4782R

HP 2006

**Phase 1B/2 Archaeological Reconnaissance Survey**
and
**Phase 3 Archaeological Mitigation/Monitoring**

**South Richmond Drainage-Conference House Park Watershed**

Installation of Storm Water Drains, Sanitary Sewers, and Water Mains along Swinnerton Street, Clermont Avenue, Massachusetts Street, Hylan Boulevard and Satterlee Street, Richmond County, New York.

New York City Department of Environmental Protection
**CEQR No. 01 DEP 004R**

917

## Management Summary

SHPO Project Review Number (if available): CEQR No. 01 DEP 004R

Involved State and Federal Agencies (DEC, CORPS,FHWA,etc.): NYCDEP

Phase of Survey: Phase 1B/2 and 3

Location Information

Location: Swinnerton St., Clermont Ave., Massachusetts St., Hylan Blvd., Satterlee St.

Minor Civil Division: Tottenville

County: Richmond

Survey Area (Metric & English)

Length: 1190 meters (3903 feet)

Width: 6 meters (20 feet)

Depth (when appropriate): 30 to 120 centimeters (1 to 4 feet)

Number of Acres Surveyed: 1.79 acres (0.73 hectares)

Number of Square Meters & Feet Excavated (Phase II, Phase III only): 20.75 square meters

20.75 square meters (223.2 square feet) at the Billops Ridge site

Percentage of the Site Excavated (Phase II, Phase III 15% excavated, Billops Ridge Site Satterlee Street Locus 1

100% monitored at the Fenceline site, Satterlee Street Locus 1

U.S.G.S. 7.5 Minute Quadrangle Map: Arthur Kill, NY-NJ (1981)

Archaeological Survey Overview

Number & Interval of Shovel Tests: 185 (at 2.5 m to 15 m)

Number & Size of units: 20 (1x1-meter)

Width of Plowed Strips:

Surface Survey of Transect Interval:

Results of Archaeological Survey

Number & name of prehistoric sites identified: Billops Ridge site, Satterlee Street Locus 2

Number & name of historic sites identified: Fenceline site, Satterlee Street Locus 1

Number & name of sites recommended for Phase II/Avoidance 2: Billops Ridge site, Fenceline site

Results of Architectural Survey

Number of buildings/structures/cemeteries within project area:

Number of buildings/structures/cemeteries adjacent to project area:

Number of previously determined NR listed or eligible buildings/structures/cemeteries/districts:

Number of identified eligible buildings/structures/cemeteries/districts:

Report Author (s): Stuart A. Reeve, Cece Saunders, Robert Jacoby, David Gubkin

Date of Report: Apr-06

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New York City Department of Environmental Protection
**CEQR No. 01 DEP 004R**

**Prepared For:**

Cruz Construction
952 Holmdel Road
Holmdel, NJ 07733

**Prepared By:**

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

**Primary Authors:**

Stuart A. Reeve, Ph.D.
Cece Sunders, RPA
Robert Jacoby
David Gubkin

April 6, 2006

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# EXECUTIVE SUMMARY

The New York City Department of Design and Construction (DDC) is installing new underground storm water drains, sanitary sewers and water mains in residential neighborhoods in the South Richmond Drainage-Conference House Park Watershed (the project area) of southeastern Staten Island, Richmond County, New York. The project area is adjacent to Conference House Park which contains significant precontact and historic archaeological sites. Historical Perspectives, Inc. (HPI) is assisting Cruz Construction, the DDC and the New York City Department of Environmental Protection (NYC DEP) in complying with CEQR and SEQR guidelines in identifying and mitigating possible adverse effects on cultural resources resulting from proposed utility installation (CEQR No. 01 DEP 004R).

Based upon previous historical and archaeological investigations, the New York City Landmarks Preservation Commission (NYCLPC) and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), which serves at the New York State Historic Preservation Office (SHPO), approved a Phase 1B/2 archaeological testing protocol for archaeological field investigations under 1,190 meters (3,903 feet) of paved streets within the project area, including portions of Swinnerton Street, Clermont Avenue, Massachusetts Street, Hylan Boulevard, and Satterlee Street. Adverse effects on archaeological sites, including perhaps Native American burials, might result from machine excavations of new utility trenches in previously undisturbed soils beneath street beds. The proposed project includes machine excavation of new utility trenches for storm water (trenches 3-meters wide), sanitary sewer (trenches 1.5-meters wide), and water mains (trenches 1.5-meters wide).

Phase 1B/2 archeological investigations involved machine-excavated test areas to remove pavement and road fill, and excavation of 50x50 centimeter Shovel Tests (ST) in areas with preserved Holocene-age soils. At Swinnerton Street, 27 STs were excavated at 5- and 10-meter intervals, but only one ST contained shell fragments and a possible precontact fire-cracked rock. Monitoring of trench excavations along southern Swinnerton Street identified no shell layers or archaeological features, and no additional archaeological investigations were recommended along Swinnerton Street. Along Clermont Avenue, 59 STs were machine-excavated at 5- and 15-meter intervals. At the west end of the street, shell fragments were recovered in five STs, historic artifacts were recovered in two STs, and one ST contained a possible precontact fire-cracked rock. Monitoring was conducted at the west end of Clermont Avenue during machine excavations of a new water main trench, but no archaeological features were identified. No additional archaeological investigations were recommended along Clermont Avenue.

Massachusetts Street contained Holocene-age soils beneath road fill. In total, 45 machine-excavated test areas were dug at 5-meter intervals, and 44 STs were dug in areas with preserved A-horizon topsoil and alluvium, and B-horizon sands. Shell fragments were identified in 22 STs, 7 STs contained Precontact artifacts and 8 STs contained historic artifacts. Phase 3 monitoring of utility trenching and mitigation of preserved archaeological features were recommended along Massachusetts Street.

Seven STs were dug in machine-excavated test areas along the western end of Hylan Boulevard. Soil profiles indicated a filled wetland or spring, but no shell fragments or artifacts were recovered. Monitoring was conducted at the west end of Hylan Boulevard during installation of a new water main, and no shell fragments or preserved A-horizon topsoils were observed. No additional archaeological investigations were recommended along Hylan Boulevard.

At Satterlee Street, 42 STs were excavated in machine test areas at 5-meter intervals. Shell fragments were identified in 19 STs, prehistoric artifacts or mammal bone fragments were recovered in 13 STs, and 13 STs contained historic artifacts. Phase 3 archaeological excavations were recommended at two locations along Satterlee Street. Satterlee Street Locus 1 was an area with possible Colonial period artifacts located at N075 meters (246 feet) north from the intersection of Hylan Boulevard. At Satterlee Street Locus 2, dense concentrations of shells, as well as precontact artifacts, bone fragments and historic artifacts were recovered from N200 to N225 meters (656 feet to 738 feet) north from the intersection of Hylan Boulevard. Previous archaeological investigations had identified the Billops Ridge site on Conference House Park, immediately west of Satterlee Street Locus 2. In addition, monitoring was recommended along Satterlee Street during utility trenching from Hylan Boulevard north for 230 meters (755 feet) to recover possible precontact and historic features.

Following Phase 1B/2 investigations, HPI submitted proposals for Phase 3 data recovery and monitoring along Massachusetts Street and Satterlee Street. Phase 3 monitoring of utility trenches along Massachusetts Street

identified and mitigated two recent historic features and one possible precontact feature, a small pit containing shell fragments and three cobbles. No precontact artifacts were recovered.

Phase 3 excavations at Satterlee Street Locus 1 discovered disturbed fill and road ruts, and no Colonial-period artifacts in two 1x1-meter Excavation Units (EUs). Monitoring was not recommended in the west trench for storm water along lower Satterlee Street, due to historic road disturbances and rocky clay subsoils. Monitoring was conducted in the east trench for water main and the center trench for sanitary sewer. In the center trench, 26 historic post hole features (a 100 percent site investigation) were between N011 and N053 meters (36 to 174 feet north from Hylan Boulevard). The Fenceline site contained remains of a post and rail fence that formerly stood along the east side of the Bentley Manor farm lane, now Satterlee Street.

Utility trenching at Satterlee Street Locus 2 included an area of approximately 138 square meters (0.03 acres). HPI's Phase 1B/2 and Phase 3 investigations included excavation of 11 50x50 centimeter STs at 2.5-meter intervals and 18 1x1-meter EUs. In total, archaeological excavations recovered data from a 15 percent sample of the impacted site area. Following excavations, machine stripping of pavement and road fill allowed recovery of archeological features. In total, 18 precontact features were recovered at the Billops Ridge site in the area of Satterlee Street Locus 2 construction. Excavations yielded 1,263 precontact artifacts, 392 historic artifacts, 500 bone fragments and over 76 kilograms of marine shells and shell fragments. Projectile points and pottery indicated precontact occupations principally during the Early and Middle Woodland periods. Precontact artifacts and features were part of the Billops Ridge site, located west of Satterlee Street in Conference House Park.

Principal authors include Stuart A. Reeve, Ph.D., Cece Saunders, RPA, Robert Jacoby, and David Gubkin. Contributing consultants include Lucianne Lavin, Ph.D., Thomas Amarosi, Ph.D. and Justine Woodard McKnight.

# 1.0 INTRODUCTION

## 1.1 Project Setting

The New York City Department of Design and Construction (DDC) is installing new underground storm water drains, sanitary sewers and water mains in residential neighborhoods in the South Richmond Drainage-Conference House Park Watershed (the project area) of southeastern Staten Island, Richmond County, New York (Figure 1-1). The project area includes Summit Road on the north, Main Street on the east, Billop Avenue and Clermont Avenue on the south, and Swinnerton Street, Massachusetts Street, Hylan Boulevard and Satterlee Street on the west. The project is adjacent to Conference House Park, a 227-acre property owned by the New York City Department of Parks and Recreation. Conference House Park faces onto Raritan Bay to the south, and the Arthur Kill to the west. Wards Point, on Conference House Park, marks the southern tip of Staten Island.

Raritan Bay and the Arthur Kill are rich and changing estuarine environments that attracted Native American settlements for more than 10,000 years, and Euro-Americans since the seventeenth century. Conference House Park contains Precontact-period Native American archaeological sites and burials include the Wards Point Site National Historical Landmark and the Wards Point Conservation District, Listed on the National Register of Historic Places (NRHP). Other areas of Precontact Native American occupation include the Billops Ridge Site, located north of Hylan Boulevard and west of Satterlee Street (Jacobson 1980). Conference House Park also contains significant historic structures and associated historic archaeological sites, including the Conference House-Billopp House, listed as a New York City Landmark and the NRHP, and the Biddle House, a New York City Landmark and on the NRHP.[1] Other historic structures include the Wood/Leven House west of Satterlee Street, and the Rutan/Fetch House at the west end of Shore Road.

## 1.2 Project Description

Historical Perspectives, Inc. (HPI) is assisting Cruz Construction, the DDC and the New York City Department of Environmental Protection (NYC DEP) in complying with CEQR and SEQR guidelines in identifying and mitigating possible adverse effects on cultural resources resulting from proposed utility installation. Adverse effects on archaeological sites, including perhaps Native American burials, might result from machine excavations of new utility trenches in previously undisturbed soils beneath street beds. The proposed project includes machine excavation of new utility trenches for storm water (trenches 3-meters wide), sanitary sewer (trenches 1.5-meters wide), and water mains (trenches 1.5-meters wide).

Based upon previous historical and archaeological investigations (Jacobson 1980; Pickman 1997; Lenik and Gibbs, 2001), the New York City Landmarks Preservation Commission (NYCLPC) and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), which serves at the New York State Historic Preservation Office (SHPO), approved a Phase 1B/2 archaeological testing protocol on July 16, 2004 for archaeological field investigations within the project area, including portions of Swinnerton Street, Clermont Avenue, Massachusetts Street, Hylan Boulevard, and Satterlee Street. Figure 1-2 depicts the streets designated for Phase 1B/2 archaeological reconnaissance investigation, as well as the identification of Phase 3 site investigations. The following paragraphs delineate actions for each street bed. Refer to Figure 1-3 as a reference guide for the detailed graphics of individual street beds and/or sections of street beds in the following discussions.

*Swinnerton Street*

Along Swinnerton Street, the project included excavation of two trenches beginning south of Clermont Avenue, and immediately east of Conference House Park. A west trench for storm water extended along the west side of Swinnerton Street for 194 meters (636 feet) south to Billop Avenue. An east trench for sanitary sewer extended for 236 meters (773 feet) south to Billop Avenue.

[1] Billop has been spelled variously over time. The local street, as well as the early farming family, is spelled Billop, while the Park is referenced as Billopp. The following discussion attempts to reflect contemporary usage.

*Clermont Avenue*
The project along Clermont Avenue included excavation of three trenches for approximately 450 meters (1476 feet) west from Main Street to Massachusetts Street, including a north trench for water, a center trench for sanitary sewer and a south trench for storm water. Conference House Park is located immediately south and west of Clermont Avenue from the intersection of Swinnerton Street. In addition, a new water main trench extended west from the west end of Clermont Avenue, crossing Satterlee Street to connect with a water main for fire hydrants in Conference House Park.

*Massachusetts Street*
Project effects along Massachusetts Street included an east trench for sanitary sewer and a west trench for storm water. The west trench for storm water was immediately east of Conference House Park and extended for approximately 122 meters (399 feet) north from Clermont Avenue. The east trench for sanitary sewer extended for approximately 230 meters (753 feet) north from Clermont Avenue. Portions of the Wards Point Archeological Site, also known as Burial Ridge, are approximately 30 meters (100 feet) west from Massachusetts Street.

*Hylan Boulevard*
The project extended for approximately 44 meters (144 feet) along Hylan Boulevard between Craig Avenue and Satterlee Street. The north trench for a new water main replaced an existing water main in an old trench and will have no adverse effects on undisturbed soils. The center trench for sanitary sewer and the south trench for storm water were in areas beneath the roadbed that were not formerly excavated. In addition, a new water main trench crossed the west end of Hylan Boulevard to a water main for fire hydrants on the south side of the street.

*Satterlee Street*
Project effects along Satterlee Street included new utility trenches for sanitary sewer and storm water drains. The proposed new water main will occupy a previously excavated gas main trench along the east side of Satterlee Street. This new east trench was proposed to have no adverse effects on undisturbed soils. The west trench for storm water will extend along the western side of Satterlee Street for approximately 205 meters north from Hylan Boulevard. The center trench for sanitary sewer will extend for approximately 230 meters north along the center of Satterlee Street before merging into the previously excavated gas-main trench. Satterlee Street is immediately east of the Conference House-Billopp House, the Billops Ridge archeological site and the nineteenth-century Wood/Leven House south of Shore Avenue. Native American burials have been reported from areas to the east and west of Satterlee Street (Jacobson 1980; Pickman 1997; Lenik and Gibbs, 2001).

HPI conducted the Phase 1B/2 archaeological reconnaissance survey from July 19 to August 17, 2004. Phase 1B/2 archaeological fieldwork was conducted by a senior archaeologist and one to three field assistants, based on the construction schedule and backhoe availability. HPI submitted a letter to NYCLPC and OPRHP on August 26, 2004 summarizing preliminary field and laboratory results of the Phase 1B/2 reconnaissance survey and presented recommendations for additional archaeological investigations at precontact and historic sites discovered beneath street beds. HPI prepared a Phase 3 protocol and responses to questions to NYCLPC and OPRHP on September 1, 2004 and September 14, 2004 for Phase 3 archaeological mitigation and monitoring at identified archaeological sites and archaeologically sensitive areas along the west end of Clermont Avenue, Massachusetts Street and Satterlee Street. Phase 3 mitigation and monitoring was conducted between October 21 and November 16, 2004. Phase 3 fieldwork, was conducted by the senior archaeologist and three field assistants. Phase 3 archaeological investigations identified two sites along Satterlee Street, including the Historic-period Fenceline Site north of Hylan Boulevard, and the Precontact-Period Billops Ridge Site, south of the Wood-Leven House. HPI submitted an end-of-fieldwork summary letter to NYCLPC and OPRHP on November 17, 2004.

## 1.3 Report Organization

Following this Introduction, Section 2.0 reviews environmental and cultural contexts guiding HPI's investigations, including previous archaeological investigations in the vicinity of the project. Section 3.0 describes Phase 1B/2 testing and recommendations for Phase 3 excavations and monitoring. Section 4.0 describes the Phase 3 research design, field methods and laboratory methods. Section 5.0 describes Phase 3 monitoring and feature mitigation along Massachusetts Street. Section 6.0 describes Phase 3 excavations and monitoring at Satterlee Street Locus 1, and the discovery of the historic Fenceline site. Section 7.0 describes Phase 3 excavations and monitoring at

Satterlee Street Locus 2, the Billops Ridge site. Section 8.0 summarizes project results and draws regional comparisons to information gained during the project. Section 9.0 presents references cited in the text. Figures, Tables, Photographs, and Appendices follow the report.

# 2.0 ENVIRONMENTAL AND CULTURAL CONTEXTS

Archaeological investigations at the South Richmond Drainage-Conference House Park Watershed were guided by previous investigations that provided contexts for interpreting and evaluating the significance of findings. Environmental contexts and previous archeological investigations will be summarized as these reflect on the project. Brief overviews for precontact and historic periods introduce chronology, terminology and important cultural processes addressed during project investigations.

## 2.1 Environmental Contexts

The project area drains a low ridge at the southeast corner of Staten Island. Elevations rise from sea level to approximately 20 meters (60 feet) above mean sea level (amsl) at Shore Road (Figure 1-1). Wave-cut bluffs rise abruptly along the shores of the Arthur Kill, including at Burial Ridge south of Hylan Boulevard, and Billops Ridge north of Hylan Boulevard. Historically, a small pond was located east of Satterlee Street and south of Shore Road. This pod probably formed over clay deposits from water draining through sands. The area formerly was drained by a stream along Finlay Street, known as Kingsbury's or Uncle Ed Ward's Brook. The remnant stream channel south of Clermont Street feeds into tidal marshes along Billop Avenue.

The area is underlain by the Raritan and Magoty formations, formed seventy million years ago during the Cretaceous Period. The Magothy Formation consists of sand silt and clay, while the underlying Raritan formation is composed of gray sand, gravel and silt deposited on the ocean floor when sea levels were higher than at present. During the Pleistocene Period, approximately 17,000 years before present (BP), Staten Island formed part of the terminal moraine for the Wisconsin glaciers. Glacial Lake Hackensack covered western Staten Island and drained along the Arthur Kill into Raritan Bay (Kraft and Chacko 1978:41). Rocky glacial till, sandy outwash and sand dunes were deposited during the glacial retreat. Local residents have long recognized that post-glacial sand dunes were favored campsites for Precontact Native Americans. As Charles W. Leng and William T. Davis observed in 1930: "Beginning at West New Brighton, and continuing around the shore of the Arthur Kill to Tottenville, wherever there are sand dunes, there is a chain of sites of former Indian habitations (Leng and Davis 1930:80)."

During the last glaciation, sea levels were more than 120 meters (400 feet) lower than at present and shorelines extended more than 100 kilometers (60 miles) south onto the Continental Shelf. Now extinct animals such as mammoths, mastodons and other large herbivores formerly roamed the coastal plain, and their bones have been recovered from the Continental Shelf (Edwards and Merrill 1977). The Hudson River and perhaps the Raritan and Arthur Kill rivers cut deep channels through coastal plain sediments, draining vast volumes of glacial meltwater (Coch and Bokuniewicz 1986; Coch et al. 1991).

During the Holocene geological period, after 10,000 BP, warming climates brought a succession of Boreal conifers, pines, Northern hardwoods and temperate deciduous forests expanding northward into the Middle Atlantic Region (Watts 1979; Davis 1983). Presently, Staten Island is within the Oak-Hickory forest zone, historically dominated by oaks, hickory, American chestnut and other hardwoods. A Deer-Turkey Biome developed in temperate mast forests, dominated by Virginia white-tailed deer, carnivores and small mammals (Shelford 1978).

Sea levels have risen through the Holocene, flooding the Continental Shelf and former river valleys along the coastal plain. Mixing of saline marine waters and fresh water rivers led to the development of highly productive estuarine ecosystems for shellfish, spawning fishes and tidal marshes in Raritan Bay and the Arthur Kill. Wards Point was famous for large shell heaps left by Native Americans. Rising seas cut steep bluffs along the Arthur Kill, progressively eroded beaches at Wards Point and flooded lowlands around Raritan Bay. Rising sea levels might have changed water tables and reduced stream gradients. Kingsbury's or Uncle Ed Ward's Brook and surrounding

wetlands might have provided sources for fresh water attracting game and people. Springs also might have seeped along the wave-cut bluffs facing the Arthur Kill.

Most of the area was deforested and plowed for crops and pastures during the eighteenth and nineteenth centuries. Agriculture led to soil erosion, especially in areas with sandy soils, deflating topsoils from ridges and slopes and filling swales and drainages. Many ancient shell heaps were carted away for road fill. During the twentieth century, suburban development led to further grading and filling for street and house construction, landscaping and utility installation. The South Richmond Drainage-Conference House Park Watershed project reflects a continuation of these historical processes.

Modern soils reflect the area's geological past and historical impacts (NRCS 2004). South of Billop Avenue, soils are classified as Bigapple-Fortress complex, 0 to 8 percent slope, fill from dredged deposits. Across Conference House Park north of Billop Avenue, soils are classified as Haledon-Hasbrouck complex, 0 to 3 percent slope, a red till on moraines and glacial plains. Residential areas of the project are classified as Pavement and Buildings of the Forest Hills-Wethersfield Complex, 0 to 8 percent slopes, of truncated glacial till that have been modified by cutting and filling.

## 2.2 Previous Archaeological Investigations

Archaeological remains of Precontact Native Americans were discovered in 1858, when workmen digging the foundation of the Joel Cole house discovered a complete human skeleton and skulls at what became known as Burial Ridge. The Cole house was west of Satterlee Street and just north of Clermont Avenue. While digging an addition in 1863, Cole discovered 20 more skeletons and grave goods of Native Americans. From 1893 to 1897, Capt. Robert D. Wainwright and George Hubbard Pepper conducted large-scale excavations, including human burials, at Burial Ridge. Their work was sponsored by the American Museum of Natural History and the Staten Island Institute of Arts and Sciences. In 1920, Mark R. Harrington of the Museum of the American Indian-Heye Foundation conducted excavations at Burial Ridge and Billops Ridge. In 1960, Columbia University conducted limited excavations, including a well-documented human burial. The Columbia University investigations provided a focus for Jerome Jacobson's 1960 master's thesis, which summarized previous archaeological investigations and analyzed available collections from Burial Ridge. Between 1959 and 1967, Albert and Robert Anderson, Donald Sainz, and other avocational archaeologists conducted further excavations, including deeply stratified areas at Burial Ridge (Ritchie and Funk 1971). Much of this early work was synthesized by Jacobson (1980), who updated his 1960 thesis and described eleven major loci for Precontact finds. Jacobson calculated that at least 77 Native American burials were unearthed from the mid-nineteenth century until 1980. Based on these finds, the Wards Point Conservation District was listed on the National Register of Historic Places in 1982 (Florence 1982). In total, more than 50 archaeological investigations were conducted at Conference House Park before 1982.

Jacobson's (1980) map of early archeological digs identified several areas that were relatively close to the project. Pepper's 1895 trench excavations at Burial Ridge were less than 100 meters (300 feet) west from the project along Massachusetts Street. Jacobson also identified an area marked 3, including Pits H-3, H-12, H-14 and H-27, located west of Satterlee Street less than 30 meters (100 feet) from the project along Massachusetts Street. The Billops Ridge site is west of Satterlee Street, between Hylan Boulevard and Shore Road, immediately west of the project. In 1920, Harrington excavated ten archaeological features, including two Native American burials at the Billops Ridge site (Jacobson 1980:9).

Recently, additional professional archaeological investigations have been conducted at Conference House Park toward identifying and managing archeological sites. Pickman and Yamin (1988) identified archaeological sensitivity zones in connection with a Master Plan for Conference House Park. In 1982, the NYCLPC sponsored excavations around the Conference-Billopp House (Baugher et al. 1991). In 1984, Pickman and Yamin (1984) conducted testing along the route of the proposed Oakwood Beach sewer, including four Shovel Tests (STs) along Billops Ridge west of Satterlee Street, where shell and lithic artifacts were recovered. Testing also was conducted south of Hylan Boulevard between Satterlee and Massachusetts Streets, where lithic artifacts were recovered from two of four STs. The following year, the New York City Department of Real Property sponsored Testing on properties adjacent to Conference House Park. In the block between Connecticut and Massachusetts Streets, 204 STs were excavated, but only one ST contained a Precontact lithic artifact and five STs contained shell

concentrations. Little evidence for Precontact sites was observed in blocks north of Clermont Avenue between Connecticut, Finlay, Aspenwall and Carteret Streets. In 1997, Arnold Pickman compiled an archeological sensitivity map for Conference House Park, describing areas west of Satterlee Street as highly sensitive for precontact sites (Zone I). Areas south of Clermont Avenue were moderately sensitive for precontact sites (Zones II and III), and areas south of Billop Avenue were not sensitive due to land filling (Zone IV). Pickman (1997) also conducted exhaustive historical research and assembled an atlas of historic maps and photographs. This information was incorporated into a Cultural Landscape Report for Conference House Park (South Street Design Company et al. 2000). Pickman (2000) also conducted an archeological assessment for a pavilion at Conference House Park.

In 2001, HPI completed the Phase 1A cultural resource assessment survey for South Richmond Drainage-Conference House Park Watershed project (Lenik and Gibbs 2001). In 2002, HPI conducted Phase 1B/2 testing at sites CHP-1 and CHP-2 for storm water management BMP installation for this project along Uncle Ed Ward's Brook, south of Clermont Avenue (Kearns et al. 2003). HPI reported extensive stream disturbances and recommended avoidance of certain areas sensitive for Precontact archaeological sites. In 2003, DPR initiated a program of landscape improvements at Conference House Park. John Milner Associates, Inc. (JMA) conducted extensive Phase 1B/2 Testing for new fence lines along Satterlee Street, Clermont Avenue and other areas at Conference House Park, monitored drainage installation along Satterlee Street, and other landscape improvements (Pickman and Yamin 2004). In 2004, JMA conducted additional Phase 1B/2 excavations around the Wood/Leven and Biddle houses west of Satterlee Street (Heaton 2005). JMA's investigations provided the first controlled archaeological investigation at the Billops Ridge Site, west of Satterlee Street. Other archaeologists have also emphasized that the Billops Ridge site extended farther east of Satterlee Street, including precontact burials (Pickman 1997; Platt 2001).

## 2.3 Precontact-Period Overview

Archaeologists have recognized that Conference House Park contains perhaps the most important precontact archeological site in New York City. Wards Point was located along possible precontact travel routes, including the Hudson and Raritan Rivers, as well as coastal routes from New England, Long Island and New Jersey. Jacobson's (1980) synthesis of archaeological excavations at Burial Ridge described a large number of precontact artifacts, including 764 projectile points and 667 precontact potsherds. Jacobson's sample of artifacts might indicate the relative intensity of precontact settlements over time in the project vicinity. In addition, regional characteristics of pottery styles and the lithic materials used for stone tools might indicate varying geographic ranges of Native Americans who revisited Wards Point and the project area through time. In particular, Jacobson (1980:56) described lithic materials used for chronologically diagnostic projectile points. Flints might have been transported from the Hudson River valley to the north. Argillite and jasper might have been brought from the Delaware Valley to the west. Quartz was commonly used on Long Island and coastal Connecticut to the north and east. Quartz, chert and other materials also might have been gathered from local glacial moraines.

The precontact period of Native American occupations in the Northeast usually is divided into four major chronological stages reflecting technological changes and new adaptations to changing environments (Ritchie 1969a; Funk 1976). These stages include the Paleoindian Stage (12,000 to 10,000 BP), the Archaic Stage (10,000 to 3200 BP), the Transitional Stage (3600 to 2800 BP) and the Woodland Stage (2800 to 400 BP). The Archaic and Woodland Stages are further divided into Early, Middle and Late periods, discussed below.

The Paleoindian Stage (12,000 to 9500 BP) marked initial human settlement of post-glacial environments. Highly mobile human groups might have subsisted through specialized hunting of large herbivores, perhaps including now-extinct mammoths, mastodons and other animals, as well as by fishing and plant gathering (Snow 1980:150-157; Kauffman and Dent 1982). Paleoindian fluted projectile points have been identified on Staten Island at Rossville, Keiserville and at the Port Mobil, Cutting and Smoking Point sites, but have not been reported at Burial Ridge or other areas adjacent to the project (Burgher 1957; Pappalardo et al. 1996:6-1; Jacobson 1980).

The Archaic Stage (9500 to 3200 BP) might have involved a transition to generalized hunting and gathering in increasingly complex forest and coastal ecosystems. The earliest evidence for human occupations at the Wards Point site occurred during the Early Archaic (10,000 to 8000 BP) and Middle Archaic (8000 to 6000 BP), including radiocarbon dates of 8250 +/- 140 BP (I-5331) and 7260 +/- 125 BP (I-4512) from deeply buried hearths (Ritchie

and Funk 1971). Early and Middle Archaic artifacts from Burial Ridge include 2 Kanawah, 2 LeCroy, 3 Guilford-like and 17 Kirk Stemmed projectile points from various excavations (Jacobson 1980:56). These small samples suggest deposition of 0.6 points per century during the Early and Middle Archaic, analogous to small human population densities. Lithic type utilization for these 24 Early and Middle projectile points include 25.0 percent flint, 16.7 percent chert, 41.7 percent argillite, 4.2 percent quartz and 12.5 percent other lithic types. The high percentage of argillite points might indicate contacts with groups in the Delaware River Valley. Other Early and Middle Archaic dated sites in the region include the Richmond Hill and the Old Place sites on Staten Island (Ritchie and Funk 1971), and Turkey Swamp, south of Raritan Bay in New Jersey (Cavallo 1981).

Human populations increased dramatically during the Late Archaic period (6000 to 3200 BP) throughout the Middle Atlantic and New England regions (Reeve and Forgacs 1999). Late Archaic projectile points have been recovered at shell middens at the Wards Point and Billops Ridge sites from Conference House Park (Jacobson 1960; Pickman and Yamin 2004). Projectile points from Wards Point include 4 Lamoka, 30 Brewerton variants, 25 Vosburg, 12 Bare Island, 63 Lackawaxen-Kittatinny, 2 Eshback, 4 Hellgramite, 97 Beekman/Squibnocket Triangle, 5 Squibnocket Stemmed, 20 Sylvan Stemmed, 22 Wading River, 9 Normanskill, and 9 Genesee points (Jacobson, 1980:56). The 302 Late Archaic projectile points suggest deposition of 10.8 points per century, suggesting increasing human populations. Late Archaic projectile points from Wards Point include 38.7 percent flint, 7.3 percent chert, 12.6 percent jasper, 24.8 percent argillite, 7.0 percent shale, 5.0 percent quartz and 4.6 percent other materials. Wards Point might have attracted groups from both the west and north.

The Transitional Stage (3200 to 2800 BP) marked the introduction of pottery, use of steatite bowls, and elaborate burial ceremonialism at certain sites in coastal Connecticut, Long Island and New Jersey (Pfeiffer 1992). No Transitional Stage burials were reported at Wards Point (Jacobson 1980). Projectile points from Wards Point include 14 Orient, 1 Perkiomen, 4 Snook Kill, and 12 Susquehanna Broad points (Jacobson 1980:56). The 31 Transitional Stage points suggest deposition of 7.8 points per century, a lower density than during the Late Archaic. Lithic types include 32.2 percent flint, 3.2 percent chert, 12.9 percent jasper, 29.0 percent argillite, 6.6 percent shale and 16.1 percent other materials, again suggesting contacts with the west and north. Ritchie and Funk (1971) described flat-bottomed pottery, possibly Ware Plain, associated with Orient points in deep sands at Burial Ridge excavations.

The Woodland Stage, from approximately 2800 to 400 BP, included widespread adoption of ceramic technology and increasingly focused subsistence patterns leading toward agriculture and the complex tribal social systems met by Europeans during the seventeenth century. The Early Woodland (2600 to 1800 BP) is marked by widespread trade and elaborate cemeteries in the Ohio River drainage, Chesapeake Bay, western New York and Vermont associated with the Adena Tradition. No Adena burials have been described at Wards Point. Early Woodland pottery is represented at Wards Point by Vinette I interior cord marked wares, including 86 sherds from at least 11 vessels (Jacobson 1980:48). Early Woodland projectile points at Wards Point include 5 Adena, 15 Meadowood points, and probably also 58 Rossville points (Jacobson 1980:56). The 78 Early Woodland projectile points from Wards Point suggest deposition of 9.8 points per century, perhaps marking increasing human populations. Lithic types include 44.9 percent flint, 3.8 percent chert, 33.3 percent argillite, 12.8 percent shale, 3.8 percent quartz and 1.3 percent other materials. Contacts might have increased with Hudson River groups to the north due to the increasing percentage of flint used for projectile points.

The Middle Woodland period (1800 to 1000 BP) was characterized by regional exchange networks with the Middle Atlantic region, especially noted at the Abbott Farm site along the lower Delaware River (Stewart 1982; Silver 1991). Burials and other features at the Wards Point site have been radiocarbon dated to the Middle Woodland (Ceci 1990). Middle Woodland projectile points at Wards Point included 30 Fox Creek Lanceolate, 32 Fox Creek Stemmed, 3 Greene, 22 Jack's Reef Corner-notched, and 10 Jack's Reef Pentagonal points (Jacobson 1980:56). The 97 Middle Woodland points from Wards Point suggest deposition of 12.1 points per century, a slight increase from the Early Woodland. Lithic types include 22.7 percent flint, 3.1 percent chert, 18.6 percent jasper, 50.5 percent argillite, and 2.1 percent shale. Strong cultural contacts with the Delaware River region perhaps are indicated by high percentages of argillite and jasper.

Middle Woodland pottery also reflected strong influences from the Delaware valley (Jacobson 1980:48-49). Pottery analogous to Abbott Farm types include Abbott Zoned Dentate (15 sherds from 3 vessels), Abbott Zoned Incised (18 sherds from 4 vessels), Corded Punctate (2 sherds from 2 vessels), Fabric Impressed (57 sherds from 14 vessels),

Net Impressed (39 sherds from 5 vessels), Paddled Cord (7 sherds from 7 vessels), Plain (4 sherds from 2 vessels) and Straight Cord (15 sherds from 2 vessels) types. Middle Woodland pottery analogous to New York and Connecticut coastal sites included Clearview Stamped (3 sherds 1 from 1 vessel) and Windsor Brushed (4 sherds from 2 vessels) types. Several sherds suggested upper New York State contacts, including St. Lawrence Pseudo Scallop Shell (2 sherds from 1 vessel), Wickham Incised (1 sherd from 1 vessel) and Wickham Punctate (1 sherd from 1 vessel) types.

The Late Woodland period (1000 to 400 BP) was marked by the widespread adoption of the bow and arrow, the appearance of tropical cultigens including maize and beans, and dramatic population increases in the Middle Atlantic and New England regions (Reeve and Forgacs 1999). Burials and other features at the Wards Point site have been radiocarbon dated to the Late Woodland (Ceci 1990). Late Woodland projectile points at Wards Point include 232 triangular Levanna/Madison points, suggesting deposition of 46.4 points per century, consistent with models for increasing populations and village sedentism (Ceci 1990; Reeve and Forgacs 1999). Lithic types include 45.3 percent flint, 5.2 percent chert, 21.6 percent jasper, 21.6 percent argillite, 1.7 percent shale, 0.4 percent quartz, and 4.3 percent other materials. Strong contacts might have become established with Hudson River groups.

Late Woodland pottery reflected the local development of the East River Tradition, perhaps reflecting expansion of Munsee-speaking people. East River pottery at Wards Point included Bowman's Brook Incised (90 sherds from 7 vessels), Bowman's Brook Stamped and/or Punctate (53 sherds from 9 vessels), Clason's Point Stamped (1 sherd from 1 vessel), East River Cord marked (6 sherds from 4 vessels) and Eastern Incised A (11 sherds from 8 vessels). Abbott Farm influences might have continued into the Late Woodland, including Fine Incised ware (3 sherds from 3 vessels). New York Iroquois influences were reflected by Castle Creek Beaded (1 sherd from 1 vessel) and Cayadutta Incised (11 sherds from 5 vessels). In addition, many sherds from Wards Point were not identified by time periods or types, including Clamshell Stamped (1 sherd from 1 vessel), Knobbed Cord Marked (4 sherds from 1 vessel), Cord Marked (161 sherds), Cord Wrapped Stick Stamped (16 sherds), Indeterminate Incised (16 sherds), Indeterminate Collared/Incised (5 sherds), and Smooth (34 sherds).

During the seventeenth century, southern Staten Island was occupied by the Raritan, whose territory extended west into New Jersey (Pickman 1997:28). Many metal arrow points, trade beads and other European trade goods were recovered in excavations at Wards Point. Other closely related Munsee-speakers occupied Manhattan, western Long Island, western Connecticut, and north along the Hudson River (Salwen 1978).

## 2.4 Historic-Period Overview

Pickman (1997) compiled a detailed history of Conference House Park and surrounding areas (also see Lenik and Gibbs 2001). Comments here will focus on specific issues relating to the development of the historic landscape and possible landscape modifications in the project area.

As summarized by Pickman (1997:29), Captain Christopher Billop had settled on the area of Conference House Park before 1675. Billop might have selected the site due to forest clearing and agricultural fields by Native Americans. Billops received two patents totaling 1,600 acres, known as the Manor of Bentley. A 1687 map depicted a dwelling and outbuilding (perhaps a barn) surrounded by a fence or stockade in the approximate location of the extant Conference House-Billopp House (see Pickman 1997:170). The eastern boundary of the Manor of Bentley extended along an early road that led north from Raritan Bay to Mill Creek, east of the project probably in the vicinity of Sharrott Avenue (Pickman 1997:30). The surviving stone manor house might have been built about 1699. Christopher Billop died in 1725, leaving the property to his daughters and grandson. Billop's will suggested substantial improvements to the manor, including an orchard and fenced fields adequate to sustain at least four horses, six oxen, ten milk cows and calves, three steers, a bull, 160 sheep and fowl (Pickman 1997:30-31). Billop also owned African-American slaves.

By 1733, or earlier, the Billops established a ferry that crossed the Arthur Kill to Perth Amboy (see Pickman 1997:171). The ferry was at the west end of Amboy Road, the first highway crossing Staten Island. Satterlee Street probably originated as a farm lane that led north from the manor house to the ferry and Amboy Road.

Billop's grandson, Thomas Farmer-Billop, and great grandson Christopher Billop II, sold substantial portions of the Manor of Bentley but retained the manor house, surrounding farm and the ferry. The Billops also maintained a family cemetery "some three hundred yards to the east of the old Manor house, in a cultivated field and beneath the shade of a few large trees." Reportedly, the graves were removed in 1859 to a site near St. Paul's Methodist Episcopal Church in Tottenville (Pickman 1997:45).

Christopher Billop II was a lieutenant-colonel in the militia and a Loyalist. At the outbreak of the American Revolution, the Billops fled the manor, which was occupied by British and Hessian troops. The Billop house probably was occupied by officers, but campsites of the British and Hessian garrisons have not been identified. After the Battle of Long Island, Lord Richard Howe convened a peace conference on September 11, 1776 at the Billop house, attended by Benjamin Franklin, John Adams and Edward Rutledge. Three years after the failed peace conference, American militiamen arrested Col. Billop. Realizing that title to his property would be forfeited to the Americans, Col. Billop sold the Manor of Bentley in 1781 and fled to Nova Scotia. At that time, the manor contained 1,078 acres, half of which was cultivated, and there were four tenant houses in addition to the manor house (Pickman 1997:32-33). The manor house and surrounding 373 acres, including the project area, were sold to Samuel Ward.

The Ward family occupied the property until 1835. Portions of the property were sold to Apka Ward, Richard Robins, Samuel Wood and Henry Biddle (Pickman 1997:36-37). In 1834, Caleb Ward Sr., sold 1.5 acres west of a rod-wide road (Satterlee Street) to his daughter and her husband Hannah and Samuel Wood, who built the standing Wood/Leven House west of upper Satterlee Street (Pickman 1997:64-65). In 1835, Caleb Ward's remaining estate, including 225 acres and the manor house, was sold to Mary Grim. A succession of absentee owners bought the property through the nineteenth century. Agriculture was practiced by tenants. A small community, briefly named Uniondale, grew around the Rutan shipyard along upper Satterlee Street.

The 1844-1845 U.S. Coastal Survey map (Pickman 1997:176) indicates that areas east of Satterlee Street and north of Clermont Avenue remained forested. Field patterns were indicated near the coastal margins, including most of present day Conference House Park.

In 1859, William H. Aspinwall initiated plans for real estate development and sold several lots west of lower Satterlee Street, including the Cole house lot where Native American burials were first discovered, as discussed above. The property passed to a succession of other prospective developers, including the Bentley Manor Company in 1889 who surveyed a street grid across the project area by 1896 and the Harmon National Real Estate Corporation in 1925. The Harmon Corporation deeded the historic Conference House-Billopp House and one acre to the City of New York for a public park.

In 1926, William T. Davis compiled a history of *The Conference or Billopp House*, including many descriptions, photographs and lithographs of the historic landscape:

> "The writer's memories of the old Billopp or Conference House date back to the year 1881, when the one-time private lane [Satterlee Street] leading from the Amboy Road, was more beautiful and attractive than in all likelihood it will ever be again. In those days there were many native red cedars along the old lane, and the sandy foot-path led a winding way among them. Many of the trees were of great size, and we used to be interested in measuring their trunks. Now and then a still smaller lane led off to some house standing on the bluff, or in the opposite direction to the woods and Uncle Ed. Wood's Brook. At the time the fields about the old house were cultivated each spring, and the ground, especially near the edge of the bluff, abounded in oyster shells, turned up by the plow. These were the remains of the feasts held there long ago by Indians, when they were in possession. On these occasions we collected scores of implements; arrow heads, fragments of pottery, hammer-stones, an occasional axe, but above all many net sinkers—stones of suitable size, grooved all around, or simply notched. The crop of Indian implements seems to be well nigh inexhaustible, and some are to be found at the present time (Davis 1926:187-188, insertion mine)."

"Paper streets" were partially constructed around the Conference House-Billopp House and in the project area, including curbs, sidewalks, fire hydrants and pavement in some areas. The first water main was installed along

Satterlee Street between 1917 and 1937 (Pickman 1997:130). However, intensive residential development occurred only after 1980 in the project area.

# 3.0 PHASE 1B/2 INVESTIGATIONS

## 3.1 Field and Laboratory Methods

From July 19 to August 17, 2004, HPI conducted Phase 1B/2 archaeological investigations along five streets in the South Richmond Drainage-Conference House Park Watershed. An *Unanticipated Discovery Plan*, acceptable to NYCLPC and OPRHP, was enacted throughout the project in the event that human remains or other significant finds were encountered during archaeological field testing and/or construction.

