street and Sunnyside Yard. Earliest historical occupation dates to the late seventeenth century, and continued through the 1860s. In addition to these earlier resources, numerous residential dwellings and commercial and industrial complexes were built throughout the project blocks starting in the 1870s. Many of these stood for decades, and some probably were not connected to sewer and water lines for some time, suggesting they may have associated deeply buried well, privies, and cisterns.

In assessing the potential for remaining historic period archaeological resources, it is assumed that where subsurface disturbance greater or equal to eight feet below the current grade can be

[1] *Archaeological* visibility is defined as a site's ability to produce buried resources which have retained their integrity, and could address potentially meaningful research issues.

documented, earlier historical archaeological potential no longer exists. However, where disturbance is less than eight feet below grade, then it is anticipated that there is the potential for earlier historical resources (e.g., 18th century farm resources or late 19th century residential dwellings) to exist.

In addition to the 18th and 19th century potential resources described above, the late 19th century and early 20th century witnessed extensive industrial development within the project area. Archaeologists investigating industrial sites study the history of technology by examining buried resources, if any exist, and by also examining company records, extant machinery, and buildings and related complexes housing industrial processes. These sites may reveal information on the lifeways of their workers; technological innovation and adaptation; and an understanding of specific industries. For example, the West Disinfecting Company was in operation on Block 264 from at least 1915 to 1996. While this structure postdates modern utilities, and therefore, historic shaft features are not anticipated, documenting the historical development of this complex could address research issues such as its response to widespread public outbreaks of specific diseases (e.g., the influenza epidemic of 1918); growing public health trends in the 1920s; medical needs during World War II; and the advent of certain vaccinations. However, the archaeological potential of this resource type and each site's ability to address meaningful research issues must be addressed on a site by site basis, and will depend solely upon the results of more intensive documentary research.

The integrity of potential prehistoric and historical period archaeological resources, and thus their potential to contribute data meaningful to pertinent research issues, is largely dependent upon subsequent disturbance. Since disturbance cannot be proven for every site, it is recommended that prior to construction on any of the project blocks, that a full Stage 1A investigation be undertaken for each specific impact location. This would include documenting the precise historical development of the lots to be impacted, the potential for prehistoric and/or historic cultural resources, and subsequent disturbance. This more intensive documentary study would also include locating any existing soil boring logs to determine subsurface stratigraphy and verify assumptions regarding prehistoric sensitivity. Specific resource types should be identified, their potential integrity evaluated, and any potential impacts from proposed construction should be assessed.

TABLE OF CONTENTS

FIGURES

INTRODUCTION

The Department of City Planning (DCP) proposes several broad zoning actions in downtown Long Island City (Figures 1, 2). These are intended to promote the City's plan to create a fourth Central Business District (CBD) in Long Island City. To that end, the proposed zoning would increase floor area ratio (FAR), particularly on large sites near transit stations, permit residential use, and remove restrictions on the location of larger retail establishments, within a strong urban design context. It is estimated that the proposed action would stimulate new commercial and residential development.

The proposed action requires discretionary approvals from the New York City Planning Commission and New York City Council. As such, it is subject to City Environmental Quality Review (CEQR). DCP has determined that it may potentially create significant adverse environmental impacts, requiring a draft environmental impact statement (DEIS).

As part of the DEIS, this preliminary archaeological assessment was completed by Historical Perspectives, Inc. (HPI). Sites where redevelopment may cause subsurface impacts through excavations were assessed for their archaeological potential (Figure 2). The goal of the assessment was to determine the likelihood that potential archaeological resources have survived the destructive forces of modern development and the associated infrastructure system.

This assessment was designed to identify the types of resources that may be present in the overall project area through the completion of documentary and cartographic research. After resource types were distinguished, potential sources of subsequent disturbance were identified and an assessment of archaeological potential was created. Historical Perspectives, Inc., herein presents the results of this preliminary assessment.

RESEARCH GOALS AND METHODS

The goal of this preliminary archaeological assessment is to determine the likelihood that potential archaeological resources have survived the destructive forces of modern development and the associated infrastructure system. Documenting known prior disturbance was established through a review of cartographic sources available at various repositories. Historical maps and atlases were compared for early and later land use, topography, historical events, and documented subsurface disturbance episodes. Early maps helped to provide an account of land-use modifications and episodes of construction over the course of the last two centuries. Twentieth century insurance maps were reviewed to track specific development episodes which may have caused subsurface impacts.

In order to assess the historical potential of 19th century homelots and to determine at what point wells and privies would have been abandoned, utility information was sought. Specifically, information on when and where sewer and water lines were installed throughout the project area was sought at the New York City Department of Environmental Protection (DEP), Bureau of Water and Sewer Operations. While only sewer hook up dates were available at the DEP, historical maps provided generalized information on when water lines were installed.

Documentary research was also completed to provided a historic context. This prehistoric and historic background was established in order to understand the types of archaeological resources that may have been deposited within the project area.

A site file search was completed at the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP), and the New York State Museum (NYSM) to determine if prehistoric or historical materials had previously been reported in the vicinity of, or within, the project area.

PREHISTORIC CONTEXT AND POTENTIAL SENSITIVITY

Prehistoric Context. In order to understand the use of the project area through time, it is necessary to develop a prehistoric context for the Long Island City Rezoning project area. The following discussions establish a contextual framework for the prehistoric eras pertinent to the project area.

The archaeological evidence of the Indian habitation of Long Island is generally divided into four periods, based on changing diet, tool kit, and the presence of ceramics and agriculture - in essence, the material remains of adapting Native American cultures. These periods are known as the Paleo-Indian (ca. 10,000 to 7,000 B.C.), the Archaic (ca. 7,000 to 1,000 B.C.), the Woodland (ca. 1,000 B.C. to A.D. 1600) and the European Contact Period (ca. A.D. 1600 to 1800). Before it is possible to formulate hypotheses concerning prehistoric archaeological potential, the following brief overview of these cultural periods is first necessary in order to determine the attractiveness of the project area to Native American settlement patterns.

- Paleo-Indian Period (c.10,000 B.C. - 7,000 B.C.)

There is currently a lively debate about the origin of the first human occupants of the Western Hemisphere. Three recent theories suggest that:

- People, possibly from Japan, migrated along the west coast by skin-covered boat and on foot, eventually reaching as far south as Monte Verde, a 12,500 year old site in Chile;

- People from southeast Asia came to South America via Australia, an idea popularized by Thor Heyerdahl and backed by DNA testing;

- The earliest inhabitants were Europeans who followed the calmer water along the ice on the shores of what are now Iceland and Greenland, landing on the east coast of North America and moving west and south (Wilford 1999:F1,4).

The fourth and still most widely held theory to date is that, toward the end of the Wisconsin Glaciation, during the Late Pleistocene Epoch, the first humans wandered across the exposed land bridge which connected Siberia and Alaska. These small groups of hunters were probably following the roaming herds of megafauna which were their chief prey. The distinctive weapon in their chipped stone tool kit was the fluted point, which has been found in association with mammoth, mastodon, bison and horse remains at various sites in the southwestern United States.

The lithic marker for this period is the Clovis Point, a finely made spear point with a flute removed from the central section. Preferred camp sites were either at the shore near swamps or river mouths, or on high bluffs or ridges where game could be more easily spotted. The rising sea level resulting from the melting glacier has obliterated the seaside sites, giving more importance to higher inland sites. Paleo-Indian sites are sparse in the Northeast, and there is much to be gained from their

discovery, particularly since faunal remains from some sites have disputed the theory that these people relied only on large game for their subsistence.
Near the end of the Wisconsin glacial period humans first appeared in the metropolitan New York area. These Paleo-Indians are identified by their utilization of fluted points, scrapers, and borers, typical of a hunting-based society's tool kit. Archaeological evidence suggests that Paleo-Indians were limited in number and traveled in small groups. Several camp sites have been excavated in the Northeast, although no human skeletal material or artifacts, such as animal hides or wood objects, have been recovered. Perhaps due to the transitory nature of these people, little remains of their culture but lithic material. In New York State a few camp sites have been examined, the closest to the project area being the Port Mobil site in Staten Island (Ritchie 1980).

The environment during the Paleo-Indian period was dominated by retreating glaciers and a change toward predominantly deciduous woodlands. The warmer climate and the new open river valleys provided ample hunting grounds. As a result, the favored location for Paleo-Indian sites, and all prehistoric sites, were well-elevated large fertile valleys close to a fresh water source where it was easy to hunt mastodon, elk, caribou, bison, and other smaller mammals (Ritchie 1965).

- Archaic Period (7,000 - 1,000 B.C.)

The transition from the Paleo-Indian period to the Archaic was marked by greater variability in plant and animal species. The decreased population of big-game led to hunting smaller animals including white-tailed deer, moose, wild turkey, and rabbit. In addition, there is archaeological evidence that Archaic peoples exploited the marine environment. Sites of this time period bear evidence of less mobility than their predecessors, and more seasonal movement over well-defined territories. Camp sites were repeatedly reoccupied.

The tool kit of the Archaic Period was expanded to include the grooved axe, beveled adz, and narrow bladed projectile point. In addition, the mortar and pestle, grinders, and various implements used for fishing and grain processing are evidence of the Archaic peoples expanded diet. An increase in the number and size of sites recovered from this period suggests that the human population had expanded and that Archaic peoples were becoming more settled and therefore having a greater impact on the landscape. Consequently, this period witnessed the emergence of different cultural phases, defined "as a recurring complex of distinctive archaeological traits" representing an individual cultural group (Ritchie 1965). The Lamoka, Vosburg, and Brewerton phases are among those identified in New York State by Ritchie (1980).

A number of small multi-component sites have been recovered in coastal New York. Like inland sites, they are usually located near fresh water ponds, tidal inlets, coves, and bays. These locales provided abundant resources including small game, fish, shellfish, and a large variety of plants and tuberous grasses. Many sites in the immediate region indicate that by the Late Archaic there was a distinct reliance upon shellfish, particularly oysters and clams. No large camp site or settlements have been found within the boundaries of the five boroughs and the few Archaic sites recorded within the city are isolated finds.

- Woodland Period (1,000 B.C. - A.D.1600)

The Woodland period is characterized by the introduction of pottery and horticulture, and the establishment of clearly defined trade networks. During the Woodland Period primary habitation sites, or villages, had increased in size and were permanent (year-round) settlements. As in the Archaic Period these sites were located near a large fresh water source (e.g., pond, lake, tributary, or river). Secondary sites, where specific activities took place (e.g., shellfish gathering and/or processing, tool making), were usually situated near the location of the resource.

The first significant and identifiable use of pottery in New York State can be traced to the Early Woodland Period, around 1,000 B.C. By the Middle Woodland Period a wide variety of stamped, impressed and cord-decorated pottery types were developed. Smoking pipes, another Woodland innovation, reflected different cultural styles which archaeologists have been able to link to specific groups. The tool kit of the Woodland peoples expanded to include a larger variety of knives, drills, hammerstones, etc. Although some Archaic human burials have been recovered, those discovered dating from the Woodland Period suggest that more complex ceremonial burials commenced during the later period. Furthermore, this widespread mortuary ceremonialism peaked during the beginning of the Middle Woodland and was essentially nonexistent by the close of the Period.

By the Early Woodland, cultigens had been introduced into the Native American diet. However, it was not until near the end of the Middle Woodland (ca.800-1000 A.D.) that agriculture became prominent. This brought about a major change in settlement patterns as larger villages, some fortified or palisaded, were established. One such site was noted by the early Dutch explorer Adriaen Block, who described seeing "large wigwams of the tribe on Castle Hill" in the Bronx (Skinner 1919). With the creation of more permanent sites came the development of extensive trade networks for the exchange of goods between the coastal and inland areas.

Late Woodland Stage sites of the East River Tradition in Manhattan and other parts of southern New York have been noted on the "second rise of ground above high water level on tidal inlets," and situated on "tidal streams or coves" and "well-drained sites" (Ritchie 1980). Carlyle S. Smith, who studied and analyzed the distribution of prehistoric ceramics in coastal New York, stated that "village sites" are found on "the margins of bays and tidal streams" (Smith 1950). Early 20th-century archaeologist Reginald P. Bolton writes that "the indispensable elements in the selection of native dwelling places," were an accessible spring, and shelter from prevailing winter winds, which on Manhattan Island was found on "the eastern side of hills, or a southern exposure" (Bolton 1922).

- Contact Period (A.D. 1600-A.D. 1800)

Much of what is known about the Contact Period has been acquired from the documentary record. Using legal documents and early ethnohistoric accounts, archaeologists have been able to learn much about the Native groups that were present upon first contact with Europeans. One example is the journal of Robert Juet who traveled with Henry Hudson on his 1609 voyage. Juet provided a

description of the native population encountered and the exchange of "Indian Wheate" (maize) and tobacco for beads and knives (Van Zandt 1981).

At the time of European contact, the inhabitants of western Long Island are believed to have been Munsee-speaking Delaware Indians. One of the founders of the town of Jamaica, Queens, Daniel Denton, reported in 1670 that the Indians of western Long Island lived principally by hunting, fishing, fowling and the cultivation of corn. They relocated their "small moveable tents" two or three times a year, going to their principal quarters where they plant their corn, hunt, and fish (Denton 1902). Like their Manhattan neighbors, Long Island Indians suffered the same depredations from war and disease introduced by European settlers and explorers. Denton noted that the number of Indian villages on western Long Island had already decreased from six to two (Denton 1902).

The affiliation of these Native Americans is unclear, because although written records report the presence of Indians in northwestern Queens, they seldom report group affiliation. In addition, declining populations, war and hostilities with European settlers and other Indians, particularly during the 1640s and 1650s, caused many Long Island Indian groups to combine and reorganize in complex ways in order maintain viable communities, and for general safety. It may be that Long Island City was occupied by members of the Rockaway chieftaincy, whose territory stretched diagonally across Long Island, from the East River to Jamaica Bay (Bolton 1922). Their main settlement was in present Far Rockaway, Queens (Grumet 1981).