Archaeological investigations involved the examination of machine-excavated test pits and hand-excavated STs beneath streets in areas of proposed utility trenching. Test pits were measured at five-meter (16-foot) intervals along streets, staggered between proposed utility trenches for water mains, sanitary sewers, and storm water drains. STs were numbered sequentially as catalogue entries, identified by street name, and measured in distance (in meters) from street datum points and by the location of the utility trench. Cruz Construction made machine-cuts to remove pavement, and backhoes removed pavement and underlying roadbed fill. All heavy machinery action was under the direction of a professional archaeologist. Machine-excavated tests measured approximately 1.5 meters (58.5 inches) wide and 2 meters (78 inches) long. Machine buckets removed road fill in approximately 10-centimeter (4-5 inch) layers. After road fill had been removed, archaeologists identified whether Holocene-aged A and/or B soil horizons were preserved beneath existing roadbeds, such as silt loams or sandy loams from topsoils, plowzones, alluvium and/or wetland soils. A/B soils potentially contained archaeological sites associated with precontact-period Native American occupations and historic-period Euro-American occupations. When A/B soils were observed in test locations, archaeologists hand-excavated STs measuring 50x50 centimeters (20x20 inches) square. Soils were screened through 0.25-inch hardware cloth to recover precontact and historic artifacts and associated biotic remains, including shells and animal bones. Field notes described each test pit and ST by location (distance in meters along the street bed and the trench position), depths of paving, road fill and underlying soil strata. Soils were described by depths from road surface, Munsell soil color, soil texture, and artifact contents. After completion of archaeological investigations, machines backfilled each test pit and restored road grades for safe traffic flow. Archaeologists conformed strictly to Cruz Construction's Health and Safety Plan. In particular, archaeologists never entered an excavation that was greater than four-feet deep. Archaeologists routinely submitted DDC-Inspector's Reports, describing archaeological activities on a daily basis from July 26 to the completion of the project on August 17, 2004.

The archaeologists noted that street construction patterns and depths of previous construction impacts varied along streetbeds. Results of ST investigations were reported to the NYCLPC and OPRHP by telephone and/or electronic consultations in order to limit test pitting in areas that had been previously deeply graded during road construction, where all A/B soils were removed along with all possible cultural materials.

Immediately following Phase 1B/2 field testing, recovered artifacts were washed and inventoried. Each test pit and/or associated ST was given a sequential catalogue number along street segments. Appendix A describes catalogue numbers, test pit locations, soils, precontact and historic artifacts and shell weights recovered during the Phase 1B/2 archaeological survey. Precontact artifacts included chipped stone waste flakes from stone tool production, a grinding stone, fire-cracked rocks (FCR) from cooking or food processing, pottery associated with cooking and food storage, and probably, also most shells and animal bones from food remains. Historic artifacts commonly included ceramics, bottle glass, window glass, nails, brick fragments, coal, and other items probably ranging in ages from the eighteenth to the twentieth centuries. Shells and animal bones also are associated with historic-period archaeological sites. Several researchers have suggested that shell fragments are nearly ubiquitous within and around Conference House Park and there was evidence of shell in most examined areas. However, shell concentrations might reflect areas of intensive precontact and/or historic human activities. Recovered shells were weighed (in grams) to suggest proximity to archaeological sites or preserved features. Figures 3-1 and 3-2 illustrate the sequence of test pits, and which associated ST contained precontact artifacts, historic artifacts, both precontact and historic artifacts and/or shells.

## 3.2 Swinnerton Street

Precontact archaeological sites previously were identified approximately 180 meters (600 feet) west of Satterlee Street at sites CHP-1 and CHP-2 along Uncle Ed Ward's Brook (Kearns et al. 2003). JMA conducted no archeological investigations during fence line installation immediately east of Swinnerton Street at Conference House Park (Pickman and Yamin 2004:81). JMA conducted Testing at the playground area at the corner of Billop Avenue and Swinnerton Street, and discovered mixed historic artifacts in disturbed soils (Pickman and Yamin 2004:80-81).

HPI conducted Phase 1B/2 archaeological investigations along Swinnerton Street on July 22, 26 and 30, 2004. See Figure 3-1. Surveyors painted centerlines onto the street for the east trench for sanitary sewer and west trench for storm water. HPI archeologists established a street datum (S000 meters) at the southeast corner of Swinnerton Street and Clermont Avenue, and measured in meters south to Billop Avenue, painting distances on curbsides. Archaeological investigation began south of an existing manhole in the east trench for sanitary sewer. Testing began 35 meters (115 feet) south from the intersection of Swinnerton Street and Clermont Avenue. Machine test pits were placed at 10-meter (33-foot) intervals along this east trench. (Note, staggered test pits at five-meter intervals were planned along the west storm-water trench). Appendix A describes soil stratigraphy encountered in test pits/STs along Swinnerton Street, catalogue numbers 1-27. Grey clay wetland soil containing no shells or artifacts was discovered at ST 2, S045 in reference to datum. A dark yellowish brown sandy clay wetland soil containing a recent car headlight fragment was identified at ST 4, S065 in reference to datum. Road grading had removed all Holocene-age soils along the east trench at STs 1 [S035], 3 [S055], and from 5 [S075] to 21 [S235]. Only Pleistocene-age subsoils of yellowish red to brownish yellow sandy clay were identified below the road fill. Following a memo from HPI to NYLPC, dated July 22, 2004, and a telephone consultation on July 30, 2004, NYCLPC agreed that due to previous road grading, test pit excavations were not needed at areas of previous severe road grading, including the west storm-water trench along Swinnerton Street from Clermont Avenue south to S240. However, at STs 23-25 [S245, S250 and S255], a wetland soil of very dark grayish brown to dark yellowish brown clay loam was identified that extended to 107 centimeters (3.5 feet) below the road surface, and Testing was conducted at both the west and east trenches in the area of the buried wetland soils. Only the ST at S255 (Cat. 25) contained mixed cultural artifacts including one historic-era coal fragment, one possible precontact fire-cracked rock, and fragmentary shells (15 grams) (Figure 3-1). Archaeological monitoring of machine trenching for installation of the sewer line along the east trench from S240 south to Billop Avenue occurred on July 30, 2004, and no areas of shell or intact plowzone layers were observed in the east trench.

In conclusion, preserved A/B silty clay loam soils along southern Swinnerton Street were very wet, and probably were associated with a wetland depression that had been filled with slopewash or landscape grading before road construction. Shell remains, precontact and historic artifacts were very rare, and did not suggest close proximity to a significant archaeological site. No additional archaeological investigations were recommended along Swinnerton Street.

## 3.3 Clermont Avenue

Precontact archaeological sites were identified previously south of Clermont Avenue at sites CHP-1 and CHP-2 along Uncle Ed Ward's Brook (Kearns et al. 2003). JMA conducted Testing during fence line installation at Conference House Park immediately south of Clermont Avenue and found disturbed soils (Pickman and Yamin 2004:81). North of Clermont Avenue, little evidence for precontact sites was observed in blocks between Massachusetts, Connecticut, Finlay, Aspenwall, and Carteret Streets during the 1985 survey by the Department of Real Property (Pickman 1997:18).

HPI conducted Phase 1B/2 archaeological investigations along Clermont Avenue from July 19 to August 12, 2004. Surveyors painted centerlines onto the street for the north trench for water main, the center trench for sanitary sewer and the south trench for storm water. HPI archeologists established a street datum (W000 meters) at the northwest

corner of Clermont Avenue and Main Street, and measured in meters west to Massachusetts Street, painting distances on curbsides or roadbeds. See Figure 3-2

Initially, machine test pits were dug at 15-meter (49-feet) intervals along the north trench for a new water main. From STs 28 to 82 [W000 to W430 in reference to datum] (1,410 feet west of Main Street), Holocene-age A-horizon (topsoil and plowzone) and B-horizon (sands and silt) had been removed from the north trench. Pleistocene-age subsoils of yellowish red to light yellowish brown clay sandy clay were identified below the road fill. In a memo from HPI to NYCLPC, dated July 22, 2004, HPI recommended that due to previous road grading along Clermont Avenue, test pit excavations were not needed along the center and south trenches in areas east of Aspinwall Street. However, west of Aspinwall Street road grading appeared to be less severe. Some road-fill resembled gravel from the earlier 1930s roadbed. Therefore, Testing was conducted in machine-cut test pits staggered at five-meter intervals in the north, center, and south trenches located west of Aspinwall Street (Figure 3-1).

In total, 59 test pits were excavated along Clermont Avenue. Eight test pits, all at the western end of Clermont Avenue, contained preserved Holocene-age A/B soils, including test pits 59, 78, and 81-86 [W315, W410, W425, W430, W435, W439, W440, and W445 in reference to datum]. Shells were identified in W430 (10 grams), W435 (5 grams), W439 (55 grams), W440 (105 grams), and W445 (5 grams). One possible precontact fire-cracked rock was recovered in W435. No precontact chipped stone artifacts or pottery were identified. Historic-period artifacts were recovered in 83/W435 (1 window glass), and 86/W445 (1 coal cinder), and were observed in fill layers. No Colonial-period artifacts were recovered.

On August 12, 2004, HPI archaeologists monitored water main excavations in the north trench in areas west from W430 along Clermont Street to the west side of Satterlee Street in Conference House Park. Soils were mixed fill and very wet. No preserved cultural features were observed, such as areas with buried shells.

In summary, A/B soils were identified only along the western end of Clermont Avenue. Shells were identified in ST Cat. 082/W430 and farther to the west. Precontact and historic-era artifacts were very rare in test pits. Monitoring was conducted during the excavation of the north trench during water main installation and no features or shell concentrations were observed. No additional archaeological investigations were recommended along Clermont Avenue.

## 3.4 Massachusetts Street

The archaeological sensitivity map of Conference House Park identifies areas west of Massachusetts Street as most sensitive and potentially sensitive for precontact archaeological sites, including possibly Native American Burials (Pickman 1997:155). Jacobson (1980) identified the locations of Pepper's excavations along Burial Ridge less than 100 meters west of Massachusetts Street, and precontact Features H-29, H-30 and H-31 within the Massachusetts Street right-of-way. However, the 1985 Department of Real Property Survey identified little evidence for precontact sites in the block between Massachusetts and Connecticut Street (Pickman 1997:18). JMA did not conduct Testing during installation of the boundary fence west of Massachusetts Street due to the likelihood of soil disturbances (Pickman and Yamin, 2004:81-82).

HPI conducted Phase 1B/2 archaeological investigations along Massachusetts Street from July 26 to August 4, 2004. Surveyors painted centerlines onto the street for the west trench for storm water and the east trench for sanitary sewer. HPI archeologists established a street datum (N000 meters) at the northwest corner of Clermont Avenue and Massachusetts Street, and measured test pit locations at five-meter intervals north for 230 meters (754 feet), painting distances on curbsides or roadbeds. See Figure 3-2.

In total, 45 test pits were excavated along Massachusetts Street north from Clermont Street. Evidently, prior road grading has not been severe along Massachusetts Street, and 44 test pits had preserved Holocene-age A/B soils. Soils indicate extensive alluvial deposits, probably associated with a filled stream or wetland. A-horizon plowzone and organic wetland soils often extended to depths greater than 80 centimeters, and ranged from dark yellowish brown to dark reddish gray silty to sandy loams (Appendix A). B-horizon sand and silt usually were wet and leached. Shell fragments were observed within A/B soils for approximately 145 meters north along Massachusetts Street from Clermont Avenue, including STs [catalogue numbers] 88-90, 92, 94-97, 99, 102, 104-108, 110-114, and

123-124. These ST locations, in reference to datum, and their recorded shell weights are: N005 (105 grams), N010 (in profile), N015 (165 grams), N025 (in profile), N045 (in profile), N050 (335 grams), N055 (in profile), N060 (155 grams), N070 (210 grams), N085 (in profile), N095 (20 grams), N100 (231 grams), N105 (in profile), N110 (in profile), N115 (200 grams), N125 (406 grams), N130 (in profile), N135 (25 grams), N140 (in profile), N145 (301 grams), N190 (in profile), and N195 (5 grams). Precontact chert and jasper chipped stone artifacts and fire-cracked rocks (FCR) were relatively rare, but were recovered in STs [catalogue numbers] 97, 105, 108, 110, 112, 114, and 124. These ST locations, in reference to datum, are: N060 (2 flakes), N100 (2 flakes), N115 (1 flake), N125 (1 flake), N135 (1 core), N145 (1 FCR), and N195 (1 FCR). Historic artifacts all dated to the nineteenth or twentieth centuries, and were recovered in STs 95, 99, 104, 105, 108, 110, 114 and 124. These ST locations, in reference to datum, are: N050, N070, N095, N100, N115, N125, N145, and N195. Historic artifacts included 1 stoneware, 3 whiteware and 1 porcelain ceramic sherd, 1 modern ceramic tile fragment, 7 vessel glass fragments, 2 nails, 6 window glass fragments, 1 brick fragment, 4 coal fragments and 2 plastic fragments.

In conclusion, A/B soils were identified along most of Massachusetts Street. However, precontact artifacts and shell remains were identified only for approximately 145 meters (475 feet) north from Clermont Avenue. Historic-period artifacts were recovered from most of the same tests. Shells were most common in tests 95/N050 (335 grams) and 110/N125 (406 grams), however no shell features were identified during test pit excavations. Massachusetts Street is adjacent to known archaeological sites at Conference House Park. Therefore, HPI recommended that Phase 3 data recovery should be conducted in the form of archaeological monitoring, to identify, document and recover possible preserved archaeological features during utility trench excavations.

## 3.5 Hylan Boulevard

The archaeological sensitivity map of Conference House Park identified areas west of Hylan Boulevard as most sensitive for precontact archaeological sites, including Native American Burials (Pickman 1997:155). Three utility trenches were proposed along the western end of Hylan Boulevard, however the northern-most trench will be located in a formerly excavated gas main trench. In addition, a new water main trench was planned crossing the west end of Hylan Boulevard to a water main west of Satterlee Street.

HPI conducted Phase 1B/2 archaeological investigations at the west end of Hylan Boulevard on August 17 and September 2, 2004. A street datum (W000 meters) was located at the northwest corner of Hylan Boulevard and Craig Avenue. Seven machine-cut test pits were excavated in the center and southern trenches for 35 meters (115 feet) west from Craig Avenue. See Figure 3-1. STs 132-136 [W005, W010, W015, W020, and W025. in reference to datum] contained buried wetland silt and sand with decayed plant material, but with no shell fragments or cultural remains. ST 137/W030 contained disturbed soils from a former gas main trench. ST 138/W035 contained sand that from post glacial dunes or outwash. Yellowish brown sand from dunes or outwash also was observed in the water main trench crossing the west end of Hylan Boulevard. The dune or outwash sand extended to a depth of 88 centimeters (2.9 feet) below the road surface before clay subsoils were encountered. No shell fragments or archaeological features were observed when monitoring the installation of the new water main trench or in other areas at the west end of Hylan Boulevard.

In conclusion, Hylan Boulevard covers filled wetlands and sandy soils. No shell fragments or cultural materials were recovered along Hylan Boulevard. No additional archaeological investigations were recommended in this street.

## 3.6 Satterlee Street

The archaeological sensitivity map of Conference House Park identified areas west of Satterlee Street, between Hylan Boulevard and Shore Road, as most sensitive for precontact archaeological sites, including Native American Burials (Pickman 1997:155). The Conference House-Billopp House is west of Satterlee Street approximately 75 meters (250 feet) north from the intersection of Hylan Boulevard and is surrounded by important historic-period archaeological sites. Precontact burials and artifacts also were discovered in areas surrounding the of the Conference House-Billopp House. The precontact Billops Ridge site extends from approximately 75 to 290 meters (250 to 950 feet) north from the intersection of Hylan Boulevard. The Billops Ridge site was tested by Harrington in 1920, who discovered Native American Burials (Jacobson 1980). Precontact artifacts and burials also have been

reported to the east of Satterlee Street. The historic Wood-Leven House is located west of Satterlee Street, approximately 250 meters (820 feet) north from the intersection of Hylan Boulevard. JMA conducted Testing along the new fenceline west of Satterlee Street and identified the highest densities of precontact and historic artifacts and shells in areas around the Wood-Leven House and farther north (Pickman and Yamin 2004:23-30). Precontact and historic artifacts and shells were recovered infrequently south of the Wood-Leven House, across the Billops Ridge site and east of the Conference House-Billopp House.

HPI conducted Phase 1B/2 archaeological investigations at Satterlee Street from July 29 to August 16, 2004. A street datum (N000 meters) was located at the northwest corner of Satterlee Street and Hylan Boulevard. Three utility trenches were proposed along the southern end of Satterlee Street, narrowing to one trench near the northern end of the street. See Figure 3-2. The east trench reportedly was located in a formerly excavated gas main trench, and the east trench was not tested during the Phase 1B/2 survey due to prior disturbance. The water main trench continued north to Shore Road. The center trench for sanitary sewer extended north from Hylan Boulevard for approximately 230 meters (750 feet) to an existing manhole. The west trench for storm water extended for approximately 205 meters (670 feet) north from Hylan Boulevard. Surveyors identified the center lines for the three utility trenches along Satterlee Street. Machine-excavated test pits and hand-excavated STs were dug at five meter intervals staggered between the center and west trenches. As noted above, the east trench was not tested during the Phase 1B/2 survey due to a formerly excavated gas main trench.

In total, 42 machine test pits were excavated along Satterlee Street from ST catalogue numbers 139 to 180/N225, and 31 test pits had preserved Holocene-age A/B soils (Appendix A). Testing revealed a wide variability of soils along Satterlee Street. Buried A-horizon topsoils an/or plowzones ranged from black to gray and brown sands that ranged to depths of 20 to 70 centimeters (0.6 to 2.3 feet) below the road surface. B-horizon included light yellowish brown to strong brown sand from dunes or outwash. B-horizon sand was observed intermittently in STs south of ST Cat. 162/N135. Sand was consistently present below A-horizon soils when nearing the crest of Billops Ridge from N175 to N225, often extending to depths greater than 80 centimeters (2.6 feet). Subsoil along Satterlee Street was light olive brown to strong brown sandy clay (Appendix A).

Appendix A describes cultural remains recovered during Testing at Satterlee Street. Shells were present in 19 STs, including 144/N045 (in profile), 148/N065 (130 grams), 149/N070 (35 grams), 150/N075 (15 grams), 152/N085 (50 grams), 154/N095 (10 grams), 162/N135 (in profile), 166/N155 (in profile), 168/N165 (15 grams), 169/N170 (15 grams), 170/N175 (145 grams), 171/N180 (20 grams), 173/N190 (250 grams), 174/N195 (100 grams), 176/N205 (805 grams), 177/N210 (1130 grams), 178/N215 (2424 grams), 179/N220 (1557 grams), and 180/N225 (112 grams). Precontact pottery, chipped and ground stone artifacts, FCR and animal bones were relatively common, including STs 162/N035 (1 flake), 150/N075 (1 FCR, 1 grinding stone), 152/N085 (1 flake), 154/N095 (1 flake), 169/N170 (1 flake), 170/N175 (1 FCR), 173/N190 (2 flakes), 175/N200 (1 FCR), 176/N205 (1 flake, 36 pottery sherds or crumbs, 4 bone fragments), 177/N210 (1 flake, 42 pottery sherds or crumbs, 2 bone fragments), 178/N215 (1 flake, 11 pottery sherds or crumbs), 179/N220 1 flake, 1 FCR, 35 pottery sherds or crumbs, 3 bone fragments), and 180/N225 (13 pottery crumbs). Diagnostic precontact pottery included an incised grit-tempered sherd from N205, and a cord-marked sand tempered sherd from 178/N215. Both sherds probably date from the Middle or Late Woodland cultural periods, between approximately 1700 to 700 BP. Historic artifacts were recovered in STs 142-143, 150, 153-154, 170, 174-180 9[N030, N035, N075, N090, N095, N175, N195, N200, N205, N210, N215, N220, and N225, in reference to datum], mostly dating from the nineteenth and twentieth centuries. However, in ST N075 probable Colonial-period artifacts were present, including 3 kaolin pipe stem fragments, and 11 clear lead-glazed red earthenware sherds.

In conclusion, preserved A/B soils were common along Satterlee Street. In ST N075, in the west trench, Colonial-period artifacts were recovered that perhaps were associated with the Conference House-Billopp House, immediately to the west. Phase 3 data recovery excavations were recommended in the areas of utility trenching adjacent to ST N075, to investigate whether Colonial architectural features were present. In STs N205, N210 and N215, preserved shell layers contained many unbroken (unplowed) shells from diverse marine mollusks, as well as chipped stone flakes, FCR, Woodland pottery, and bone fragments. These findings suggest the presence of a significant precontact midden. Phase 3 data recovery was recommended within areas of utility trenching between approximately ST Cat. 175/N200 and ST Cat. 180/N225 to further investigate this precontact archaeological site. In addition, Phase 3 monitoring was also recommended during utility trench excavations in areas along Satterlee Street

that contain shell and historic- and precontact-period artifacts with the goal to identify precontact and historic features, if preserved.

## 3.7 Summary and Recommendations

Phase 1B/2 archaeological testing was completed in accordance with the guidelines presented in the New York Archaeological Council's (NYAC) *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections* (1994:7-11) and the New York City Landmarks Preservation Commission's (NYCLPC) *Draft Guidelines for Archaeological Work in New York City* (2002). Determination of archaeological significance was based upon consideration of whether or not the archaeological resource(s) can meet the eligibility criteria of the National Register of Historic Places (NR). These criteria, A to D, are used on federal, state, and city levels of review (Department of the Interior, National Park Service, National Register Bulletin 15/Code of Federal Regulations, Title 36, Part 60). Criterion D is applicable to archaeological sites:

> *Properties may be eligible for the National Register if they have yielded, or may be likely to yield, information important in prehistory or history.*

Phase 1B/2 machine-test pits and hand-dug STs encountered no potentially significant cultural remains along Swinnerton Street, Clermont Avenue and Hylan Boulevard. HPI recommended that no additional archaeological investigations should be conducted along these three streets. Potentially significant concentrations of marine shells and precontact artifacts were identified along portions of Massachusetts Street and Satterlee Street, while Colonial-period artifacts were also recovered in a small area along Satterlee Street. HPI's *Phase 1B/2 End of Fieldwork Summary Report* with the recommendations for Phase 3 Data Recovery was forwarded to the NYCLPC. HPI recommended that archeological remains along Massachusetts Street and Satterlee Street are potentially eligible for the National Register of Historic Places, and recommended Phase 3 Data Recovery along portions of these streets.

Along Massachusetts Street, precontact artifacts and shell remains were most common from Clermont Avenue north for approximately 145 meters (475 feet). Massachusetts Street is adjacent to known archaeological sites at Conference House Park. HPI recommended that Phase 3 data recovery should be conducted in the form of archaeological monitoring, to identify, document and recover possible preserved archaeological features during utility trench excavations.

Along Satterlee Street, possible Colonial-period artifacts were recovered in ST Cat. 150/N075, perhaps associated with the Conference House-Billopp House, immediately to the west of Satterlee Street. Phase 3 data-recovery excavations were recommended in the areas of utility trenching adjacent to ST 150/N075, to recover additional artifacts and to investigate possibilities for associated Colonial architectural features. Precontact artifacts and shell concentrations were recovered from STs near the crest of Billops Ridge. Phase 3 data recovery was recommended within areas of utility trenching between approximately ST 175/N200 and ST 180/N225 to further investigate this precontact site. In addition, Phase 3 monitoring was also recommended during utility trench excavations in areas along Satterlee Street that contain shell and historic- and precontact-period artifacts to identify and recover preserved possible features.

# 4.0 PHASE 3 MITIGATION AND MONITORING

## 4.1 Research Design

Artifacts and shell remains are common indicators of archeological sites. Precontact artifacts recovered during Phase 1B/2 testing along Massachusetts and Satterlee Streets included chipped stone waste flakes from stone tool production, a grinding stone, fire-cracked rocks (FCR) from cooking or food processing, pottery associated with cooking and food storage, and shells and animal bones from food remains. Historic artifacts commonly included ceramics, bottle glass, window glass, nails, brick fragments, coal fragments, and other items ranging in ages from the perhaps the eighteenth to the twentieth centuries. Shells and animal bones are also associated with historic-period archaeological sites. Shell concentrations might reflect areas of intensive precontact and/or historic human

activities. Oysters, hard-shell clams, soft-shell clams, whelks, scallops, and other marine fauna might reflect changing estuarine environments during the precontact and historic cultural periods.

The significance of archaeological sites usually relies on the quality and quantity of information preserved at sites that can be recovered to address specific research questions. As discussed by Binford (1964), archaeological research designs usually address three general topics that are applicable to both precontact- and historic-period sites: 1. identify the cultural *chronology* of occupations; 2. identify *lifeways* of occupants, including subsistence, technological, social, and ideological patterns; and 3. identify *cultural processes* of continuity and change affecting site settlement, site activities and/or site abandonment. Data necessary for addressing specific research questions are usually possible only when archaeological remains have been preserved with high integrity within depositional and/or architectural features.

The South Richmond Drainage-Conference House Park Watershed project area is adjacent to the Raritan Bay estuary, near the confluence of the Arthur Kill River. Extant archaeological evidence suggests that precontact- and probably also historic-period occupants were highly focused on exploiting rich marine and estuarine resources, especially shellfish. The project area is also at the junction of major water travel routes. In addition, the Burial Ridge Native American cemetery at Conference House Park suggests that the area was of great ideological importance during the Precontact and Contact periods. Archaeological investigations at the South Richmond Drainage Conference House Park Watershed project can yield important information concerning changes within environmental and cultural systems. In particular, oyster shells preserve environmental evidence for habitats from shell shapes, salinity ranges from parasites, and season of harvest from annual growth patterns (Kent, 1988). Shell features often also allow preservation of other plant and animal remains, due to basic soil conditions. Major research questions are listed below:

*What is the evidence for the chronology for human occupations, based on radiometric dating of features, diagnostic Precontact projectile points, Precontact- and historic-period pottery, and other artifacts?*

*What is the diversity of marine and terrestrial animal and plant remains in datable archeological features?*

*Do these biotic remains indicate processes of environmental change or changes in human environmental selection between Precontact and historic periods, such as seasonal variations in the use of estuarine resources?*

*Do Precontact lithic artifacts reflect specific tasks social groups, related to knapping processes or tool wear?*

*Is there archaeological evidence for regional interaction and/or trade within Precontact periods? In particular, were yellow jasper and chert artifacts procured locally, or through long-distance transport?*

*Is evidence preserved for Native American ideological systems possibly associated with the Burial Ridge cemetery, including possible undiscovered burials or artifacts associated with ceremonial activities?*

## 4.2 Phase 3 Field Methods

Based on results of Phase 1B/2 field testing, HPI submitted a Phase 3 protocol and responses to questions to NYCLPC and OPRHP on September 1 and September 14, 2004 that described field and laboratory methods proposed for data recovery and construction monitoring along Massachusetts and Satterlee Streets. HPI worked closely with Cruz Construction to maintain safety, work schedules for utility installation, and to assure sufficient time to perform archaeological investigations. HPI also consulted with NYCLC and OPRHP by phone and email when modifications seemed warranted in the proposed Phase 3 data recovery work plan.

### 4.2.1 Archaeological Excavations

Systematic archaeological excavations were recommended to recover information at two locations along Satterlee Street. Satterlee Street Locus 1 included an area contiguous to ST 150/N075 that contained possible Colonial-period

artifacts. Satterlee Street Locus 2, also known as the Billops Ridge site, contained a precontact shell midden between approximately STs 175/N200 and 180/N225.

The construction contractor surveyed locations of the proposed utility trenches, cut pavement along utility trenches, and removed road fill using a smooth-bladed backhoe bucket. The construction contractor placed pedestrian barricades around areas of archeological investigation to restrict pedestrian entry. Metal road plates were placed over excavations at the end of each work day to restrict public access and for public and vehicle safety. Following completion of archaeological investigations, the construction contractor removed barricades, refilled the archaeological excavations, and restored road surfaces for vehicle traffic.

Archaeological EUs were 1x1 meter squares, excavated in 10 centimeter levels within natural and/or cultural strata, and within quadrates (50 x 50 centimeters). Each EU was described on field data sheets and in written notes, with two walls drawn in profile, and photographed. Excavated soils within three quadrates were screened through 0.25-inch mesh for recovery of artifacts, and bone, although shells were not collected. One quadrate from each excavation level was extracted for water screening through 0.125-inch mesh for recovery of shells, bones, charcoal and artifacts. Water screening was conducted while in the field. Soil samples, approximating 5 liters in volume, were extracted from midden levels and features for possible flotation to recover plant remains.

### 4.2.2 Archaeological Monitoring

Archaeological monitoring of utility trench excavations was conducted along both Massachusetts and Satterlee Streets. All monitoring/mitigation conducted by the archaeologists and all hand excavation of archaeological deposits followed the standards established by NYCLPC and the New York Archaeological Council (NYAC).

The construction contractor did not commence any utility excavation along Massachusetts or Satterlee Streets unless the archaeologist was present at the site. After removal of the road surface, all machine excavations were conducted with a smooth-bladed bucket. The archaeologists had the opportunity to inspect the trench and excavation area after excavation progressed every five to twenty-five feet in horizontal intervals, covering the length of the two designated areas. Archaeologists were allowed up to 30 minutes to investigate the trench segment. Inspection occurred every two feet in depth until reaching a maximum of 4 feet below current grade. Archaeological monitoring procedures were flexible to conform to excavation procedures of the construction contractor.

The archaeologists monitoring the utility trench excavation had the ability, in consultation with the DDC Resident Engineer, to stop the excavation when archaeological features were identified in the area of utility trench excavation. The archaeologist inspected the archaeological feature by entering the utility trench excavation area, clearing away any loose soil with hand tools to fully expose the feature, clearing the profile closest to the feature and collecting any archaeological material in association with the archaeological feature. At the completion of the inspection, if it was determined that the archaeological feature was *in situ* and required further evaluation to determine if the archaeological feature was eligible for listing on the NRHP (Phase 3 Mitigation), the construction contractor worked in a different portion of the project area until the archaeological consultant finished investigating/mitigating the archaeological feature. If the archaeological feature lacked integrity, or following mitigation, the archaeologist directed the construction contractor to continue excavating.

At the direction of the archaeologists, the construction contractor immediately stopped construction at that location and construction work recommenced only with the approval of the archaeologists. The archaeologists used their best efforts, consistent with their professional responsibilities, to grant such approvals to the construction contractor in a timely manner.

If the archaeologists determined that significant archaeological resources would be adversely impacted by further construction activities, archaeological excavations were conducted to identify, document and remove (mitigate) archeological remains. If the archaeologist determined that it was not feasible to excavate and fully document the location in one day, the location was plated and/or barricaded to restrict public access.

According to the standing *Unanticipated Discovery Plan for Human Remains,* if human remains were identified by the archaeologist, all construction and archaeological activities were to cease in the vicinity of find. No human remains were identified during Phases 1B/2 or Phase 3 investigations

To evaluate an *in situ* archaeological feature (Phase 3 Mitigation) exposed during utility trenching, the archaeological team exposed the archaeological feature using hand tools, drew a plan or profile view and photographed the feature, collected any archaeological material in association with the feature, sectioned the feature, removed any large elements of the feature and drew the nearest soil profile (including Munsell soil color, matrix and a brief description of soils and associated artifacts). Recovered bulk soils were water screened through 0.125-inch mesh. If warranted, five-liter soil samples of feature soils were retained for possible flotation or other specialized analyses.

The construction contractor allowed the archaeologists full work access to the site, and furnished the archaeologists with necessary information and assistance to perform their work. Cruz Construction offered to dig construction utility trenches before utility installation along Massachusetts Street and Satterlee Street, allowing archeologists ample time to identify, document and excavate anticipated archeological pit features. Therefore, no construction delays were caused by unexpected archaeological discoveries during utility installation.

The construction contractor was responsible for providing a safe excavation environment as per OSHA standards, and informing the archaeologists of unsafe conditions. The construction contractor provided equipment and labor support for the archaeologist's operations, such as plating, shoring and pedestrian barricades. The archaeologists complied with the construction contractor's health and safety plan, and only entered machine excavations that were deemed safe by the construction contractor.

## 4.3 Laboratory Methods

Following completion of fieldwork, collected materials including artifacts, faunal and shell remains were cleaned and conserved to ensure their stability. The provenience of collected materials was verified, and bags were appropriately labeled. Descriptive data from the Phase 3 field investigations and laboratory analyses are presented in Appendices B and C, and in following sections.

The laboratory analysis and classification of the artifact assemblage were oriented toward the research issues addressed at each locus, especially at Satterlee Street Locus 2. Interpretations of precontact activities depended on comparisons of the numbers and kinds of artifacts recovered from Phase 1B/2 STs, and Phase 3 EUs, STs and features. However, STs, EUs, and features differed in the areas excavated (0.25 square meters for STs, one square meter for EUs, and variable areas for features), biasing interpretations of past activities based simply on artifact counts from differing units. In addition, the volumes of soils varied between the differing thickness of plowzone and sub-plowzone levels in excavations, soil strata in STs, and feature sizes. Therefore, soil volumes (cubic meters) were calculated in the laboratory for each shovel stratum, excavation level and feature by multiplying the length, width, and thickness of each unit and level. Artifact densities (artifacts per cubic meter) were calculated by dividing artifact counts by soil volumes. Artifact densities provide valid quantitative comparisons of assemblages from differing unit sizes and stratigraphic contexts from Phase 1A/2 and 3 investigations at Satterlee Street Locus 2 (Appendix A).

A number of specialized analyses were conducted for each specific artifact class such as lithics and pottery. Additional tasks such as flotation analysis, oyster shell analyses and the dating of radiocarbon-14 samples were considered based on assessments of the integrity of archaeological deposits and availability of data.

### 4.3.1 Lithic Analysis

Lithic analysis attempted to determine a range of activities, including the stages of lithic reduction, tool manufacture and tool use that occurred at this site. The analysis of stone tools included recording lithic material, formal morphological classification, and possible functional modifications. Lithic analyses were conducted by archaeologists Dr. Stuart A. Reeve and Ron Jacoby.

Stone knapping is usually characterized as a reduction process by progressively decreasing the size of lithic artifacts from the acquisition of raw materials to the shaping of completed tools. Early-stage stone knapping produces primary objects with weathered cortex from cobbles or rock outcrops that cover more than 50 percent of proximal surfaces. Secondary objects have cortex covering less than 50 percent of proximal surfaces. Late-stage stone knapping produces tertiary objects without cortex.

Formal lithic categories indicate knapping processes. Waste flakes vary in sizes and shapes based on the availability of raw material, knapping stages and the objectives of tool use. Formal categories are described below:

- Cores (primary, secondary or tertiary) are large pieces selected for knapping from stream gravel, glacial till, or bedrock deposits. Cores maintain multiple flake scars from trimming cortex and flakes.
- Chunks (primary, secondary or tertiary) are blocky pieces more than two centimeters long, which lack flake characteristics and probably result from uncontrolled core breakage.
- Shatter (primary, secondary or tertiary) are blocky pieces less than two centimeters long, which lack flake characteristics and probably result from uncontrolled core or flake breakage.
- Flakes (primary, secondary or tertiary) are relatively flat, sharp-edged pieces with evidence for conchoidal fracture, bulbs of percussion, and striking platforms. However, many flakes break during or following knapping. Flakes often were selected for use as expedient tools due to edge-shape and edge-angle characteristic for cutting, scraping or piercing activities.
- Chips are small flakes less than one-centimeter long produced from shaping cores or other artifacts.
- Crude bifaces are usually roughly shaped and thickly lenticular in profile with a few small flake scars from thinning and pressure retouching. Fragmentary edges, tips, and basal pieces were noted.
- Refined bifaces are usually symmetrically shaped and thinly lenticular in profile with many small flake scars from thinning and pressure retouching. Fragmentary edges, tips, and basal pieces were noted. Crude and refined bifaces were often utilized for cutting, scraping, and piercing tools and might have been hafted to handles.
- Projectile points maintain size, shape, and hafting characteristics that are usually diagnostic of precontact cultural periods. Although projectile points are generally associated with hunting technology, broken or discarded points often were resharpened for cutting, scraping, or piercing activities.
- Hammerstones were usually cobbles of quartz or quartzite that retain pits from pecking or battering during hard-hammer stone knapping or other resource processing activity.
- Grinding stones were usually cobbles of quartzite or sandstone that retain abraded, crushed, or polished cortex on cobble faces.
- Fire-cracked rocks are usually angular broken cobbles, often with pot-lid spalls and discoloration from exposure to high heat in hearths, stone boiling, or earthovens. Therefore, fire-cracked rock might indicate residential camps or sites associated with plant processing.

Lithic artifacts were examined for evidence of edge wear suggesting tool use, such as pecking, grinding, polishing, edge-snapping, micro-chipping, and retouching.

### 4.3.2 Pottery Analysis

Precontact pottery can determine the cultural affiliations of the occupants of this site. Styles and designs of precontact vessels have established cultural chronologies based on sherds recovered from many shell middens and dated features in the Middle Atlantic region. Pottery fragments were examined for decoration, treatment, cultural

affiliation, form, function, temper, and cordage-twist. Analysis of pottery will follow the Rouse/Smith system of ceramic classification, subsequently elaborated and refined by L. Lavin and R. Kra. Dr. Lucianne Lavin of the Institute of American Indian Studies, Washington, Connecticut, conducted the ceramic analysis.

### 4.3.3 Shell Analysis

Various species of mollusks thrive in differing marine, brackish and fresh water habitats. Shells at archaeological sites might indicate changing estuary habitats. In particular, oyster shells contain important information concerning estuarine habitats, based on measurement of growth characteristics, parasites and other data (e.g. Kent 1988). Shell analyses were conducted by consultant David Gubkin, Wayne, New Jersey under the direction of Dr. Stuart A, Reeve.

Marine shells were ubiquitous at Satterlee Street Locus 2, the Billops Ridge site. Most shells were broken into small fragments. In order to streamline shell sampling, one quadrate (0.25 square meters) from each midden excavation level was extracted for water screening through 0.125-inch mesh for recovery of shells, bones, charcoal and artifacts. In the laboratory, shells were screened through 0.5-inch mesh for recovery of larger shell fragments. Large shell fragments were classified into marine taxa, and each taxon and residual (unclassified) shell fragments were weighed separately (in grams) (Appendix C). Ratios of marine taxa were calculated for each quadrate and level soil volume (cubic meters). Total shell densities (shell kilograms per cubic meter) were calculated for excavation levels (1.0 square meter) based on quadrate shell samples. This process also was conducted for known volumes of ST and feature soil samples at Satterlee Street Locus 2, the Billops Ridge site.

### 4.3.4 Faunal Analysis

The identification of mammal, bird and fish remains provides information about diets and habitats exploited by Native Americans. Faunal materials were collected during Phase 3 field excavations and in the laboratory during separation of fine-screened samples. Unfortunately, most bone fragments were extremely broken and small, precluding taxonomic identifications. Several mammal teeth were recovered and were analyzed by Dr. Thomas Amarosi of Montclair State University, Montclair, New Jersey.

### 4.3.5 Botanical Analysis

Flotation of soil samples allows recovery of plant remains from archeological features. However, during Phase 3 excavations and water screening very few charcoal fragments were identified, and most fragments that were recovered were very small. Sandy soils might have promoted soil oxidation and leaching, reducing organic preservation. Due to potentially poor preservation, two-liter soil samples were floated from three deeply buried features at the Billops Ridge site in order to assess plant preservation. Flotation samples were analyzed by archeobotanist Justine Woodard McKnight, Laurel, Maryland. Unfortunately, botanical preservation was very poor. Charcoal fragments usually were too small for identification. Carbonized seeds or cultigens were not recovered. Recovery of non-carbonized seeds and fibers indicated downward movement of modern plants through sandy soils.

### 4.3.6 Radiometric Dating

Radiocarbon dating was planned for precontact archaeological features discovered in the project. Unfortunately, little charcoal was recovered during excavations or from fine screen samples. Archaeologists also noted downward movement of coal cinders and tar from road paving that might have contaminated charcoal or soil samples. Also, dating of mollusk shells often provides unreliable radiocarbon dates. Therefore, no samples were submitted for radiocarbon samples.

# 5.0 MASSACHUSETTS STREET MONITORING AND FEATURE MITIGATION

Phase 1B/2 test pit and ST excavations along Massachusetts Street revealed marine shells and rare precontact and historic artifacts for approximately 145 meters (476 feet) north from the intersection of Clermont Avenue. Phase 3 archaeological monitoring and feature mitigation was recommended by HPI during utility trench excavations, especially since Native American burials were possible so close to Burial Ridge. In order to ensure that utility installation would not be delayed by archaeological monitoring, Cruz Construction excavated the new utility trenches before utility installation, allowing archaeologist the time necessary to document features, if present.

Archaeological monitoring of the east trench was conducted from October 25 to 28, 2004. A smooth bladed backhoe excavated five meter sections of the trench to sandy clay wetland subsoil, allowing archeologists to look for shell and rock concentrations, soil stains and record soil profiles. Due to the wet nature of the soils, the backhoe trenches began filling with groundwater at depths of 20 to 70 centimeters (7.9 to 27.6 inches) below road surface.

Archaeological monitoring along Massachusetts Street led to the discovery of three cultural features below the road fill (Figure 5-1; Note that the graphics for the Phase 3 investigations identify Features, EUs, or ST3 as Phase 3 actions.). Features 1 (Cat. 181) and 2 (Cat. 182) in the east trench were historic features, probably dating to the twentieth century. Feature 3 (Cat. 183), in the west trench, was a possible precontact pit.

In the east trench, from N000 to N010 (i.e., from datum at the intersection of Massachusetts and Clermont Streets north 10 meters (32.8 feet), dark yellowish brown silty sand topsoil or plowzone, with fragmentary shells, extended from depths of 40 to 60 centimeters below the road surface and road fill. Feature 1 (Cat. 181) was an oval pit discovered at N004. See Figure 5-1 and Appendix B for Phase 3 Soil Descriptions and Artifact Summary. Feature 1 had straight sides and extended into sandy clay to 150 centimeters below road surface, probably a filled telephone pole hole. Feature 1 was not a significant cultural resource.

A thin layer of fragmentary shells were observed at the top of the silty sand topsoil from N013 to N022. This thin shell layer and topsoil were approximately 20 centimeters above a thin black layer of decayed plant material at the interface of the very dark olive brown sandy clay subsoil at a depth of 80 centimeters below road surface. Therefore, the shell layer and topsoil probably were redeposited slopewash filling a shallow wetland depression. The topsoil and shell fragments rose and narrowed to depths of 30 centimeters below road surface at N055, where fragmentary shell disappeared. Sandy clay subsoil underlay the road-fill until approximately N083, when deep depressions were observed in trench walls, including 60 centimeters of fill containing brick and glass destruction debris, over brown silty sand slopewash to depths of 120 centimeters from N087 to N105. Intermittent layers of black plant detritus indicated a filled wetland.