Both Parker and Bolton suggest the present Maspeth neighborhood, along Mespacht Kill, or Mespaethches (present Maspeth Creek), approximately 2 miles southeast of the study area, as the location of a village. The New York State Museum records the site in its inventories as NYSM#4536 (ACP Queens13). Several incidents between the Dutch and Native Americans occurred here during the Governor Kieft War (1643-1645), and a wigwam was recorded at Maspeth Kills in 1669 (Grumet 1981). According to historian James Riker, writing in ca.1852, the Indians' "rude implements," chiefly "stone axes and arrowheads, and arrows of reed" were still to be found (Riker 1852). Other researchers have suggested that Maspeth or Mispat is also the name of a subdivision of the Canarsee chieftaincy, whose main village was at Canarsie in southern Brooklyn, but who had settlements scattered above the Newtown Creek wetlands. However, this assertion in not supported by surviving documentation (Grumet 1981).

Recorded place names, or toponyms, are also an indication of the Native American presence in the study area. Dutch Kills, where the project area is situated, was once referred to as Canapaukah. A 1656 deed describes the "small Creeke called by the Indyans Canapaukah," mentioned in conjunction with Burger's Mill, a water-powered grist mill built near the project area, between 41st Avenue and 41st Road, slightly south of Jackson Avenue (Grumet 1981; Seyfried 1984).

Site File Search Results. A search of inventoried sites conducted at the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) and the New York State Museum (NYSM) has noted six recorded prehistoric sites in the vicinity of the project area:

OPRHP #A081-01-0100 "Sunwick"
NYSM #3613, ACP Kings no #
NYSM #4535, ACP Queens #12
NYSM #4538, ACP Queens no #
NYSM #4537, ACP Queens #14
NYSM #8217, ACP Queens no #

In an attempt to describe more accurately the generalized locations provided by the NYSM, the information provided was supplemented by other archaeological and historical sources (Bolton 1972; 1922; 1920; Skinner 1915; Beauchamp 1971; 1900; Grumet 1981). Unfortunately, these publications provide little additional data with which to pinpoint the site locations on the present landscape.

Four of the sites identified fall outside of the project area. OPRHP #A081-01-0100 "Sunwick" was described by archaeologist Reginald Bolton who reported that Sunwick (also Sunwicks or Sunswicks) was a "native station" which yielded shell deposits and a few artifacts. Sunwick was in Ravenswood Park, and although the original Ravenswood Park lay roughly between 38th and 43rd Avenues from 11th to 21st Streets, the site description better conforms to the location pinpointed by the New York State Museum at present Rainey Park, along the East River Shore, about 1.5 miles northwest of the project area (Bolton 1922; Grumet 1981). In addition, Sunswick Creek might refer to a location in Nassau County (Grumet 1981).

NYSM #3613, ACP Kings no # is a site in Greenpoint, Kings County, at the mouth of Newtown Creek. Archaeologist Arthur C. Parker[2] reported "traces of occupation" there (Parker 1920). It lies approximately 3,000 feet southwest of the study area, on the opposite shore of Newtown Creek.

NYSM #4535, ACP Queens 12 identifies a shell heap or midden found at Sanford's Point in Astoria, Queens. Parker writes that "early and modern relics" were recovered, and Bolton mentions "various Indian objects." Parker's map places the midden on the northern shore of Hallett's Cove, about two miles northeast of the study area (Parker 1920; Bolton 1972).

NYSM#8217 (ACP Queens No #) is a camp site, north of the shell heap discussed in the previous paragraph (NYSM#4535), at Sanford's Point, in Astoria, Queens (Parker 1920). The location is about two miles northeast of the study area.

Two of the sites are near, and possibly within, the current project area. These are:

[2] Parker's research into the known prehistoric sites of New York State identified a number of sites within New York City, which he describes, and often gives numbered designations (ACP#) in his 1920 publication, "The Archaeological History of New York." The NYSM locates these sites based on his maps.

NYSM#4538, ACP Queens No# refers to a village site in Long Island City, Queens. The location provided by the NYSM includes the section of the study area north of Queens Plaza North from the railyard complex at Sunnyside on the east, to 12th Street on the west. Parker's published map appears to show the village somewhat further north, approximately centered on 35th Avenue and Crescent Street (Parker 1920), which would place it about seven blocks north of the study area. However, since the NYSM and OPRHP site evaluations may rely on Parker's more detailed unpublished maps, this village site must be considered as potentially within the project area.

NYSM#4537, ACP Queens 14 identifies a burial site in Long Island City, Queens. Parker places this burial on Crescent Street, but does not provide the cross street. His map seems to put it northeast of the village site (NYSM#4538 from the previous paragraph) on or northeast of Broadway, which would mean that it was at least eleven blocks north of the project area (Parker 1920). Bolton reports human burials (note the plural), "near Crescent Street," although his map siting is the same as Parker's (Bolton 1972). The locations and comments provided by the NYSM suggest two or more burials, giving two locations, both centered on Crescent Street south of Queens Plaza within the project area.

Potential Prehistoric Sensitivity. As discussed above, prehistoric and contact period settlement patterns documented in the greater New York area, including the region surrounding the project area, demonstrates a preference for well-drained slightly elevated terrain near fresh water. This type of topography would have been utilized for resource procurement and processing, short-term encampments, and more permanent settlements which are highly visible archaeologically[3].

Evidence of Indian exploitation of natural resources within the greater project area, and occupation in its vicinity, is well-documented through archaeological and historical research. The nearest inventoried sites are NYSM#4538 (ACP Queens No #) a prehistoric village site and NYSM#4537 (ACP Queens 14) a burial site, both in Long Island City. The boundaries of these sites, which are currently unknown, may overlap sections of the project area. Furthermore, the existence of an Indian place name for Dutch Kills, Canapaukah, is also an indication that Native Americans valued the stream and the surrounding marshes east of the project area.

Because of the preponderance of known prehistoric sites nearby, and the presence of fresh water sources close to the project area, the project area may have a high potential to host prehistoric cultural resources. However, this contention depends on understanding the pre-development topography, and determining if it could have sustained a Native American presence.

To evaluate prehistoric archaeological potential, maps providing information on historical topography were reviewed to determine what western Queens looked like when European settlers first arrived on the island. These include Taylor and Skinner's 1781 British army survey, the 1844-45

---

[3]Archaeological visibility is defined as a site's ability to produce buried resources which have retained their integrity, and could address potentially meaningful research issues.

USC&GS and 1874 USGS Coast Surveys, Sidney's Map of 1849, et al. These maps were largely created before intensive development had impacted much of the project area.

The project area was originally part of a much larger tract of hilly, forested land stretching from the East River as far as Flushing Bay, known to the natives as Wandowenock, usually translated as meaning "the fine land between the long streams," referring to the East River and Flushing Bay (Bolton 1922). The topography would have surely been conducive for Native American use, and comparable locations, between two fresh water streams, have often possessed prehistoric cultural resources. The chief resource in the project area vicinity was Dutch Kills and its surrounding marshes, directly east of the project area, which would have provided a rich source of food and raw materials for Native Americans (Sidney 1849; Dripps 1852; Walling 1859). Prior archaeological surveys in the metropolitan New York region have demonstrated that prehistoric sites tend to be within 150 feet of a fresh water source. Given this comparative data, it is more than likely that the project area was occupied prehistorically, and that the occupation would have been extensive enough to allow for a recoverable archaeological record.

HISTORICAL CONTEXT AND POTENTIAL SENSITIVITY

Historical Context. The northwestern section of Queens was originally an outlying section of the town of Newtown, approximately four miles to the east. However, due to its proximity to Manhattan Island, agriculture, commercial, industrial and residential development has been dominated by the needs of the population and economy of New York City. The study area historically fell within Dutch Kills, a community centered in the vicinity of Bridge Plaza.

The earliest recorded European residents in the area settled near Dutch Kills. In 1643, Burger Jorissen, a native of Silesia, received a land grant to the area around the headwaters of Dutch Kills, the vicinity of present Bridge Plaza, and eastward along Jackson Avenue, including the project area. Here he settled with his wife and five sons. By 1650 he had built a dam and water-powered grist mill on Dutch Kills, east of the project area within what is now Sunnyside Yard. The farm and mill were purchased in 1690 by Burgon Brocard or Bragaw, a French Huguenot refugee, whose family built a house on the site of Burger Jorissen's dwelling and a second house nearby in ca.1790. The farm was eventually sold to John Parcell, and after 1818 it came into the hands of the Payntar family (Munsell 1882; Riker 1852; Seyfried 1984).

To the south of Jorissen, Tymen Jansen had also taken out his "ground brief" or deed. This was later purchased by Joris Stevenson Van Alst, who acquired two farms on the west bank of Dutch Kills by 1670. The property was later purchased by his son Johannes in 1704, where he lived till his death in 1749 (Riker 1852). His son, also Johannes, bought the estate upon his father's death and built a new house near Queens Boulevard and Jackson Avenue in 1766 (Seyfried 1984). The older house stood somewhat to the south and west of the new house, near what is now 45th Avenue and Jackson Avenue, out of the project area (Ibid.). Johannes's grandson, Isaac, eventually inherited the new house at Queens Boulevard. Ultimately, the farm houses remained in the Van Alst family for two centuries.

It was also in 1670 that local farmers petitioned to lay out a limited road system around the kills (Riker 1852). It was at this time that a road was laid out crossing the Dutch Kills approximately where Queens Boulevard now crosses Sunnyside Yard, east of the project area.

Despite efforts to improve transportation, there were few roads in the vicinity of project area which was virtually isolated from the rest of Long Island. Crops were transported to New York City markets via boats on the East River, or from a wharf on present Court Street, down Dutch Kills and Newtown Creek to the East River. As shown on the 1781 map of western Long Island, the only road traversing the Dutch Kills swamp crossed the creek at the line of present Queens Plaza North. Things had not improved much over the 18th century. This road, which ran through the project area, was a pivotal link which joined other routes going south, north, and west (Taylor and Skinner 1781; Seyfried 1984). The main road in the project area ran north and south along the west side of the Dutch Kills swamp, along the present path of Jackson Avenue, and eventually veered northwest toward the East River (Taylor and Skinner 1781). In the 1780s there was only one structure depicted

within the project area, approximately where Queens Boulevard and Jackson Avenue now intersect, (probably the Van Alst house).

By the time of the Revolution, Dutch Kills was a crossroads hamlet with two or three long-established farms. Other occupants of this part of the study area included the Bragaws who built a farmhouse north of 41st Avenue at Jackson Avenue, just north and east of the study area, in the early 1700s. The Payntar family occupied this house from 1801 until it was torn down in 1912. There was an early tavern at 41st Avenue and 28th Street, possibly within the project area, which was run by John Francis Ryerson during the second half of the 18th century. Killed in a tavern brawl in 1798, Ryerson's grave and tombstone were found during the excavation of the basement of Long Island City High School (at the northwest corner of 29th Street and 41st Avenue), six feet below the 29th Street sidewalk (Seyfried 1984).

British forces occupied northwestern Queens from 1776 until 1783. The road crossing at Dutch Kills was one of the chief communication and transportation routes between east and west, and neighboring areas were heavily manned with British troops. Officers commandeered the better rooms of local farmhouses and emptied kitchens. The soldiers were a scourge on the area, stealing valuables and livestock, and destroying fences, buildings and orchards in search of firewood (Munsell 1882; Seyfried 1984; Gregory 1994).

Common soldiers were bivouacked in huts and tents on the farms all along main roads and in the adjacent fields. One account placed the 33rd regiment on the lands of John Bragaw near the Dutch Kills, possibly what became the Payntar house within the project area. The narrow rectangular huts of the regiment were 50 feet long, and open along the southern side to allow sunlight. The inner walls were of square-hewn logs. The slanting roofs were of thatch, and the sides were sodded to the eaves to keep out the northwest winds. The soldiers would parade and drill at the center of the enclosure formed by the huts (Riker 1852:210). Into the 1880s and 1890s some of the huts were still visible, and there were regular reports of local farmers plowing up Revolutionary War relics. After the war, Dutch Kills returned to a peaceful agricultural existence for at least another century.

Through the middle of the 18th century, Dutch Kills, and more specifically the project area, was considered prime agricultural land. In 1844-45 at least three farm houses, as well as the tavern, represented the only development in the immediate area. The Dutch Kills and surrounding meadow land to the east were completely undeveloped, and the project area was depicted as at the top of a gentle rise adjacent to the marsh (Hassler 1844-45). Surrounding parcels were under cultivation. A detailed map of Dutch Kills dating to 1852 shows three farm complexes complete with outbuildings situated within the project area. These belonged to the Hunger, Van Alst, and Payntar families, discussed above. No other development had occurred in the immediate area, which appeared as undeveloped wood and farm land (Dripps 1852). A second map dating to 1852 (Figure 3) also showed the three farm houses present, and a store where the Ryerson tavern was formerly operating (Riker 1852). The project area appeared virtually unchanged by 1859, although it had been temporarily renamed "Payntarville" (Walling 1859).

In the 1850's, the land area of Hunter's Point to the south was doubled. Between 1852 and 1858 the Van Alst Farm was acquired in stages; this great tract covered all the land from 21st Avenue to Dutch Kills Creek, and from about 43rd Avenue south to Newtown Creek, including the project area south of 43rd Avenue. John G. Van Alst died in 1851 and his children sold to Messrs. Crane and Ely 131 acres of land for the sum of $50,000 in May 1853. Crane & Ely deeded one-third of the premises to Union College in February 1857, while the other two-thirds went to Leicester K. Ely and William Judson, and ultimately, to Union College in 1860. Union College subsequently hired Peter G. Van Alst, civil engineer, to make a new map of the Hunter and Van Alst farms south of the project area in 1861, and began to sell lots based on the survey (Seyfried 1984).

By the 1860s, a more intensive urban development design had been imposed on the Hunters Point landscape to the south and at Ravenswood to the north. Between the two, Dutch Kills remained largely undeveloped and in the hands of long-term landowners including the Hunter and Payntar families. During this time it was referred to as a "gardening community" (French 1860). In 1861 most of the project area was still under cultivation (Seyfried 1984:Figure 3). By 1865 only two structures were portrayed in the vicinity of the project area, somewhere near 41st Avenue and Jackson Avenue (Dripps 1865). It was also by this time that a railroad line has been established from Hunters Point on the East River, northeast through Dutch Kills, and out to the farther reaches of Long Island. The tracks were laid directly east of the project area essentially along the western boundary of the marsh surrounding the Dutch Kills, and were eventually designated as part of the Flushing & North Shore Rail Road.