Feature 2 (Cat. 182) was discovered at N092, a conical pit approximately 150 centimeters in diameter and extending from 80 to 120 centimeters below road surface. See Figure 5-1 and Appendix B for Phase 3 Soil Descriptions and Artifact Summary. Feature 2 contained black silty sand, stoneware sherds, a condiment bottle, a cold cream jar, window glass, coal and oyster shells, suggesting early twentieth-century fill. Feature 2 was not a significant cultural resource.

East trench contained historic fill from N100 to N230, with copper wire, wood, bricks, shells and coal ash over sandy clay subsoil to the north end of the east trench.

Contrary to previous descriptions of project effects, the west storm-water trench entailed machine excavations only one meter beyond the limits of the previously monitored east trench for sanitary sewer. As a result of previous archeological monitoring at the east trench for sanitary sewer, HPI recommended in a memo dated October 28, 2004 to OPRHP and NYCLPC that the only area sensitive for precontact archeological sites extended from the intersection of Massachusetts and Clermont Streets (N000) north along Massachusetts Street for 279 feet, to N085.

Cruz Construction dug the west trench on November 15, 2004 to allow controlled archaeological monitoring before storm-water installation along Massachusetts Street. Monitoring was conducted from N010 to N090 along the west trench. The west trench profile was similar to soils seen in the east trench. A narrow dark yellowish brown topsoil

or plowzone was observed below road fill and extended from depths of 20 centimeters at the base of road fill, to between 30 and 40 centimeters below the road surface from N010 to N032, when the topsoil became graded away. Shell fragments were observed in the topsoil, however no shell layer was observed in the west trench. The narrow topsoil layer reappeared between N040 and N080, but was less than 10 centimeters thick. At N080, the deep wetland depression was encountered with historic fill, and monitoring was discontinued at N090, i.e., from datum at the intersection of Massachusetts and Clermont Streets north 90 meters (295.5 feet).

Feature 3 (Cat.183) was a circular basin-shaped pit feature at N055.9 in the west trench. See Appendix B for Phase 3 Soil Descriptions and Artifact Summary. The feature was 20 centimeters in diameter and extended below the topsoil from depths of 30 to 49 centimeters below the road surface. The feature contained black silty sand, with shell fragments and three quartzite cobbles in the south wall, but no definitive precontact or historic artifacts (Photograph 5-1). Feature 3 probably was a precontact feature, similar to other isolated features described in the vicinity by Jacobson (1980).

In conclusion, archeological monitoring along Massachusetts Street verified extensive wetland soil deposits that might have been associated springs and marshes providing fresh water to precontact occupants of the Wards Point site further to the west. Monitoring also suggested that precontact archaeological sites might be preserved west of Massachusetts Street from approximately 10 to 80 meters (33 to 260 feet) north from the intersection of Clermont Avenue. Extensive wetland filling probably occurred along Massachusetts Street through the early twentieth century before residential development.

# 6.0 SATTERLEE STREET LOCUS 1, THE FENCELINE SITE

Precontact- and Colonial-period artifacts, Satterlee Street Locus 1, were identified during Phase 1B/2 testing along Satterlee Street at ST 150/N075 in the west storm-water trench. Artifact-bearing soils at ST 150/N075 were covered by 24 centimeters (9.45 inches) of pavement and road fill, but dark yellowish brown silty sand extended to depths of 60 centimeters (23.6 inches) below the road surface. Initially, HPI recommended four Excavation Units (EUs) continuous to ST Cat. 150/N075 to observe whether historic artifacts or features associated with Conference House-Billop House were preserved below the roadbed along lower Satterlee Street.

## 6.1 Satterlee Street Locus 1 EUs

Two 1x1-meter EUs were begun on October 1, 2004 at N072 and N074 (Cat. 210 and 211). (See Figure 6-2. Note that the graphics for the Phase 3 investigations differentiate the catalogue numbers as ST, Phase 1B/2 action, or Features, EUs, or ST3, Phase 3 action.) Archaeologists discovered that the area was extensively disturbed by road fill and deep wheel ruts, probably related to the unpaved early twentieth-century roadway along Satterlee Street. EU N072 (Cat. 210) contained mixed fill over compacted clay subsoil from 18 to 47 centimeters (7.1 to 18.5 inches) below the road surface. Precontact artifacts included 2 yellow jasper tertiary flakes and 1 jasper heat-altered spall. Historic artifacts were of recent origin, and included 1 white porcelain sherd and 5 clear vessel glass sherds (Appendix B). EU N074 (Cat. 211) contained mixed fill over compacted clay subsoil from 28 to 55 centimeters (11 to 21.7 inches) below the road surface. Flat cobbles, perhaps rut fill, were on clay in the east half of the unit. Historic artifacts included 2 window glass fragments, in addition to 8 grams of oyster shells and 10 grams of hard shell clams. No Colonial-period artifacts were recovered from either EU. Cruz Construction engineers also informed HPI archaeologists that a water line trench ran west across Satterlee Street to a fire hydrant at approximately N078, or approximately 256 feet north of Hylan Boulevard, an additional disturbance.

HPI conducted telephone consultations on October 1, 2004 with NYLPC and OPRHP, and recommended suspension of excavations at Satterlee Street Locus 1. HPI recommended that additional excavations were better directed to the Billops Ridge site, farther to the north along Satterlee Street. HPI assured NYLPC and OPRHP that Phase 3 monitoring would be conducted at Satterlee Street Locus 1 to document possibly deeply buried features.

## 6.2 Monitoring and the Fenceline Site

HPI monitored machine excavation of the east trench along Satterlee Street during installation of the new water main from October 6 and 7, 2004. This trench was supposed to occupy the formerly disturbed gas main trench, however project engineers discovered that the former gas main trench turned west and then east of the proposed route for the new water main. Therefore, northward from approximately N050, the new water main would be installed in undisturbed soils that might contain archaeological features, including perhaps human burials. Archaeologists observed buried A-horizon topsoil at N068 and N071 but no shells suggesting preserved archeological features. No other areas were observed with preserved A-horizon soils in the east trench until approximately N200 at Satterlee Street Locus 2, approximately 657 feet north of Hylan Boulevard. B-horizon yellowish brown sand extended upslope along Satterlee Street from Hylan Boulevard (N000 to N105). C-horizon sandy clay subsoil was below the road fill from N105 to N110. A pocket of B-horizon sand reappeared below the road fill from N110 to N120. C-horizon sandy clay subsoil was below the road fill from N120 to N145. Another pocket of B-horizon sand appeared below the road fill at N145. C-horizon sandy clay subsoil was below the road fill from N145 to N175. B-horizon sand reappeared below the road fill in the east trench at N175 and this sand layer thickened to more than a meter farther north to the Billops Ridge site. As noted above, A-horizon topsoil - containing shell fragments and precontact and historic artifacts - was observed at N200. The archeological finds in east trench north from Cat. 175/N200 will be discussed below in conjunction with investigations at Satterlee Street Locus 2, the Billops Ridge site. No cultural features were observed in the east trench along Satterlee Street from N000 to N200.

Cruz Construction offered to excavate the center trench along Satterlee Street before utility installation, allowing archaeologist the time necessary to document features in the vicinity of Satterlee Street Locus 1, if present. HPI archaeologists monitored utility trenching of the center trench on October 30, November 1 and November 11, 2004 north to N190 at Satterlee Street Locus 2. The center trench west wall revealed complex layering of light and dark sands often with coal cinders, indicating soil disturbances and slope wash from the former unpaved road surface along Satterlee Street. Road fill covered yellowish brown clay to dark red rocky clay subsoil. The depth of road fill varied from 30 to 61 centimeters (12 to 24 inches) below the road surface.

The Fenceline site was discovered while monitoring machine excavations of the center trench at Satterlee Street Locus 1 (Figure 6-2). In total, 26 historic post-hole features were identified by dark soil stains that extended into clay subsoil from N011 to N053 (Photograph 6-1), approximately 36 to 175 feet north of Hylan Boulevard. Fence remains were destroyed north of N053 by the former gas main trench. The Fenceline site contains remains of a post and rail fence that stood along the early Bentley Manor farm lane, or the east side of Satterlee Street. Appendix B describes individual post-hole features. The post-holes varied greatly in size (ranging from 20 to 45 centimeters, or 8 to 18 inches, in diameter), shapes (circular, elliptical, rectangular, triangular and irregular) and in depths and bottom characteristics post-holes (rounded, squared to pointed post bottoms). Post molds from decayed fence posts were observed in 17 of 26 post-holes. Preserved red cedar posts were recovered from Features 17 and 23.

The post-holes generally were clustered into groups of two and three features, suggesting at least one episode of fence line replacement (Figure 6-1). Other episodes of fence repair or replacement might be obscured due to farmers redigging earlier post-holes, therefore explaining larger, elliptical and irregular shaped post-holes, or by post-holes that lacked post molds—the posts having been removed.

Alternate post-holes might represent an earlier and a later fence line. Table 6-1 identifies post holes that contain molds of former posts, depths (in centimeters) below road surface for the bottom of post holes, and sizes (areas in square meters) of post holes. Lengths of fence rails between post-holes were calculated in meters and feet. Perhaps, an earlier fence might have fewer preserved post molds since older rotting fence posts were removed. Earlier fence posts might have been dug deeper than replacement posts. Earlier post-holes might have been smaller than replacement post-holes, if the earlier hole were expanded to remove old fence posts or if new post-holes were enlarged for alignment. Distances between fence posts, or rail lengths, might be more standardized in an original fence than replacement posts installed intermittently over time. As indicated on Table 6-1, there is no appreciable difference in the percentage of post-holes with observed post molds: post molds were observed in 73 percent of Fence A and 70 percent of Fence B post holes. Fence A post-holes were generally dug deeper than Fence B post holes. Fence A post-hole areas were slightly smaller than Fence B post holes. Fence A rails appeared somewhat

more standardized, between 11 and 12 feet, than Fence B rails. Shorter distances between posts might reflect gates or bar-ways. Although Fence A conforms to expectations of predating Fence B, no conclusive data is available for the actual ages of individual post-holes.

In summary, the Fenceline site identified a previously unknown agricultural landscape feature associated with the Conference House-Billopp House. An 1878 illustration from *Harper's Monthly* magazine (Figure 6-3) portrayed a post-and-rail fence along the western side of Satterlee Street. This fence line is probably preserved beneath paved western portions of Satterlee Street. The Fenceline site demonstrated that post-and-rail fences bordered the east side of Satterlee Street, and probably surrounded fields to the east.

## 7.0 SATTERLEE STREET LOCUS 2, THE BILLOPS RIDGE SITE

Phase 1B/2 test pit and Testing along Satterlee Street revealed dense marine shells, animal bones and precontact and historic artifacts between approximately Cat. 170/N200 and Cat. 180/N225, referred to as Satterlee Street Locus 2. The Phase 1A/2 investigation included excavation of six STs (Cat. 175 to 180). The Precontact-period Billops Ridge site was previously identified at Conference House Park, immediately west from Satterlee Street Locus 2. Originally, two new utility trenches were proposed in previously undisturbed soils beneath Satterlee Street. The west trench for storm water extended north approximately 673 feet from Hylan Boulevard/N205, while the center trench for a sanitary sewer crossed the site to a manhole approximately 755 feet north of Hylan Boulevard/N230. The east trench for water main was supposed to occupy a preexisting trench for an abandoned gas main. Therefore, the expected area of project effect was expected to be approximately 60 square meters in the west and center trenches, and Phase 1B/2 testing (1.5 square meters) included a 2.5 percent sample of the proposed impact area from utility trenching. However, when utilities were mapped by project surveyors, the former gas main was found to be east of the proposed east trench for the water main. Therefore, the area of potential effect increased to 90 square meters. Therefore, additional Testing and monitoring were conducted in the east trench. See Figures 7-1, 7-2, 7-3, and 7-4 for the Satterlee Street Phase 3 excavations.

Phase 3 excavation and monitoring at Satterlee Street Locus 2 began on September 9 and progressed intermittently until November 8, 2004. The Features, EUs, and STs excavated during Phase 3 investigations were assigned catalogue numbers that followed the Phase 1B/2 sequence. However, as seen on the graphics, Phase 3 catalogue numbers are noted by Feature, EU, or ST3.

Originally, ten 1x1-meter EUs were planned in the west and center trenches (a 19-percent sample of areas impacted by utility trenching). This number was increased to 12 EUs after excavations were discontinued at Satterlee Street Locus 1. In addition, five STs were excavated in previously undisturbed portions of the east trench before utility trenching, including five 50x50 centimeter STs at N202.5 (Cat. 219), N207.5 (Cat. 224), N212.5 (Cat. 231), N217.5 (Cat 236) and N222.5 (Cat. 239). The additional EUs and STs (totaling 14.75 square meters for all excavations and STs) included a 16 percent sample of the impact area of proposed utility trenching.

Unfortunately, an old but still active water main burst immediately north of the Billops Ridge site (at approximately 804 feet north of Hylan Boulevard/N245) during installation of the new water main. A torrential flood in the east trench led to extensive soil erosion along the east and center trenches (Photograph 7-1). Utility trenching and floodwater erosion of sandy soils also revealed a previously unknown buried shell midden around the former manhole at N230. As a result of flooding, the area of project effect increased to approximately 138 square meters. Following consultations with OPRHP and NYLPC on October 12, 2004, the number of archaeological excavations was increased to a total of 18 EUs in order to mitigate unforeseen adverse effects from the water main break in the east trench and potential additional damage from soil slumping during utility installation in the center trench. The total area of EUs and STs (20.75 square meters) equated to a 15 percent sample of the area of project effects at the Billops Ridge site.

In addition, monitoring was conducted on November 4 and 5, 2004 from N170 to N206 in the west trench, i.e., from 558 to 676 feet north of Hylan Boulevard. Monitoring was also conducted from N170 to N225 in the center trench,

i.e., from 558 to 739 feet north of Hylan Boulevard. Six additional precontact features were documented and sampled (Features 13 to 18).

Appendix B describes Phase 3 excavations, STs and features consecutively from west to east and south to north (Cat. 212 to 242). Appendix C provides the artifact catalogue from Phase 3 excavations, STs and features from the Billops Ridge site. Phase 1B/2 STs (ST169 to ST180) have been integrated into analyses and discussions of Phase 3.

Table 7-1 synthesizes information from the Phase 1B/2 and Phase 3 investigations at Satterlee Street Locus 2, identified as part of the Billops Ridge site. The following detailed description is an aid to interpreting the data presented in Table 7-1. The first column on Table 7-1 identified catalogue numbers (Cat.) of units, with decimals identifying excavation levels (e.g. Cat. 169.1 is unit 169, level 1). Phase 1B/2 STs (Cat. 169 to Cat 180) are identified with asterisks (e.g. Cat. 169.1*). Phase 3 EUs, STs and features extend from Cat. 212 to 242. Features identified within EUs also were identified by the EU catalogue number and a decimal (e.g. Feature 4 is Cat. 215.5). Features identified during monitoring were given a separate unit catalogue number (e.g. Feature 18 is Cat. 212). STs, EUs and features are ordered sequentially from west to east and from south to north on Table 7-1. In the following discussion in Section 7.1, STs (ST) and EUs (EU) will be identified by unit type prefix and catalogue numbers (e.g. ST169 or EU212). Features will be identified by the feature field number (e.g. Feature 4 or Feature 18).

In the second column on Table 7-1, Location is identified by north (N) and east (E) grid coordinates (in meters) at the southwest corner of STs and EUs, and at the center of features. Grid locations at Satterlee Street Locus 2 were measured in meters north from the northeast corner at the intersection of Satterlee Street and Hylan Boulevard (see Figure 6-1), and east from the western concrete curb of Satterlee Street (see Figure 7-1). Feature center locations within EUs were measured (in meters) from the southwest corner of units (e.g. the center of Feature 11 is 0.2 meter north and 0.5 meter east from the southeast corner of the EU Cat 230 (southwest corner at N212E2) and Feature 11 is identified as Cat. 230.6 at grid location N212.2E2.5).

In the third column on Table 7-1, Unit:Soils are identified. Abbreviations identify STs (ST), EUs (EU) and Features (Fea.). Features were assigned feature numbers (Feature 1 to 18) as discovered during fieldwork, and these feature numbers are retained in the following discussions for continuity with field records and field photographs. Soils are identified by soil strata or features. **A** is A-horizon topsoil or **Midden** where densely packed shells were identified. **A/B** is a mottled transition zone between A-horizon and B-horizon soil strata. **B** is B-horizon sand. Detailed discussions of soil stratigraphy are presented in Section 7.1.

The fourth through sixth columns on Table 7-1 identify level and feature measurements. Level Depths were measured in centimeters (cm). Area was calculated in square meters (m2): STs were 0.25 square meters; EUs were 1.00 square meters; and feature areas were calculated by geometric approximations to circles or ellipses. Volume was calculated in cubic meters (m3) by multiplying the area by level thickness (depths) for ST and excavation levels, or feature geometric approximations to columns, hemispheres, or other shapes.

In the following columns, Table 7.1 summarizes artifact counts and densities of major precontact and historic artifact categories in unit/levels and features (Cat.). Precontact artifact categories include lithic types used in chipped stone tool industries (quartz, quartzite, chert, jasper and diverse other lithics), pecked and ground stone cobble tools associated with resource processing, fire-cracked rocks from hearths or other features associated with camp activities, and pottery sherds and small (unidentifiable) pottery crumbs associated with Woodland-Stage camp activities. Historic artifacts are grouped by major functional categories, including ceramics and vessel glass reflecting domestic activities, flat glass, nails and bricks associated with architectural sites, coal from fuel or road fill, and diverse other artifacts. Table 7.1 also compares artifact densities (artifacts per cubic meter) in unit/levels and features for total precontact and historic artifacts, bone fragments and marine shell weights (kilograms per cubic meter). Shell samples were not taken in the field for all units and levels (no data). Note that pottery crumbs were excluded from calculations of precontact artifact densities for unit/levels and features, due to inflation of artifact totals due to sherd disintegration. Coal fragments and cinders were excluded for calculations of unit/level and feature historic artifact densities, due to probable contamination from road fill.

In total, 10.8 cubic meters of soil were excavated and screened during Phase 1B/2 and Phase 3 fieldwork at the Satterlee Street Locus 2 (Table 7-1). In total, 1,263 precontact artifacts, 392 historic artifacts, and 500 bone

fragments (non-human) were recovered. In addition marine shells from middens and features were systematically sampled, classified and weighed. Eighteen (18) precontact features were identified in EUs and during machine grading in the west, center, and east trenches at the Billops Ridge site. No human skeletal remains were identified during field or laboratory investigations. Artifacts and features are associated with the larger Billops Ridge site, located to the west of Satterlee Street Locus 2 area of field investigation.

Precontact artifacts and features are most likely associated with the Billops Ridge site, extending to the west and probably east of Satterlee Street Locus 2. One objective of fieldwork and laboratory analyses was to clarify whether the recovered shell and bone samples were also associated with precontact occupations at the Billops Ridge site. Instead, shell, bone, and historic artifacts might have been deposited as road fill or might be a previously unknown historical archaeological site.

## 7.1 Site Stratigraphy and Features

At Satterlee Street Locus 2, cultural stratigraphy surprisingly was preserved beneath the modern road. Cultural remains included many fragile items such as marine shells, bone fragments and precontact pottery that were not expected to have survived centuries of road travel or redeposition as road fill. Five soil strata were identified in excavations: 1) recent road fill, 2) a deeper historic fill at the north end of the site, 3) A-horizon topsoil and shell middens; 4) a transitional A/B-horizon, and 5) B-horizon sands. Features were dark soil stains, often with artifacts and/or shells that extended into the B-horizon sands.

Table 7-2 summarizes total counts and densities (artifacts per cubic meter) of major precontact and historic artifact categories, bone fragments and shell weights (kilograms per cubic meter) in soil strata at the Billops Ridge site. Table 7.2 provides a preliminary model for evaluating stratigraphic trends among differing time periods (precontact- and historic-periods), functional categories (precontact tool manufacturing and manufacturing or historic domestic and architectural activities) and food remains (bone fragments and shell weights).

### 7.1.1 Stratum 1: Recent Road Fill

The existing street pavement and gravel fill are relatively shallow along upper Satterlee Street in the vicinity of the Billops Ridge site, varying between depths of 13 and 30 centimeters (5 to 12 inches), but sloping downward toward the east trench and north of N225. Road fill contained abundant trap rock. In some areas, coal cinders were common, perhaps remnants of earlier road surfaces. No artifacts were collected from recent road fill. The question remains unresolved about how much of the Billops Ridge site was graded away for road construction.

### 7.1.2 Stratum 2: Historic Fill

At excavations on the northern end of Satterlee Street, deeper historic fill extended beneath the road gravel to depths of 56 centimeters (22 inches) in EU240.3, to 63 centimeters (25 inches) in ST241 and 68 centimeters (27 inches) below road surface in EU242.2. These EUs ranged between 788 and 796 feet north of Hylan Boulevard. Soils included a layers of yellowish brown silty sand fill over mottled black to dark grayish brown silty sand fill, containing mixed precontact and historic artifacts, bone fragments and shells. In total, 0.51 cubic meters of historic fill were excavated. Predictably, historic artifact densities (92.2 historic artifacts per cubic meter) were more common than precontact artifact densities (56.9 precontact artifacts per cubic meter). Substantial artifact mixing was evident in historic fill layers. In particular, the relatively high densities of historic architectural artifacts (flat glass, nails, and brick fragments) suggest land filling with building demolition debris.

### 7.1.3 Stratum 3: A-Horizon and Midden

Road fill covered a layer of buried brown silty sand topsoil (A-horizon) containing whole and broken marine shells, precontact and historic artifacts and small animal bone fragments. There was little evidence for historic plowing of buried topsoils and midden deposits. Topsoil and midden deposits extended to depths ranging between 30 and 79 centimeters (12 to 31 inches) below the road surface. Dense shell layers were buried under historic fill in EU240 and EU242 (Photograph 7-3). In total, 3.28 cubic meters of A-horizon and midden deposits were excavated.

Shell densities varied greatly (Figure 7-1). No shells were reported in ST172.1. Seven (7) units contained very low shell densities (less than 1 kilogram per cubic meter), including from south to north ST169.2, ST171.1, ST173.1, ST174.1, ST175.1 ST219.3 and ST224.3. Ten (10) units contained occasional shells (1 to less than 50 kilograms per cubic meter), including from south to north ST170.1, ST176.1, ST177.1, EU229.1, ST231.3, ST178.1, ST236.3, ST179,1, ST238,3 and ST180.1. The midden included denser concentrations of whole and broken marine shells. Seven (7) units contained common shells (50 to less than 100 kilograms per cubic meter), including from south to north EU214.1, EU215.1, EU216.1, EU218.1, EU221.1, EU223.1 and EU232.1. Abundant shells (more 100 kilograms per cubic meter) were identified in 6 units, including from south to north EU217.1, EU234.1 EU235.1, EU237.1 EU240.4 and EU242.3. Unfortunately, machine disturbances during road fill removal and earlier road grading led to extensive mixing and shell breakage in some units precluding systematic shell sampling, including no data from EU221, EU227, EU230 and EU233. For 33 tested A-horizon samples, shell densities averaged 67.35 kilograms per cubic meter.

As indicated on Table 7-2, extensive artifact mixing occurred in the buried topsoil and midden deposits. Historic artifacts were common (95.4 historic artifacts per cubic meter, or 46 artifacts per cubic meter if coal is excluded). Precontact artifacts increased dramatically over densities in historic fill (229.0 precontact artifacts per cubic meter, or 119 artifacts per cubic if pottery crumbs are excluded). In particular, high densities of pottery sherds and crumbs suggest Woodland Stage associations for topsoil and midden soils, in comparisons with precontact artifacts recovered in other soil strata. However, historic domestic artifacts (ceramics and vessel glass) also were more common in topsoil and midden soils than in other soil strata, suggesting an alternative hypothesis that the shell midden might be related to historic domestic dumping.

### 7.1.4 Stratum 4: A/B-Horizon Transition

Below the zone of densest shell, mottled very dark grayish brown and dark yellowish brown sand continued to depths ranging from 40 to 60 cm (16 to 24 inches) below the road surface before yellowish brown sand (B-horizon) was encountered. In total, 2.0 cubic meters of A/B-horizon transitional soils were excavated. Shells were either absent or only occasionally recovered in most excavation levels (Figure 7-1). This mottled transition zone at first was considered a product of organic leaching, perhaps with soil mixing by precontact people or burrowing rodents. Although historic artifacts, shell, bone and precontact pottery densities decreased dramatically from the A-horizon, precontact chert and jasper chipped stone and fire-cracked rocks increased in the A/B-horizon, perhaps suggesting a pre-ceramic Archaic-Stage settlement (Table 7-2).

### 7.1.5 Stratum 5: B-Horizon Sand

Unconsolidated yellowish brown to dark yellowish brown sand caps Billops Ridge and underlies the A-horizon topsoil, shell midden and A/B-Horizon transition zone. These sands were formed by post-glacial outwash or by dunes, and were favored for precontact burials at Burial Ridge and elsewhere on Staten Island. Sandy soils also were favored campsites for Archaic- and Woodland-Stage campsites (Pappalardo et al, 1996). In total, 4.46 cubic meters of B-horizon sands were excavated at the Billops Ridge site. As indicated on Table 7-2, precontact and historic artifacts, bone fragments and shells decrease dramatically in B-horizon sands. However, chert and jasper chipped stone and fire-cracked rocks remain the most common artifacts, continuing the pattern observed in the overlying A/B-horizon transition.

### 7.1.6 Features

Features were identified by dark soils, often with shells, intruding into the dark yellowish brown B-horizon sand. In total, 18 features were identified during excavations and trench monitoring at the Billops Ridge site (Figure 7-1). Table 7-3 presents feature descriptions and summarizes artifact contents. Most features were relatively small conical-shaped, basin-shaped or bell-shaped pits, averaging 29 centimeters (11.4 inches) in diameter or 0.21 square meters in area. Most features were relatively shallow; 14 of 18 features extended less than 30 centimeters (12 inches) into B-horizon sand. Only Feature 5 (Cat. 217.6), Feature 17 (Cat. 220), Feature 13 (Cat 227.4) and Feature 11 (Cat. 230.6) extended to greater depths. Historic artifacts were recovered only in Feature 11, while precontact artifacts were recovered in 10 features (Features 1, 5, 7, 9, 10, 11, 12, 13, 15, and 17). Woodland-Stage pottery sherds or crumbs were recovered in only three features (Features 9, 12, and 13). Although only 0.57 cubic meters of

feature soils were excavated, precontact artifact densities were analogous to the A-horizon midden stratum (107.0 precontact artifacts per cubic meter in Features, or 71.9 precontact artifacts per cubic meter when excluding pottery crumbs). Bone densities also were similar to the A-horizon and midden stratum (Table 7-2).

Feature 14 (Cat 213), Feature 4 (Cat. 215.5), Feature 5 (Cat. 217.6), Feature 17 (Cat. 220) and Feature 1 (Cat. 221.6) had the highest densities of shells in feature fill, and all five of these features were in the southern end of the site. Feature 5 was the largest shell pit excavated, extending below a dense shell layer in the A-horizon to a depth of 67 centimeters (26.4 inches) below the road surface (Photograph 7-3). Features 4, 5 and 17 (discovered during monitoring) were relatively closely clustered within an approximate one-meter radius, and might reflect shell dumping into a deep pit (Figure 7-1).

In the center of the site, small pit features appeared to have been clustered into groups, including one group composed of Features 12, 13, 15 and 16, a second group with Features 9, 10 and 11 (Photograph 7-4), and a third group with Features 2 and 3. Machine grading following excavations failed to reveal linear or circular patterns of pit features that might have reflected house patterns. However, Phase 3 investigations at Satterlee Street Locus 2 covered only a very small portion of the Billops Ridge site.

The pit features and depressions discovered at the Billops Ridge site were analogous to the many small conical and basin-shaped pits at the Wards Point site, discussed by Jacobson (1980:20-28). However, no distinctive hearths associated with charcoal and clusters of fire-cracked rocks, were discovered in excavations at the Billops Ridge site. Similarly, no large storage pits were identified at the Billops Ridge site that might have been used as storage pits for agricultural surpluses (Bendremer, et al. 1991).

### 7.1.7 Stratigraphy and Spatial Artifact Patterning

Discussions have focused on overall trends of precontact and historic artifact distributions between soil strata, but have not addressed spatial variability of artifacts within soil strata. Artifact densities (artifacts per cubic meter of soil) were calculated for excavation and ST levels to identify principal areas of precontact and historical activities within soil strata and features (Table 7-1). Low density areas included excavation and ST levels with below-average precontact or historic artifact densities. Moderate density areas included STs with above-average artifact densities. High density was defined by the 90-percentile approximation to a normal distribution (Thomas 1976:201). Table 7-4 computes adjusted parameters for low, moderate and high density for precontact artifacts, historic artifacts, bone fragments and shell weights within different soil strata and features. Note that Table 7-4 density means differ from Table 7-2 because computations were based on densities in excavation and ST levels, rather than artifacts within soil volumes. Pottery crumbs were excluded from calculations of precontact artifact densities. Coal was excluded from calculations of historic artifact densities. Some levels and features with extremely high densities of precontact artifacts and shell also were excluded for calculations of means and 90-percent parameters.

Figures 7-3 to 7-5 compare precontact and historic spatial distributions of high, moderate and low artifact densities across soil strata and features. In the A-Horizon and midden, highest precontact artifact densities tend to cluster near features with abundant shells including EU218.1 east of Feature 5, EU221.1 containing Feature 1, and from buried shell middens in EU240.4 and EU242.3 (Figure 7.3A). However, moderate and high historic artifact densities also were scattered across the site, suggesting a more randomized process of historic artifact deposition (Figure 7-3B).

In the A/B-horizon transition, high precontact artifact densities continued to cluster in EU217.3, EU218.2 near Features 5 and EU221.2 near Feature 1 (Figure 7-4A). Moderate precontact artifact densities were located in the northern part of the site, north from N215, or 215 meters (706 feet) north of Hylan Boulevard. Low precontact artifact densities were recovered in the central part of the site from N205 to N215, or 673 to 706 feet) north of Hylan Boulevard. In contrast, historic artifact were most abundant in EU232.2 and ST178.1 in the middle of the site, but were sporadically recovered in high or moderate densities across all parts of the site, suggesting a more random distribution than among precontact artifacts (Figure 7-4B).

Figure 7-5 compares precontact artifact densities in Features and B-horizon sands. Feature 1 in the south and Feature 9 in the center part of the site contained high precontact artifact densities (Figure 7-5A). High and moderate precontact artifact densities were more broadly distributed in B-horizon soils (Figure 7-5B).

In summary, precontact artifacts and features suggest three general zones within the Billops Ridge site. A southern feature area is centered around Features 1, 4, 5, and 17 shell pits. A middle feature area contains small feature clusters and generally low precontact artifact densities from N205 to N216. A northern midden area contains high densities of shells and precontact artifacts, but few features, from N216 to N231, or 710 to 758 feet north of Hylan Boulevard.

## 7.2 Chronology

As noted in Section 4.3.6, charcoal was very rare in most EUs and features at the Billops Ridge site. Possibilities of charcoal contamination, especially contamination from coal dust and tar from road fill filtering downward in sandy soils, precluded submission of charcoal samples for radiocarbon dating. Dating of soil strata and features relied on chronologically diagnostic artifacts, including projectile points and pottery for precontact occupations, and historic ceramics and other items to understand time spans of historic deposits.

### 7.2.1 Projectile Points

Chronologically diagnostic projectile points and bifaces were extremely rare in excavations. Only four potentially diagnostic projectile points and hafted bifaces were recovered from excavations at the Billops Ridge site (Photograph 7-5).

A Middle Woodland Fox Creek Stemmed point was recovered from the A-horizon in EU214.1.02 (N200E1, level 1, southeast quad) (Photograph 7-5A). The point was made from non-local rhyolite. The base was asymmetrically convex. The stem height from base to shoulder was 5 and 7 millimeters (0.20 to 0.28 inch). The stem width was 13 millimeters (0.51 inch). Although the tip was broken, the length was approximately 50 millimeters (1.98 inches). The point is 9 millimeters thick (0.35 inch) at the base of the blade. The blade was extensively resharpened on both edges, perhaps indicating use as a hafted knife before the artifact was discarded. The point was recovered south of Features 4 and 5.

The base from a Middle Woodland Greene or Fox Creek Lanceolate point, or early Late Woodland Jack's Reef Pentagonal point was recovered from the A-horizon in EU214.1.03 (N200E1, level 1, northwest quad) (Photograph 7-5B). The point was made from dark gray chert. The base was straight and 22 millimeters wide (0.87 inch). The stem contracted from shoulder to base, and the stem height was 15 millimeters (0.59 inch). The blade was broken transversely, probably at the haft. This point base probably reflects tool repair and replacement of the projectile point in a fore-shaft or knife handle. The point was recovered south of Features 4 and 5.

The resharpened blade of a corner-notched or side-notched hafted biface was recovered from A-horizon EU221.1.04 (N204 E3, level 1, northeast quad) (Photograph 7-5C). The biface was made of brownish yellow jasper. The stem was broken and the base was missing. The stem width was 10 millimeters (0.39 inch). The shoulder tangs were broken, and a lateral break had removed part of the blade. The blade was 7 millimeters thick (0.28 inch), and the blade was asymmetrically shaped, probably from resharpening for secondary use as a hafted knife. Before breaking, the biface might have been approximately 50 centimeters long (1.97 inches). The notched stem and narrow stem width were suggestive of an early Late Woodland Jack's Reef Corner-notched style, or perhaps a Middle Woodland notched point such as those associated with the Selby Bay Complex in Chesapeake Bay. However, the artifact was too heavily damaged and modified for confident classification. This biface was above Feature 1.

A broken Early Woodland Rossville contracting-stemmed point base was recovered from mixed A-horizon and fill in EU240.3.03 (N226 E3, level 3, northwest quad) (Photograph 7-5D). The point was made from black chert. Only portions of the stem and blade were recovered. The base was convex, and the stem contracted from the shoulders to the base. The stem height was 14 millimeters (0.55 inch). The stem width was 19 millimeters (0.75 inch). The blade thickness was 8 millimeters (0.31 inch). The blade was broken transversely and along both edges, preventing estimations original point length. The point was found immediately above the buried shell layer.

These isolated point/bifaces suggest precontact occupations from approximately 2400 to 800 BP at the Billops Ridge site. This interval was also a time of intensive occupation at the Wards Point site (see Section 2.3). At Billops

Ridge, all point/bifaces were probably associated with the A-horizon/midden. No diagnostic projectile points were recovered from the deeper A/B-horizon, B-horizon, or from features. Perhaps significantly, no Late Archaic or Late Woodland projectile points were recovered from the Billops Ridge site excavations. These were, however, periods of intensive occupations at the Wards Point site.

### 7.2.2 Pottery (by Lucianne Lavin and Stuart A. Reeve)

In total, 63 precontact pottery sherds and 414 small, unidentifiable pottery crumbs were recovered during excavations at the Billops Ridge site. Most (83 percent) of the potentially identifiable sherds were recovered from the A-horizon/midden (Table 7-2).

Pottery was studied by Dr. Lucianne Lavin, Director of Research at the Institute of American Indian Studies, Washington, Connecticut. Sherds were described by manufacturing characteristics, including paste, temper, vessel part (rim, collar, or body), thickness, color resulting from firing, and coiling characteristics. Sherds also were described by interior and exterior surface treatments and decorations, including smoothing, fabric-impressions, net-impressions, cord-marking, incising and other attributes. Cordage twist patterns (Z- or S-twist) were described when identifiable. Very few sherds were large enough to allow confident descriptions of manufacturing and decorative attributes. Many sherds and crumbs in units and levels were from single vessels. Based on Dr. Lavin's analysis, Stuart A Reeve attempted to expand comparisons of sherds between EUs and levels.

Table 7-5 describes 57 sherds that were sufficiently well preserved to warrant analysis. Unfortunately, recovered pottery included mostly body sherds with surface treatments such as cord marking, net marking and fabric impressions that were shared among many pottery types.

Cord-marked pottery was analogous to several Early to Middle Woodland ceramic types, including Vinette 1 and Matinnicock Stamped wares. This was a moderately thick ware (7 to 9 millimeters, or 0.28 to 3.1 inches), with grit and coarsely crushed stone temper, and exterior and interior cord marking, often involving a cord-wrapped paddle and often smoothed. Cordage included both Z- and S-twists. Sherds were recovered from both the A-horizon and A/B-horizon in southern excavations (EU214.2.1 and EU216.1.04) and from the shell midden in the northern part of the site (EU240.4.05) (Photograph 7-6B).

North Beach Net Impressed pottery was related to Vinette 1 pottery on Long Island, and probably dated from the Early Woodland to Middle Woodland (Silver, 1991:14). This was a thick ware (7 to 10 millimeters, or 0.28 to 0.39 inches) with distinctive or smoothed net impressions on exterior surfaces, and smoothed net impressions on interior surfaces (Photograph 7-6A, D and G). Rim sherds were recovered in EU242, with flattened rim lips, crenulated (pie-crust) decorated exterior, and notched interior rims (Photograph 7-6G).

Fabric-impressed pottery was common at the Wards Point site, and was attributed to Middle to Late Woodland occupations (Jacobson, 1980:48). However, Ritchie (1969b) also described Early Woodland fabric impressed Vinette 1 pottery on Martha's Vineyard that might be analogous to Billops Ridge pottery. At the Billops Ridge site, sherds were moderately thick (7 to 9 millimeters, or 0.28 to 3.1 inches), grit tempered, with fabric impressions on exterior surfaces, and smoothed or textile-wrapped paddle interior surfaces. Fabric-impressed pottery was common (30 sherds) in the vicinity of the northern shell midden (EU240.4, EU240.5 and EU242.2 to EU242.4). Due to the relatively thick construction, an Early to Middle Woodland affiliation is proposed for most fabric-impressed pottery at the Billops Ridge site.

In contrast to the high frequency of incised-decorated pottery at the Wards Point site, only one incised rim sherd was identified at the Billops Ridge site (ST176.1; Photograph 7-6C). This was a coiled, burned-shell tempered sherd, with smoothed-over incised lines, possibly part of a filled triangle or chevron design. Too little of the pot was recovered for a confident type identification, although Late Woodland affiliation seems likely.

Many sherds remain untyped. A thin, shell-tempered, cord-marked sherd was recovered from ST178.1 that might date to the Late Woodland period. A grit-tempered sherd with a brushed and scored surface and a drill hole was recovered from EU221.1. Other unidentified sherds include a grit-tempered cord-marked sherd from EU218.2, an eroded shell-tempered sherd from EU235.2, and a grit-tempered fabric-impressed sherd from EU240.5.

In summary, the assemblage of mostly Early to Middle Woodland pottery at the Billops Ridge site appears relatively consistent with the small number of projectile points. No distinctive stratigraphic trends were apparent among pottery types. However, a large number of fabric-impressed sherds (perhaps from only two vessels) were restricted to the area of the shell midden at the northern end of the site.

### 7.2.3 Historic Artifacts

Historic artifacts were relatively common in excavations at the Billops Ridge site, including 392 historic artifacts. Historic artifacts were most common in fill and A-horizon strata, but also were recovered from the shell midden, A/B horizon and in Feature 11. Historic artifacts might have become mixed into precontact levels as fill, or might reflect an historic archaeological site in the area.

Many artifacts relate to historic processes of manufacture that help date archaeological deposits. For example, coal from Pennsylvania became a common domestic fuel after the opening of the Morris Canal and the Delaware and Raritan Canal in the 1830s. All coal at the Billops Ridge site is expected to date after 1830, and most probably dates to street development after 1920.

Ceramics also reflect general periods of manufacture, and therefore might indicate a single period of site occupation, or else mixing of artifacts from many periods. In total, 47 ceramic sherds were recovered in excavations. Possible Colonial-period artifacts included 6 lead glazed red earthenware sherds (1 sherd from EU214.1, 1 sherd from EU217.1, 2 eroded sherds from EU227.1, and 1 sherd from EU240.3), and one sherd of Westervald salt-glazed pottery (EU215.1). Other ceramics dated from the late nineteenth or twentieth centuries, including 10 whiteware, 3 yellow-ware, and 2 clear-glazed stoneware sherds, as well as 25 unglazed red earthenware sherds probably from flowerpots. Many common eighteenth and early nineteenth-century ceramics were not recovered, including creamwares and pearlwares.

Among the 43 vessel glass fragments, all appeared to be recently manufactured clear, amber or green glass. No possibly Colonial hand-blown olive green wine bottle or case bottle fragments were recovered.

In total, 26 nails were recovered in excavations. Wrought nails were manufactured into the nineteenth century, but only 4 possible wrought nails were identified (1 nail in ST176.1, 2 nails in EU230.1, an 1 nail in EU240.3). Other wire or cut nails were manufactured later or were unidentified.

Several personal items were recovered that might reflect Colonial occupations, including a small bead from EU214.1, a kaolin pipe stem fragment from EU216.1, a pipe bowl fragment from 233.1, a fragment from a flint ballast stone in EU 232.1, and two lead shot from EU237.1.

In summary, possible Colonial-period artifacts were widely dispersed in A-horizon and fill layers, and did not indicate an area of intensive use. This section of Satterlee Street might have been used as a farm lane since the seventeenth century. Many nineteenth- and twentieth-century artifacts probably were introduced with road fill during street construction. Sandy soils at the Billops Ridge site have allowed mixing of historic artifacts into deeper soil strata.

## 7.3 Lithic Analysis (by Stuart A. Reeve and Robert Jacoby)

### 7.3.1 Lithic Types

Precontact artifacts included chipped stone resulting from stone knapping, and pecked cobble hammerstones, abraded grinding stones, and fire-cracked rocks related to hearths or food processing. As described in Section 4.3.1, lithic technology was a complex process starting with the procurement of suitable stone materials and ending with the production of finished tools. Many stone materials at the Billops Ridge site might have been acquired from local beaches, especially quartz and quartzite cobbles washed from glacial till. The Raritan Formation, underlying southern Staten Island, produces pale-yellow, tan-brown to brownish-red jasper nodules (LaPorta, 1996; Pappalardo, et al., 1996:13-3). Jacobson (1980) proposed that many stone tools at the Wards Point site resulted from travel or

trade over great distances to procure lithic materials for stone tools. For example, the Hudson Highlands to the north of Staten Island, have geological formations that might have yielded chert (Seifried, 1994). Yellow jasper and argillite was found in eastern New Jersey and in the Delaware River valley. Rhyolite was traded from Maryland and Pennsylvania. Many high quality cherts were traded from northern and western New York, including Normanskill and Onondaga cherts. Slate was available in the Taconic Mountains to the north. Relative quantities of local and exotic stone materials provided evidence for social interaction and might allow identification of different periods of site occupation.

Stone knapping, usually characterized as a reduction process by progressively decreasing the size of lithic artifacts, actually includes the entire process, from the acquisition of raw materials to the shaping of completed tools. Early-stage stone knapping produces primary- or secondary-stage objects with weathered cortex over most or part of struck pieces. Late-stage stone knapping produces tertiary objects without cortex. Late-stage knapping also produces many waste flakes and small chips in the process of shaping finished unifacial and bifacial stone tools. Projectile points often had stems or notches for hafting onto weapon shafts or knife handles.

As indicated on Table 7-2, the lithic assemblage at the Billops Ridge site included 565 pieces from lithic knapping, 12 pecked or ground cobbles, and 209 fire-cracked rocks from cobbles. Lithic knapping included 16 quartz artifacts, 15 quartzite artifacts, 374 chert artifacts (including a wide variety of colors), 146 jasper artifacts (yellow to red colors) and 12 "other" lithic types. The miscellaneous other lithic types included:

2 argillite artifacts (1 artifact from EU232.3 and 1 artifact from EU235.1);
4 basalt artifacts (3 artifacts from EU229.1 and 1 artifact from EU232.1);
2 rhyolite artifacts (1 artifact from EU214.1 and 1 artifact from ST176.1);
1 siltstone artifact (from EU240.5);
2 slate artifacts (1 artifact from EU215.1 and 1 artifact from EU217.3); and,
1 unknown lithic type (from EU240.3).

Table 7-6 summarizes artifacts produced from early-stage knapping (primary and secondary stage artifacts with cortex) and late-stage knapping (tertiary stage artifacts without cortex) among major lithic types recovered from the Billops Ridge site. Many formal categories described in Section 4.3.1 were rarely observed and some formal categories were combined in Table 7-6. Blocky large chunks and smaller shatter pieces were combined. Refined unifaces, bifaces and projectile points also were combined for comparisons. Definitive patterns of lithic reduction are difficult to discern. Quartz, quartzite and other lithics have high percentages of early stage artifacts, while quartzite, chert, jasper and other lithics all have comparable percentages of late-stage flakes, suggesting similarities in late stage knapping processes.

Several simple statistical tests were utilized to evaluate variability of lithic reduction among lithic types (Table 7-7), and distributions of lithic artifacts in site strata and in site areas (Tables 7-8 to 7-11). Chi-square tests were particularly useful to identify significant statistical differences in the observed numbers of artifacts from expected random distributions.

Table 7-7 compares patterns of early- and late-stage reduction among lithic types. The null hypothesis states that there is no significant difference in lithic reduction stages among lithic types. However, a chi-square test for differences indicates that the observed chi-square value (observed chi-square = 22.32, applying Yates' correction for small and discontinuous samples) exceeds the expected value for random distribution (expected chi-square = 9.48, with 4 degrees of freedom, and probability less than 0.05), indicating different knapping patterns among lithic types. Local lithic materials are indicated by greater than expected numbers of early-stage artifacts for quartz, quartzite and other lithics. Jasper has fewer than expected numbers of early-stage artifacts, suggesting that much of the jasper was brought to the site with cortex removed, possibly as a result of long distance trade.

### 7.3.2 Stratigraphic and Spatial Patterns of Lithic Artifacts

Table 7-8 compares distributions of lithic types in soil strata at the Billops Ridge site. (Note that artifacts from fill and mixed levels were excluded from Table 7-8.) The null hypothesis states that if stratigraphic mixing occurred, significant differences among lithic types should not be observed between soil strata. The observed chi-square

(18.71, applying Yates' correction) did not exceed the expected for random distribution (expected chi-square = 21.03, with 12 degrees of freedom, and probability less than 0.05), supporting the null hypothesis that artifact mixing of lithic artifacts and lithic types probably occurred between soil strata.

Analyses of shell densities (Figure 7-2), precontact artifacts (Figures 7-2 and 7-3) and features (Figure 7-4) suggested three possible activity areas at the Billops Ridge site. These three areas are the Southern Feature Area, the Central Feature Area and the Northern Midden Area.

- The Southern Feature Area includes ST169, ST170, ST171, ST172, Feature 18 (Cat.212), Feature 14 (Cat. 213), ST174, EU214, EU215, EU216, EU217, EU218, ST219, Feature 17 (Cat.220), and ST176.
- The Central Feature Area includes EU222, EU223, ST224, Feature 15 (Cat. 226), Feature 16 (Cat. 226), EU227, Feature 6 (Cat. 227), ST177, EU229, EU230, ST231, EU232, and ST178.
- The Northern Midden Area includes EU234, EU235, ST236, ST179, EU237, EU238, Feature 7 (Cat. 239), ST180, EU240, Feature 8 (Cat.241), and EU242.

Table 7-9 describes lithic types in these three areas, combining artifacts from all soil strata and features. The null hypothesis states that due to artifact mixing, there is no significant difference in the distribution of lithic types between site areas. However, the observed chi-square value (22.88, applying Yates' correction) exceeds the expected value for random distribution (expected chi-square = 15.51, with 8 degrees of freedom, and probability less than 0.05), indicating that lithic types are distributed differently at the Billops Ridge site. Quartz and other lithics are under represented in the Southern Feature area, but over represented in the Central Feature Area. Quartzite is under represented in the Northern Midden Area. The most abundant lithic types, chert and jasper, represent the most randomized distribution of material. This test implies the existence of distinct activity areas related to infrequent knapping of local lithic materials.

### 7.3.3 Lithic Knapping and Cobble Artifacts

Lithic knapping represents only one aspect of the lithic technology. Naturally smooth cobbles were often pecked or ground from an array of heavy work activities. In total, 12 pecked or ground cobble tools were recovered from excavations at the Billops Ridge site. These cobble tools included 9 hammerstones (EU216, EU227.1, 3 from EU230.4-Feature 9, 2 from EU234.2, EU240.6), an anvil stone (EU230.4-Feature 9), a grinding stone (mano) perhaps for plant flours (EU216.3), a possible grinding slab (metate) also for plant flours (EU242.1).

Fire-cracked rocks reflect a different set of activities possibly related to small hearths, large cobble-filled earthovens, dispersed scatters from stone-boiling, or other forms of resource processing. In total, 209 fire-cracked rocks were recovered from excavation, but not in concentrations that suggested a hearth, earthoven or other rock feature.

Table 7-10 compares distributions of pecked and ground cobbles (Peck/Grind), fire-cracked rocks (FCR), and total chipped stone lithic artifacts (Lithics) within soil strata. (Note that artifacts from fill or mixed levels were not included in Table 7-10.) Again, the null hypothesis expects mixing of lithic knapping and various cobble artifacts between soil strata and features, similar to the pattern among lithic types (Table 7-8). However, the observed chi-square value (22.29, applying Yates' correction) exceeds the expected value for random distribution (expected chi-square = 12.59, with 6 degrees of freedom, and probability less than 0.05), indicating a significant difference in lithc and cobble stratigraphic distributions. Pecked and ground cobbles were absent in the A/B-horizon transition and over represented in features. In contrast, fire-cracked rocks were under represented in features, suggesting that most precontact pit features (with or without shells) probably were not used for cooking.

Table 7-11 compares distributions of pecked and ground cobbles, fire-cracked rocks, and total chipped stone lithic artifacts within site areas. The null hypothesis for random distribution was rejected. The observed chi-square value (71.81, applying Yates' correction) greatly exceeds the expected value for random distribution (expected chi-square = 9.49, with 4 degrees of freedom, and probability less than 0.05). Lithic knapping was most important in the Southern Feature Area, and under represented in other areas. Pecked and ground cobbles were recovered in lower than expected numbers in the Southern Feature Area. Fire-cracked rocks were over-represented in the Central Feature Area and the Northern Midden Area, and under represented in the Southern Feature Area.

In summary, lithic analysis indicated a diversity of activities at the Billops Ridge site, perhaps reflecting differing periods of site use. Lithic reduction stages indicated use of local quartz, quartzite and other lithics available in till and beach margins (Table 7-7). Chert and jasper might have been procured from local and distant sources and are most randomized in reduction stages and spatial distributions in site areas (Table 7-9). Significant differences also were observed in the stratigraphic and spatial distributions of lithic knapping and pecked and ground cobbles and fire-cracked rocks, suggesting variations in site activities (Tables 7-10 and 7-11).

## 7.4 Shell Analysis (by Stuart A. Reeve and David Gubkin)

Marine shells were the most conspicuous evidence of human subsistence at the Billops Ridge Site. As discussed in Section 7.1, shell densities varied within and between soil strata and features in distinct areas of the site. It is assumed that most shell relates to precontact occupations. Differing kinds of shells might reflect the kinds of marine and estuarine habitats exploited by precontact people.

As noted in Section 1.0, marine and estuarine habitats in Raritan Bay have changed dramatically over the period of human occupation of southern Staten Island. Sea levels have risen, bringing increasingly saline waters into the bay, and affecting the kinds of shellfish and other resources available to precontact people occupying the Billops Ridge site. For example, soft shell clams (*Mya arenaria*) are most abundant in waters with salinity of 5 parts per thousand (ppt) or greater, and extend up rivers within inter-tidal zones. Oysters (*Cassostrea virginica*) maintain salinity tolerances greater than 5 to 7 ppt, but many oyster parasites only survive in more saline conditions. Hard shell clams (*Mercenaria mercenaria*) are found in more saline waters of 18 ppt or greater with channel whelks (*Busycon canalicutum*). Bay scallops (*Argopectan irradians*) thrive in coastal areas with eel grass beds, while New England dog whelks (*Nassarius trivittatus*) can be found on shallow rocky inter-tidal beaches (Lippson and Lippson 1984). Lower salinity might reflect lower sea levels and older archaeological deposits, or wetter climatic conditions and greater fresh water discharge by the Raritan River and other coastal tributaries.

### 7.4.1 Shell Diversity

Shell analyses at the Billops Ridge site identified and quantified the variety of shellfish in EUs and Features (Appendix C). Detailed studies were conducted on oyster shells to further identify the kinds of estuarine habitats exploited by precontact people (Appendix D). As described in Section 4.3.4, only one quarter (quad) of EU levels were fine-screened (1/8-inch or 3 millimeter) for shell analysis. Fine screen samples were limited to A-horizon and A/B-horizon transition strata. Feature fill and Phase 3 STs were also fine-screened, yielding some whole shells but mostly broken shells. Recovered shells and shell fragments were then passed through ½-inch (13-millimeter) mesh for recovery of larger shell fragments. Only the larger (more than ½-inch) shell fragments were classified into shellfish taxa. Large fragments of individual shell taxa were weighed together (in grams), not as individual shell fragments. Appendix C lists shell weights for common shellfish taxa. The residual shell fragments (less than ½-inch) were scanned closely for unusual shell taxa, noted under Comments in Appendix C. The residual shell was also weighed, and total shell weights were computed for level and feature samples. Total shell densities also were computed based on soil volumes of units, levels and features.

Table 7-12 summarizes results of shell analyses from 51 fine screen samples. Table 7-12 describes the catalogue number, unit location (in meters), site area, site strata or feature numbers, calculated unit soil volume (cubic meters) and calculated total shell densities (kilograms per cubic meter). Table 7-12 then presents percentages of major shellfish taxa (percentages of ½-inch shell weights) for oysters (*Cassostrea virginica*), hard shell clams (*Mercenaria mercenaria*), soft shell clams (*Mya arenaria*), channel whelks (*Busycon canalicutum*), and bay scallops (*Argopectan irradians*). A second set of percentages were calculated to quantify the relative amount of shell breakage, including the percent of shell fragments less than ½-inch and the percent of shell greater than ½-inch. Weights (grams) of shell greater than ½-inch and total shell weight (grams) also are reported on Table 7-12. Shell breakage comparisons might provide some post-depositional insight.

In total, 76.337 kilograms of shells and shell fragments were separated during the fine-screening and 41.952 kilograms of shells and shell fragments were classified in the ½-inch samples. Oysters were the predominant shell identified, including 77 percent of identified shells by weight. Oysters were reported in 96 percent (49 of 51) of the fine screen samples. Oysters were the most dominant shellfish (98 percent of identified shells) in EU234.3, in the

A/B-horizion of the Northern Midden Area. Hard shell clams included 22 percent of identified shells by weight, and were reported in 98 percent (50 of 51) of fine screen samples. Hard shell clams were the most dominant taxa (94 percent of identified shells) in EU232.2, in the A/B-horizon of the Central Feature Area. Soft shell clams included only 0.4 percent of the identified shells by weight, and were present in 39 percent (21 of 51) of the fine screen samples. Soft shell clams were most abundant (6 percent of identified shells) in E232.2, with hard shell clams. Channel whelks included only 0.4 percent of the identified shells by weight, and were present in 27 percent (14 of 51) of the fine screen samples. Scallops were very rare, including only 0.01 percent of identified shells by weight, and were present in only 14 percent (7 of 51) of the fine-screen samples. Scallops were most abundant (0.1 percent of identified shells) in EU214.1, in the A-horizon of the Southern Feature Area. Other shell taxa (Appendic C) included New England dog whelks (from EU216.1, E240.3, EU240.4), slipper shells (from EU240.3 and EU240.4), barnacles (from EU233.1 and EU233.2), Atlantic oyster drill snails (EU214.1 and EU230.4, EU240.4), and unidentified snails (from EU216.1, Feature 1, EU222.2, EU240.4, EU240.5, EU240.6 and 242.2).

Table 7-13 summarizes the shellfish diversity and shell breakage in Billops Ridge site soil strata and features, and in site areas. Excavation levels and features with rare shell densities (less than 1 kilogram per cubic meter) were excluded from these analyses. Note that shell taxa mean percentages and standard deviations were based on level and feature percentages rather than shell weights. Therefore, larger EU shell samples (weights) were equated with smaller feature samples (weights), and reducing averages based on shell weights alone. Oysters were most common in feature samples, averaging 72 percent of identified shells, and were less common in A/B-horizon samples, averaging 56 percent of identified shells. Higher percentages of oysters in features might reflect shellfish gathering preferences or greater availability in less saline waters of Raritan Bay. Hard shell clams were most common in the A/B-horizon samples, averaging 43 percent of identified shells, and were less common in features, averaging 22 percent of identified shells. Higher percentages of hard shell clams seems to indicate higher salinity in association with the deeper and older A/B horizon over the A-horizon and midden average, 33 percent of identified shells. Perhaps drier climatic conditions prevailed during the Early or early Middle Woodland period, reducing fresh water discharge and increasing salinity and hard shell clam availability in Raritan Bay. Soft shell clams were also most common in the A/B-horizon, averaging only 1 percent of identified shells. Channel whelks were most abundant in features, averaging only 0.3 percent of identified shells. Scallops were reported too infrequently to include in this summary. Shell densities and percentages of oysters and hard shell clams at the Satterlee Street Locus 2 part of the Billops Ridge were similar to patterns observed at other areas of the Billops Ridge site investigated by JMA in 2004 (Pickman and Yamin 2004:88).

Shell diversity was compared between site areas (Table 7-13). Oysters were most common in the Northern Midden Area, averaging 76 percent of identified shells, and were least common in the Central Feature Area, averaging 55 percent of identified shells. Hard shell clams were most common in the Central Feature Area, averaging 45 percent of identified shells, and were least common in the Northern Midden Area, averaging 23 percent of identified shells. Soft shell clams were also most common in the Central Feature Area, averaging only 0.6 percent of identified shells. Channel whelks were most common in the Southern Feature Area, averaging only 0.4 percent of identified shells. Again, scallops were reported too infrequently to include in this summary. In conclusion, if spatial patterns of shellfish are analogous to stratigraphic patterning, then the Central Feature Area and Southern Feature Area, with more hard shell clams, might reflect shellfish populations collected during more recent periods when sea levels were higher, or during a drier climatic period when fresh water discharge was reduced.

Table 7-13 also indicates patterns of shell breakage in strata and features, and in site areas. Less breakage was reflected by higher percentages of shells greater than ½-inch. Consistent with stratigraphic expectations, less breakage occurred in the deeper A/B-horizon samples, averaging 58 percent of shells greater than ½ inch. Shells were more fragmentary in the A-horizon and midden, averaging 45 percent of shells greater than ½ inch, and subjected to greater breakage from historic road travel along Satterlee Street. Shell breakage was less in the Southern Feature Area, averaging 55 percent of shells greater than ½ inch. Shells were more broken in the Central Feature Area, averaging 44 percent of shells greater than ½ inch.

### 7.4.2 Oyster Shell Analysis

Oysters grow in a broad range of environmental conditions with respect to salinity, water temperatures, depths and bottom sediments that affect shell growth (Kent 1988). Many studies have examined the left valves of oysters for

growth patterns in varying habitats, and associations with parasites (e.g. Kent 1988; Custer and Doms 1990; Steponaitis and Herbert 1995).

At the Billops Ridge site, 163 oyster left valves were analyzed for height, length, height/length ration and observed oyster parasites. Oyster samples were selected only from unit-levels and features that contained a minimum number of 10 or more whole (unbroken) left valves. In total, oyster shells were selected from six excavation levels (EU217.1, EU221.2, EU234.2, EU240.4, EU240.5, and EU242.3) and four features (Features 1, 5, 11 and 17) (Appendix D). Table 7-14 summarizes measurements (in millimeters) of left valve heights, lengths, and height/length (H/L) ratios within EU levels and features. Note that the shell samples from two midden levels in EU240 were combined in this analysis.

The average height of the oysters recovered best reflects the general age of shellfish collected. As shellfish gathering became more intensive, the general oyster ages (heights) were likely to decrease. The oldest (largest) oyster shells were all located in the Southern Feature Area, in Features 5, 17 and 1. This might reflect an occupation at the Billops Ridge site following a long period of abandonment when shellfish grew to larger sizes under reduced gathering pressure. In contrast, oyster shells were smallest in Feature 11, the only feature at the Billops Ridge site that contained historic-period artifacts. While oyster gathering was often intensive during precontact periods, permanent Euro-American settlements during the historic period might have exposed near-shore oyster beds to prolonged gathering, thus reducing the sizes of oyster shells. Therefore, Feature 11 might be a historic feature that included re-deposited precontact artifacts.

Shell shapes can yield information about the substrates in which oysters grew. Elongated shells with height/length rations greater than 2.0, are commonly found in densely packed oyster reefs or in soft mud (Kent 1988:28, 30). Very round oysters, with height/length ratios less than 1.3 are often associated with hard surfaces. Intermediate ratios (1.3 to 2.0) are common with oysters growing singly or in small clusters in mixed mud and sand (Kent 1988:28). As indicated in Table 7-14, most oyster shells at the Billops Ridge site suggest gathering in near-shore mud and sand. Feature 5 had the greatest variability (standard deviation 0.45) suggesting the widest range of exploited habitats.

Analysis of oyster parasites can provide additional information about the estuarine habitats exploited by precontact people (Kent 1988:39-47). *Clionid* sponges are particularly sensitive to salinity and do not grow on oysters in brackish intertidal areas *Cliona celata* generally are found where salinity is more than 15 ppt and create large boreholes (0.8 to 4.5 millimeters in diameter). *C. trutti* can survive somewhat less saline conditions, and creates clusters of smaller boreholes. *Polychaete* worms leave distinctive double holes on oyster shells and are common below the tidal fluctuations on muddy bottoms (Kent 1988:42). Atlantic oyster drill snails (*Urosalipinx cinerea*) die when salinity drops below 15 ppt (Federighi 1931).

Table 7-14 summarizes the percentage of oyster shells in excavation and feature samples that contain oyster parasites. Perhaps significantly, oyster parasites were generally more common in the Southern Feature Area than in the Northern Midden Area or Feature 11 in the Central Midden Area. The Southern Feature Area might reflect exploitation of higher salinity habitats. Note also, among shellfish taxa (Table 7-13) hard shell clams were more common in the Southern Feature Area than in the Northern Midden Area, also perhaps indicating higher salinity during periods when oysters were gathered and deposited in the southern part of the site.

## 7.5 Faunal Analysis (by Thomas Amorosi and Stuart A. Reeve)

As indicated on Tables 7-1 and 7-2, bone fragments were extremely common in excavations and features at the Billops Ridge site. In total, 500 bone fragments were recovered at the site, mostly in fine-screen samples. HPI archaeologists were extremely sensitive to possibilities of unearthing human skeletal remains. For example, during Phase 1B/2 Testing a large long bone fragment was recovered from ST179 (N220). This was sent to Dr. Thomas Amorosi for verification that it was non-human. During Phase 3 excavations bone fragments were found to be most common in the A-horizon/midden and in features (115.5 and 103.5 bone fragments per cubic meter, respectively). Most bone fragments were very small, and very few fish, bird, rodent or other small bones were recovered in fine-screen samples. One rodent mandible was recovered from EU217.4.03, and one fish scale was identified in Feature 12 (Cat. 227.3). The best information regarding animal resources came from six preserved

large mammal teeth. These were submitted to Dr. Amorosi at Montclair State University. Dr. Amorosi's analyses are presented below:

> **Cat. 214.1.02.** EU N200E1, A-horizon/midden, Southern Feature Area. **Taxonomic Assignment:** Canidae (Wolves, Dogs and Foxes). **Tooth:** Lower left canine, the tooth apex is closed and there is minimal to moderate wear on the tooth's occlusal surface. **Age:** Young to Mature adult age range, more than 7 months. **Comment:** Unfortunately an isolated tooth is not the best diagnostic trait to distinguish between large sized dogs and wolves. When comparing this tooth against my reference samples, the CHP canine falls within the upper range of large dogs and the lower range of wolves. Therefore it is taxonomically appropriate to give the tooth the biological Family assignment. Whether this remain reflects its historic period context or that of the Pre-Contact lithic materials depends on the tooth's stratigraphic recovery.
>
> **Cat. 221.2.02.** EU N204E3, A/B-horizon transition, Southern Feature Area. **Taxonomic Assignment:** *Odocoileus virginianus* (White-tailed Deer). **Tooth:** Right lower molar 1, the tooth root's apices are closed. There is a moderate amount of dental wear on the occlusal surface. Although Grant's (1982) dental wear stages were intended for domestic ungulates, a T.W.S. assignment of g-h is observed. **Age:** Young to Mature adult age range, > 12 months.
>
> **Cat. 227.4.** Feature 13, N209.1E2.7, Central Feature Area. **Taxonomic Assignment:** *Odocoileus virginianus* (White-tailed Deer). **Tooth:** Maxillary premolar fragment. **Age:** Adult age range.
>
> **Cat. 230.4.** Feature 9, N212.3E2.3, Central Feature Area. **Taxonomic Assignment:** *Bos taurus* (Domestic Cattle). **Tooth:** Left lower molar 1, the tooth's root apices are closed, and there is a heavy amount of dental wear on the occlusal surface (Grant's dental wear T.W.S. o-p, Grant 1982). The tooth also exhibits a heavy amount of dental plaque on all aspects of the crown extending down pass the cementum enamel junction. There is also a "wrinkling" of the buccal enamel surface. **Age:** Mature to Senile adult age range, more than 18 months. **Comment:** Although the site context information indicates a Pre-Contact date, this tooth could either be intrusive from the Plow Zone or brought onto site by Native Americans as curio. This is not an unusual occurrence for this time period or location. There is a low frequency of recovering Euro-American domesticates (mostly cattle, caprines and pigs) from Late Woodland contexts in the lower Hudson and New York Harbor area (Amorosi 1991).
>
> **Cat. 240.4.01.** EU N226E3, A-horizon/midden, Southern Midden Area. **Taxonomic Assignment:** *Odocoileus virginianus* (White-tailed Deer). **Tooth:** Right upper premolar 3. The tooth is missing its roots (no observation possible on root closure), however, the tooth's occlusal dental wear can be assigned to Grant (1982) T.W.S. g-h. **Age:** Mature adult age range, approximately 29 months.
>
> **Cat. 240.4.05.** EU N226E3, A-horizon/midden, Southern Midden Area. **Taxonomic Assignment:** *Odocoileus virginianus* (White-tailed Deer). **Tooth:** Left upper premolar 3, the tooth was in an erupting state. **Age:** Young adult age range, approximately 29 months.

Analyses of deer teeth at the Billops Ridge site indicated that hunting was probably an important activity among precontact people. The Canidae tooth from the A-horizon midden at EU214.1.02 can not be attributed to dog or wolf, based on morphology or stratigraphic relationship. The senile cow from Feature 9 is interesting given interpretations of unusually small oyster shells an historic artifacts in Feature 11, found in the same 1x1-meter EU (EU230). Features 9 and 11 might reflect either a Contact Period Native American occupation or an historic Euro-American occupation.

## 7.6 Botanical Analysis (by Justine Woodard McKnight and Stuart A. Reeve)

Charcoal fragments and other indications of plant remains were scarcely identified during fieldwork, and also were rare when sorting fine screen samples. Two to five liter soil samples were extracted from the southeast quads of most levels excavated in the A-horizon/midden and A/B-horizon transition for possible flotation to extract carbonized plant remains. However, as fine-screen sorting progressed and little charcoal was found, expectations diminished for the preservation of plant remains.

Three soil samples were selected for flotation and botanical analyses possibly relating to precontact occupations at the Billops Ridge site. Soil samples were from Feature 5 (Cat, 217.6), Feature 11 (Cat. 230.6), and from the buried shell midden in EU240.4 (Table 7-15).

Two-liter soil samples were processed at the archaeological laboratory of Historical Perspectives, Inc., using water flotation. The recovered light fractions were submitted for analysis to archeobotanist Justine Woodard McKnight.

Fraction matrices were generally composed of non-carbonized roots, small snails, and spherical silicaceous material (which is formed when plant parts high in silica – such as grass leaves and stems – are burned and the silica melts and forms droplets which persist in the archaeological record). Each flotation sample was passed through graduated geological sieves to provide divisions for analysis. Weights and sample descriptions of the resulting greater-than or equal-to 2 millimeters and less-than 2 millimeter fractions were recorded. The greater-than or equal-to 2 millimeter botanical specimens were examined under low magnification (10X to 40X) and sorted into general categories of material (i.e. wood, seeds, etc.). Descriptions were recorded for each category of the greater-than or equal-to 2 millimeter material. The less-than 2 millimeter size fractions were examined under low magnification, described, and scanned for the remains of seeds or cultivated plants.

Identifications were attempted on all recovered plant remains, according to standard practices (Pearsall 2000). Identifications of all classes of botanical remains were made to the genus level when possible, and to the species level only when the assignment could be made with absolute certainty. When botanical specimens were found to be in eroded or fragmentary condition, a variety of general categories were used to reflect the degree of identification possible. General wood categories within the analyzed assemblage include *'deciduous taxa'* and *'unidentifiable'*.

All identifications were made under low magnification (10X to 40X) with the aide of standard texts (Panshin and deZeeuw 1980; Schopmeyer 1974; Martin and Barkely 1961; Hoadley 1990), and checked against plant specimens from a modern reference collection representative of the flora of the project area (Collins and Anderson 1994; Mitchell and Tucker 1997; Gleason 1962). Specimens were weighed using an electronic balance accurate to 0.01 grams.

Flotation processing of a total of six liters of cultural fill yielded 0.07 grams of carbonized plant material (an average of 0.012 grams of carbonized material per liter of processed fill). Carbonized plant macro-remains were recovered from EU240.4 and Feature 5, but were absent from Feature 11. An inventory of recovered plant macro-remains is provided in Table 7-16.

Carbonized archeobotanical remains were limited to wood charcoal. Present in the flotation samples from Feature 5 and the buried shell midden, wood charcoal totaled 15 greater-than 2 millimeter fragments (weighing 0.07 grams). Hickory *(Carya spp.)* was identified (3 fragments or 20 percent of the wood assemblage, by fragment count). Forty-six percent of the wood assemblage was classified as *'deciduous taxa'* and 33 percent was *'unidentifiable'*.

Non-carbonized seeds were present within two of the analyzed flotation samples, the buried shell midden sample from EU240.4 and the sample from Feature 11. Jimson weed *(Datura stramonium)* seeds were identified. Jimson weed is of neotropical origin, and is now widely introduced throughout the northeastern United States (Gleason and Cronquist1991:405-406). These seeds recovered from Billops Ridge are probably historic or modern origin, and are unrelated to precontact activities at the site. Their recovery from buried levels and features at the Billops Ridge site might have resulted from burrowing rodents or from downward migration through sandy soils.

In conclusion, the archeobotanical assemblage from the Billops Ridge site provides data regarding local landscape conditions during the precontact period. The site lies within the Oak-Chestnut Forest Region as defined by Braun (1950:248) and within the Appalachian Oak Forest Region according to Kuchler (1964). Native forest cover over the region was characterized by a mixture of species including oaks, chestnut, hickory, maple, birch, ash, and elm (Taylor 1923; Russell 1981). The archeobotanical assemblage recovered from features at the site is predominantly composed of wood charcoal, and identification of wood fibers reveals that deciduous tree species native and common to the region were utilized at the site. Similarly, studies of wood charcoal at Wards Point site identified walnut (*Juglans* spp,), oak (*Quercus* spp.), hickory (*Carya* spp.) and elm (*Ulmus* spp.) (Ceci 1990:17). The archeobotanical assemblage at the Billops Ridge site contained no edible plants or cultigens, preventing assessment of precontact subsistence practices.

An extremely low density of carbonized plant remains was recovered in flotation samples, an average of 0.012 grams of carbonized material per liter of processed fill. Also, historic or modern non-carbonized plant remains were discovered in buried levels and features. No plant taxa were preserved that might have reflected precontact plant resources. Therefore, analyses of additional flotation samples are not recommended.

## 7.7 Billops Ridge Site Summary

Phase 1B/2 Testing identified precontact and historic artifacts, bones, and diverse marine shells beneath Satterlee Street between approximately N200 and N225 meters (610 and 738 feet) north from the intersection of Hylan Boulevard. This interval was identified as Satterlee Street Locus 2 in the area proposed for utility trenching. Satterlee Street Locus 2 is probably part of the previously identified Billops Ridge site, located west of Satterlee Street in Conference House Park and tested during the 1920s by Mark R. Harrington of the Museum of the American Indian-Heye Foundation. JMA also conducted archaeological investigations in 2002 and 2004 at the Billops Ridge site in Conference House Park (Pickman and Yamin 2004; Heaton 2004).

Utility trenching at Satterlee Street Locus 2 included an area of approximately 138 square meters (0.03 acres). HPI's Phase 1B/2 investigation in this area included the excavation of six 50x50 centimeter STs at five meter intervals (a 1.1 percent site sample) to identify the site boundaries. Phase 3 investigations included the excavation of five additional STs and 18 1x1-meter EUs. In total, archaeological excavations recovered data from a 15 percent sample of the impacted site area. Following excavations, machine stripping of pavement and road fill allowed for the recovery of archeological features.

In total, 18 precontact features were identified and excavated at the Billops Ridge site in the area of Satterlee Street Locus 2 construction. Excavations yielded 1,263 Precontact artifacts, 392 historic artifacts, 500 bone fragments, and over 76 kilograms of marine shells and shell fragments. Site stratigraphy was complex, with areas of dense shell middens, bone fragments, and precontact and historic artifacts in A-horizon topsoil buried beneath road fill. Historic artifacts and shells decreased dramatically in the deeper A/B-horizon transition and B-horizon sand. However, precontact artifacts and bone fragments were recovered in these deeper strata. The 18 features were mostly small conical, basin or bell-shaped depressions of dark brown to black soils, often with dense shells, that extended into dark yellowish brown B-horizon sands. Most features are attributed to precontact occupations.

Projectile points were rare, but indicated Early and Middle Woodland occupations. Precontact pottery was common but often included unidentifiable crumbs or body sherds that were mostly attributable to Early to Middle Woodland types. Only two possible Late Woodland pot sherds were identified. Historic artifacts were mostly of nineteenth or twentieth-century origins and did not indicate an historic archaeological site. Lithic knapping employed small numbers of local quartz, quartzite, and other cobbles from beaches and till, but many more chert and jasper artifacts were found, possibly indicative of trade. Non-random distributions of lithic types, and pecked and ground cobbles and fire-cracked rocks indicated varying activities, both between site strata and site areas. Stratigraphic and spatial diversity among marine shells also indicated varying activities over time. In particular, greater percentages of hard shell clams and oyster parasites might reflect the exploitation of higher salinity marine resources in the Southern Feature Area than in the Northern Midden Area of the site. Higher salinity was also indicated in the A/B-horizon perhaps indicating an Early Woodland dry period with reduced fresh water runoff into Raritan Bay, and perhaps moister climates and reduced salinity during the Middle Woodland period. Oyster shell analyses suggested that precontact people exploited oysters from mostly mixed sand and mud bottoms, probably adjacent to the site.

Although bone fragments were frequent in the excavations, few were identifiable. Very few skeletal remains were observed from fish, bird, or small mammals, probably due to poor preservation in sandy soils. Net impressions on precontact pottery suggest that fishing probably was an important economic activity for Early Woodland occupants and probably later people at the Billops Ridge site. Six tooth fragments indicated hunting of mature deer, one wolf or large dog, and a senile cow, perhaps from a Contact-Period or historic feature. Botanical analyses were most disappointing. Little charcoal was preserved in features or soil strata, preventing radiocarbon dating. Only small fragments of hickory charcoal and non-carbonized seeds of jimson weed, a historically introduced plant, were recovered.

# 8.0 SUMMARY AND CONCLUSIONS

From July 19 to November 17, 2004, HPI conducted Phase 1B to Phase 3 archaeological investigations at the South Richmond Drainage-Conference House Park Watershed prior to utility trenching. The archeological investigations were conducted along five streets adjacent to Conference House Park, described in Section 1.0. The park contains the Wards Point site—the largest known Native American cemetery in the New York City Area and a National Historic Landmark. The park also contains the Conference House-Billopp House which is listed on the National Register of Historic Places, as well as other historic structures and precontact archaeological sites, described in Section 2.0. Furthermore, Native American burials were previously identified at Conference House Park immediately adjacent to streets where new water mains, sanitary sewers and storm water drains would be installed. HPI's archaeological investigations at the South Richmond Drainage-Conference House Park Watershed were conducted to identify precontact period Native American archaeological sites and/or burials, as well as historic Euro-American sites possibly buried beneath streetbeds.

## 8.1 Phase 1B/2 Archaeological Results

HPI's Phase 1B/2 archeological investigations, described in Section 3.0, included completing machine-excavated STs to remove pavement and road fill, and the hand-excavation of 50x50 centimeter STs in areas with preserve Holocene-age soils. At Swinnerton Street, 27 STs were excavated, but only one contained shell fragments and a possible precontact fire-cracked rock. Monitoring of trench excavations along southern Swinnerton Street identified no shell layers or archaeological features, and no additional archaeological investigations were recommended along Swinnerton Street.

Along Clermont Avenue, 59 tests were machine-excavated. At the west end of the street, shell fragments were recovered in five STs, historic artifacts were recovered in two STs, and one ST contained a possible precontact fire-cracked rock. Monitoring was conducted at the west end of Clermont Avenue during machine excavations of the new water main trench, but no archaeological features were identified. No additional archaeological investigations were recommended along Clermont Avenue.

Massachusetts Street contained Holocene-age soils beneath road fill. In total, 45 machine-excavated tests were dug at 5-meter intervals, and 44 STs were dug in areas with preserved A-horizon topsoil and alluvium, and B-horizon sands. Shell fragments were identified in 22 STs, 7 STs contained precontact artifacts, and 8 STs contained historic artifacts. Phase 3 monitoring of utility trenching and mitigation of the preserved archaeological features were recommended along Massachusetts Street.

Seven STs were dug along the western end of Hylan Boulevard. Soil profiles indicated a filled wetland or spring, but no shell fragments or artifacts were recovered. Monitoring was conducted at the west end of Hylan Boulevard during the installation of a new water main, and no shell fragments or preserved A-horizon topsoils were observed. No additional archaeological investigations were recommended along Hylan Boulevard.

At Satterlee Street, 42 STs were excavated in machine excavated trenches. Shell fragments were identified in 19 STs, Prehistoric artifacts or mammal bone fragments were recovered in 13 STs, and 13 STs contained historic artifacts. Phase 3 archaeological excavations were recommended at two locations along Satterlee Street, designated as Locus 1 and Locus 2. Satterlee Street Locus 1 was an area with possible Colonial period artifacts located at N075 meters (246 feet) north from the intersection of Hylan Boulevard. Four 1x1-meter EUs were recommended at Satterlee Street Locus 1 in the area where Colonial artifacts were recovered, east of the Colonial-period Conference House-Billopp House. At Satterlee Street Locus 2, dense concentrations of shell, precontact artifacts, bone fragments, and historic artifacts were recovered from N200 to N225 meters (656 feet to 738 feet) north from the intersection of Hylan Boulevard. Previous archaeological investigations had identified the Billops Ridge Precontact site in Conference House Park, immediately west of Satterlee Street Locus 2. Ten 1x1-meter EUs were recommended in areas of proposed utility trenching at Satterlee Street Locus 2. In addition, monitoring was recommended along Satterlee Street during utility trenching from Hylan Boulevard north for 230 meters (755 feet) to recover possible precontact and historic features and to identify human burials, if present.

## 8.2 Phase 3 Data Recovery and Monitoring Results

Following Phase 1B/2 investigations, HPI submitted a Phase 3 Data Recovery Plan and a proposal for monitoring along Massachusetts Street and Satterlee Street, described in Section 4.0.

Phase 3 monitoring of utility trenches along Massachusetts Street, described in Section 5.0, identified areas with preserved topsoil and shell fragments below the streetbed that extended north from Clermont Avenue for 85 meters (280 feet). Farther north, buried wetland soils were identified beneath Massachusetts Street. Three features were identified and mitigated in the utility trenches. Feature 1, at N004 in the east trench, was probably a filled telephone pole hole, not a significant cultural resource. Feature 2, at N092 in the east trench was a historic pit that contained early twentieth-century domestic and architectural artifacts. Feature 2 was not considered a significant cultural resource. Feature 3, at N055.9 in the west trench was a basin-shaped pit, 20 centimeters in diameter, which contained shell fragments and three cobbles. However, no precontact or historic artifacts were recovered from the feature fill. Feature 3 might be related to precontact occupations at the Wards Point site in Conference House Park immediately to the west. In addition, the filled wetlands identified during trench monitoring along Massachusetts Street might have provided fresh water to precontact people occupying the Wards Point site.

Phase 3 excavations at Satterlee Street Locus 1, described in Section 6.0, discovered that the area recommended for testing around N075 had been previously disturbed by filling and road cuts. No additional Colonial-period artifacts were recovered from the two 1x1-meter EUs completed, and additional excavations were not conducted due to soil disturbances. Monitoring was not recommended in the west trench for the proposed storm water drain along lower Satterlee Street, due to historic road disturbances and rocky clay subsoils. Monitoring was conducted in the east trench for the proposed water main and the center trench for the proposed sanitary sewer. No shell fragments or archaeological features were observed in the east trench from Hylan Boulevard north to N170 meters (578 feet). In the center trench, 26 historic post-hole features were identified between N011 and N053 meters (36 to 174 feet north from Hylan Boulevard). The Fenceline site contained remains of a post and rail fence that formerly stood along the east side of the Bentley Manor Farm Lane, now Satterlee Street. At least two episodes of fence construction were indicated by paired post holes. Preserved red cedar posts were recovered from two post holes.

Phase 3 data recovery and monitoring at Satterlee Street Locus 2 was described in Section 7.0. Utility trenching at Satterlee Street Locus 2 included an area of approximately 138 square meters (0.03 acres). HPI's Phase 1B/2 investigation included the excavation of six 50x50 centimeter STs at five meter intervals (a 1.1 percent sample of the impacted area) to identify the site boundaries. Subsequent Phase 3 investigations included the excavation of five additional STs and 18 1x1-meter EUs. In total, archaeological excavations recovered data from a 15 percent sample of the impacted site area. Following excavations, the machine stripping of pavement and road fill allowed for the recovery of archeological features. In total, 18 precontact features were recovered at the Billops Ridge site in the area of Satterlee Street Locus 2 construction. Excavations yielded 1,263 precontact artifacts, 392 historic artifacts, 500 bone fragments, and over 76 kilograms of marine shells and shell fragments. Precontact artifacts and features were part of the Billops Ridge site, located west of Satterlee Street in Conference House Park.

Site stratigraphy was complex, with areas of dense shell middens, bone fragments, and precontact and historic artifacts in A-horizon topsoil buried immediately beneath the road fill. Historic artifacts and shells decreased dramatically in the deeper A/B-horizon transition and B-horizon sand. However, precontact artifacts and bone fragments were recovered in these deeper strata. The 18 features were mostly small conical, basin or bell-shaped depressions of dark brown to black soils, often with dense shells, that extended into dark yellowish brown B-horizon sands. Most features are attributed to precontact deposition.

Phase 3 archaeological investigations at the Satterlee Street Locus 2 site were guided by a research design and research questions developed in a formal Data Recovery Plan accepted by both LPC and SHPO, and described in Section 4.1. These research questions are addressed below.

> *What is the evidence for the chronology for human occupations, based on radiometric dating of features, diagnostic Precontact projectile points, Precontact- and historic-period pottery, and other artifacts?*

At Satterlee Street Locus 2, definitive evidence is lacking for the complete range of human occupations at the Billops Ridge site. Unfortunately, charcoal was extremely rare in excavations, fine screen samples and flotation

samples, and thus no charcoal samples were submitted for radiocarbon dating. As described in Section 7.2.1, precontact projectile points were rare, including one Early Woodland Rossville point, one Middle Woodland Fox Creek stemmed point and one Middle Woodland Greene/Fox Creek lanceolate or Jack's Reef pentagonal point. No projectile points were recovered that clearly indicated Late Archaic or Late Woodland occupations. As described in Section 7.2.2, precontact pottery was common but often included unidentifiable crumbs or body sherds that were mostly attributable to Early to Middle Woodland types. Only two possible Late Woodland pot sherds were identified. As described in Section 7.2.3, historic artifacts were mostly of nineteenth or twentieth-century origins and did not indicate an *in situ* historic archaeological site.

*Do Precontact lithic artifacts reflect specific tasks or social groups, related to knapping processes or tool wear?*

As described in Sections 7.2, 7.4 and 7.5, precontact artifacts, varying shell densities and features indicated three distinct site areas within the Satterlee Street Locus 2 excavations: the Southern Feature Area, the Central Feature Area, and the Northern Midden Area. Non-random distributions of lithic types, pecked and ground cobbles and fire-cracked rocks and shell taxa indicated varying activities, both between site strata and site areas. The Southern Feature Area contained greater than expected numbers of total lithic knapping artifacts and features containing large oyster shells and oyster parasites. The Central Feature Area contained greater than expected numbers of quartz artifacts and miscellaneous other lithic types, including fire-cracked rocks, as well as hard and soft shell clams in comparisons with other site areas. The Northern Midden Area had higher than expected numbers of fire-cracked rocks and higher percentages of oyster shells than other site areas.

Differing activities were also indicated between site strata. Beneath the road fill dense concentrations of marine shells, bone fragments, and precontact and historic artifacts were recovered in A-horizon topsoil. Historic artifacts and shells decreased dramatically in the deeper A/B-horizon transition and B-horizon sand. However, precontact artifacts and bone fragments were recovered in these deeper strata. Precontact artifacts, bone fragments, and shells were also recovered in most features.