With the incorporation of Astoria, Ravenswood, Dutch Kills (including the project area), Hunters Point and Blissville as Long Island City in 1870, numerous municipal improvements were made against a background of the worst Tammany Hall-style political corruption. As a result, the work was interminable and expensive. Hunters Point, at the mouth of Newtown Creek and south of the project area, became the industrial hub of the area and contained the majority of the population, mostly factory workers. It was there that street grading, paving and sewerage was started in the early 1870s. Long Island City remained an independent municipality until consolidation with New York City in 1898.

With these infrastructure improvements, land in the immediate area became more valuable. The concentration of new factories and businesses in Hunters Point, Astoria and later Ravenswood, encouraged the residential and commercial development of previously empty areas during the 1860s and 1870s. By 1873 the pristine landscape that Dutch Kills enjoyed had succumbed to subdivision. A system of blocks and lots had been superimposed over the landscape where vacant agricultural land formerly lay, and some of the smaller lots were developed with small residential dwellings. Larger tracts remained surrounding the Payntar and Hunter farm houses near 41st Avenue and Jackson Avenue, but these paled in size compared to their former configurations (Beers 1873). A small cemetery stood near the intersection of Barn Street, now West Street, and the Flushing & North Shore Rail Road on land once part of the Van Alst farm(Ibid.). The Van Alst burying ground, portrayed on the 1873 atlas, was described by Seyfried as follows:

Van Alst Burying Ground: west side of Barn Street at Long Island R.R. property line in Hunter's Point and very close to Queens Plaza. The cemetery was already falling into ruin in 1887; a building has for years stood on the site. In 1887 six stones of Van Alsts, Hunters and Parsells could still be read; there were other crude fieldstones with initials.

The cemetery did not appear on earlier maps, and no mention of it could be found in other local references (Kross 1983; Miegs 1932; Riker 1852); However, its unlabeled outline was present on an 1898 Sanborn map.

A topographic map of the project area created in 1874 did not show the same extent of development that the previously discussed 1873 Beers atlas did (U.S.C. and G.S. 1874). This map portrayed seven buildings along Jackson Avenue south of Queens Plaza South, and about five structures north of Jackson Avenue near 41st Avenue. Since the exact locations of these historic structures are unknown, it is possible that some of them may have fallen within the project area. Furthermore, this topographic map showed that the landscape in the vicinity of the project area was virtually level south of 41st Avenue, while north of 41st Avenue there was a small knoll (Ibid.). Land to the north, west, and south continued to be shown under cultivation.

During the 1880s the remaining farms in Dutch Kills were subdivided, and more than a hundred small frame and brick houses and several churches were erected within the project blocks. By 1891 the grid system of roads within the project area had been laid out and the cemetery on Barn Street was no longer labeled as such, although its boundaries were still depicted within the block (Wolverton 1891). Each of the city blocks which constitute the project area was subdivided into lots by this time. Block and lot designations changed through the ensuing years until they finally received their current designations (Sanborn 1898-1993; see the table below).

Development in Dutch Kills was further fueled by the opening of the Queensboro Bridge in 1909. This vehicular connection to Manhattan spawned an increase of cars, trolleys, wagons, trucks, and trains which crossed the new structure into Queens. A whole new road system grew up to accommodate the traffic, and Queens Boulevard was laid out as the main arterial highway of the new borough. Bridge Plaza, now Queens Plaza (along the northwestern edge of the project area), started as an open green square, but with the construction of rapid transit lines, it became a banking, commercial and rapid transit center. In the two decades following the bridge's opening, the population of the borough quadrupled.

Not long after this, much of northern and southwestern Queens came within reach of the New York City subway system. Interborough service reached Hunters Point in 1915, further drawing residents to the area. In 1920 BMT trains came to Long Island City and development in the study area boomed. "Builders suddenly converged on the area as soon as the war was over and began a frenzied pace of home and apartment building that had no equal before or since" (Seyfried 1984). Neighborhoods grew in response to this increased ease of mobility.

During the remainder of the 20th century, the project area transformed from a predominantly residential neighborhood to a mixed residential/commercial/industrial area. A review of late 19th and 20th century Sanborn maps reveals the extent of block and lot changes within the project area over the last century (see below):

BLOCK AND LOT #s IN PROJECT AREA	1950 LOT #S	FORMER BLOCK #S	1898 LOT #S	1915 LOT #S
Block 86, 1, 22	1, 22	Block 86	Lots 9-57	Lots 9-29
Block 263, All	All	Block 189	All	Lots 11-19
Block 264, All	All	Block 190	All	All
Block 413, Lots 5-6, 20-31, 33-37	16,22-23, 32 & 37	Block 107	12, 13, 16-33 36-41	16, 17, 20-30, 32-37
Block 414, Lots 19-38	17,23,35	Block 108	Lots 9-32	Lots19-33
Block 415, Lots 24-29	24,26,28	Block 109	Lots 20-25	Lots 24-29
Block 416, Lots 27-32	28,32	Block 110	Lots 17-22	Lots 27-32
Block 417, Lots 14-17, 19-20	14,20	Block 111	Lots 14-17, 19-20	Lots 13-16 18-22
Block 420, All Lots	All	Block 114	All	All
Block 421, All Lots	All	Block 115	All	All
Block 422, Lots 18-20	31	Block 116	Lots 31-34	Lots 25-28
Block 431, Lots 7-8, 26-27, 31-33	7,8,17,27	Block 124	Lots 3-4, 12-14, 19-20	Lots 7-8 17-21, 26-27
Block 432, Lots 8-17, 38-40, 45-46	8,38,47	Block 125	Lots 10-12, 16-18, 25-32	Lots 8-17, 38-40, 44-46
Block 435	?	Block 128	Lots1-26	Lots1-24

Potential Historical Sensitivity. Documentary and cartographic research portrays historical land use within the project area dating as early as the mid-17th century, and progressively becoming more intensified through the 20th century. During this time the Dutch Kills neighborhood grew from a sparse rural agricultural settlement - once described as a gardening community - to a thriving urban center. The bulk of this transformation began in the 1870s when urbanization to the north and south slowly took hold here. Agricultural practices were abandoned, large farm tracts were subdivided, and a street grid system was imposed on the landscape. Remnants of farms were lost to late 19th century development as streets were laid out and city blocks were further divided into small lots, each only 25' by 100'.

The types of development that the project area experienced have undoubtedly left a footprint on the landscape. The earliest use of the project area for farmland dates to the late 17th century. By 1781 at least one house stood within the project area (Taylor and Skinner 1781), and by the 1840s at least three farmsteads had been established (Hassler 1844-45). Furthermore, there was an early tavern at 41st Avenue and 28th Street, possibly within the project area, during the second half of the 18th century. These structures were clustered within the former hamlet of Dutch Kills, bounded on the north by 41st Avenue, on the south by 42nd Road, on the west by 27th Street, and on the east by what is now Sunnyside Yard (Figure 3). Some of these farm buildings were still standing in the late 1860s when the neighborhood was first subdivided and the current street grid system was laid out.