*Is there archaeological evidence for regional interaction and/or trade within Precontact periods? In particular, were yellow jasper and chert artifacts procured locally, or through long-distance transport?*

Lithic knapping employed small numbers of local quartz, quartzite, and other cobbles from beaches and till, but produced many more chert and jasper artifacts of questionable origins. Some jasper artifacts might have been procured from cobbles in the Raritan Formation. However, it is likely that many of the chert and jasper artifacts found were a result of trading with groups occupying the Delaware River valley and upper Hudson River valley. There was not enough data available to make a definitive determination of the origins of lithics, and whether they were procured from trade or travel. Differences were not observed in the distributions of chert and jasper artifacts between site strata or site areas. Non-local rhyolite, argillite, and slate artifacts were very rare in the Satterlee Street Locus 2 excavations.

*What is the diversity of marine and terrestrial animal and plant remains in datable archeological features?*

Marine shells were common in Satterlee Street Locus 2 excavations. Nearly 42 kilograms of shells and shell fragments from fine-screen samples were classified into shellfish taxa. Shell taxa that were possibly used as subsistence resources included oysters, hard shell clams, soft shell clams, channel whelks, scallops, and to a lesser extent, New England dog whelks and other marine taxa. Oyster percentages were highest in relation to other shellfish in the Northern Midden Area than in other site areas. Percentages of oysters also were higher in features than in soil strata. The highest percentages of hard shell and soft shell clams were observed in the Central Feature and in the A/B-horizon, below the A-horizon and shell midden. Although bone fragments were common in excavations, few were identifiable. Very few skeletal remains were observed from fish, bird, or small mammals in excavations and fine-screen samples, probably due to poor preservation in sandy soils. Net impressions on precontact pottery suggested that fishing probably was an important economic activity for Early Woodland occupants and probably later people at the Billops Ridge site. Six tooth fragments indicated the presence of mature deer, one wolf or large dog, and a senile cow, perhaps from a Contact-Period or historic feature. Botanical analyses were most disappointing. Little charcoal was preserved in features or soil strata. Only small fragments of hickory

charcoal and non-carbonized seeds of jimson weed, a historically introduced plant, were recovered. No evidence was recovered for precontact cultigens or agricultural storage features.

*Do these biotic remains indicate processes of environmental change or changes in human environmental selection between Precontact and Historic periods, such as seasonal variations in the use of estuarine resources?*

Stratigraphic and spatial diversity among marine shells possibly indicated changing estuarine environments and biotic communities. In particular, greater percentages of hard shell clams and oyster parasites might reflect the exploitation of higher salinity marine resources in the Southern Feature Area than in the Northern Midden Area of the site. Higher salinity was also indicated in the A/B-horizon by higher percentages of hard shell clams, perhaps indicating an Early Woodland dry period with reduced fresh water runoff into Raritan Bay, and perhaps moister climates and reduced salinity during the Middle Woodland period. Oyster shell analyses suggested that precontact people exploited oysters mostly from mixed sand and mud bottoms, probably adjacent to the site. No analyses were conducted for seasonality of shellfish harvests or mammal tooth deaths.

*Is evidence preserved for Native American ideological systems possibly associated with the Burial Ridge cemetery, including possible undiscovered burials or artifacts associated with ceremonial activities?*

Non human remains were recovered during Phase 1B/2 and Phase 3 investigations at the South Richmond Drainage-Conference House Park Watershed. No unusual artifacts were recovered that might relate to Native American ideological systems or ceremonial activities.

In conclusion, Phase 1B/2 and Phase 3 recovered abundant evidence for precontact occupations at the Billops Ridge site, the historic agricultural landscape at the Fenceline site, and former wetland landforms along Massachusetts Street and Hylan Boulevard. Recovered archaeological data contributes to broader understanding of precontact lifeways and estuarine ecosystems of Raritan Bay during the Early and Middle Woodland Periods, perhaps from 3000 to 1000 BP. Archaeological information has been reported that will aid management and public interpretation of cultural resources at Conference House Park, immediately adjacent to this project.

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Table 6-1. Fenceline Site: Alternate Feature Comparisons

| Cat. | Feature | Fence | Location (m) | Post Mold | Depth (cm) | Area (m2) | Length Rail (m) | Length Rail (ft) |
|---|---|---|---|---|---|---|---|---|
| 184 | Fea. 1 | A | N011.0 E3.8 | Absent | 52 | 0.03 | | |
| | | | Rail | | | | 5.3 | 17.4 |
| 186 | Fea. 3 | A | N016.3 E3.77 | Present | 45 | 0.05 | | |
| | | | Rail | | | | 2.7 | 8.9 |
| 188 | Fea. 5 | A | N019.0 E3.26 | Present | 60 | 0.07 | | |
| | | | Rail | | | | 4.4 | 14.4 |
| 190 | Fea. 7 | A | N023.4 E3.92 | Present | 80 | 0.05 | | |
| | | | Rail | | | | 3.35 | 11.0 |
| 192 | Fea. 9 | A | N026.75 E3.94 | Present | 72 | 0.05 | | |
| | | | Rail | | | | 3.75 | 12.3 |
| 195 | Fea. 12 | A | N030.5 E4.2 | Present | 85 | 0.06 | | |
| | | | Rail | | | | 3.5 | 11.5 |
| 197 | Fea. 14 | A | N034.0 E3.8 | Present | 88 | 0.03 | | |
| | | | Rail | | | | 3.6 | 11.8 |
| 199 | Fea. 16 | A | N037.6 E3.8 | Absent | 57 | 0.03 | | |
| | | | Rail | | | | 3.6 | 11.8 |
| 201 | Fea. 18 | A | N041.2 E4.05 | Present | 78 | 0.14 | | |
| | | | Rail | | | | 3.7 | 12.1 |
| 204 | Fea. 21 | A | N044.9 E4.28 | Absent | 93 | 0.05 | | |
| | | | Rail | | | | 4.5 | 14.6 |
| 206 | Fea. 23 | A | N049.4 E4.13 | Wood | No Data | 0.06 | | |
| | | | Rail | | | | 1.4 | 4.6 |
| 208 | Fea. 25 | A | N050.8 E4.23 | No Data | No Data | 0.05 | | |
| | Fenceline | A | Average | 73% molds | 71.00 | 0.056 | 3.62 | 11.87 |
| 185 | Fea. 2 | B | N011.7 E3.8 | Absent | 49 | 0.04 | | |
| | | | Rail | | | | 5.45 | 17.9 |
| 187 | Fea. 4 | B | N017.15 E3.7 | Present | 55 | 0.07 | | |
| | | | Rail | | | | 2.85 | 9.3 |
| 189 | Fea. 6 | B | N020.0 E3.7 | Present | 60 | 0.07 | | |
| | | | Rail | | | | 3.9 | 12.8 |
| 191 | Fea. 8 | B | N023.9 E3.9 | No | 76 | 0.06 | | |
| | | | Rail | | | | 3.25 | 10.7 |
| 193 | Fea. 10 | B | N027.15 E3.98 | Present | 82 | 0.05 | | |
| | | | Rail | | | | 3.65 | 12.0 |
| 196 | Fea. 13 | B | N030.8 E4.2 | Present | 70 | 0.06 | | |
| | | | Rail | | | | 3.7 | 12.1 |
| 198 | Fea. 15 | B | N034.5 E3.8 | Present | 70 | 0.06 | | |
| | | | Rail | | | | 3.5 | 11.5 |
| 200 | Fea. 17 | B | N038.0 E3.8 | Wood | 57 | 0.12 | | |
| | | | Rail | | | | 3.8 | 12.5 |
| 202 | Fea. 19 | B | N041.8 E4.1 | Present | 70 | 0.07 | | |
| | | | Rail | | | | 3.3 | 10.8 |
| 205 | Fea. 22 | B | N045.1 E4.05 | Absent | 61 | 0.07 | | |
| | | | Rail | | | | 4.5 | 15.8 |
| 207 | Fea. 24 | B | N049.6 E4.21 | No Data | No Data | 0.04 | | |
| | | | Rail | | | | 2.8 | 9.2 |
| 209 | Fea. 26 | B | N052.4 E4.15 | No Data | No Data | 0.09 | | |
| | Fenceline | B | Averages | 70% molds | 65.00 | 0.061 | 3.39 | 11.12 |
| 194 | Fea. 11 | unknown | N030.3 E3.9 | Yes | 55-85 | 0.05 | | |
| 203 | Fea. 20 | unknown | N042.6 E4.1 | Yes | 51-79 | 0.06 | | |

Table 7-1. Billops Ridge Site Summary: Artifact Counts and Densities

| Unit/Level/Stratum | | | Measurements | | | Precontact Artifact Category Counts | | | | | | | | | | Historic Artifact Category Counts | | | | | | | | Artifact and Shell Densities | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cat.* | Location (m) | Unit:Soils | Depth (cm) | Area (m2) | Volume (m3) | Lithic Q | Lithic Z | Lithic C | Lithic J | Lithic Other | Peck-Grind | FCR | Pot Sherd | Pot Crumb | Precont. Total | Bone | Cer | Vessel Glass | Flat Glass | Nail | Brick | Coal | Other | Hist. Total | Precont. /m3 | Historic /m3 | Bone /m3 | Shells kg/m3 |
| 169.1* | N170 E3.5 | ST:A | 18-33 | 0.25 | 0.04 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25.0 | 0.0 | 0.0 | 0.38 |
| 170.1* | N175 E1 | ST:A | 15-44 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 14.3 | 14.3 | 0.0 | 2.07 |
| 170.2* | N175 E1 | ST:B | 44-55 | 0.25 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 171.1* | N180 E3.5 | ST:A | 20-46 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.29 |
| 171.2* | N180 E3.5 | ST:B | 46-86 | 0.25 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 172.1* | N185 E1 | ST:A | 19-32 | 0.25 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 172.2* | N185 E1 | ST:B | 32-60 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 212 | N186 E0 | Fea. 18 | 33.00 | 0.38 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 24.60 |
| 213 | N188 E2 | Fea. 14 | 30-40 | 0.07 | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 1000.0 | 266.00 |
| 173.1 | N190 E3.5 | ST:A | 17-34 | 0.25 | 0.04 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50.0 | 0.0 | 0.0 | 6.25 |
| 173.2 | N190 E3.5 | ST:B | 32-60 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 174.1* | N195 E1 | ST:A | 19-42 | 0.25 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.0 | 0.0 | 0.0 | 1.43 |
| 174.2* | N195 E1 | ST:B | 42-82 | 0.25 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 214.1 | N200 E1 | EU:A | 27-40 | 1.00 | 0.13 | 1 | 0 | 14 | 4 | 1 | 0 | 4 | 2 | 1 | 27 | 47 | 2 | 1 | 0 | 1 | 1 | 4 | 4 | 13 | 200.0 | 68.2 | 361.5 | 65.17 |
| 214.2 | N200 E1 | EU:A/B | 40-53 | 1.00 | 0.13 | 0 | 1 | 1 | 3 | 0 | 0 | 3 | 0 | 11 | 19 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 61.5 | 46.2 | 38.5 | 0.86 |
| 214.3 | N200 E1 | EU:B | 53-67 | 1.00 | 0.14 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21.4 | 0.0 | 0.0 | 0.00 |
| 214.4 | N200 E1 | EU:B | 67-77 | 1.00 | 0.10 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20.0 | 0.0 | 0.0 | 0.00 |
| 175.1* | N200 E3.5 | ST:A | 38-50 | 0.25 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 33.3 | 0.0 | 0.0 | 1.67 |
| 175.2* | N200 E3.5 | ST:B | 50-77 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 215.1 | N201 E1 | EU:A | 20-40 | 1.00 | 0.20 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 8 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 40.0 | 5.0 | 15.0 | 60.38 |
| 215.2 | N201 E1 | EU:A/B | 40-49 | 1.00 | 0.09 | 0 | 2 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 3.11 |
| 215.3 | N201 E1 | EU:B | 49-56 | 1.00 | 0.07 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28.6 | 0.0 | 0.0 | 0.00 |
| 215.4 | N201 E1 | EU:B | 56-70 | 1.00 | 0.14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14.3 | 0.0 | 0.0 | 0.00 |
| 215.5 | N201.6 E1 | Fea. 4 | 32-60 | 0.02 | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 86.00 |
| 216.1 | N202. E1 | EU:A | 23-40 | 1.00 | 0.17 | 0 | 0 | 8 | 7 | 0 | 1 | 4 | 1 | 23 | 44 | 47 | 1 | 2 | 1 | 0 | 1 | 13 | 15 | 33 | 123.5 | 117.6 | 276.5 | 61.60 |
| 216.2 | N202. E1 | EU:A/B | 40-48 | 1.00 | 0.08 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 2 | 7 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 62.5 | 37.5 | 25.0 | 3.53 |
| 216.3 | N202. E1 | EU:B | 48-60 | 1.00 | 0.12 | 0 | 0 | 1 | 1 | 0 | 1 | 7 | 0 | 0 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91.7 | 0.0 | 25.0 | 0.00 |
| 216.4 | N202. E1 | EU:B | 60-70 | 1.00 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 216.5 | N202. E1 | EU:B | 70-78 | 1.00 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 217.1 | N202 E2 | EU:Midden | 16-24 | 1.00 | 0.08 | 1 | 0 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 17 | 11 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 212.5 | 37.5 | 137.5 | 360.55 |
| 217.3 | N202 E2 | EU:A/B | 24-33 | 0.58 | 0.05 | 0 | 1 | 26 | 13 | 1 | 0 | 2 | 1 | 0 | 44 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 880.0 | 0.0 | 100.0 | 64.80 |
| 217.4 | N202 E2 | EU:A/B | 33-44 | 0.61 | 0.07 | 0 | 0 | 15 | 1 | 0 | 0 | 1 | 0 | 0 | 17 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 242.9 | 0.0 | 14.3 | no data |
| 217.5 | N202 E2 | EU:B | 44-67 | 0.86 | 0.20 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35.0 | 0.0 | 0.0 | 0.00 |
| 217.6 | N202.5E2.7 | Fea. 5 | 18-67 | 0.43 | 0.09 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 7 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75.3 | 0.0 | 43.0 | 154.82 |
| 218.1 | N202 E3 | EU:A | 15-25 | 1.00 | 0.10 | 0 | 2 | 10 | 3 | 0 | 0 | 6 | 2 | 21 | 44 | 8 | 3 | 4 | 0 | 0 | 0 | 3 | 1 | 11 | 230.0 | 80.0 | 80.0 | 75.38 |
| 218.2 | N202 E3 | EU:A/B | 25-40 | 1.00 | 0.15 | 0 | 1 | 28 | 5 | 0 | 0 | 4 | 1 | 4 | 43 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 260.0 | 0.0 | 20.0 | 0.80 |
| 218.3 | N203 E3 | EU:B | 40-58 | 1.00 | 0.18 | 1 | 0 | 7 | 1 | 0 | 0 | 2 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61.1 | 0.0 | 0.0 | 0.00 |
| 218.4 | N203 E3 | EU:B | 58-71 | 1.00 | 0.13 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.7 | 0.0 | 0.0 | 0.00 |
| 218.5 | N203 E3 | EU:B | 71-81 | 0.25 | 0.03 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40.0 | 0.0 | 0.0 | 0.00 |
| 219.3 | N202.5 E5 | ST:A | 32-46 | 0.25 | 0.04 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.14 |
| 219.4 | N202.5 E5 | ST:B | 46-78 | 0.25 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 220 | N203.9 E2 | Fea. 17 | 30-86 | nd | 0.02 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150.0 | 0.0 | 450.0 | 123.50 |
| 221.1 | N204 E3 | EU:A | 13-24 | 1.00 | 0.11 | 0 | 1 | 14 | 7 | 0 | 0 | 4 | 3 | 10 | 39 | 32 | 5 | 5 | 0 | 0 | 0 | 12 | 2 | 24 | 263.6 | 109.1 | 290.1 | 58.68 |
| 221.2 | N204 E3 | EU:A/B | 24-44 | 0.91 | 0.18 | 1 | 1 | 30 | 16 | 0 | 0 | 1 | 0 | 15 | 64 | 13 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 4 | 272.2 | 22.2 | 72.2 | 12.00 |
| 221.3 | N204 E3 | EU:B | 44-53 | 1.00 | 0.09 | 0 | 0 | 8 | 1 | 0 | 0 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111.1 | 0.0 | 0.0 | 0.00 |
| 221.4 | N204 E3 | EU:B | 53-68 | 1.00 | 0.15 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20.0 | 0.0 | 0.0 | 0.00 |
| 221.5 | N204 E3 | EU:B | 68.00 | 1.00 | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 221.6 | N204.2 E3.8 | Fea. 1 | 24-37 | 0.09 | 0.01 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 875.0 | 0.0 | 750.0 | 103.13 |
| 176.1* | N205 E1 | ST:A | 20-43 | 0.25 | 0.06 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 35 | 37 | 4 | 5 | 0 | 0 | 1 | 0 | 15 | 0 | 21 | 33.3 | 100.0 | 66.7 | 13.42 |
| 176.2* | N205 E1 | ST:B | 43-67 | 0.25 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |

Notes: * Phase 1B/2. ST shovel test, EU excavation unit, Fea. feature, A topsoil, A/B transition, B sand. Q quartz, Z quartzite, C chert, J jasper, Peck-Grind pecked or ground stone, FCR fire-cracked rock, Cer ceramics.

Table 7-1. Billops Ridge Site Summary: Artifact Counts and Densities

| Unit/Level/Stratum | | | Measurements | | | Precontact Artifact Category Counts | | | | | | | | | | Historic Artifact Category Counts | | | | | | | | Artifact and Shell Densities | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cat.* | Location (m) | Unit:Soils | Depth (cm) | Area (m2) | Volume (m3) | Lithic Q | Lithic Z | Lithic C | Lithic J | Lithic Other | Peck-Grind | FCR | Pot Sherd | Pot Crumb | Precont. Total | Bone | Cer | Vessel Glass | Flat Glass | Nail | Brick | Coal | Other | Hist. Total | Precont. /m3 | Historic /m3 | Bone /m3 | Shells kg/m3 |
| 222.1 | N206 E2 | EU:A | 21-39 | 1.00 | 0.18 | 0 | 0 | 2 | 1 | 0 | 0 | 11 | 0 | 0 | 14 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 3 | 77.8 | 16.7 | 0.0 | no data |
| 222.2 | N206 E2 | EU:A/B | 39-48 | 1.00 | 0.09 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55.6 | 0.0 | 0.0 | no data |
| 223.1 | N207 E3 | EU:A | 17-25 | 1.00 | 0.08 | 3 | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 6 | 16 | 8 | 2 | 2 | 0 | 0 | 2 | 18 | 2 | 26 | 125.0 | 100.0 | 100.0 | 74.15 |
| 223.2 | N207 E3 | EU:A/B | 25-42 | 1.00 | 0.17 | 2 | 0 | 4 | 1 | 0 | 0 | 2 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 52.9 | 11.8 | 5.9 | 1.07 |
| 223.3 | N207 E3 | EU:B | 42-58 | 1.00 | 0.16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 224.3 | N207.5 E5 | ST:A | 31-41 | 0.25 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.64 |
| 224.4 | N207.5 E5 | ST:B | 41-61 | 0.25 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 225 | N207.8 E3 | Fea. 15 | 40-50 | 0.08 | 0.02 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55.6 | 0.0 | 111.1 | 12.56 |
| 226 | N208.6 E3.2 | Fea. 16 | 40-52 | 0.09 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 14.71 |
| 227.1 | N209 E2 | EU:A | 31-38 | 1.00 | 0.07 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 0 | 6 | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 85.7 | 42.9 | 42.9 | no data |
| 227.2 | N209 E2 | EU:B | 38-44 | 1.00 | 0.06 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83.3 | 0.0 | 0.0 | 0.00 |
| 227.3 | N209.8 E2 | Fea. 12 | 36-55 | 0.25 | 0.02 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 19 | 22 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 125.0 | 0.0 | 125.0 | 27.71 |
| 227.4 | N209.1 E2.7 | Fea. 13 | 37-81 | 0.11 | 0.05 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38.5 | 0.0 | 38.5 | 6.15 |
| 228 | N209 E5.5 | Fea. 6 | 41-46 | 0.55 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | no data |
| 177.1* | N210 E3.5 | ST:A | 20-37 | 0.03 | 0.04 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 42 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 43 | 25.0 | 0.0 | 50.0 | 28.25 |
| 177.2* | N210 E3.5 | STB: | 37-62 | 0.25 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 229.1 | N211 E3 | EU:A | 15-30 | 1.00 | 0.15 | 1 | 0 | 17 | 4 | 3 | 0 | 1 | 0 | 0 | 26 | 14 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 173.3 | 6.7 | 93.3 | 48.64 |
| 229.2 | N211 E3 | EU:A/B | 30-40 | 1.00 | 0.10 | 0 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 0 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 30.0 | 0.96 |
| 229.3 | N211 E3 | EU:B | 40-58 | 1.00 | 0.18 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16.7 | 0.0 | 0.0 | 0.04 |
| 230.1 | N212 E2 | EU:A | 27-38 | 1.00 | 0.11 | 0 | 0 | 7 | 4 | 1 | 0 | 8 | 0 | 0 | 20 | 7 | 3 | 0 | 1 | 3 | 1 | 2 | 1 | 11 | 181.8 | 81.8 | 63.6 | no data |
| 230.2 | N212 E2 | EU:A/B | 38-48 | 1.00 | 0.10 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 90.0 | 0.0 | 20.0 | 0.40 |
| 230.3 | N212 E2 | EU:B | 48-59 | 1.00 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 230.4 | N212.7 E2.3 | Fea. 9 | 38-76 | 0.11 | 0.04 | 0 | 0 | 1 | 1 | 0 | 4 | 1 | 1 | 0 | 8 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 200.0 | 0.0 | 225.0 | 66.95 |
| 230.5 | N212.9 E2.9 | Fea. 10 | 37-57 | 0.16 | 0.02 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50.0 | 0.0 | 0.0 | 30.50 |
| 230.6 | N212.2 E2.5 | Fea. 11 | 38-66 | 0.19 | 0.08 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 16 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 52.6 | 39.5 | 210.5 | 60.74 |
| 231.3 | N212.5 E5 | ST:A | 40-50 | 0.25 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 3.96 |
| 231.4 | N212.5 E5 | ST:B | 50-74 | 0.25 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 232.1 | N213 E3 | EU:A | 18-29 | 1.00 | 0.11 | 0 | 2 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 7 | 5 | 1 | 1 | 0 | 0 | 0 | 0 | 4 | 6 | 63.6 | 36.4 | 45.5 | 87.36 |
| 232.2 | N213 E3 | EU:A/B | 29-40 | 1.00 | 0.11 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 54.5 | 0.0 | 18.2 | 1.64 |
| 232.3 | N213 E3 | EU:B | 40-62 | 1.00 | 0.22 | 0 | 0 | 5 | 2 | 1 | 0 | 1 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40.9 | 0.0 | 0.0 | 0.00 |
| 233.1 | N215 E2 | EU:A | 21-32 | 1.00 | 0.11 | 1 | 1 | 11 | 1 | 0 | 0 | 5 | 0 | 0 | 19 | 14 | 5 | 0 | 0 | 1 | 8 | 10 | 2 | 26 | 172.7 | 145.5 | 127.3 | no data |
| 233.2 | N215 E2 | EU:A/B | 32-42 | 1.00 | 0.10 | 0 | 0 | 3 | 0 | 0 | 0 | 11 | 0 | 0 | 14 | 6 | 6 | 0 | 0 | 0 | 5 | 0 | 0 | 11 | 140.0 | 110.0 | 60.0 | no data |
| 233.3 | N215 E2 | EU:A/B | 42-60 | 1.00 | 0.18 | 0 | 0 | 3 | 1 | 0 | 0 | 3 | 0 | 0 | 7 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 38.9 | 11.1 | 5.6 | no data |
| 178.1* | N215 E3.5 | ST:A | 22-44 | 0.25 | 0.06 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 10 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 18 | 33.3 | 300.0 | 0.0 | 35.74 |
| 178.2* | N215 E3.5 | ST:B | 44-52 | 0.25 | 0.02 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 14.00 |
| 234.1 | N216 E3 | EU:Midden | 16-21 | 1.00 | 0.05 | 0 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 7 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 140.0 | 20.0 | 100.0 | 180.98 |
| 234.2 | N216 E3 | EU:Midden | 21-31 | 1.00 | 0.10 | 0 | 0 | 17 | 2 | 0 | 2 | 0 | 0 | 0 | 21 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 210.0 | 10.0 | 50.0 | 152.92 |
| 234.3 | N216 E3 | EU:A/B | 31-47 | 0.81 | 0.12 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25.0 | 0.0 | 0.0 | 11.27 |
| 234.4 | N216 E3 | EU:B | 47-58 | 0.92 | 0.11 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27.7 | 0.0 | 9.1 | 0.00 |
| 234.5 | N216 E3 | EU:B | 58-74 | 1.00 | 0.16 | 0 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43,8 | 0.0 | 0.0 | 0.00 |
| 234.6 | N216.2 E3.5 | Fea. 2 | 27-47 | 0.15 | 0.07 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75.8 | 0.0 | 75.8 | 17.21 |
| 234.7 | N216.7 E3.8 | Fea. 3 | 25-37 | 0.04 | 0.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | no data |
| 235.1 | N217.5 E3 | EU:Midden | 20-35 | 1.00 | 0.15 | 0 | 0 | 5 | 3 | 1 | 0 | 2 | 2 | 0 | 13 | 6 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 5 | 86.7 | 33.3 | 40.0 | 102.11 |
| 235.2 | N217.5 E3 | EU:A/B | 35-46 | 1.00 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27.3 | 0.0 | 27.3 | 2.04 |
| 235.3 | N217.5 E3 | EU:B | 46-59 | 1.00 | 0.13 | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38.5 | 0.0 | 0.0 | 0.00 |
| 235.4 | N217.5 E3 | EU:B | 59-72 | 1.00 | 0.13 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30.8 | 0.0 | 0.0 | 0.00 |
| 236.3 | N217.5 E5 | ST:A | 37-69 | 0.25 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.0 | 12.5 | 0.0 | 2.86 |
| 236.4 | N217.5 E5 | ST:B | 69-88 | 0.25 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0. | 0.0 | 0.0 | 0.00 |
| 179.1* | N220 E3.5 | ST:A | 25-54 | 0.25 | 0.07 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 35 | 37 | 3 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 9 | 28.5 | 0.0 | 42.9 | 22.24 |
| 179.2* | N220 E3.5 | ST:B | 54-75 | 0.25 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |

Notes: * Phase 1B/2. ST shovel test, EU excavation unit, Fea. feature, A topsoil, A/B transition, B sand. Q quartz, Z quartzite, C chert, J jasper, Peck-Grind pecked or ground stone, FCR fire-cracked rock, Cer ceramics.

Table 7-1. Billops Ridge Site Summary: Artifact Counts and Densities

| Unit/Level/Stratum | | | Measurements | | | Precontact Artifact Category Counts | | | | | | | | | | | Historic Artifact Category Counts | | | | | | | | Artifact and Shell Densities | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cat.* | Location (m) | Unit:Soils | Depth (cm) | Area (m2) | Volume (m3) | Lithic Q | Lithic Z | Lithic C | Lithic J | Lithic Other | Peck-Grind | FCR | Pot Sherd | Pot Crumb | Precont. Total | Bone | Cer | Vessel Glass | Flat Glass | Nail | Brick | Coal | Other | Hist. Total | Precont. /m3 | Historic /m3 | Bone /m3 | Shells kg/m3 |
| 237.1 | N221 E3 | EU:Midden | 20-30 | 1.00 | 0.10 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 6 | 1 | 1 | 0 | 3 | 0 | 0 | 5 | 10 | 30.0 | 50.0 | 60.0 | 113.72 |
| 237.2 | N221 E3 | EU:A | 30-46 | 1.00 | 0.16 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 18.8 | 0.0 | 43.8 | 65.88 |
| 237.3 | N221 E3 | EU:A/B | 46-63 | 1.00 | 0.17 | 0 | 0 | 2 | 3 | 0 | 0 | 21 | 0 | 0 | 26 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 152.9 | 0.0 | 11.8 | 0.64 |
| 237.4 | N221 E3 | EU:B | 63-74 | 1.00 | 0.11 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45.5 | 0.0 | 0.0 | 0.00 |
| 237.5 | N221 E3 | EU:B | 74-94 | 1.00 | 0.20 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10.0 | 0.0 | 0.0 | 0.00 |
| 238.3 | N222.5 E5 | ST:A | 37-63 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 18 | 0.0 | 257.1 | 14.3 | 6.08 |
| 238.4 | N222.5 E5 | ST:B | 63-92 | 0.25 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 239 | N224 E5.5 | Fea. 7 | 66-76 | 0.50 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 20.0 | 4.68 |
| 180.1* | N225 E3.5 | ST:A | 35-79 | 0.25 | 0.11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0.0 | 0.0 | 0.0 | 1.02 |
| 180.2* | N225 E3.5 | ST:B | 79-100 | 0.25 | 0.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.00 |
| 240.1 | N226 E3 | EU:Fill | 33-36 | 0.93 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | no data |
| 240.2 | N226 E3 | EU:Fill | 36-38 | 0.93 | 0.02 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 4 | 10 | 200.0 | 450.0 | 0.0 | no data |
| 240.3 | N226 E3 | EU:Mixed | 38-56 | 0.93 | 0.17 | 0 | 0 | 1 | 1 | 0 | 0 | 8 | 1 | 1 | 12 | 8 | 1 | 0 | 0 | 4 | 6 | 3 | 6 | 20 | 64.7 | 100.0 | 47.1 | no data |
| 240.4 | N226 E3 | EU:Midden | 56-68 | 0.93 | 0.09 | 0 | 0 | 5 | 2 | 0 | 1 | 20 | 11 | 49 | 88 | 105 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 4 | 433.3 | 33.3 | 1166.7 | 312.47 |
| 240.5 | N226 E3 | EU:Midden | 68-78 | 0.93 | 0.09 | 0 | 0 | 2 | 0 | 2 | 0 | 8 | 5 | 16 | 33 | 26 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 188.9 | 33.3 | 288.9 | 69.29 |
| 240.6 | N226 E3 | EU:B | 78-89 | 0.03 | 0.09 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66.7 | 0.0 | 0.0 | no data |
| 241 | N227 E5.8 | Fea. 8 | 63-83 | 0.28 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 11.77 |
| 242.1 | N229 E3 | EU:Fill | 39-52 | 1.00 | 0.13 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 4 | 0 | 1 | 6 | 12 | 15.4 | 84.6 | 0.0 | no data |
| 242.2 | N229 E3 | EU: Mixed | 52-68 | 1.00 | 0.16 | 1 | 0 | 2 | 2 | 0 | 0 | 5 | 1 | 0 | 11 | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 5 | 68.8 | 31.3 | 18.8 | no data |
| 242.3 | N229 E3 | EU:Midden | 68-70 | 1.00 | 0.02 | 1 | 0 | 25 | 0 | 0 | 0 | 3 | 20 | 100 | 149 | 19 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 2450.0 | 100.0 | 950.0 | 206.80 |
| 242.4 | N229 E3 | EU:B | 70-89 | 1.00 | 0.19 | 1 | 0 | 18 | 0 | 0 | 0 | 1 | 1 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 115.8 | 0.0 | 0.0 | no data |
| 242.5 | N229 E3 | EU:B | 89-98 | 1.00 | 0.09 | 0 | 0 | 1 | 3 | 0 | 0 | 3 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66.7 | 0.0 | 0.0 | no data |

Notes: * Phase 1B/2. ST shovel test, EU excavation unit, Fea. feature, A topsoil, A/B transition, B sand. Q quartz, Z quartzite, C chert, J jasper, Peck-Grind pecked or ground stone, FCR fire-cracked rock, Cer ceramics.

Table 7-2. Billops Ridge Site Total Artifact Counts and Densities (per cubic meter) in Soil Strata.

| | Soil Strata Counts and Densities (artifacts per cubic meter) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Historic Fill | | A-Horizon | | A/B-Horizon | | Features | | B-Horizon | | Total | |
| Volume (cubic meters) | | 0.51 | | 3.28 | | 2.00 | | 0.57 | | 4.46 | | 10.81 |
| Artifact Categories | Count | Density (/m3) | Count | Density (/m3) | Count | Density (/m3) | Count | Density (/m3) | Count | Density (/m3) | Count | Density (/m3) |
| Precontact Artifacts | | | | | | | | | | | | |
| Stone Knapping | | | | | | | | | | | | |
| Quartz | 1 | 2.0 | 9 | 2.7 | 4 | 2.0 | 0 | 0 | 2 | 0.4 | 16 | 1.5 |
| Quartzite | 0 | 0 | 7 | 2.1 | 7 | 3.5 | 1 | 1.8 | 0 | 0 | 15 | 1.4 |
| Chert | 4 | 7.8 | 166 | 50.5 | 126 | 63.0 | 16 | 28.1 | 62 | 13.9 | 371 | 34.6 |
| Jasper | 5 | 9.8 | 56 | 17.1 | 49 | 24.5 | 13 | 22.8 | 23 | 5.2 | 146 | 13.5 |
| Other | 0 | 0 | 10 | 3.0 | 2 | 1.0 | 0 | 0 | 2 | 0.4 | 14 | 1.3 |
| Pecked or Ground Cobbles | 1 | 2.0 | 5 | 1.5 | 0 | 0 | 4 | 7.0 | 2 | 0.4 | 12 | 1.1 |
| Fire-cracked Rocks | 13 | 25.5 | 85 | 25.9 | 70 | 35.0 | 6 | 10.5 | 35 | 7.8 | 209 | 19.3 |
| Pottery | | | | | | | | | | | | |
| Sherds | 4 | 7.8 | 52 | 15.9 | 4 | 2.0 | 1 | 1.8 | 2 | 0.4 | 63 | 5.8 |
| Crumbs | 1 | 2.0 | 361 | 110.1 | 32 | 16.0 | 20 | 35.1 | 0 | 0 | 414 | 38.3 |
| Precontact Total | 29 | 56.9 | 751 | 229.0 | 294 | 147.0 | 61 | 107.0 | 128 | 28.7 | 1363 | 116.8 |
| Bone Fragments | 11 | 21.6 | 379 | 115.5 | 47 | 23.5 | 59 | 103.5 | 4 | 0.9 | 500 | 46.3 |
| Shell Weight (kilograms) | | no data | | 67.4 | | 7.4 | | 63.2 | | no data | | no data |
| Historic Artifacts | | | | | | | | | | | | |
| Domestic | | | | | | | | | | | | |
| Ceramics | 1 | 2.0 | 37 | 11.3 | 9 | 4.5 | 0 | 0 | 0 | 0 | 47 | 4.3 |
| Vessel Glass | 3 | 5.9 | 39 | 11.9 | 1 | 0.5 | 0 | 0 | 0 | 0 | 43 | 4.0 |
| Architectural | | | | | | | | | | | | |
| Flat Glass | 1 | 2.0 | 2 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.3 |
| Nails | 11 | 21.6 | 14 | 4.3 | 0 | 0 | 1 | 1.8 | 0 | 0 | 26 | 2.4 |
| Bricks | 9 | 17.6 | 16 | 4.9 | 8 | 4.0 | 2 | 3.5 | 0 | 0 | 35 | 3.2 |
| Coal | 5 | 9.8 | 162 | 49.4 | 1 | 0.5 | 0 | 0 | 0 | 0 | 168 | 15.5 |
| Other | 17 | 33.3 | 43 | 13.1 | 10 | 5.0 | 0 | 0 | 0 | 0 | 70 | 6.5 |
| Historic Total | 47 | 92.2 | 313 | 95.4 | 29 | 14.5 | 3 | 5.3 | 0 | 0 | 392 | 36.3 |
| Total Artifacts | 87 | 170.6 | 1443 | 439.9 | 370 | 185.0 | 123 | 215.8 | 132 | 29.6 | 2155 | 199.4 |

Table 7-3. Billops Ridge Site Feature Descriptions and Artifact Summary

| Feature Provenience | | | Measurements | | | Description | Stone Knapping | | | | | Processing | | Food Preparation | | | Artifact Totals | | Artifact Densities | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cat. | Location (m) | Feature Number | Depth (cm) | Area (m2) | Volume (m3) | Feature Dimensions and Soils | Q | Z | C | J | Oth | Peck-Grind | FCR | Pot Sherd | Pot Crumb | Bone | Precont. Total | Hist. Total | Precont. /m3 | Bone /m3 | Shells kg/m3 |
| 212 | N186 E0 | Fea. 18 | 33 | 0.38 | 0.005 | Precontact pit, circular, 70 cm diameter. 10YR2/2 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 24.60 |
| 213 | N188 E2 | Fea. 14 | 30-40 | 0.07 | 0.002 | Precontact pit, circular 30 cm diameter. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.0 | 1000.0 | 266.00 |
| 215.5 | N201.6 E1 | Fea. 4 | 32-60 | 0.02 | 0.002 | Precontact pit in west wall, elliptical, 44 cm N-S, 10 cm from west wall. 10YR2/1 moist sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 86.00 |
| 217.6 | N202.5 E2.7 | Fea. 5 | 18-67 | 0.43 | 0.093 | Precontact pit, conical shell deposit in north half of EU. 10YR2/3 silty sand. | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 7 | 0 | 75.3 | 43.0 | 154.82 |
| 220 | N203.9 E2 | Fea. 17 | 30-86 | no data | 0.02 sample | Precontact pit, dense shell concentration northwest of Feature 5, 2 liter sample. 10YR3/2 silty sand. | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 9 | 3 | 0 | 150.0 | 450.0 | 123.50 |
| 221.6 | N204.15 E3.75 | Fea. 1 | 24-37 | 0.09 | 0.008 | Precontact pit, northwest quarter of basin-shaped depresssion in southeast corner, estimated total size 60 cm N-S and 80 cm E-W. 10YR3/4 mottled with 10YR5/6 sand. | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 7 | 0 | 875.0 | 750.0 | 103.13 |
| 225 | N207.8 E3 | Fea. 15 | 40-50 | 0.08 | 0.018 | Precontact pit, ellipical, basin-shaped depression, 30 cm N-S, 36 cm E-W. 2.5Y3/3 sand. | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 55.6 | 111.1 | 12.56 |
| 226 | N208.6 E3.2 | Fea. 16 | 40-52 | 0.09 | 0.024 | Precontact pit, elliptical, basin-shaped deperssion, 40 cm N-S, 30 cm E-W. 10YR3/3 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 14.71 |
| 227.3 | N209.8 E2 | Fea. 12 | 36-55 | 0.25 | 0.024 | Precontact pit, southeast quarter of a basin-shaped pit in NW corner of EU, estimated total area of 80 cm N-S, 40 cm E-W. 10YR 3/3 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 19 | 3 | 22 | 0 | 125.0 | 125.0 | 27.71 |
| 227.4 | N209.09 E2.7 | Fea. 13 | 37-81 | 0.11 | 0.052 | Precontact pit, north half of a conical pit in the SE corner of the EU, estimated total area 36 cm NS and 40 cm EW. 7.5YR 3/3 silty fine sand. | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 0 | 38.5 | 38.5 | 6.15 |
| 228 | N209 E5.5 | Fea. 6 | 41-46 | 0.55 | 0.006 | Precontact pit/lens, 39 cm N-S, 18 cm E-W. 10YR3/2 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | no data |
| 230.4 | N212.7 E2.27 | Fea. 9 | 38-76 | 0.11 | 0.040 | Precontact pit, bell-shaped, 35 cm N-S, 39 cm E-W. 10YR3/3 sand. | 0 | 0 | 1 | 1 | 0 | 4 | 1 | 1 | 0 | 9 | 8 | 0 | 200.0 | 225.0 | 66.95 |
| 230.5 | N212.94 E2.87 | Fea. 10 | 37-57 | 0.16 | 0.020 | Precontact pit, southwest quarter of a basin-shaped pit in the NE corner of the EU, with a complete area estimated 42 cm N-S, 50 cm E-W. 10YR3/3 sand. | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 50.0 | 0.0 | 30.50 |
| 230.6 | N212.2 E2.5 | Fea. 11 | 38-66 | 0.19 | 0.076 | Precontact pit, north two-thirds of a straight-sided basin extending from the south wall of the EU, with of complete area 59 cm N-S and 42 cm E-W. 10YR3/3 sand. | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 16 | 4 | 3 | 52.6 | 210.5 | 60.74 |

Notes: Lithic Types: Q quartz, Z quartzite, C chert, J jasper Oth other, Peck-Grind pecked or ground cobbles, FCR fire-cracked rocks.

Table 7-3. Billops Ridge Site Feature Descriptions and Artifact Summary

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 234.6 | N216.23 E3.5 | Fea. 2 | 27-47 | 0.15 | 0.066 | Precontact pit, irregular and bell-shaped, 48 cm N-S, 42 cm E-W. 10YR3/2 silty sand. | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 5 | 5 | 0 | 75.8 | 75.8 | 17.21 |
| 234.7 | N216.26 E3.8 | Fea. 3 | 25-37 | 0.04 | 0.002 | Depression in NE corner (probably natural). 10YR3/2 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | no data |
| 239 | N224 E5.5 | Fea. 7 | 66-76 | 0.50 | 0.050 | Depresson, east half of from East Trench wall. 10YR3/2 mottled with 10YR3/4 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.0 | 20.0 | 4.68 |
| 241 | N227 E5.8 | Fea. 8 | 63-83 | 0.28 | 0.060 | Precontact pit, west half of circular pit 60 cm diameter from East Trench wall. 10YR3/4 mottled with 10YR3/3 sand. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 11.77 |

Notes: Lithic Types: Q quartz, Z quartzite, C chert, J jasper Oth other, Peck-Grind pecked or ground cobbles, FCR fire-cracked rocks.

Table 7-4. Billops Ridge Site, Adjusted Artifact, Bone and Shell Density Parameters in Soil Stratum Levels

| | Soil Strata Densities | | | | |
|---|---|---|---|---|---|
| | Historic Fill | A-Horizon | A/B-Horizon | Features | B-Horizon |
| Volume (cubic meters) | 0.51 | 3.28 | 2.00 | 0.57 | 4.46 |
| Precontact Artifact (1) Densities (artifacts per cubic meter) | | | | | |
| number of levels | 5 | 37 (3) | 16 (5) | 18 | 44 |
| mean | 69.78 | 89.17 | 108.51 | 61.35 | 34.00 |
| standard deviation (SD) | 78.76 | 100.01 | 82.79 | 101.62 | 37.67 |
| 90 percent interval | 170.59 | 217.18 | 214.48 | 191.42 | 82.22 |
| Historic Artifact (2) Densities (artifacts per cubic meter) | | | | | |
| number of levels | 5 | 38 | 17 | 18 | 44 |
| mean | 133.18 | 47.66 | 14.05 | 2.19 | 0 |
| SD | 181.63 | 68.97 | 28.55 | 9.31 | 0 |
| 90 percent interval | 365.67 | 136.94 | 50.59 | 14.11 | 0 |
| Bone Fragment Densities (fragments per cubic meter) | | | | | |
| number of levels | 5 | 38 | 17 | 18 | 44 |
| mean | 13.18 | 118.59 | 26.59 | 169.38 | 0.75 |
| SD | 20.64 | 243.90 | 50.59 | 285.01 | 3.98 |
| 90 percent interval | 39.60 | 437.78 | 91.35 | 534.19 | 5.84 |
| Shell Weight (grams) Densities (kilograms per cubic meter) | | | | | |
| number of levels | no data | 33 (4) | 14 (6) | 16 (7) | no data |
| mean | | 67.35 | 7.37 | 63.19 | |
| SD | | 88.13 | 16.97 | 70.93 | |
| 90 percent interval | | 180.16 | 29.09 | 153.98 | |

Notes: 1. Precontact artifact density excludes pottery crumbs.
2. Historic artifact density excludes coal.
3. Precontact densities in A-horizon excludes EU242.3 (2450.0 art./m3)
4. Shell densities in A-horizon excludes ST172.1, EU221.1, EU227.1, EU231.1 and EU233.1 (no data)
5. Precontact densities in A/B-horizon excludes EU217.3 (880.0 art./m3)
6. Shell densities in A/B-horizon excludes EU222.2, EU233.2 and EU233.3 (no data)
7. Shell densities in Features excludes Fea. 3 and Fea. 6 (no data)

Table 7-5. Billops Ridge Site Precontact Pottery

| Cat. | Location (m) | Stratum | Sherds | Temper | Thick (mm) | Exterior Treatment | Interior Treatment | Cord Twist | Type | Woodland Period |
|---|---|---|---|---|---|---|---|---|---|---|
| 214.1.03 | N200E1 | A | 1 body | coarse crushed stone | 8 | net-impressed | smoothed-over net impressions | | North Beach Net-Marked (Photograph 7-6A) | Early to Middle |
| 214.2.01 | N200E1 | A/B | 1 body | grit | 7 | roughened, cord-wrapped paddle | smoothed | Z | Unnamed (small sherd) | unkown |
| 216.1.04 | N202E1 | A | 1 body | coarse crushed stone | 9 | smoothed, cord-wrapped paddle | smoothed-over cord-wrapped paddle | S | Unnamed (possible Vinette 1 varient) (Photograph 7-6B) | Early to Middle |
| 218.2.01 | N202E3 | A/B | 1 body | grit | 6 | smoothed-over cord marking | smoothed | | Unnamed | unknown |
| 221.1.02 | N204E3 | A | 1 body | grit | 7 | brushed and scored, drill hole | smoothed | | Unnamed | unknown |
| 176.1 | N205E1 | A | 2 body, 1 rim | burned shell | 7 | smoothed incised lines, possible filled triangle or chevron | smoothed | | Unnamed (sherds too small to observe collar) (Photograph 7-6C) | possible Late |
| 178.1 | N215E3.5 | A | 1 body | shell | 5 | smoothed-over cord marking | smoothed | Z | Unnamed | Late? |
| 235.1.04 | N217.5E3 | Midden | 1 body | shell | 7 | eroded | eroded | | Unnamed | unknown |
| 235.2.02 | N217.5E3 | A/B | 1 body | coarse crushed stone | 10 | smoothed-over net impressions? | smoothed-over net impressions? | | North Beach Net-Marked (Photograph 7-6D) | Early to Middle |
| 240.4.01 | N226E3 | Midden | 8 body | grit | 7 to 8 | fabric impressions, smoothed and wiped | smoothed and textile-wrapped paddle | | Fabric Impressed (possible Vinette 1 varient) (Photograph 7-E) | Early to Middle |
| 240.4.05 | N226E3 | Midden | 3 body | coarse crushed stone | 8 | roughened, cord-wrapped paddle | smoothed, cord-wrapped paddle | S | Unnamed (possible Vinette 1 varient) | Early to Middle |
| 240.5.01 | N226E3 | Midden | 1 body | grit | 7 | fabric impressed | smoothed, eroded | | Unnamed | unknown |
| 242.2 to 242.4 | N229E3 | Midden and B | 22 body | grit | 7 to 9 | fabric impressed | smoothed | | Fabric Impressed (possible Vinette 1 varient) (Photograph 7-F) | Early to Middle |
| 242.3 and 242.5.02 | N229E3 | Midden and B | 2 rims | coarse crushed stone | 7 to 8 | rim lip flattened, crenulated (pie-crust) decoration, interior rim notched; body net-impressed | smoothed-over net impressions? | | North Beach Net-Marked (Photograph 7-6G) | Early to Middle |

Notes: Pottery analyzed by Lucianne Lavin, March 20, 2006, annotated by Lavin and Stuart A. Reeve, April 2, 2006. Thick sherd thickness. Measurements: m meters, mm millimeters.

Table 7-6. Summary of Lithic Type Reduction at the Billops Ridge Site.

| | Lithic Types | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quartz | | Quartzite | | Chert | | Jasper | | Other | | |
| | Count | Percent | Count | Percent | Count | Percent | Count | Percent | Count | Percent | Total |
| Early Stage Reduction (Primary/Secondary Artifacts) | | | | | | | | | | | |
| Cores | 0 | 0 | 1 | 6.7 | 1 | 0.3 | 0 | 0 | 0 | 0 | 2 |
| Chunks and Shatter | 5 | 31.3 | 2 | 13.3 | 6 | 1.6 | 1 | 0.7 | 0 | 0 | 14 |
| Flakes | 0 | 0 | 1 | 6.7 | 17 | 4.5 | 5 | | 3 | | 26 |
| Late Stage Reduction (Tertiary Artifacts) | | | | | | | | | | | |
| Cores | 0 | 0 | 0 | 0 | 3 | 0.8 | 2 | 1.4 | 0 | 0 | 5 |
| Chunks and Shatter | 5 | 31.3 | 0 | 0 | 19 | 5.1 | 3 | 2.1 | 0 | 0 | 27 |
| Flakes | 4 | 25.0 | 10 | 66.7 | 253 | 67.6 | 100 | 68.5 | 9 | 64.3 | 376 |
| Chips | 1 | 6.3 | 1 | 6.7 | 72 | 19.3 | 29 | 19.9 | 1 | 7.1 | 104 |
| Unifaces/Bifaces/Points | 1 | 6.3 | 0 | 0 | 3 | 0.8 | 6 | 4.1 | 1 | 7.1 | 11 |
| Total | 16 | | 15 | | 374 | | 146 | | 14 | | 565 |

Table 7-7. Chi-Square Test for Differences* of Early and Late Stage Reduction among Lithic Types

| | Early Stage Reduction | | | Late Stage Reduction | | | |
|---|---|---|---|---|---|---|---|
| Lithic Types | Obs. | Exp. | Chi-square | Obs. | Exp. | Chi-square | Tot. |
| Quartz | 5 | 1.19 | 9.21 | 11 | 14.81 | 1.25 | 16 |
| Quartzite | 4 | 1.12 | 5.06 | 11 | 13.88 | 0.82 | 15 |
| Chert | 24 | 27.80 | 0.66 | 350 | 346.20 | 0.03 | 374 |
| Jasper | 6 | 10.85 | 2.64 | 140 | 135.15 | 0.14 | 146 |
| Other | 3 | 1.04 | 2.04 | 11 | 12.96 | 0.47 | 14 |
| Total | 42 | | | 523 | | | 565 |

Null hypothesis: there is no significant difference in reduction stages among lithic types.
Chi-square observed = 22.32 (*Yates' correction).
Chi-square expected = 9.48 (df = 4; $p < 0.05$).
Result: the null hypothesis is rejected, there is a significant difference between reduction stages among lithic types.

## Table 7-8. Chi-square Test for Differences Among Lithic Types Within Soil Strata

| | Soil Strata (1) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A-Horizon/Midden | | | A/B-Horizon | | | Features | | | B-Horizon | | | |
| Lithic Types | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Tot. |
| Quartz | 9 | 6.70 | 0.48 | 4 | 5.08 | 0.49 | 0 | 0.70 | 2.06 | 2 | 2.41 | 0.34 | 15 |
| Quartzite | 7 | 6.70 | 0.01 | 7 | 5.08 | 0.40 | 1 | 0.70 | 0.06 | 0 | 2.41 | 3.51 | 15 |
| Chert | 166 | 165.33 | 0.00 | 126 | 125.33 | 0.00 | 16 | 20.00 | 1.01 | 62 | 59.33 | 0.08 | 370 |
| Jasper | 56 | 63.01 | 0.90 | 49 | 47.76 | 0.01 | 13 | 7.62 | 3.13 | 23 | 22.62 | 0.00 | 141 |
| Other | 10 | 6.26 | 1.68 | 2 | 4.74 | 2.21 | 0 | 0.77 | 2.09 | 2 | 2.25 | 0.25 | 14 |
| Total | 248 | | | 188 | | | 30 | | | 89 | | | 555 |

Null hypothesis: there is no significant difference between lithic types among soil strata.
Chi-square observed = 18.71 (*Yates' correction).
Chi-square expected = 21.03 (df = 12; $p < 0.05$).
Result: the null hypothesis is accepted.
Note: (1) Artifacts from historic fill are not included

## Table 7-9. Chi-square Test for Differences Among Lithic Types Within Site Areas

| | Site Areas (1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Southern Feature Area | | | Central Feature Area | | | Northern Midden Area | | | |
| Lithic Types | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Tot. |
| Quartz | 5 | 8.75 | 2.06 | 8 | 3.28 | 5.43 | 3 | 3.96 | 0.54 | 16 |
| Quartzite | 9 | 8.20 | 0.01 | 5 | 3.08 | 0.65 | 1 | 3.72 | 2.79 | 15 |
| Chert | 201 | 204.54 | 0.08 | 72 | 76.79 | 0.36 | 101 | 92.67 | 0.66 | 374 |
| Jasper | 90 | 79.84 | 1.17 | 24 | 29.98 | 1.40 | 32 | 36.18 | 0.61 | 146 |
| Other | 4 | 7.66 | 2.26 | 7 | 2.87 | 4.59 | 3 | 3.47 | 0.27 | 14 |
| Total | 309 | | | 116 | | | 140 | | | 565 |

Null hypothesis: there is no significant difference between lithic types among site areas.
Chi-square observed = 22.88 (*Yates' correction).
Chi-square expected = 15.51 (df = 8; $p < 0.05$).
Result: the null hypothesis is rejected, there is a significant difference of lithic types among site areas.

Notes: (1) Site areas include combined artifacts from excavation units, shovel tests and features.
Southern Feature Area: ST169, ST170, ST171, ST172, Fea. 18 (Cat. 212), Fea. 14 (Cat. 213), ST174, EU214, EU215, EU216, EU 217, EU218, ST219, Fea. 17 (Cat. 220), EU221, ST176.
Central Feature Area: EU222, EU223, ST224, Fea. 15 (Cat. 225), Fea. 16 (Cat. 226), EU227, Fea. 6 (Cat. 228), ST177, EU229, EU230, ST231, EU232, EU233, ST178.
Northern Midden Area: EU234, EU235, ST236, ST179, EU237, ST238, Fea. 7 (Cat. 239), ST180, EU240, Fea. 8 (Cat. 241), EU242.

Table 7-10. Chi-square Test for Differences Among Lithic and Cobble Artifacts Within Soil Strata

| | Soil Strata (1) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A-Horizon/Midden | | | A/B-Horizon | | | Features | | | B-Horizon | | | |
| Activity | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Tot. |
| Lithics | 248 | 246.18 | 0.01 | 188 | 187.91 | 0.00 | 30 | 29.13 | 0.00 | 89 | 91.77 | 0.12 | 555 |
| Peck/Grind | 5 | 4.88 | 0.03 | 0 | 3.72 | 4.79 | 4 | 0.58 | 14.70 | 2 | 1.82 | 0.06 | 11 |
| FCR | 85 | 86.93 | 0.07 | 70 | 66.36 | 0.15 | 6 | 10.29 | 2.23 | 35 | 32.41 | 0.13 | 196 |
| Total | 338 | | | 258 | | | 40 | | | 126 | | | 762 |

Null hypothesis: there is no significant difference in the distribution of lithic and cobble artifacts among soil strata.

Chi-square observed = 22.29 (*Yates' correction).

Chi-square expected = 12.59 (df = 6; $p < 0.05$).

Result: the null hypothesis is rejected, there is a significant differencein the distribution of lithic and cobble artifacts among soil strata.

Note: (1) Artifacts from historic fill are not included

Table 7-11. Chi-square Test for Differences Among Lithic and Cobble Artifacts Within Site Areas

| | Site Areas (1) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Southern Feature Area | | | Central Feature Area | | | Northern Midden Area | | | |
| Activity | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Obs. | Exp. | Chi-square* | Tot. |
| Lithics | 309 | 255.90 | 11.19 | 116 | 140.89 | 4.58 | 140 | 168.21 | 4.90 | 565 |
| Peck/Grind | 2 | 5.44 | 2.85 | 5 | 2.99 | 0.76 | 5 | 3.57 | 0.24 | 12 |
| FCR | 45 | 94.66 | 26.58 | 75 | 52.12 | 9.61 | 89 | 62.22 | 11.10 | 209 |
| Total | 356 | | | 196 | | | 234 | | | 786 |

Null hypothesis: there is no significant difference in the distribution of lithic and cobble artifacts among site areas.

Chi-square observed = 71.81 (*Yates' correction).

Chi-square expected = 9.49 (df = 4; $p < 0.05$).

Result: the null hypothesis is rejected, there is a significant difference in the distribution of lithic and cobble artifacts among site areas.

Notes: (1) Site areas include combined artifacts from excavation units, shovel tests and features.

Southern Feature Area: ST169, ST170, ST171, ST172, Fea. 18 (Cat. 212), Fea. 14 (Cat. 213), ST174, EU214, EU215, EU216, EU 217, EU218, ST219, Fea. 17 (Cat. 220), EU221, ST176.

Central Feature Area: EU222, EU223, ST224, Fea. 15 (Cat. 225), Fea. 16 (Cat. 226), EU227, Fea. 6 (Cat. 228), ST177, EU229, EU230, ST231, EU232, EU233, ST178.

Northern Midden Area: EU234, EU235, ST236, ST179, EU237, ST238, Fea. 7 (Cat. 239), ST180, EU240, Fea. 8 (Cat. 241), EU242.

Table 7-12. Billops Ridge Site Shell Diversity in Strata and Features

| Cat. | Location (m) | Site Area | Stratum/ Feature | Unit Volume (m3) | Shell Density (kg/m3) | Oyster Percent | HS Clam Percent | SS Clam Percent | Whelk Percent | Scallop Percent | Shell <1/2 in. Percent | Shell >1/2 in. Percent | Shell Weight >1/2 in. (g) | Total Shell Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 212 | N186 E0 | South | Feature 18 | 0.01 | 24.60 | 64 | 36 | 0 | 0 | 0 | 27 | 73 | 90 | 123 |
| 213 | N188 E2 | South | Fearure 14 | 0.002 | 266.00 | 63 | 37 | 0 | 0 | 0 | 55 | 45 | 238 | 532 |
| 214.1 | N200 E1 | South | A | 0.13 | 66.17 | 73 | 27 | 0 | 0 | 0.1 | 62 | 38 | 803 | 2118 |
| 214.2 | N200 E1 | South | A/B | 0.13 | 0.86 | 63 | 38 | 0 | 0 | 0 | 71 | 29 | 8 | 28 |
| 215.1 | N201 E1 | South | A | 0.20 | 60.38 | 54 | 45 | 0.4 | 0.2 | 0 | 67 | 33 | 992 | 3019 |
| 215.2 | N201 E1 | South | A/B | 0.09 | 3.11 | 64 | 36 | 0 | 0 | 0 | 64 | 36 | 25 | 70 |
| 215.5 | N201.6 E1 | South | Feature 4 | 0.002 | 86.00 | 63 | 27 | 0 | 0 | 0 | 63 | 37 | 16 | 43 |
| 216.1 | N202 E1 | South | A | 0.17 | 61.6 | 70 | 29 | 0.5 | 0.5 | present | 58 | 42 | 1090.1 | 2618.1 |
| 216.2 | N202 E1 | South | A/B | 0.08 | 3.53 | 73 | 24 | 2 | 0 | 0 | 71 | 29 | 20.5 | 70.5 |
| 217.1 | N202 E2 | South | A Midden | 0.08 | 360.55 | 56 | 43 | 0.1 | 0.7 | present | 48 | 52 | 3740 | 7211 |
| 217.3 | N202 E2 | South | A/B | 0.05 | 64.8 | 29 | 70 | 0.3 | 0.3 | 0 | 26 | 74 | 596 | 810 |
| 217.6 | N202 E2 | South | Feature 5 | 0.09 | 154.82 | 92 | 7 | 0.3 | 0.3 | 0 | 19 | 81 | 11690 | 14398 |
| 218.1 | N 202 E3 | South | A | 0.10 | 75.38 | 65 | 35 | present | present | 0 | 64 | 36 | 670.5 | 1884.5 |
| 218.2 | N 202 E3 | South | A/B | 0.15 | 0.8 | 75 | 25 | 0 | 0 | 0 | 33 | 67 | 20 | 30 |
| 219.3 | N202.5 E5 | South | A | 0.04 | 1.35 | 61 | 39 | 0 | 0 | 0 | 24 | 76 | 41 | 54 |
| 220 | N204 E1 | South | Feature 17 | 0.02 | 123.5 | 73 | 23 | 0 | 4 | 0 | 20 | 80 | 1987 | 2470 |
| 221.1 | N204 E3 | South | A | 0.11 | 58.68 | 74 | 26 | 0.1 | 0 | present | 61 | 39 | 625.6 | 1613.6 |
| 221.2 | N204 E3 | South | A/B | 0.18 | 12.00 | 93 | 7 | 0 | 0 | 0 | 18 | 82 | 445 | 540 |
| 221.6 | N204.15 E3.75 | South | Feature 1 | 0.008 | 103.50 | 82 | 18 | 0 | 0 | 0 | 12 | 88 | 725 | 825 |
| 223.1 | N207 E3 | Central | A | 0.08 | 74.15 | 38 | 60 | 0.6 | 0.6 | 0 | 45 | 55 | 820 | 1483 |
| 223.2 | N207 E3 | Central | A/B | 0.17 | 1.07 | 50 | 50 | 0.7 | 0 | 0 | 11 | 89 | 40.4 | 45.3 |
| 224.3 | N207.5 E5 | Central | A | 0.025 | 0.64 | 40 | 60 | 0 | 0 | 0 | 69 | 31 | 5 | 16 |
| 225 | N207.8 E3 | Central | Feature 15 | 0.018 | 12.56 | 54 | 46 | 0 | 0 | 0 | 43 | 57 | 128 | 226 |
| 226 | N208.6 E3.2 | Central | Feature 16 | 0.024 | 14.58 | 60 | 40 | 0 | 0 | 0 | 50 | 50 | 176 | 353 |
| 227.3 | N209.8 E2 | Central | Feature 12 | 0.024 | 14.58 | 68 | 32 | 0 | 0 | 0 | 72 | 28 | 185 | 665 |
| 227.4 | N209 E2 | Central | Feature 13 | 0.052 | 6.15 | 64 | 35 | 0.5 | 0 | 0 | 33 | 67 | 215 | 320 |
| 229.1 | N211 E3 | Central | A | 0.15 | 48.64 | 65 | 35 | 0 | 0 | 0 | 66 | 34 | 616 | 1824 |
| 229.2 | N211 E3 | Central | A/B | 0.10 | 0.96 | 33 | 67 | 0 | 0 | 0 | 0 | 100 | 24 | 24 |
| 229.3 | N211 E3 | Central | B | 0.18 | 0.04 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 2 |
| 230.4 | N212.7 E2.27 | Central | Feature 9 | 0.04 | 66.95 | 77 | 23 | 0 | 0 | 0 | 72 | 28 | 737 | 2678 |
| 230.5 | N212.94 E2.87 | Central | Feature 10 | 0.02 | 30.50 | 73 | 27 | 0 | 0 | 0 | 82 | 18 | 112 | 610 |
| 230.6 | N212.2 E2.5 | Central | Feature 11 | 0.076 | 60.74 | 71 | 29 | 0 | 0.1 | 0 | 66 | 34 | 1588 | 4616 |
| 231.3 | N212.5 E5 | Central | A | 0.025 | 3.96 | 82 | 18 | 0 | 0 | 0 | 49 | 51 | 50 | 99 |

Notes: Shells HS Hard Shell Clam, SS Soft Shell Clam. Measurements; m meters, m3 cubic meter, kg/m3 kilograms per cubic meter, 1/2 in 0.5 inch, g grams.

Table 7-12. Billops Ridge Site Shell Diversity in Strata and Features

| Cat. | Location (m) | Site Area | Stratum/ Feature | Unit Volume (m3) | Shell Density (kg/m3) | Oyster Percent | HS Clam Percent | SS Clam Percent | Whelk Percent | Scallop Percent | Shell <1/2 in. Percent | Shell >1/2 in. Percent | Shell Weight >1/2 in. (g) | Total Shell Weight (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 232.1 | N213 E3 | Central | A | 0.11 | 87.36 | 25 | 75 | 0 | present | 0 | 62 | 38 | 908.4 | 2402.4 |
| 232.2 | N213 E3 | Central | A/B | 0.11 | 1.64 | 0 | 94 | 6 | 0 | 0 | 64 | 36 | 16 | 45 |
| 234.1 | N216 E3 | North | A Midden | 0.05 | 180.98 | 75 | 25 | 0.1 | 0 | present | 68 | 32 | 720.3 | 2262.3 |
| 234.2 | N216 E3 | North | A Midden | 0.10 | 152.92 | 85 | 15 | 0.1 | present | present | 44 | 56 | 2130 | 3823 |
| 234.3 | N216 E3 | North | A/B | 0.12 | 11.27 | 98 | 2 | 0 | 0 | 0 | 17 | 83 | 279 | 338 |
| 234.6 | N216.23 E3.5 | North | Feature 2 | 0.066 | 17.21 | 84 | 16 | 0.1 | 0 | 0 | 48 | 52 | 593.4 | 1136.4 |
| 235.1 | N217.5 E3 | North | A Midden | 0.15 | 102.11 | 76 | 23 | 1 | 0.2 | 0 | 76 | 24 | 924 | 3829 |
| 235.2 | N217.5 E3 | North | A/B | 0.11 | 2.04 | 40 | 60 | 0 | 0 | 0 | 65 | 35 | 20 | 56 |
| 236.3 | N217.5 E5 | North | A | 0.08 | 5.30 | 77 | 23 | 0 | 0 | 0 | 49 | 51 | 117 | 229 |
| 237.1 | N221 E3 | North | A Midden | 0.10 | 113.72 | 73 | 25 | 0.2 | 0 | 0 | 69 | 31 | 878 | 2843 |
| 237.2 | N221 E3 | North | A | 0.16 | 65.88 | 55 | 44 | 0.2 | 0.8 | 0 | 65 | 35 | 927 | 2635 |
| 237.3 | N221 E3 | North | A/B | 0.17 | 0.64 | 25 | 75 | 0 | 0 | 0 | 85 | 15 | 4 | 27 |
| 238.3 | N222.5 E5 | North | A | 0.07 | 6.08 | 87 | 13 | 0 | 0 | 0 | 41 | 59 | 251 | 424 |
| 239 | N224 E5.5 | North | Feature 7 | 0.05 | 4.68 | 75 | 25 | 0 | 0 | 0 | 45 | 55 | 129 | 234 |
| 240.4 | N226 E3 | North | A Midden | 0.09 | 312.47 | 86 | 12 | 1 | present | present | 36 | 64 | 4530.6 | 7030.6 |
| 240.5 | N226 E3 | North | A Midden | 0.09 | 62.29 | 66 | 33 | 2 | 0 | 0 | 39 | 61 | 950 | 1559 |
| 241 | N227 E5.8 | North | Feature 8 | 0.06 | 11.77 | 89 | 11 | 0 | 0 | 0 | 45 | 55 | 387 | 706 |
| 242.3 | N229 E3 | North | A Midden | 0.02 | 206.80 | 79 | 21 | 0.3 | 0 | 0 | 44 | 56 | 577 | 1034 |

Notes: Shells HS Hard Shell Clam, SS Soft Shell Clam. Measurements; m meters, m3 cubic meter, kg/m3 kilograms per cubic meter, 1/2 in 0.5 inch, g grams.

Table 7-13. Comparisons of Shell Diversity and Breakage in Billops Ridge Site Strata/Features and Site Areas

| | Shellfish Taxa Percentages | | | | Shell Breakage | | Total Shell |
|---|---|---|---|---|---|---|---|
| | Oyster Percent | HS Clam Percent | SS Clam Percent | Whelk Percent | Shell <1/2 in. Percent | Shell >1/2 in. Percent | Density (kg/m3) |
| **Shell Diversity in Strata and Features** | | | | | | | |
| **A-Horizon and Midden** | | | | | | | |
| number | 22 | | | | 22 | | 22 |
| mean | 66.45 | 33.00 | 0.30 | 0.14 | 54.82 | 45.18 | 95.79 |
| standard deviation (SD) | 16.38 | 16.32 | 0.49 | 0.26 | 13.50 | 13.50 | 95.81 |
| **A/B-Horizon Transition** | | | | | | | |
| number | 8 | | | | 8 | | 8 |
| mean | 55.88 | 42.88 | 1.13 | 0.04 | 42.00 | 58.00 | 12.43 |
| SD | 33.04 | 31.75 | 2.09 | rare | 26.07 | 26.07 | 21.59 |
| **Features** | | | | | | | |
| number | 16 | | | | 16 | | 16 |
| mean | 72.00 | 22.00 | 0.06 | 0.28 | 47.01 | 52.98 | 62.38 |
| SD | 10.78 | 10.64 | 0.14 | 1.00 | 26.07 | 20.86 | 21.59 |
| **Shell Diversity in Site Areas** | | | | | | | |
| **Southern Feature Area** | | | | | | | |
| number | 17 | | | | 17 | | 17 |
| mean | 67.59 | 31.12 | 0.22 | 0.35 | 44.66 | 55.33 | 89.76 |
| SD | 14.81 | 14.84 | 0.49 | 0.96 | 21.35 | 21.33 | 95.86 |
| **Central Feature Area** | | | | | | | |
| number | 14 | | | | 14 | | 14 |
| mean | 54.79 | 44.57 | 0.56 | 0.05 | 56.00 | 44.00 | 30.25 |
| SD | 25.59 | 21.41 | 1.59 | rare | 18.78 | 18.78 | 30.92 |
| **Northern Midden Area** | | | | | | | |
| number | 15 | | | | 15 | | 15 |
| mean | 76.33 | 23.20 | 0.33 | 0.07 | 50.07 | 49.93 | 83.70 |
| SD | 14.33 | 14.25 | 0.57 | rare | 15.64 | 15.64 | 93.99 |

Notes: Shells HS Hard Shell Clam, SS Soft Shell Clam. Measurements 1/2 in. 0.5 inch, kg/m3 kilograms per cubic meter.

Table 7-14. Comparisons of Oyster Shells and Parasites in Billops Ridge Site Strata and Features

| Cat. | Location (m) | Stratum/ Feature | Site Area | Stat. | Oyster Left Valves Height | Length | H/L Ratio | Percent of Oyster Valves with Parasites *Cliona trutti* | *Cliona celata* | Polychaete Worms | Boring Bivalves |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 217.1.01 | N202E2 | A Midden | South | | | | | | | | |
| | | | | number | 20 | | | 25.0 | 5.0 | 5.0 | 0 |
| | | | | mean (mm) | 49.05 | 32.70 | 1.52 | | | | |
| | | | | standard deviation (SD) | 10.88 | 7.90 | 0.21 | | | | |
| 217.6 | N202.5E2.7 | Feature 5 | South | | | | | | | | |
| | | | | number | 20 | | | 10.0 | 0 | 20.0 | 0 |
| | | | | mean (mm) | 70.00 | 44.05 | 1.57 | | | | |
| | | | | SD | 28.61 | 13.24 | 0.45 | | | | |
| 220 | N203.9E2 | Feature 17 | South | | | | | | | | |
| | | | | number | 17 | | | 0 | 0 | 9.1 | 9.1 |
| | | | | mean (mm) | 59.76 | 40.06 | 1.48 | | | | |
| | | | | SD | 14.94 | 5.76 | 0.27 | | | | |
| 221.2.01 | N204E3 | A/B | South | | | | | | | | |
| | | | | number | 16 | | | 0 | 0 | 0 | 0 |
| | | | | mean (mm) | 44.69 | 30.63 | 1.50 | | | | |
| | | | | SD | 11.15 | 9.18 | 0.27 | | | | |
| 221.6 | N204.15E3.75 | Feature 1 | South | | | | | | | | |
| | | | | number | 12 | | | 8.3 | 8.3 | 0 | 8.3 |
| | | | | mean (mm) | 59.17 | 39.25 | 1.51 | | | | |
| | | | | SD | 16.28 | 9.50 | 0.22 | | | | |
| 230.6 | N212E2.5 | Feature 11 | Central | | | | | | | | |
| | | | | number | 17 | | | 0 | 0 | 0 | 0 |
| | | | | mean (mm) | 39.59 | 26.47 | 1.54 | | | | |
| | | | | SD | 5.81 | 6.12 | 0.29 | | | | |
| 234.2.01 | N216E3 | A Midden | North | | | | | | | | |
| | | | | number | 19 | | | 0 | 0 | 5.3 | 0 |
| | | | | mean (mm) | 51.53 | 35.67 | 1.48 | | | | |
| | | | | SD | 14.41 | 10.52 | 0.23 | | | | |
| 240.4.01/ 240.5.01 | N226E3 | A. Midden | North | | | | | | | | |
| | | | | number | 31 | | | 0 | 0 | 3.2 | 0 |
| | | | | mean (mm) | 46.35 | 30.52 | 1.58 | | | | |
| | | | | SD | 14.35 | 11.63 | 0.36 | | | | |
| 242.3.01 | N229E01 | A Midden | North | | | | | | | | |
| | | | | number | 11 | | | 9.1 | 0 | 0 | 0 |
| | | | | mean (mm) | 45.09 | 30.82 | 1.47 | | | | |
| | | | | SD | 7.67 | 4.81 | 0.16 | | | | |

Table 7-15. Summary of Analyzed Flotation Samples.

| Feature | Type | Age | Flotation | | |
|---|---|---|---|---|---|
| | | | No. Samples | Soil Volume (l) | Weight Light Fraction |
| Midden | Buried shell | Early Woodland | 1 | 2 | 1.23 |
| 5 | Large shell filled pit | Early to Middle Woodland | 1 | 2 | 0.18 |
| 11 | Deep conical pit | Undetermined | 1 | 2 | 0.14 |
| Total | | | 3 | 6 | 1.55 |

Table 7-16. Inventory of Recovered Plant Remains.

| Catalog Number | 240.4 | 217.6 | 230.6 | Total |
|---|---|---|---|---|
| Coordinates | N226 E3 | N202 E2 | N212 E2 | |
| Feature | midden | 5 | 11 | |
| Level | 4 | 2 | | |
| Total feature volume (liters) | 2 | 2 | 2 | 6 |
| Total light fraction weight (grams) | 1.23 | 0.18 | 0.14 | 1.55 |
| Total analyzed carbon weight (grams) | 0.06 | 0.01 | 0 | 0.07 |
| | | | | |
| WOOD CHARCOAL (carbonized) (number >2 mm fragments) | 13 | 2 | 0 | 15 |
| total weight (grams) | 0.06 | 0.01 | 0 | 0.07 |
| *Carya spp.* (hickory) | 3 | | | 3 |
| Deciduous taxa | 5 | 2 | | 7 |
| Unidentifiable | 5 | | | 5 |
| Total identified fragments | 13 | 2 | 0 | 15 |
| | | | | |
| SEED REMAINS (non-carbonized) (number of seeds) | 1 | 0 | 1 | 2 |
| *Datura stramonium* (jimson weed) entire | | | 1 | 1 |
| Fragment | 1 | | | 1 |

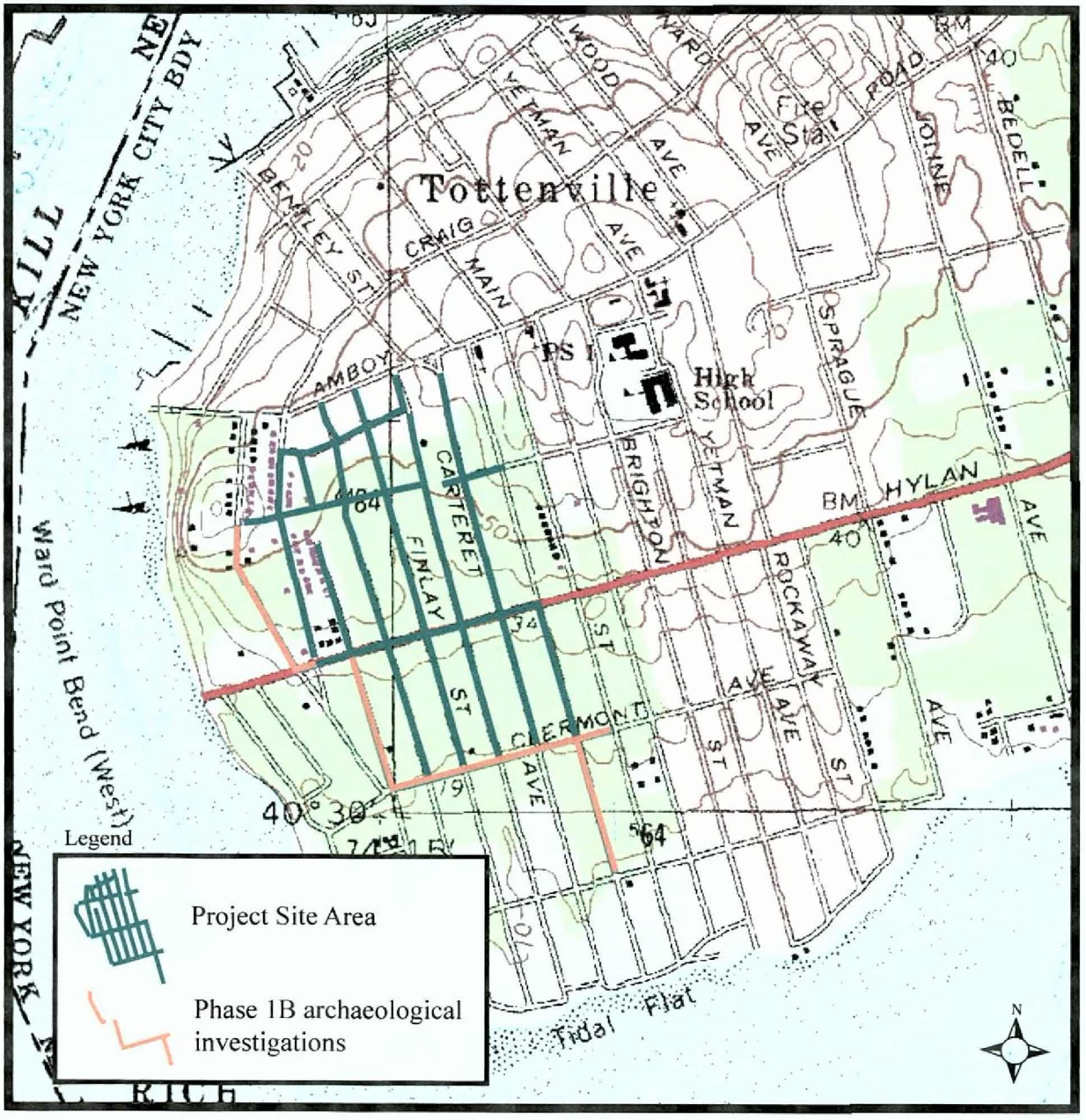



**Figure 1-1** **Location of Conference House Park project site area and Phase 1B archaeological investigations on USGS map (USGS Quadrangles, 7.5' Series; Arthur Kill NY, NJ 1981; Perth Amboy NJ, NY 2000; South Amboy NJ, NY 2000; Keyport, NJ 1977)**

**Scale 1:24,000**

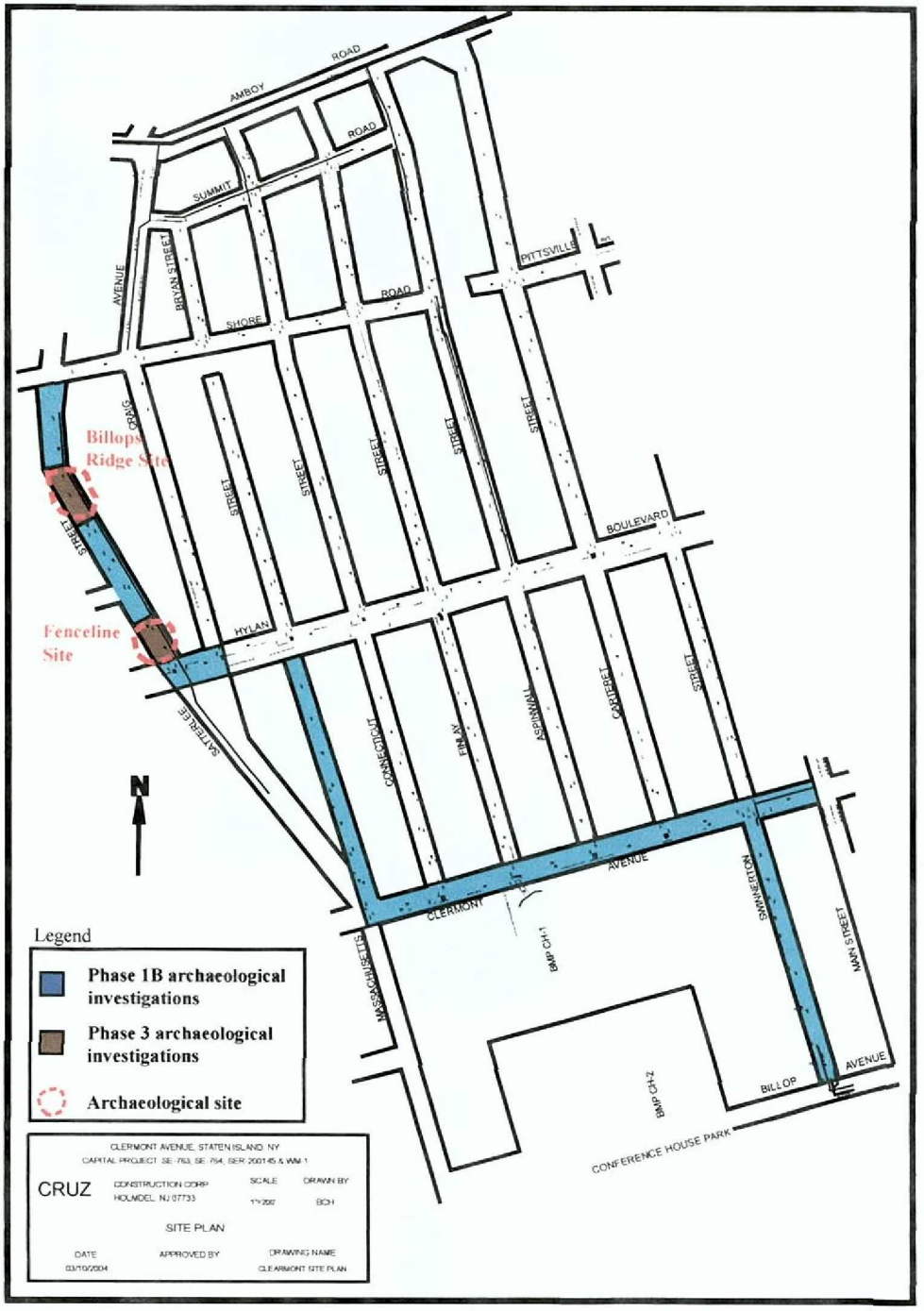



**Figure 1-2.** **Location of project site area and recorded archaeological sites.**

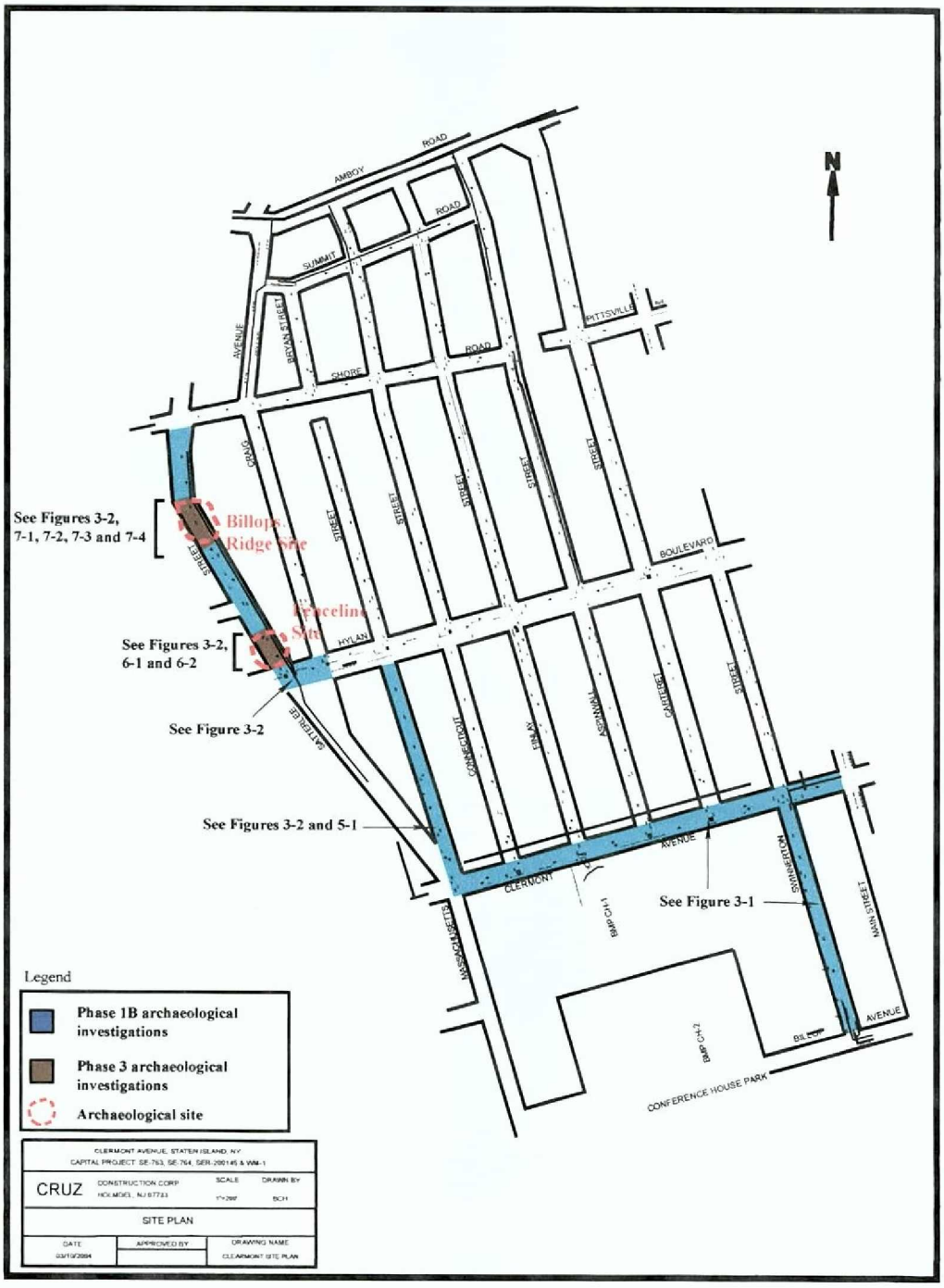
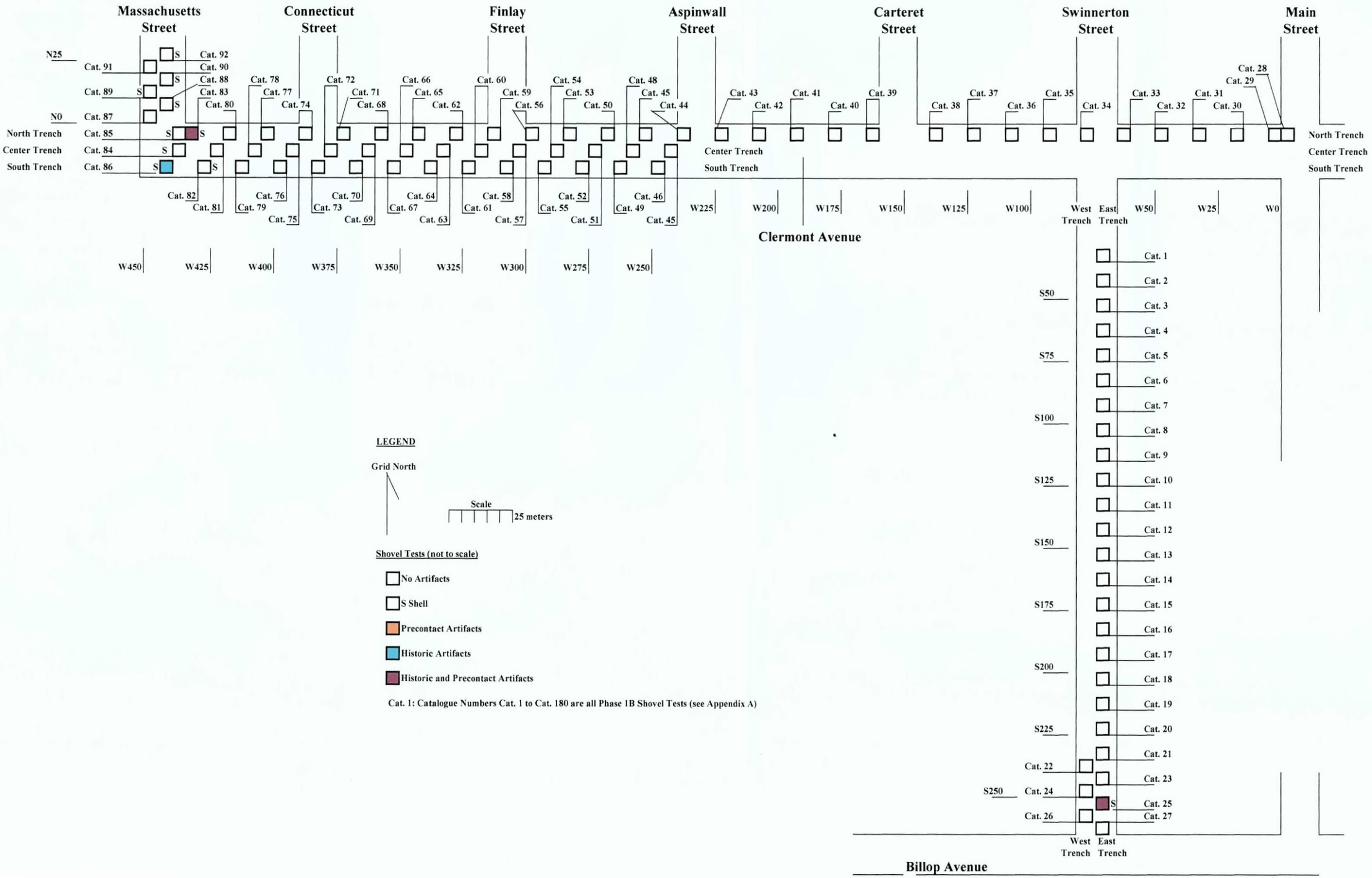