While the exact location of each farm complex, including dwellings and outbuildings, is unclear, it is safe to say that at least some of the structures associated with these farmsteads once stood within the project area. Along with these would have been privies, cisterns, and wells which are also of archaeological concern. Furthermore, the Van Alst cemetery which had at least six stones visible in 1887, was identified on Block 264 between Orchard and West Streets (Seyfried 1984; Beers 1873). Although the site was abandoned, at this stage of research there is no indication that burials were reinterred elsewhere.

By the 1870s dozens of frame houses and commercial structures had been built within the project area blocks. These operated for some time without publically available sewer and water lines, but the exact date of utility installation is unknown. Attempts were made to establish specific hook up dates for project area blocks, but only generalized sewer maps were available from the Department of Environmental Protection (DEP), and no water line information of any sort was made accessible. The sewer maps that were provided by the DEP date some of the lines in the project area to as early as 1904, while others date to around 1914 (City of New York, Department of Environmental Protection 1985: Sheet 32). Most of the dates of sewer lines are indicated as unknown, while some date to the 1930s and even later. These are presumably replacements for earlier systems which required modernization. Although there appeared to be no sewer and water lines within the project area by 1873 (Beers 1873), by 1898 water pipes had been installed (Sanborn 1898). In all probability, sewer and water lines were installed at the same time, probably in the 1880s or early 1890s.

In the early 20th century, the project area became largely industrialized. Numerous factories stood within the project area blocks including the extensive Neptune Meter Company on Block 86 at Crane and Davis Streets, the Cole Electric Products/Federal Pacific Electric Company, Metal Pressing and Shaping on Block 435 between Crescent and 24th Streets, and the West Disinfecting Company on Blocks 263 and 264 between Queens Boulevard and Orchard Street (Sanborn 1898-1993). Some of these replaced earlier industries, others were displaced by later buildings. Regardless, many of these industrial complexes created extensive disturbance to the historic and prehistoric landscape. Conversely, some of these, depending on their function and length of operation, may have generated deposits which are now of archaeological concern.

ARCHAEOLOGICAL POTENTIAL

A lot by lot analysis documenting historical development and subsequent disturbance would be necessary to determine the specific archaeological potential of each block within the project area. For this preliminary assessment, generalized categories of archaeological resource types are developed, and potential disturbance is discussed.

Due to differences in technology, land use, and lifeways, archaeological resources from the prehistoric and historical periods generally vary in depth of burial relative to the ground surface at the time of deposition. As a result, subsequent activities such as construction or grading result in different degrees of impact on buried cultural remains.

Prehistoric Resources. As discussed above, the known prehistoric presence in the immediate area and the documented predevelopment topography strongly suggests that it is more than likely that the project area was occupied prehistorically, and that the occupation would have been extensive enough to allow for archaeological visibility.

Under normal circumstances, prehistoric archaeological resources are shallowly-buried, usually within three or four feet of the pre-development surface. As a result, they are extremely vulnerable to post-depositional disturbance. However, within the current project area there is the likelihood that prehistoric resources from earlier periods are more deeply buried due to periodic inundation. The project area's proximity to the Dutch Kills and its surrounding marshland suggests that it may have been subjected to seasonal flooding. This action tends to result in deep layers of silt building up over time, essentially burying prehistoric resources beneath a protective layer of soil. It is anticipated that prehistoric resources within the project area probably lie within the first five feet below grade. However, an analysis of available soil borings would be required to verify this presumed subsurface stratigraphy.

Twentieth century industrialization and intensive residential development has likely caused the greatest degree of impact to potential prehistoric resources. Extensive excavations for deep footings, basements, utility lines, buried tanks, and similar necessities typical of modern development would have caused enough disturbance to negate archaeological potential. However, some residential, industrial and commercial structures were built with slab foundations. This action can actually seal and protect buried prehistoric resources.

It is assumed that where subsurface disturbance greater or equal to five feet below the current grade is documented, prehistoric archaeological potential no longer exists. Typically, excavations for basements and footings cause impacts great enough to destroy archaeological integrity. In all likelihood, no prehistoric resources exist beneath these deep areas of impact. However, where disturbance is less than five feet below grade, then it is anticipated that there is the potential for prehistoric resources to exist. As stated above, precise soil profiles for each project block would be needed to verify this assumption.

Historic Resources. Documentary research has determined that the project area once hosted the former hamlet of Dutch Kills, bounded on the north by 41st Avenue, on the south by 42nd Road, on the west by 27th Street, and on the east by Sunnyside Yard. Within this neighborhood were three farm complexes, a tavern/store, and at least one recorded cemetery. Earliest historical occupation dates to the late17th century, and continued through the 1860s. In addition to these earlier resources, numerous residential dwellings and commercial and industrial complexes were built throughout the project blocks starting in the 1870s. Many of these stood for decades, and some probably were not hooked to sewer and water lines for some time.

The Van Alst cemetery which was recorded on Block 264 near the intersection of West (Barn) Street and the railroad right of way, has different issues than other historical resources identified within the project area. The cemetery had six stones standing in the 1890s, and no mention of its removal could be found in the historical literature. Although it was unlabeled as such, the cemetery's boundaries were demarcated on an 1898 map (Sanborn 1898). While the site was vacant in 1912 (Hyde 1908 updated to 1912), by 1915 the West Disinfecting Company industrial complex had been built over the cemetery. However, it is not clear whether the building directly over the cemetery possessed a basement (Sanborn 1915). The industrial complex is extant on the site and apparently remained in its original configuration throughout the 20th century (Sanborn 1915; 1936; 1947; 1980; 1991; 1996). In 1955 the building over the cemetery was reported as a five-story structure, although no basement was noted (Hyde 1928 updated to 1955). If in fact the building over the cemetery was built on a slab foundation, then burials from the Hunter, Parcell, and Van Alst families may still exist beneath it

Historical archaeological resources relating to dwellings are often preserved in privies, cisterns or wells, which in the days before the construction of municipal services - namely sewers and a public water supply - were an inevitable part of daily life. These shafts became convenient receptacles for all sorts of trash, providing a valuable time capsule of stratified deposits for the modern archaeologist. They frequently provide the best domestic remains recovered on urban sites. Truncated portions of these shaft features are often encountered on homelots because the shafts' deeper (to approximately eight feet) and therefore earlier layers remain undisturbed by subsequent construction. In fact, construction often preserves the lower sections of these features by sealing them beneath structures and fill layers.

Other commonly occurring, but much more shallowly-buried historical remains include foundations and builder's trenches, which, would extend only a few feet below the pre-development land surface except where basements were excavated. These were typically about six to seven feet below grade to allow the storage of produce prior to refrigeration among other things. Even more fragile backyard remains such as fence lines, paths, traces of landscaping and sheet midden scatter[4] can provide valuable data to the archaeologist, but these tend to be even more shallowly buried and often do not survive in the urban landscape.

---

[4] Sheet midden scatter refers to domestic refuse deposited haphazardly in yards around dwellings and historic complexes.

It is assumed that where subsurface disturbance greater or equal to eight feet below the current grade can be documented, earlier historical archaeological potential no longer exists. Typically, excavations for deep basements and footings cause impacts great enough to destroy the integrity of earlier historical sites. In all likelihood, no historical resources exist beneath these deep areas of impact. However, where disturbance is less than eight feet below grade, then it is anticipated that there is the potential for earlier historical resources (e.g., 18th century farm resources or late 19th century residential dwellings) to exist.

In addition to these early residential resources, the late 19th century and early 20th century witnessed extensive industrial development within the project area. Some of the sites of these buildings and complexes, both razed and extant, may be considered archaeologically sensitive due to their industrial component. Archaeologists investigating industrial sites study the history of technology by examining buried resources, if any exist, and by also examining company records, extant machinery, and buildings and related complexes housing industrial processes. Industrial sites may reveal information on the lifeways of their workers; technological innovation and adaptation; and an understanding of industry trends. For example, the West Disinfecting Company was in operation on Block 264 from at least 1915 to 1996. While this structure postdates modern utilities, and therefore, historic shaft features are not anticipated, documenting the historical development of this complex could address research issues such as its response to widespread public outbreaks of specific diseases (e.g. the influenza epidemic of 1918); growing public health trends in the 1920s; changing medical demands during World War II; and the advent of certain vaccinations. A detailed documentary study of specific resources types would be required to determine which industrial resources within the project area have the potential to address significant research issues.

CONCLUSIONS AND RECOMMENDATIONS

The topography and environmental conditions of the Long Island City Rezoning project area that enticed early historical settlers, were similar to those preferred by Native American peoples. Given the number of documented prehistoric sites in the surrounding area, the designation of Dutch Kills as "Canapuukah" - a Native American term - and demonstrated prehistoric settlement preferences for upland sites near fresh water in the western Long Island area, the project area probably once hosted a prehistoric presence. The site's proximity to Dutch Kills and its surrounding marshland, coupled with the ease of access to Newtown Creek and ultimately the East River, suggests there is a strong probability that Native Americans inhabited the area. This habitation was probably extensive enough to produce a perceivable archaeological record.

Historically, the project area was developed as the village of Dutch Kills. Originally settled in the 1640s and known through the 1860s as an agricultural center, the area was subsequently subdivided, a street grid system was imposed on the landscape, and urban development ensued. The Van Alst cemetery, associated with one of the earliest farming families in the neighborhood, is shown on an 1873 map on Block 264 near the intersection of West (Barn) Street and Sunnyside Yard. Although the cemetery had fallen into disrepair in the 1890s, at least six headstones were visible at that time. By the late 19th century, dozens of residential dwellings were built on the project blocks, and numerous industries grew around them. Both these residential and industrial uses of the project area may have resulted in potentially important archaeological resources.

The continued integrity of potential prehistoric and historical period archaeological resources, and thus their potential to contribute data meaningful to pertinent research issues, is largely dependent upon subsequent disturbance.

Potential prehistoric resources would have most likely been deposited within the first five feet below grade. Any succeeding impacts which extended this deep would have compromised site integrity and thus destroyed research prospects. Where building foundations, footings, cellars, or any other types of ground disturbing activity extended five feet beneath the surface, it is assumed that there is no longer any prehistoric potential due to the lack of site integrity. That is, previous excavations to a depth of five feet below grade would have destroyed prehistoric potential. However, this sensitivity assessment for the depths of potential resources would require verification through an analysis of available soil boring logs.

Early historical resources associated with the residential use of the project area are typically found within shaft features that can be up to eight feet deep. Privies, cisterns, and wells which were in use prior to public utilities, and which were deeply excavated, are often filled with historical deposits representative of site occupants. Where subsequent disturbance to the location of residential homelots and farmsteads has occurred beneath the depth of eight feet, then no historical archaeological potential remains. Where disturbance cannot be documented to this depth, then there may be a potential historical archaeological component.

The site of the Van Alst cemetery on Block 264 also has the potential to yield burials from the Van Alst, Parcell, and Hunter families. Early 20th century development at the site of the cemetery either destroyed it - if a basement was excavated - or preserved it, if a slab foundation at or near grade was laid over it. There is the possibility that these family plots still exist beneath the extant industrial complex on the block. Additional research would be required to determine if the cemetery was removed, and if 20th century development obliterated the site.

The locations of late 19th and early 20th century industrial buildings and complexes may be considered archaeologically sensitive due to their research potential. Archaeologists investigating industrial sites study the history of technology by examining buried resources, if any exist, and by also examining company records, extant machinery, and buildings and related complexes housing industrial processes. These sites may reveal information on the lifeways of their workers; technological innovation and adaptation; and an understanding of specific industries. A detailed documentary study of each block and specific resources types would be required to determine which industrial resources within the project area have the potential to address significant research issues.

It is recommended that prior to construction on any of the project blocks that a full Stage 1A investigation be undertaken for each specific impact location. This would include documenting the precise historical development of the lots to be impacted, the potential for buried resources to exist, and subsequent disturbance. This more intensive documentary study should also include locating and reviewing any existing soil boring logs to determine subsurface stratigraphy and to verify assumptions regarding prehistoric sensitivity. Specific resource types should be identified, their potential integrity evaluated, and any potential impacts from proposed construction should be assessed.

BIBLIOGRAPHY

Beauchamp, William M.
1971 *Aboriginal Place Names of New York.* Reprint of 1907 edition. Grand River Books, Detroit.

1900 *The Aboriginal Occupation of New York.* University of the State of New York, Albany.

Beers, F. W.
1873 *Atlas of Long Island, New York.* Beers, Comstock & Clive, New York.

Bolton, Reginald Pelham
1922 "Indian Paths in the Great Metropolis." *Indian Notes and Monographs,* Museum of The American Indian, Heye Foundation Misc. No. 23.

1972 *Indian Life of Long Ago in the City of New York.* Enlarged edition. Harmony Books.

Boesch, Eugene
1995 *Archaeological Evaluation and Sensitivity Assessment of the Prehistoric and Contact Period Aboriginal History of the Bronx, New York.* Ms. On file at the New York City Landmarks Preservation Commission.

City of New York, Department of Environmental Protection
1985 *Infiltration/Inflow Analysis Existing Sewer System, Bowery Bay, Borough of Queens.* Bureau of Water Pollution Control.

Denton, Daniel
1902 *Denton's New York.* Reprint of the 1670 original. Burrows Brothers, Cleveland.

Dripps, Matthew
1852 *Map of Kings and Part of Queens Counties.* M. Dripps, New York.

1866-1867 *New York City, County, and Vicinity.* Prepared for Valentine's Manual, by M. Dripps, New York.

1874 *Map of Long Island City, Queens County, New York.* M. Dripps, New York.

French, J. H.
1860 *Gazetteer of the State of New York: Embracing a Comprehensive View of the Geography, Geology, and General History of the State.* J. H. French, LLD, New York.

Grumet, Robert S.
1981 *Native American Place Names in New York City.* Museum of the City of New York.

Hyde, E. Belcher
1908 *Atlas of the City of New York.* Updated to 1912. Volume 3. E. Belcher Hyde, New York.

1928 *Atlas of the City of New York.* Updated to 1955. Volume 1. E. Belcher Hyde, New York.

Kross, Jennifer
1983 *The Evolution of an American Town: Newtown, New York, 1642-1775.* Temple University Press, Philadelphia.

Meigs, Alice H. (ed.)
1932 *Description of Private and Family Cemeteries in the Borough of Queens.* Compiled by the Topographical Bureau, Charles U. Powell, Engineer. The Queens Borough Public Library, Jamaica, New York.