**Figure 1-3.** **Reference guide to detailed figures of specific street bed and site testing.**

**Figure 3-1. Conference House Park-South Richmond Drainage Phase 1B/2 Archaeological Survey Shovel Test Locations**
**Clermont Avenue and Swinnerton Street**




LEGEND

Grid North

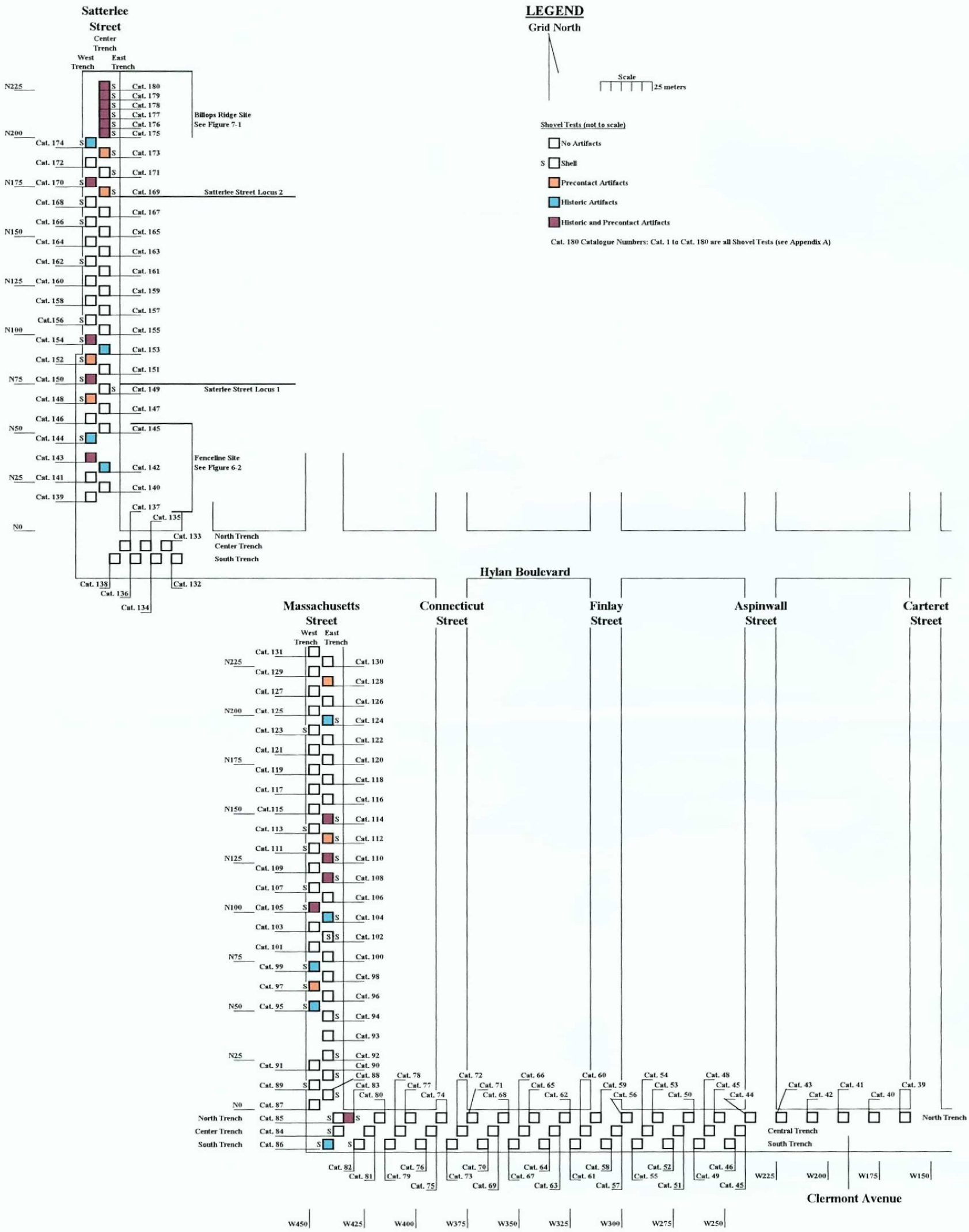
Scale
25 meters

Shovel Tests (not to scale)

- No Artifacts
- S Shell
- Precontact Artifacts
- Historic Artifacts
- Historic and Precontact Artifacts

Cat. 1: Catalogue Numbers Cat. 1 to Cat. 180 are all Phase 1B Shovel Tests (see Appendix A)

**Figure 3-2. Conference House Park-South Richmond Drainage Phase 1B/2 Archaeological Survey Shovel Test Locations**
**Satterlee Street, Hylan Boulevard, Massachusetts Street and Clermont Avenue**



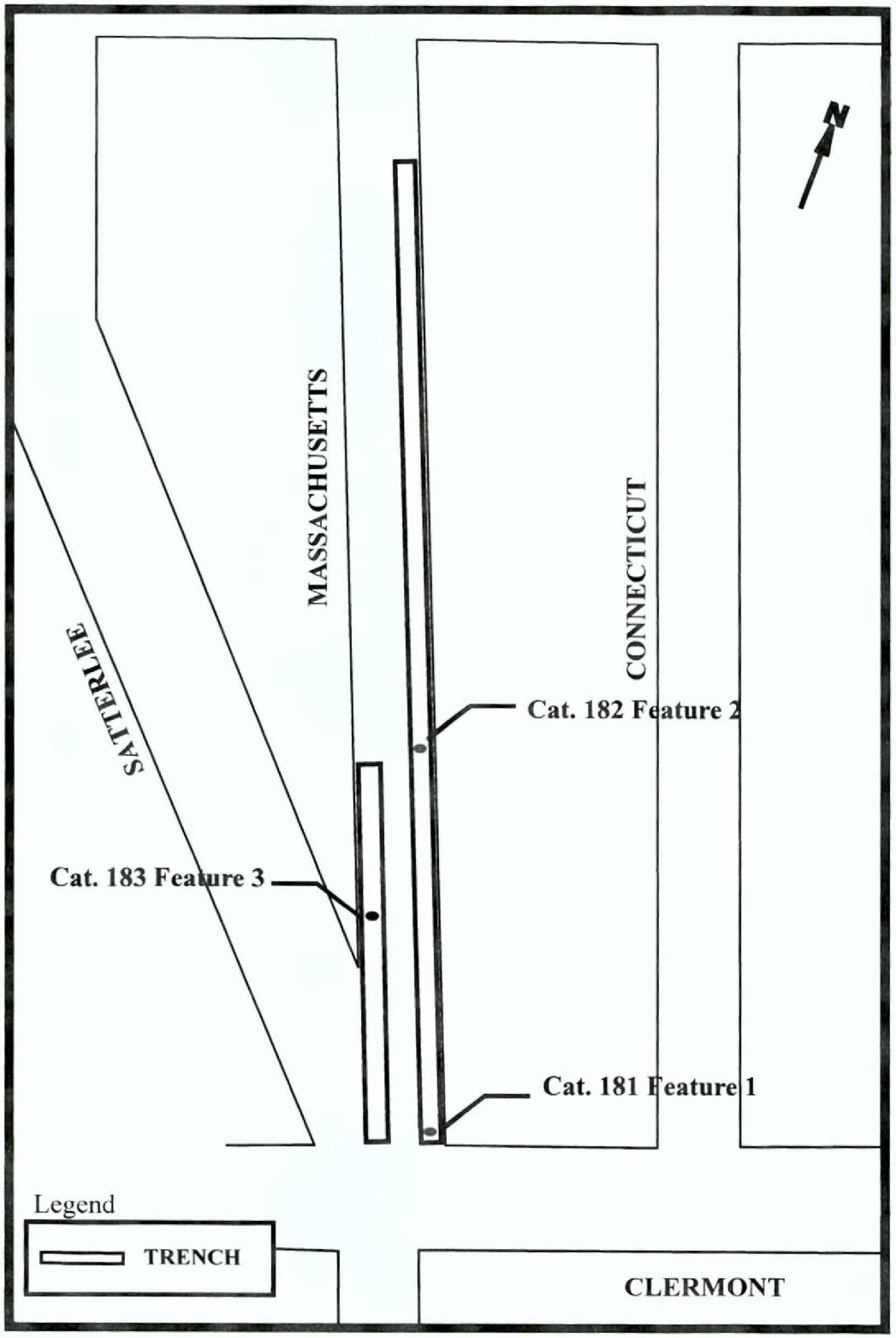



**Figure 5-1. Massachusetts Street Phase 3 Monitoring and Features.**

10 0 10 20 30 40 50 m

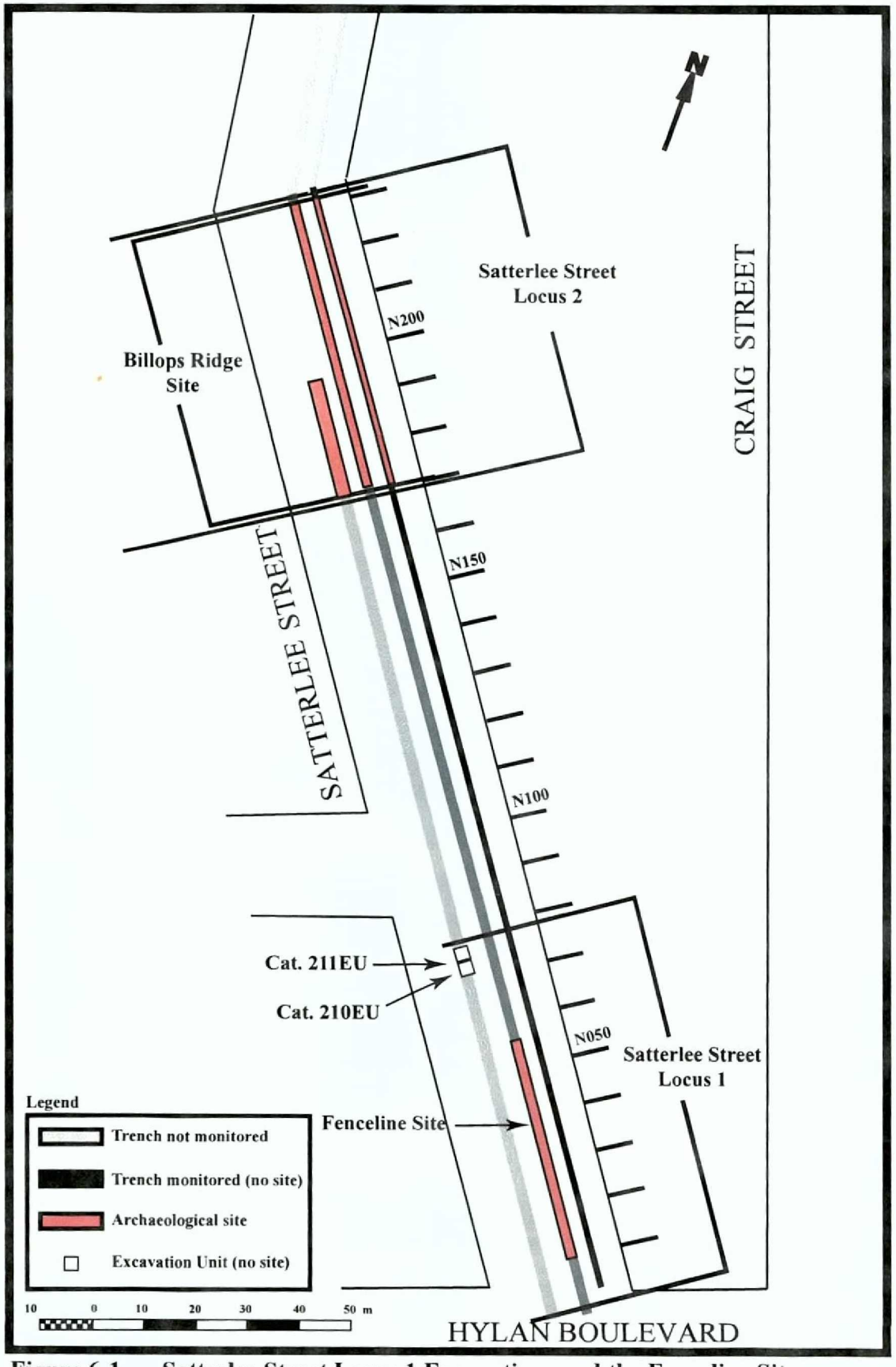
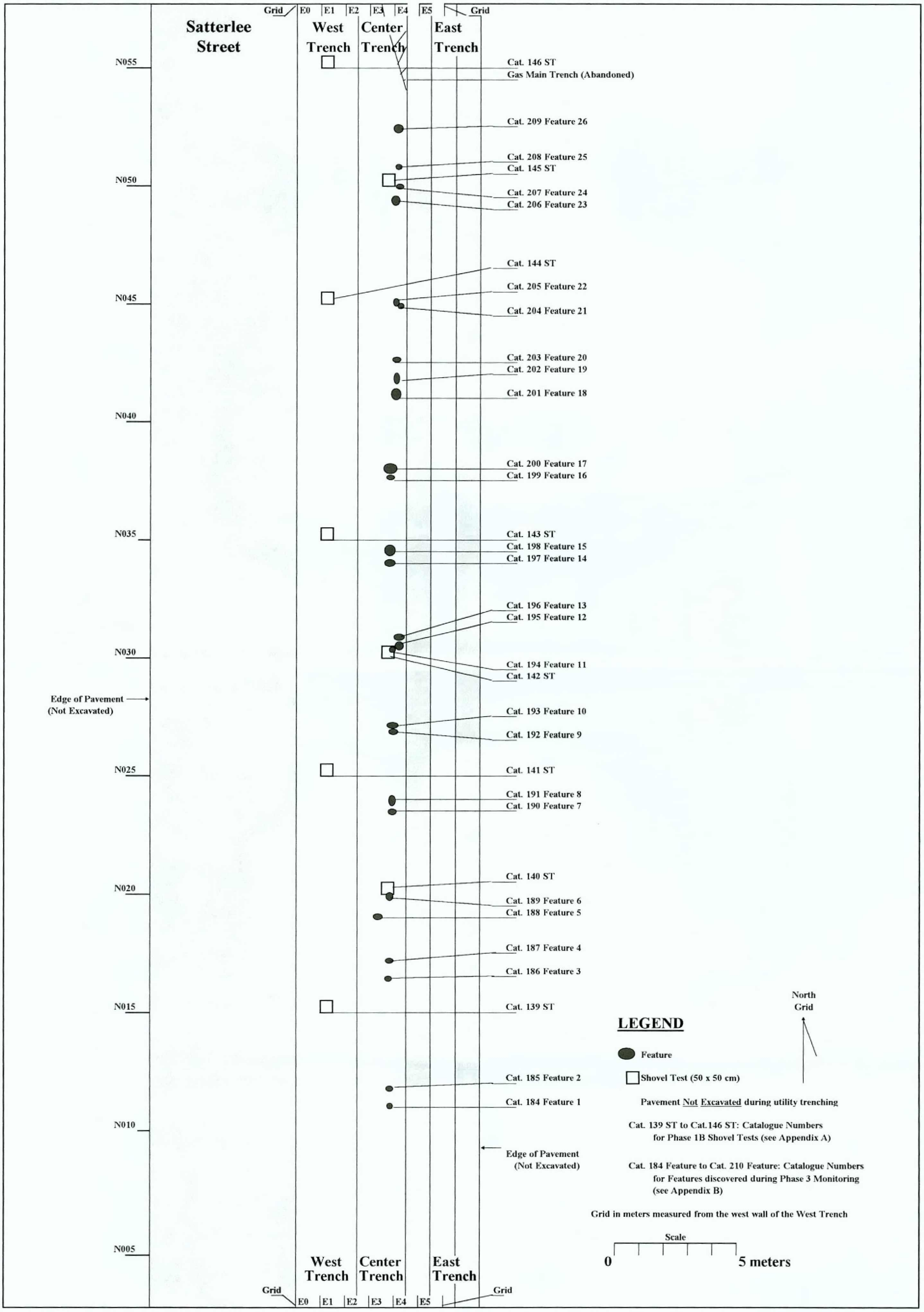



**Figure 6-1.** **Satterlee Street Locus 1 Excavations and the Fenceline Site and Satterlee Locus 2, the Billops Ridge Site.**

Figure 6-2. Satterlee Street Locus 1, Fenceline Site Shovel Tests and Features



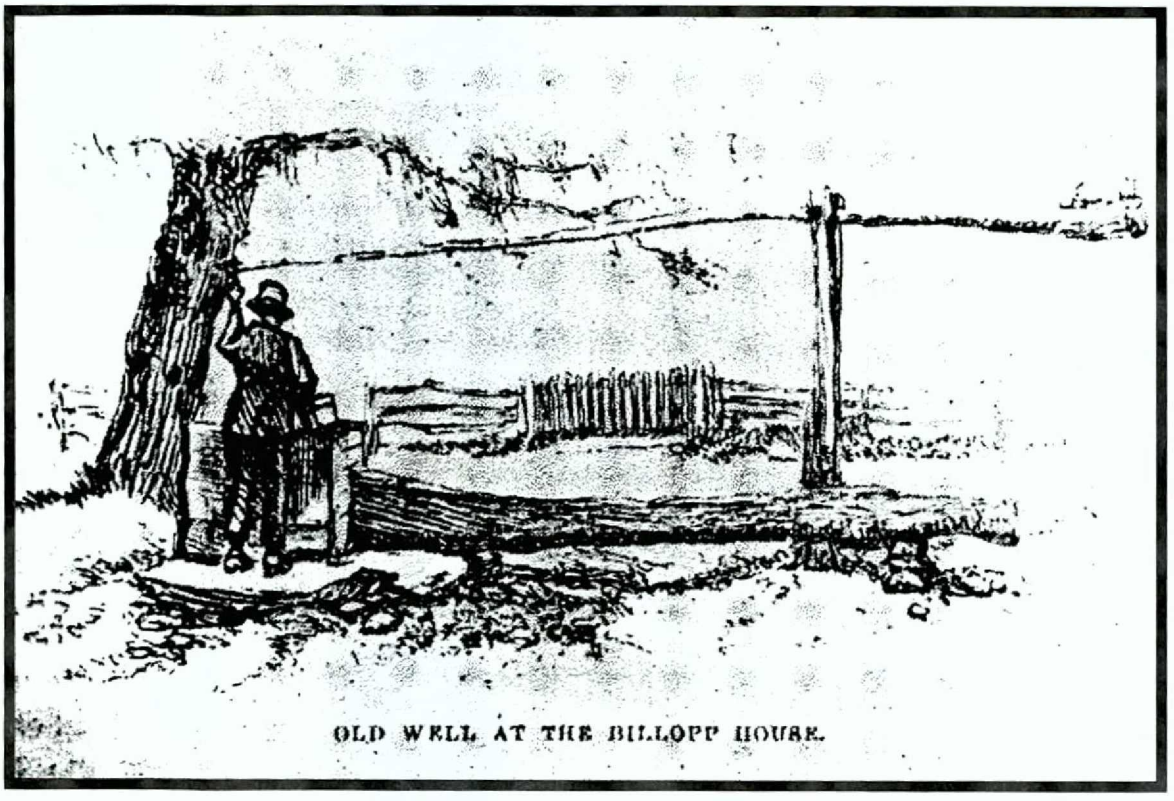



**Figure 6-3.** **Drawing of a post and rail fence along Satterlee Street from *Harper's Monthly Magazine*, 1878 (after Davis, 1926:175).**

Figure 7-1. Satterlee Street Locus 2, the Billops Ridge Site Excavations and Features

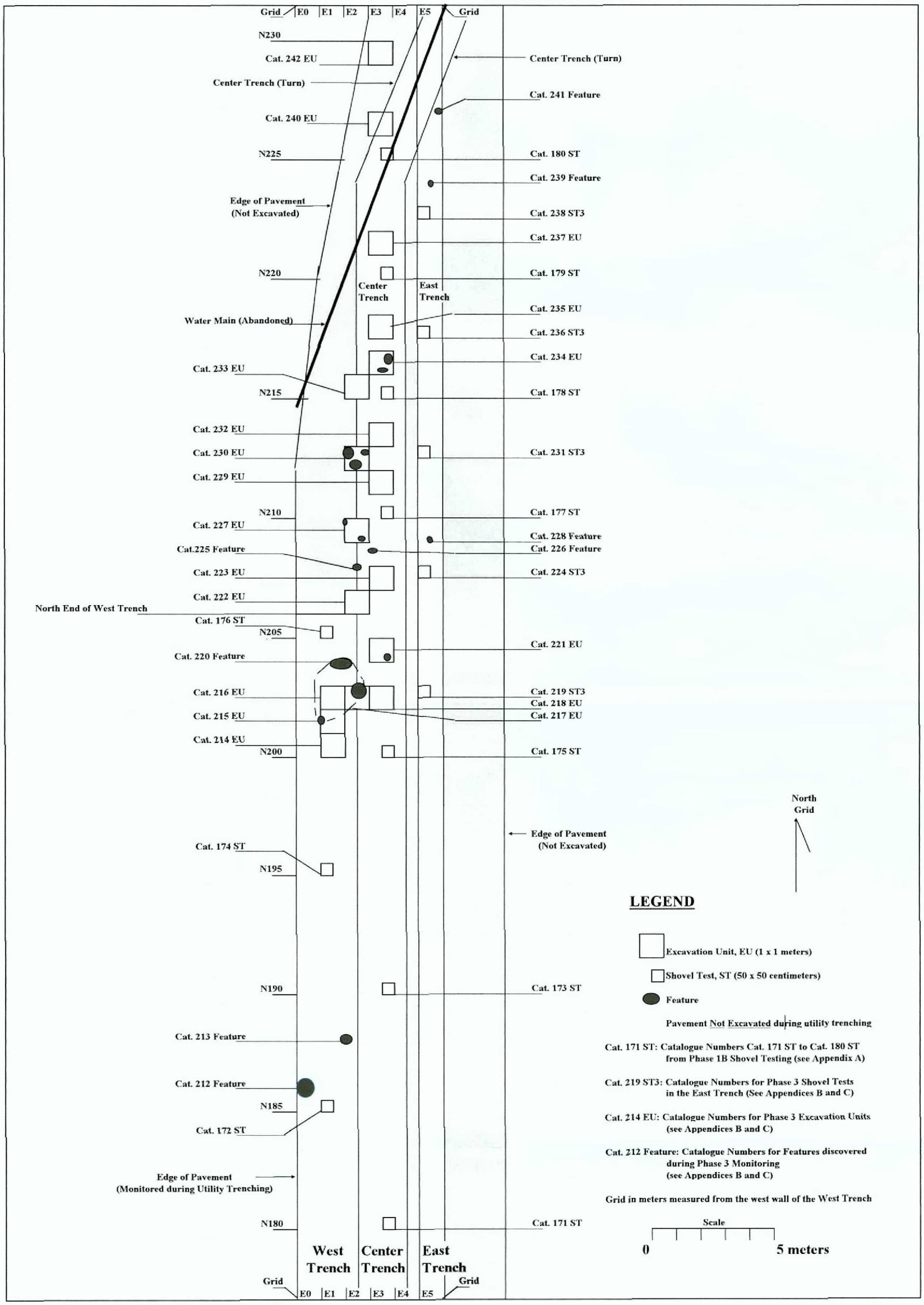


Figure 7-2. Satterlee Street Locus 2, Billops Ridge Site Shell Densities (kilograms per cubic meter)

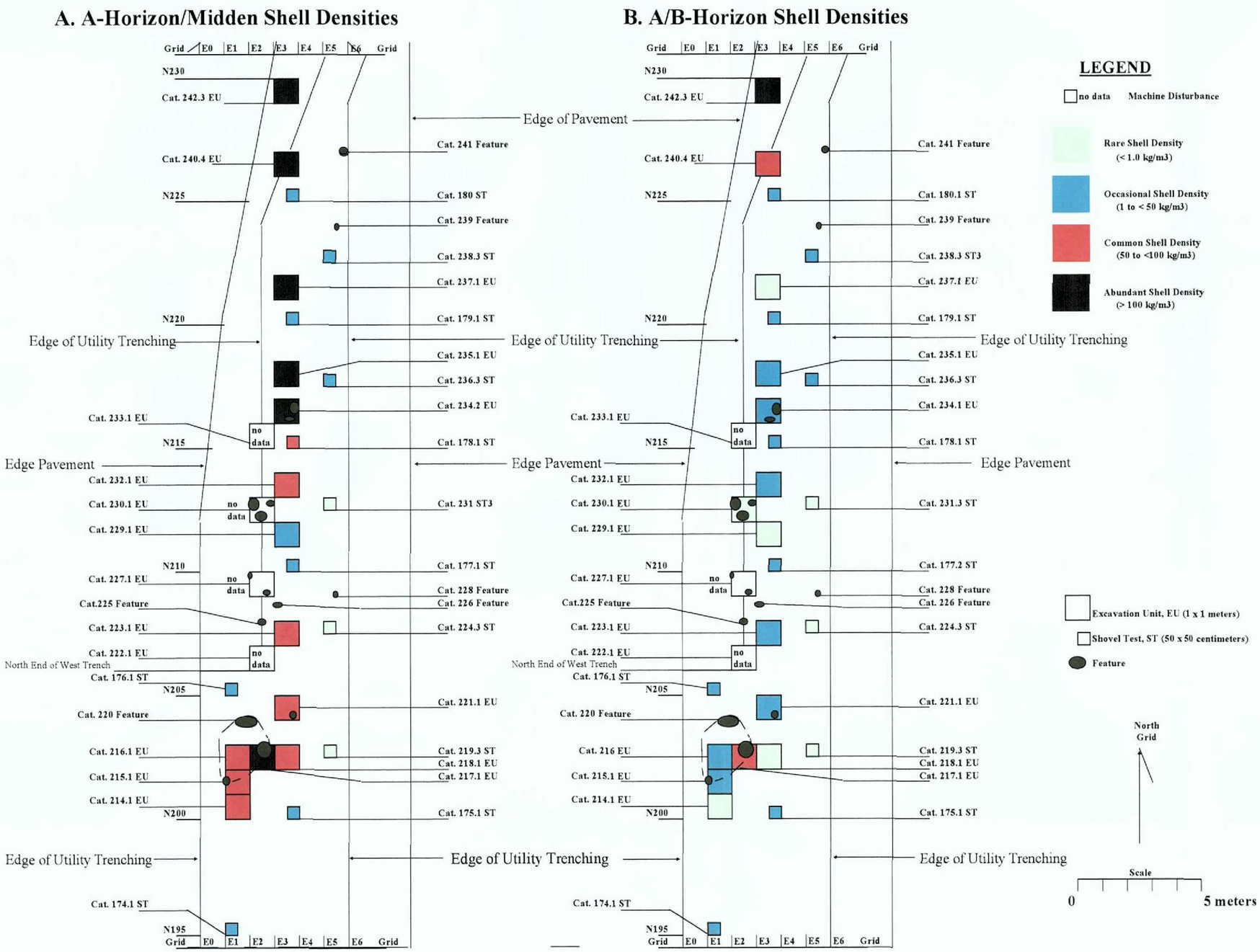


Figure 7-3. Satterlee Street Locus 2, Billops Ridge Site Precontact and Historic Artifact Densities in the A-Horizon and Shell Midden

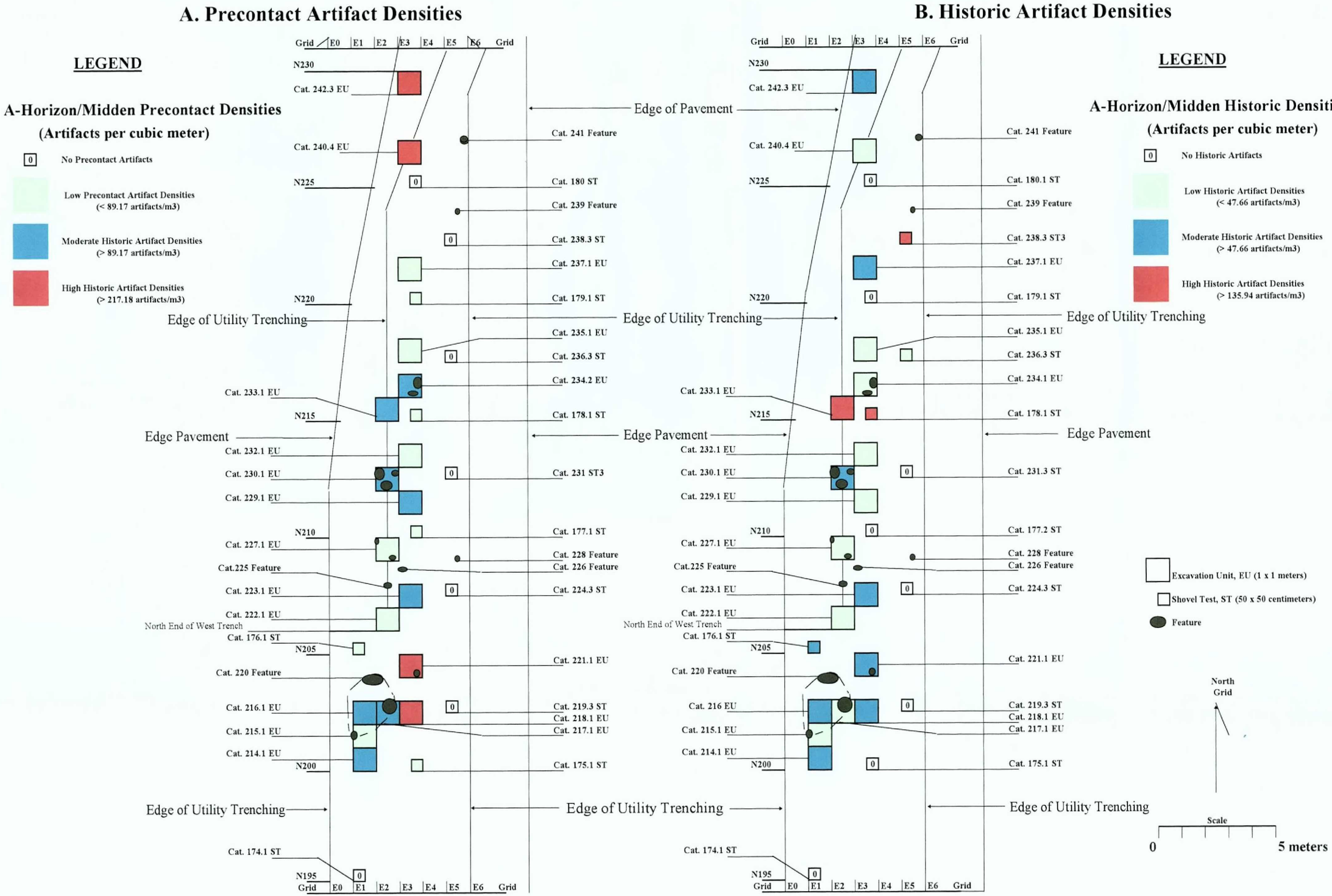


Figure 7-4. Saterlee Street Locus 2, Billops Ridge Site Precontact and Historic Artifact Densities in the A/B-Horizon Transition

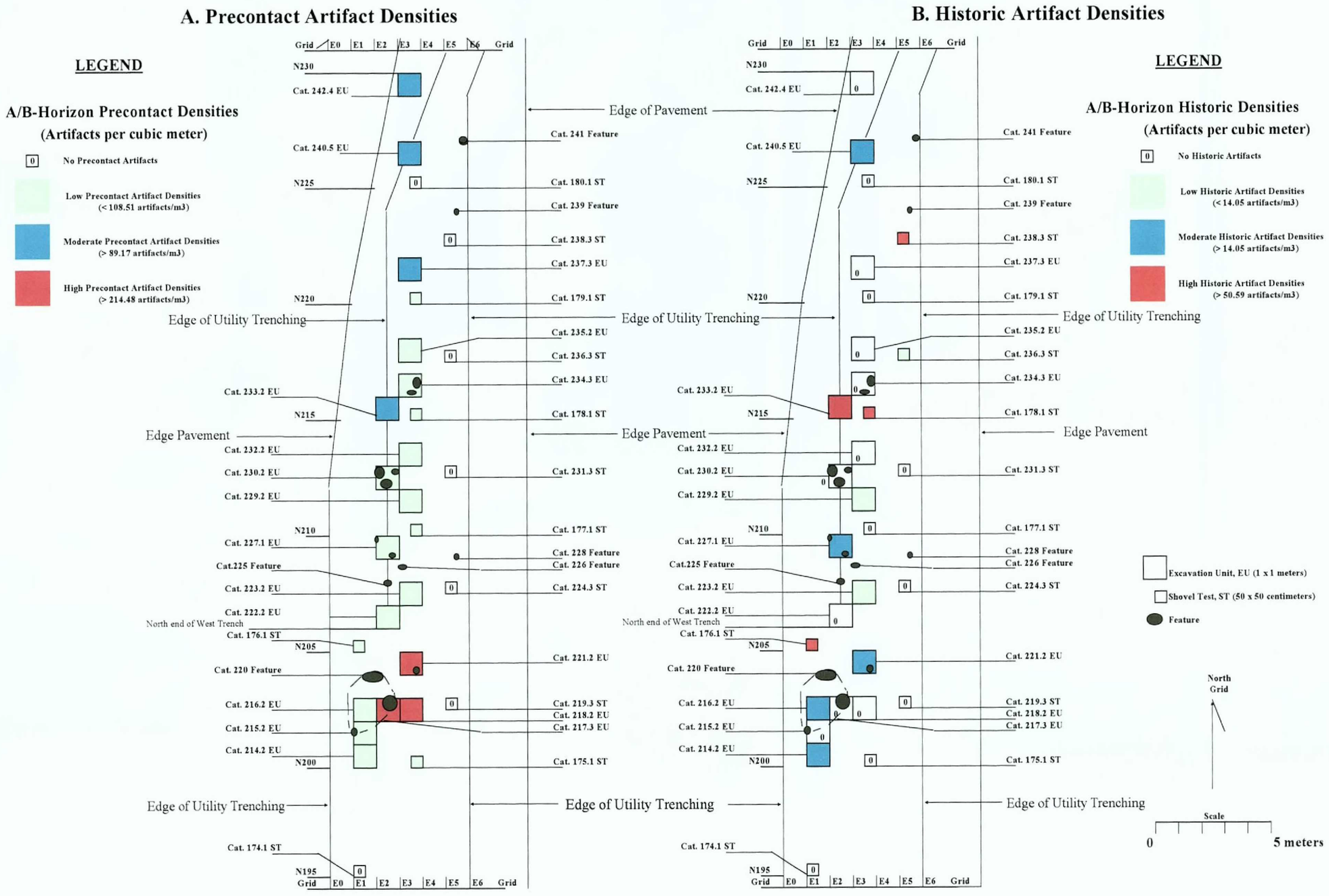
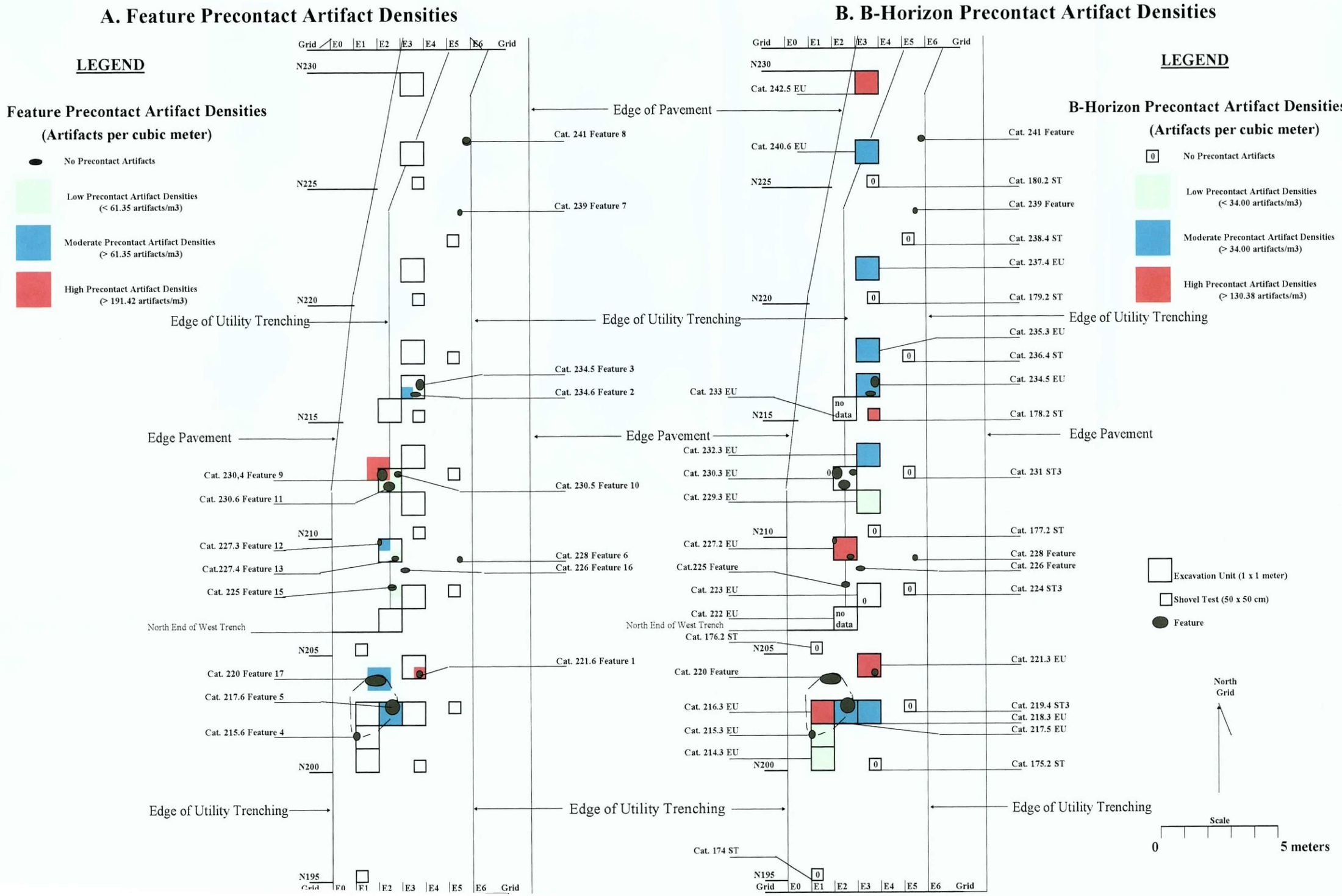
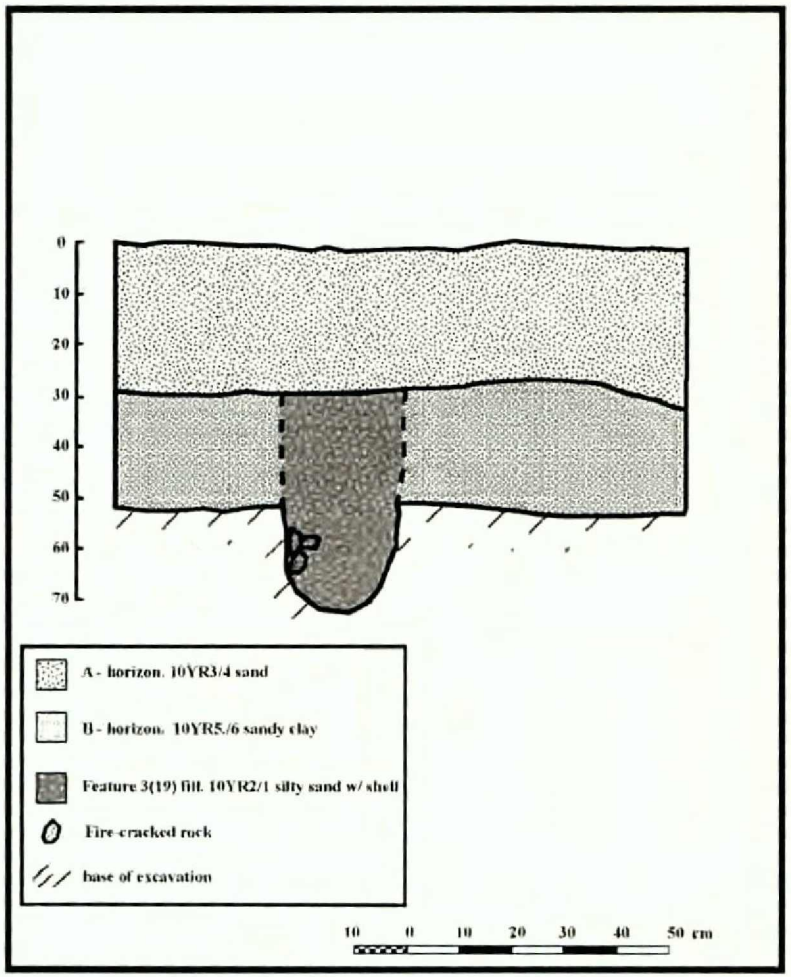


Figure 7-5. Satterlee Street Locus 2, Billops Ridge Site Precontact Artifact Densities in Features and B-Horizon Sand



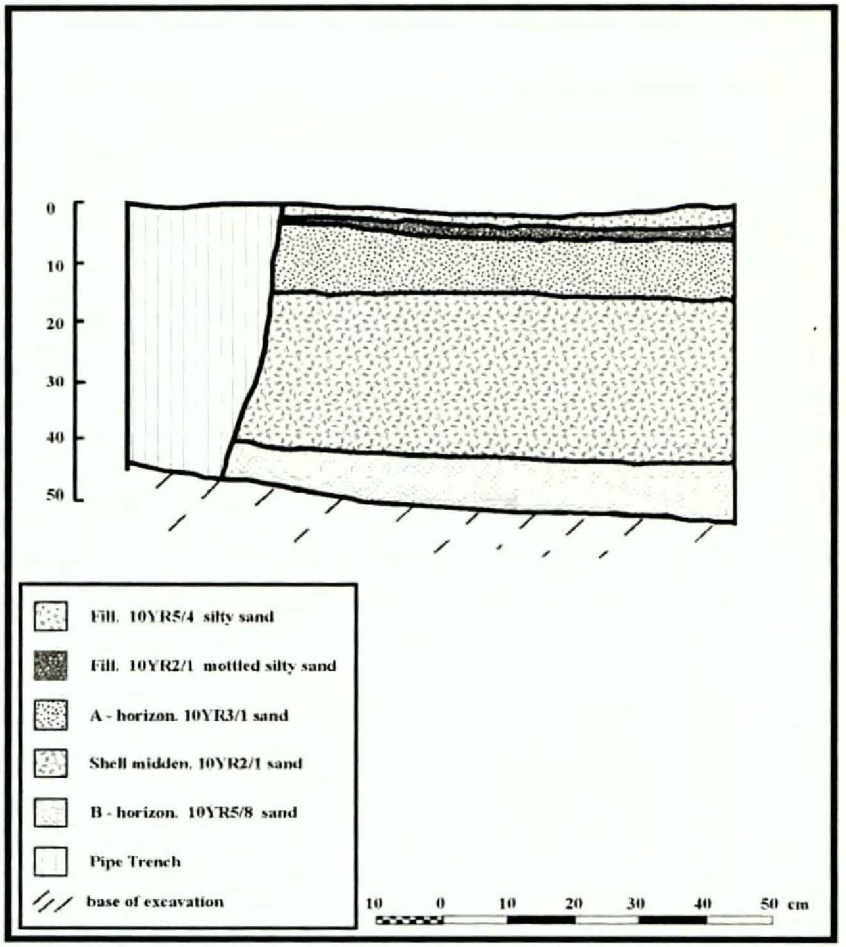




Photograph 5-1. Massachusetts Street monitoring, Feature 3 (19) at N055.9 in the west trench. View to the west (Photographer James Cox, November 15, 2004).