Munsell & Co.
1882 *History of Queens County New York, with Illustrations, Portraits and Sketches of Prominent Families and Individuals.* Part 6. W. W. Munsell & Co., New York.

Parker, Arthur C.
1920 "The Archeological History of New York-Part II." *New York State Museum Bulletin,* 237/238, September/October, 471-743.

Queens Borough Library
1939 BULLETIN #650. Queens Borough Library.

Riker, James
1852 *The Annals of Newtown in Queens County, New York.* D. Fanshaw, New York.

Ritchie, William A.
1965 *The Archaeology of New York State.* Revised edition. Harbor Hill Books, Harrison, New York.

1980 *The Archaeology of New York State.* Revised edition. Harbor Hill Books, Harrison, New York.

Ritchie, William A. and Robert E. Funk
1973 *Aboriginal Settlement Patterns in the Northeast.* Memoir 20, New York State Museum and Science Service, The State Education Department, Albany, New York.

Sanborn (REDI-Sanborn)
1891 *Insurance Maps, Bronx New York.* Sanborn Map Company, New York

1898 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

Sanborn (con't.)
1909 *Insurance Maps, Bronx New York.* Sanborn Map Company, New York

1915 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

1936 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

1947 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

1950 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

1951 *Insurance Maps, Bronx New York.* Sanborn Map Company, New York

1980 *Insurance Maps, the Borough of Queens.* Sanborn Map Company, New York.

1981 *Insurance Maps, Bronx New York.* Sanborn Map Company, New York

1991 *Insurance Maps, Bronx New York.* Sanborn Map Company, New York

1993 *Borough of Queens.* Sanborn Map Company, New York

Seyfried, Vincent
1984 *Three Hundred Years of Long Island City 1630-1930.* Queens Community Series/Edgian.

Sidney
1849 *Sidney's Map of Twelve Miles Around New-York with the Names of Property Holders & c.* H. Camp, printer, Philadelphia.

Skinner, Alanson
1915 *The Indians of Manhattan Island and Vicinity.* Reprint Ira J. Friedman, Inc., Port Washington, 1961.

1919 "Exploration of Aboriginal Sites at Throg's Neck and Clason's Point, New York City." *Contributions from the Museum of Natural History* 43(2).

Smith, Carlyle Shreeve
1950 "The Archaeology of Coastal New York." *Anthropological Papers of the American Museum of Natural History*, 43(2), New York.

Taylor, George and Andrew Skinner
1781 "Map of New York & Staten Islands and Part of Long Island." Surveyed by order of Sir Henry Clinton.

United States Coastal and Geodetic Survey (USC & GS)
1874 *Bay and Harbor of New York* (No. 369).

Walling, H. F.
1859 "Topographical Atlas of the Counties of Kings and Queens." H.F. Walling, New York.

Wolverton, C.
1891 *Atlas of Queens County, Long Island, New York.* Chester Wolverton, New York.

Van Zandt, Roland
1981 *Chronicles of the Hudson: Three Centuries of Traveler's Accounts.* Rutgers University Press, New Brunswick, New Jersey.

FIGURE 1

Project Site Location

U.S.G.S. *Central Park and Brooklyn Quads.* 1979

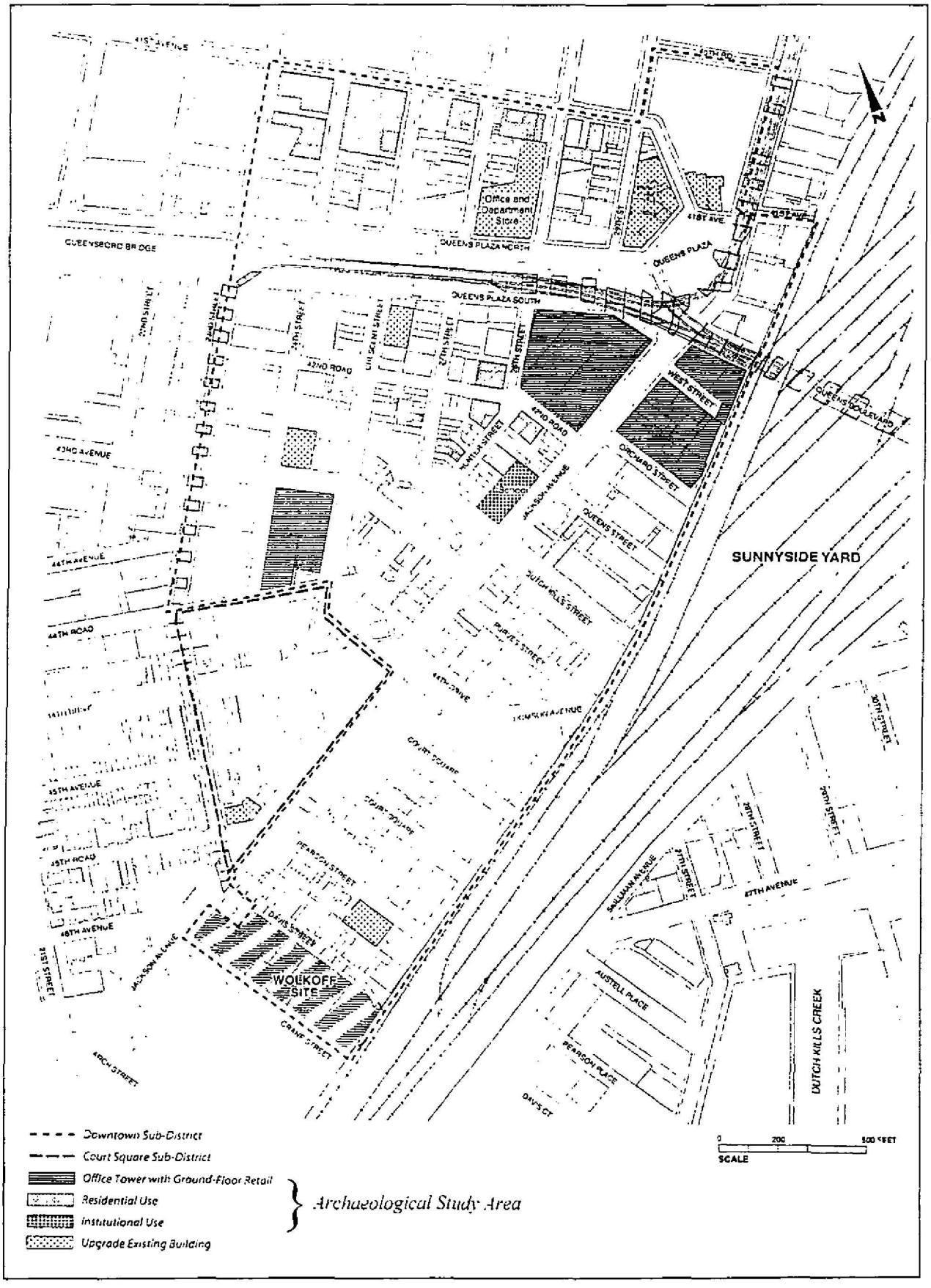

FIGURE 2

Long Island City Rezoning Archaeological Project Site Boundaries

FIGURE 3

Map of Newtown, Long Island. J. Riker, 1852.
No scale.