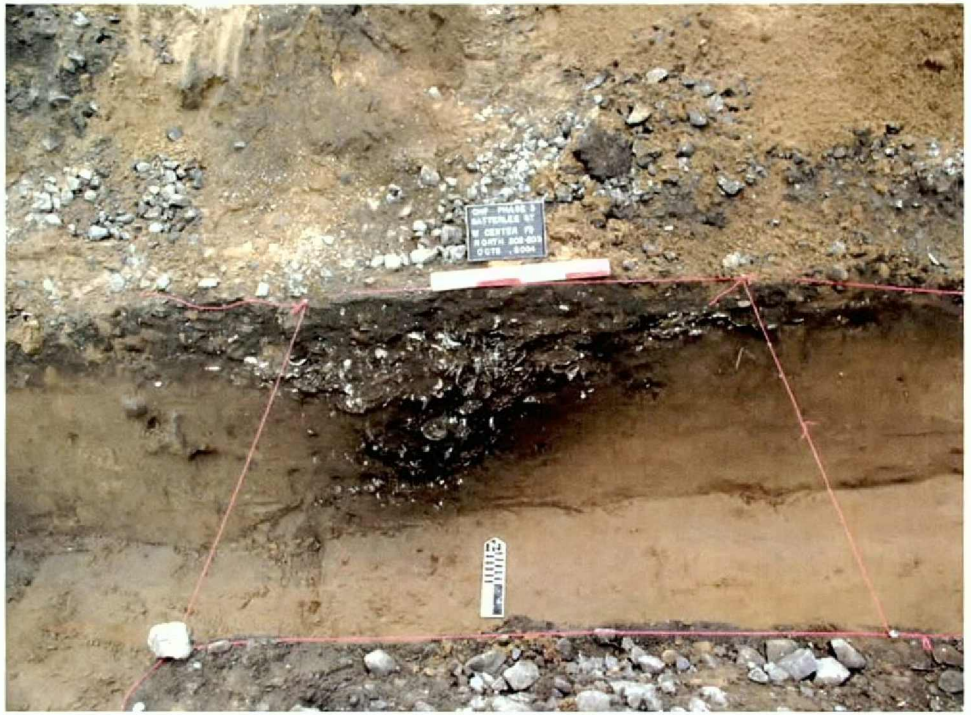

Photograph 6.1

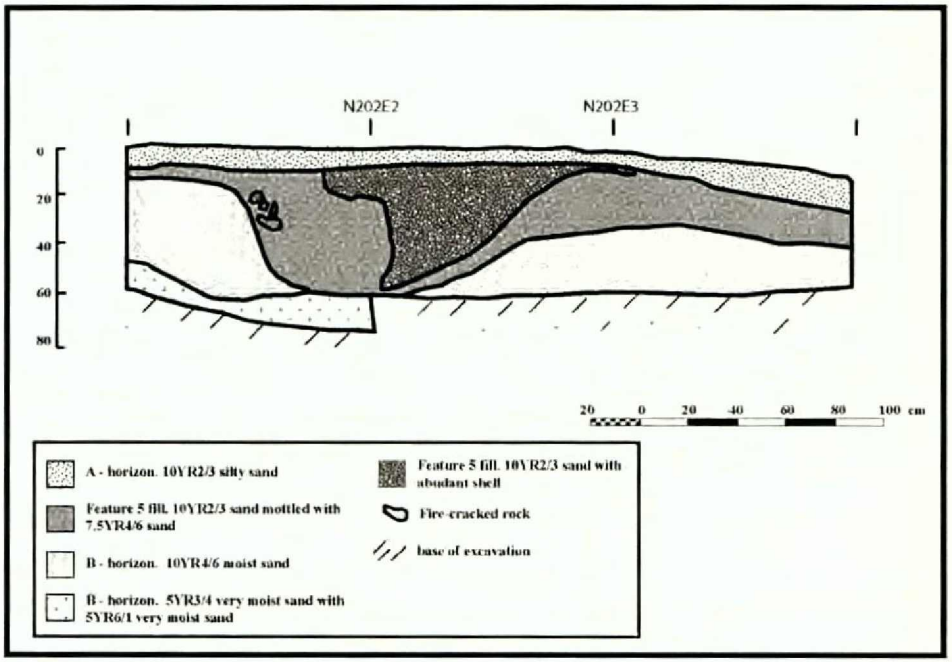
Photograph 6-1. Satterlee Street Locus 1 monitoring in the center trench, the Fenceline site Feature 3 (Cat. 186) and Feature 4 (Cat. 187), historic post holes extending into clay subsoil (Photographer Stuart Reeve, October 29, 2004).

Photograph 7-1. Satterlee Street Locus 2, flood damage following a water main break in the east trench at the Billops Ridge site. View to the northwest (Photographer Stuart Reeve, October 12, 2004).

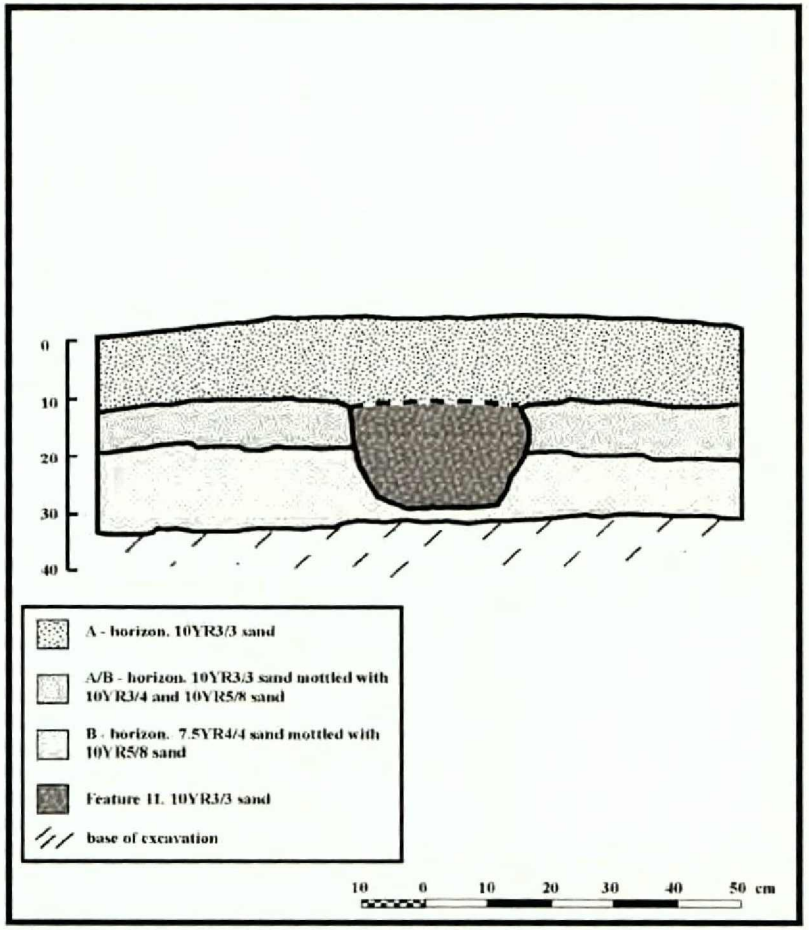




Photograph 7-2 Billops Ridge site, excavation unit at N226E3 (Cat.240) showing buried shell midden beneath historic fill and abandoned water main trench disturbance (left).
View to the south (Photographer Stuart Reeve, November 5, 2004).

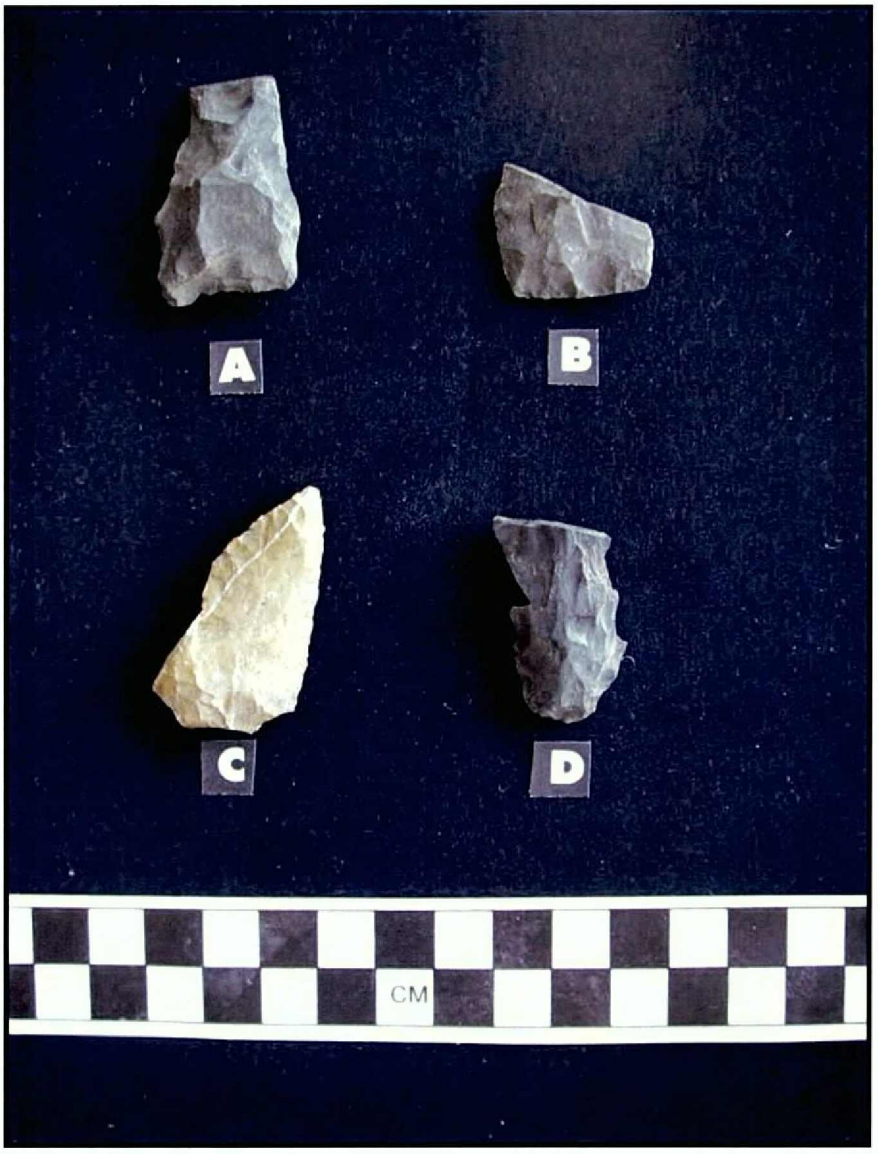





Photograph 7-3 Billops Ridge site, excavation units at N202E1 (Cat 216), N202E2 (Cat. 217) and N202E3 (Cat. 218), north wall profile, showing Feature 5 shell-filled pit beneath a shell midden and extending into B-horizon sand. View to the north (Photographer Stuart Reeve, October 8, 2004).


Photograph 7-4. Billops Ridge site, Feature 11 pit beneath A-horizon and extending into B-horizon sand in excavation unit N212E2 (Cat. 230), south wall profile. View to the south. (Photographer Stuart Reeve, November 3, 2004).




Photograph 7-5. Satterlee Street Locus 2, the Billops Ridge site projectile points.

A. Fox Creek Stemmed point, reshapened, from rhyolite (EU214.1.02).
B. Greene, Fox Creek Lanceolate, or Jack's Reef Pentagonal point base, from dark gray chert (EU214.1.03).
C. Untyped notched biface, asymmetrical blade, from yellow jasper (EU221.1.04).
D. Rossville point stem, broken blade, from black chert (EU240.3.03).


Photograph 7-6. Satterlee Street Locus 2, the Billops Ridge site Precontact pottery.

A. North Beach Net-Marked body sherd (EU214.1.03).
B. Unnamed cord-wrapped paddle body sherd, possible Vinette 1 variant (EU216.1.04).
C. Unnamed incised rim sherd (ST176.1).
D. North Beach Net-Marked body sherd, smoothed-over net impressions (EU235.2.02)
E. Fabric-Impressed body sherd, possible Vinette 1 variant (EU240.4.01).
F. Fabric-Impressed body sherd, possible Vinette 1 variant (EU242.2.01).
G. North Beach Net-Marked rim sherd, crenulated lip (EU242.3.05).

**APPENDIX A**

# Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 1 | Swinnerton | S035 | East | 0 to 14 | 14 to 44 | Removed. | Removed. | C 44 to >56: mixed 10YR6/8 and chart 2 for gley 4/5B clay and marl, subsoil. |
| 2 | Swinnerton | S045 | East | 0 to 16 | 16 to 33 | Removed. | B 33 to 50: 7.5YR2.5/1 clay with decayed plant matter, wetland soil. | C >50:chart 2 for gley 4/5B clay and marl, subsoil. |
| 3 | Swinnerton | S055 | East | 0 to 18 | 18 to 58 | Removed. | Removed. | C 58 to >72: 5YR4/6 sandy clay, subsoil. |
| 4 | Swinnerton | S065 | East | 0 to 13 | 13 to 50 | Removed. | B 50 to >70: 10YR3/4 sandy clay, with car headlight fragment (not collected), probable wetland soil. | Not identified. |
| 5 | Swinnerton | S075 | East | 0 to 13 | 13 to 63 | Removed. | Removed. | C 63 to >81: 5YR4/6 sandy clay, subsoil. |
| 6 | Swinnerton | S085 | East | 0 to 18 | 18 to 49 | Removed. | Removed. | C 49 to >70: 5YR4/6 sandy clay, subsoil. |
| 7 | Swinnerton | S095 | East | 0 to 18 | 18 to 54 | Removed. | Removed. | C 54 to >72: 5YR3/3 sandy andy silty clay, subsoil. |
| 8 | Swinnerton | S105 | East | 0 to 20 | 20 to 48 | Removed. | Removed. | C 48 to >65: 5YR4/6 sandy clay, subsoil. |
| 9 | Swinnerton | S115 | East | 0 to 15 | 15 to 36 | Removed. | Removed. | C 36 to >56: 7.5YR5/8 silty clay, subsoil. |
| 10 | Swinnerton | S125 | East | 0 to 13 | 13 to 36 | Removed. | Removed. | C1 36 to 46: 7.5YR5/6 sandy clay, subsoil. C2 46 to >74: 5YR4/6 sandy clay with large cobbles, subsoil. |
| 11 | Swinnerton | S135 | East | 0 to 18 | 18 to 30 | Removed. | Removed. | C 30 to >50: 2.5Y6/4 sandy clay, subsoil. |
| 12 | Swinnerton | S145 | East | 0 to 10 | 10 to 46 | Removed. | Removed. | C 46 to >70: 5YR4/6 sandy clay, subsoil. |
| 13 | Swinnerton | S155 | East | 0 to 12 | 12 to 33 | Removed. | Removed. | C1 33 to 50: 10YR4/6 clay, subsoil. C2 50 to >70: 5YR4/6 clay, subsoil. |
| 14 | Swinnerton | S165 | East | 0 to 17 | 17 to 36 | Removed. | Removed. | C 36 to >48: 7.5YR4/6 clay, subsoil. |
| 15 | Swinnerton | S175 | East | 0 to 7 | 7 to 28 | Removed. | Removed. | C1 28 to 63: 7.5YR4/6 silty clay, subsoil. C2 >63: 5YR4/6 clay, subsoil. |
| 16 | Swinnerton | S185 | East | 0 to 22 | 22 to 37 | Removed. | Removed. | C 37 to >49: 7.5YR4/6 silty clay, subsoil. |
| 17 | Swinnerton | S195 | East | 0 to 20 | 20 to 36 | Removed. | Removed. | C 36 to >77: 5YR4/6 silty clay, subsoil. |
| 18 | Swinnerton | S205 | East | 0 to 22 | 22 to 27 | Removed. | Removed. | C 27 to >56: 5YR4/6 silty clay, subsoil. |
| 19 | Swinnerton | S215 | East | 0 to 22 | 22 to 26 | Removed. | Removed. | C 26 to >65: 5YR4/6 silty clay, subsoil. |
| 20 | Swinnerton | S225 | East | 0 to 23 | 23 to 33 | Removed. | Removed. | C 33 to >71: 5YR4/6 silty clay, subsoil. |
| 21 | Swinnerton | S235 | East | 0 to 20 | 20 to 25 | Removed. | Removed. | C 25 to >54: 7.5YR4/6 silty clay, subsoil. |
| 22 | Swinnerton | S240 | West | 0 to 19 | 19 to 44 | Removed. | Removed. | C 44 to >53: 10YR6/6 clay, subsoil. |
| 23 | Swinnerton | S245 | East | 0 to 18 | 18 to 48 | Removed. | B 48 to 69: 10YR3/2 wet silt, wetland | C 69 to >109: 10YR5/6 silty clay, subsoil. |
| 24 | Swinnerton | S250 | West | 0 to 21 | 21 to 30 | A 30 to 80: 10YR4/4 clay loam, wetland soil or slopwash. | B 80 to >106: mottled 5Y4/2 and 5Y4/6 clay loam, wetland soil or subsoil. | Not identified. |
| 25 | Swinnerton | S255 | East | 0 to 17 | 17 to 46 | A 46 to 97: 10YR3/3 sandy silt, plowzone or slopewash. Artifacts: Precontact: 1 fire-cracked rock; undifferentiated shell (15 grams). Historic: 1 coal cinder. | B 97 to >107: 2.5Y4/2 sandy clay, wetland soil or subsoil. | Not identified. |
| 26 | Swinnerton | S260 | West | 0 to 32 | 32 to 59 | Removed, drywell. | Not identified. | Not identified. |
| 27 | Swinnerton | S265 | East | Unex. | Manhole | Water main trench. | Not identified. | Not identified. |
| 28 | Clermont | W000 | North | 0 to 20 | 20 to 70 | Water main trench. | Removed. | Not identified. |

# Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 29 | Clermont | W005 | North | 0 to 18 | 18 to 50 | Removed. | Removed. | C 50 to >89: mottled 2.5Y4/4 and 2.5Y5/1 clay, |
| 30 | Clermont | W020 | North | 0 to 8 | 8 to 59 | Removed. | Removed. | C 59 to >89: 7.5YR4/4 clay, subsoil. |
| 31 | Clermont | W035 | North | 0 to 10 | 10 to 30 | Removed. | Removed. | C 30 to >120: 7.5YR4/4 clay with cobbles, subsoil. |
| 32 | Clermont | W050 | North | 0 to 26 | 26 to 43 | Removed. | Removed. | C 43 to >63: 10YR4/4 compact sandy clay, subsoil. |
| 33 | Clermont | W065 | North | 0 to 15 | >15 | Drywell gravel with water. | Not identified. | Not identified. |
| 34 | Clermont | W080 | North | 0 to 19 | 19 to 34 | Removed. | Removed. | C 34 to >63: 2.5Y6/4 clay, subsoil. |
| 35 | Clermont | W095 | North | 0 to 18 | 18 to 40 | Removed. | Removed. | C 40 to >70: 2.5Y6/4 clay, subsoil. |
| 36 | Clermont | W110 | North | 0 to 17 | 17 to 54 | Removed. | Removed. | C1 54 to 64: 2.5Y6/4 clay, subsoil. C2 64 to >94: 2.5Y4.1 clay, subsoil. |
| 37 | Clermont | W125 | North | 0 to 18 | 18 to 56 | Removed. | Removed. | C 56 to >75: 2.5Y4/1 clay, subsoil. |
| 38 | Clermont | W140 | North | 0 to 19 | 19 to 45 | Removed. | Removed. | C 45 to >68: 2.5Y4/8 clay, subsoil. |
| 39 | Clermont | W165 | North | 0 to 20 | 20 to 73 | Removed. | Removed. | C 73 to >75: mottled 2.5Y5/3 and 10YR5/6 sandy clay, subsoil. |
| 40 | Clermont | W180 | North | 0 to 18 | 18 to 44 | Removed. | Removed. | C 44 to >70: 7.5YR4/4 clay, subsoil. 67 to >70: mottled 2.5Y5/3 and 10YR5/6 clay, subsoil. |
| 41 | Clermont | W195 | North | 0 to 17 | 17 to 37 | Removed. | Removed. | C 37 to >70: 7.5YR4/4 clay, subsoil. |
| 42 | Clermont | W210 | North | 0 to 12 | 12 to 49 | Removed. | Removed. | C >49: mottled 2.5Y5/3 and 10YR5/6 sandy clay, subsoil. |
| 43 | Clermont | W225 | North | 0 to 17 | 17 to 60 | Removed. | Removed. | C 60 to >75: 2.5Y6/4 clay, subsoil. |
| 44 | Clermont | W240 | North | 0 to 15 | 15 to 30 | Removed. | Removed. | C 30 to >45: 2.5Y6/4 clay, subsoil. |
| 45 | Clermont | W245 | Center | 0 to 13 | 13 to 29 | Removed. | Removed. | C 29 to >56: 5YR4/6 silty clay, subsoil. |
| 46 | Clermont | W250 | South | 0 to 12 | 12 to 28 | Removed. | Removed. | C 28 to >70: 5YR4/6 silty clay, subsoil. |
| 47 | Clermont | W255 | North | 0 to 18 | 18 to 32 | Removed. | Removed. | C 32 to >42: 2.5Y6/4 clay, subsoil. |
| 48 | Clermont | W260 | Center | 0 to 18 | 18 to 33 | Removed. | Removed. | C 33 to >63: 5YR4/6 silty clay, subsoil. |
| 49 | Clermont | W265 | South | 0 to 10 | 10 to 18 | Removed. | Removed. | C >18: 5YR4/6 clay, subsoil. |
| 50 | Clermont | W270 | North | 0 to 15 | 15 to 31 | Removed. | Removed. | C 31 to >38: 5YR4/6 silty clay, subsoil. |
| 51 | Clermont | W275 | Center | 0 to 16 | 16 to 43 | Removed. | Removed. | C1 43 to 60: 10YR4/6 sandy clay, subsoil. C2 60 to >70: 5YR4/6 sandy clay, subsoil. |
| 52 | Clermont | W280 | South | 0 to 16 | 16 to 25 | Removed. | Removed. | C 25 to >78: 7.5YR5/1 sandy clay, subsoil. |
| 53 | Clermont | W285 | North | 0 to 15 | 15 to 60 | Removed. | Removed. | C >60: 5YR4/6 clay, subsoil. |
| 54 | Clermont | W290 | Center | 0 to 13 | 13 to 39 | Removed. | Removed. | C 39 to >59: 10YR5/2 sandy clay, subsoil. |
| 55 | Clermont | W295 | South | 0 to 10 | 10 to 25 | Removed. | Removed. | C 25 to >45: 2.5Y6/4 wet sandy clay, subsoil. |
| 56 | Clermont | W300 | North | 0 to 12 | 12 to 40 | Removed. | Removed. | C 40 to >61: 7.5YR4/6 sandy clay, subsoil. |
| 57 | Clermont | W305 | Center | 0 to 16 | 16 to 38 | Removed. | Removed. | C 38 to >64: 7.5YR3/2 silty clay, subsoil. |
| 58 | Clermont | W313 | South | 0 to 10 | 10 to 44 | Removed. | Removed. | C 44 to >64: 5YR4/6 silty clay, subsoil. |
| 59 | Clermont | W315 | North | 0 to 28 | 28 to 38 | Removed. | B 38 to 48: 10YR4/4 compact silty sand. | C 48 to >62: 7.5YR4/6 clay, subsoil. |
| 60 | Clermont | W320 | Center | 0 to 17 | 17 to 36 | Removed. | Removed. | C 36 to >72: 7.5YR3/2 silty clay, subsoil. |
| 61 | Clermont | W325 | South | 0 to 17 | 17 to 43 | Removed. | Removed. | C 43 to >74: 5YR4/6 silty clay, subsoil. |

## Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 62 | Clermont | W330 | North | 0 to 20 | 20 to 40 | Removed. | Removed. | C 40 to 70: 7.5YR4/6 clay, subsoil. 70 to >75: 7.5YR5/1 clay, subsoil. |
| 63 | Clermont | W335 | Center | 0 to 19 | 19 to 35 | Removed. | Removed. | C 39 to >67: 5YR4/6 silty clay, subsoil. |
| 64 | Clermont | W340 | South | 0 to 12 | 12 to 40 | Removed. | Removed. | C 40 to >65: 10YR4/1 sandy clay, subsoil. |
| 65 | Clermont | W345 | North | 0 to 17 | 17 to 44 | Removed. | Removed. | C 44 to >73: mottled 10YR4/6 and 2.5Y5/3 clay, subsoil. |
| 66 | Clermont | W350 | Center | 0 to 17 | 17 to 39 | Removed. | Removed. | C 39 to >65: 5YR4/6 silty clay, subsoil. |
| 67 | Clermont | W355 | South | 0 to 15 | 15 to 43 | Removed. | Removed. | C 43 to >54: 10YR4/6 sandy clay, subsoil |
| 68 | Clermont | W360 | North | 0 to 19 | 19 to 40 | Removed. | Removed. | C 40 to >61: 7.5YR4/6 silty clay, subsoil. |
| 69 | Clermont | W365 | Center | 0 to 18 | 18 to 35 | Removed. | Removed. | C 35 to >58: 10YR4/6 silty clay, subsoil |
| 70 | Clermont | W370 | South | 0 to 13 | 13 to 27 | Removed. | Removed. | C 27 to >58: 10YR4/6 silty clay, subsoil |
| 71 | Clermont | W375 | North | 0 to 17 | 17 to 42 | Removed. | Removed. | C 42 to >62: mottled 10YR4/6 and 7.5Y4/6 clay, subsoil. |
| 72 | Clermont | W380 | Center | 0 to 18 | 18 to 30 | Removed. | Removed. | C 30 to 39: 5YR4/6 clay, subsoil. 39 to >59: 10YR4/6 clay, subsoil. |
| 73 | Clermont | W385 | South | 0 to 10 | 10 to 30 | Removed. | Removed. | C 30 to >51: 10YR4/6 silty clay, subsoil |
| 74 | Clermont | W390 | North | 0 to 14 | 14 to 48 | Removed. | Removed. | C 48 to >88: 7.5YR4/4 sandy clay, subsoil. |
| 75 | Clermont | W395 | Center | 0 to 19 | 19 to 43 | Removed. | Removed. | C1 43 to 54: 5YR4/6 silty clay, subsoil. C2 54 to >71: 10YR4/6 sandy clay, subsoil. |
| 76 | Clermont | W401 | South | 0 to 8 | 8 to 19 | Removed. | Removed. | C1 19 to 26: 5YR4/6 silty clay, subsoil. C2 26 to >47: 10YR4/6 silty clay, subsoil. |
| 77 | Clermont | W407 | North | 0 to 14 | 14 to 40 | Removed. | Removed. | C 40 to >50: 10YR4/6 clay, subsoil |
| 78 | Clermont | W410 | Center | 0 to 18 | Absent | Removed. | B 38 to 48: 10YR4/4 compact silty sand. | C 30 to >50: 10YR4/6 sandy clay, subsoil. |
| 79 | Clermont | W415 | South | 0 to 7 | 7 to 46 | Removed. | Removed. | C 46 to >67: mottled 5Y6/6 and 5Y4/2 silty clay, subsoil. |
| 80 | Clermont | W420 | North | 0 to 8 | 8 to 58 | Removed. | Removed. | C >58: 7.5YR4/4 clay, subsoil. |
| 81 | Clermont | W425 | Center | 0 to 23 | 23 to 39 | Removed. | B 23-39: 5YR4/6 organic silty clay. | C 39 to >58: 10YR4/6 sandy clay, subsoil. |
| 82 | Clermont | W430 | South | 0 to 6 | 6 to 50 | A 50 to 59: 5Y4/2 compact silty clay, plowzone. Artifacts: 1 oyster shell (10 grams) | B 59 to 80: mottled 2.5Y5/6 and 5Y4/4 compact clay loam, wetland soil. | C >80: mottled 5Y5/3, 5Y5/6 and 10YR46 compact clay, subsoil. |
| 83 | Clermont | W435 | North | 0 to 17 | 17 to 43 | A 43 to 67: 2.5Y4/3 silty sand, plowzone. Artifacts: Precontact: 1 possible fire-cracked rock; undifferentiated shell (5 grams). Historic: 1 window glass fragment; 2 coal cinders. | Absent | C 67 to >82: mottled 10YR5/6 and 2.5Y5/4 sandy clay, subsoil. |
| 84 | Clermont | W439 | Center | 0 to 8 | 8 to 40 | A 40 to 50: 5Y2.5/1 silty loam, plowzone. Artifacts: undifferentiated shell (55 grams) | B 50 to 77: mottled 10YR6/6 and 5Y2.5/1 sand. | C 77 to >102: 10YR6/8 wet sand, subsoil. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 85 | Clermont | W440 | North | 0 to 8 | 8 to 40 | A 40 to 50: 5Y2.5/1 silty loam, plowzone. Artifacts: undifferentiated large shells (105 grams). | B 50 to 77: mottled 10YR6/6 and 5Y2.5/1 sand. | C 77 to >102: 10YR6/8 wet sand, subsoil. |
| 86 | Clermont | W445W | South | 0 to 7 | 7 to 52 | A 52 to 57: 5Y3/1 silty sand loam, plowzone. Artifacts: 1 coal cinder; undifferentiated shell (5 grams). | B 57 to 78: 5Y4/2 loamy clay, possible wetland soil. | C 75 to >92: mottled 5Y5/1 and 5Y5/6 mottled loamy clay, wetland soil or subsoil. |
| 87 | Massachusetts | N000 | West | 0 to 16 | 16 to 65 | A 65 to >76: 2.5Y4/1 silty sand, plowzone or alluvium. >70: water. | Not identified. | Not identified. |
| 88 | Massachusetts | N005 | East | 0 to 12 | 12 to 50 | A 50 to 58: 10YR2/1 silty sand, tposoil or alluvium. Artifacts: undifferentiated large shells (105 grams). | B 58 to 73: 5Y2.5/2 wet sand, decayed plant matter, wetland soil. | C 73 to >92: 5Y5/4 clay, possible subsoil. |
| 89 | Massachusetts | N010 | West | 0 to 13 | 13 to 62 | A 62 to >72: 5Y3/1 wet silty sand, shell in profile, topsoil or alluvium. >72: water. | Not identified. | Not identified. |
| 90 | Massachusetts | N015 | East | 0 to 6 | 6 to 49 | A 49 to 59: 10YR2/1 sandy loam, plowzone or topsoil. Artifacts: undifferentiated large shells (165 grams). | B 59 to >90: 10YR4/4 wet sand, possible alluvium. >85:water. | Not identified. |
| 91 | Massachusetts | N020 | West | 0 to 7 | >7 | Not identified, >7: water. | Not identified. | Not identified. |
| 92 | Massachusetts | N025 | East | 0 to 7 | 7 to 30 | A 30 to 53: 10YR3/3 silty loam with shell in profile, plowzone. | B1 53 to 87: 10YR6/6 sandy clay, shell in profile, possible alluvial deposit. B2 87 to 109: 5Y2.5/2 wet clay loam with decayed plant-matter. | C 109 to >126: 5Y5/4 wet clay, subsoil. |
| 93 | Massachusetts | N035 | East | 0 to 9 | 9 to 21 | A 44 to 56: 10YR3/3 silty sand, plowzone. | B1 56 to 65: 10YR5/6 sand, possible alluvial deposit. B2 65 to 92: 5Y2.5/2 clay loam with decayed plant matter. | C 92 to >105: 5Y5/4 wet clay, subsoil. |
| 94 | Massachusetts | N045 | East | 0 to 10 | 10 to 33 | A 33 to 70: 5Y3/1 silt loam, shell in profile, plowzone. | B 70 to 91: 5Y5/1 clay loam, possible leached subsoil.. | C 91 to >97: 5YR5/6 clay with cobbles, subsoil. |
| 95 | Massachusetts | N050 | West | Absent | Absent | A 0 to 42: 10YR4/4 silty loam, plowzone. Artifacts undifferentiated shell (335 grams). Historic: 1 brown bottle glass fragment; 2 window glass fragments; 1 brick fragment; 1 coal fragment; 2 plastic fragments. | Absent. | C 42 to >65: 10YR6/6 wet clay, subsoil. |
| 96 | Massachusetts | N055 | East | 0 to 7 | Absent | A 7 to 33: 2.5Y3/1 silt loam, shell in profile, plowzone | Absent. | C 33 to >66: 10YR6/8 clay loam with cobbles from 53, subsoil. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 97 | Massachusetts | N060 | West | Absent | 0 to 25 | A 25 to 40: 10YR4/4 clay loam, plowzone. Artifacts: Precontact: 1 gray chert tertiary flake; 1 yellow jasper tertiary flake, 1 unworked yellow jasper pebble; undifferentiated shell (155 grams) | Absent. | C 40 to >110: 10YR6/8 clay loam with cobbles from 90, subsoil. |
| 98 | Massachusetts | N065 | East | 0 to 7 | 7 to 21 | Removed. | B 21 to 54: 7.5YR7/8 silty loam. | C 54 to >70: 5YR4/4 compact silt with gravel, subsoil. |
| 99 | Massachusetts | N070 | West | Absent | 0 to 24 | A 24 to 42: 7.5YR5/6 sandy loam, possible disturbed plowzone. Artifacts: undifferentiated large shells (210 grams). Historic: 1 window glass fragment. | B 42 to >50: 5YR4/6 compact sand, with sandstone pebbles, subsoil. | Not identified. |
| 100 | Massachusetts | N075 | East | 0 to 6 | 6 to 14 | A 14 to 44: 7.5YR7/8 compact clay loam, probably alluvium. | B 44 to >67: 5YR5/6 mottled with 5YR5/8 silty sand with cobbles, alluvium. | Not identified. |
| 101 | Massachusetts | N080 | West | Absent | 0 to 47 | Removed. | B 47 to 100: 5YR4/6 sandy clay, alluvium. | C 100 to >109: 5YR4/6 sandy clay with cobbles, subsoil. |
| 102 | Massachusetts | N085 | East | 0 to 7 | 7 to 36 | A1 36 to 42: 10YR3/2 silty sand with shell in profile, topsoil. A2 42 to 45: 7.5YR2.5/1sandy loam, possible alluvium. A3 45 to 62: 10YR3/2 mottled silty sand, possible alluvium. | B 62 to >78: 10YR4/6 sand, probable alluvium. | Not identified. |
| 103 | Massachusetts | N090 | West | Absent | 0 to 60 | A 60 to 80: 5YR5/1 wet sand, possible alluvium. >70: water. | Not identified. | Not identified. |
| 104 | Massachusetts | N095 | East | 0 to 7 | 7 to 42 | A 42 to 82: mixed 5Y3/1 and 5Y5/6 wet sand, shell in profile, probable disturbed alluvium. >78: water. Artifacts: 1 oyster shell (20 grams), Historic: 1 whiteware sherd, blue transfer-print decorated. | Not identified. | Not identified. |
| 105 | Massachusetts | N100 | West | Absent | 0 to 38 | A1 39 to 61: 5YR5/1 sand, possible disturbed plowzone. Artifacts: Precontact: 1 black chert primary flake; 1 red chert chip: undifferentiated shell (231 grams). Historic: 1 clear vessel glass fragment. A2 61 to 77: 5Y3/1 sand, shell in profile, possible plowzone. Artifact: modern tile, not collected. >77: water. | Not identified. | Not identified. |
| 106 | Massachusetts | N105 | East | 0 to 3 | 3 to 59 | A 59 to 88: mixed 5Y3/1 and 5Y5/6 wet sand, shell in profile, disturbed alluvium. >86: water. | Not identified. | Not identified. |

# Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 107 | Massachusetts | N110 | West | Absent | 0 to 80 | A 80 to 114: 10YR4/2 silty clay loam with shell in profile, possible alluvium. | B 114 to >170: 2.5Y6/4 sand, possible alluvium. | Not identified. |
| 108 | Massachusetts | N115 | East | 0 to 8 | 8 to 63 | A 63 to 140: 5Y3/1 silty sand, alluvium. Artifacts: Precontact: 1 black chert primary flake; undifferentiated large shells (200 grams). Historic: 1 whiteware sherd, undecorated rim; 1 stoneware shered undecorated salt glaze; 1 porcelain rim sherd, painted overglaze gold line; 4 blue-green molded medicine vile fragments; 2 window glass fragments; 1 unidentified nail; 2 coal fragments. | B 140 to >153: 5Y2.5/1 organic clay and vegetation, wetland soil. | Not identified. |
| 109 | Massachusetts | N120 | West | Absent | 0 to 78 | Removed. | B 78 to >94: 2.5Y4/2 clay loam, probably alluvium. >94: water. | Not identified. |
| 110 | Massachusetts | N125 | East | 0 to 8 | 8 to 77 | A 77 to 117: 5Y3/1 silty loam, plowzone or alluvium. Artifacts: Precontact: 1 black chert primary flake: undifferentiated large shells (406 grams). Historic: 1 cut nail; 1 window glass fragment. | B 117 to >177: 5Y4/1 wet sand, possible alluvium. >177, water. | Not identified. |
| 111 | Massachusetts | N130 | West | Absent | 0 to 72 | A1 72 to 92: 5Y3/3 loamy clay, shell in profile, possible alluvium. A2 92 to 101: 5Y3/3 loamy sand, shell in profile, possible alluvium. | B 101 to >120: mottled 5Y3/3 and 2.5Y6/6 sand, possible alluvium. | Not identified. |
| 112 | Massachusetts | N135 | East | 0 to 8 | 8 to 67 | A 67 to 107: 10YR3/2 humic sand, plowzone or alluvium. Artifacts: Precontact: 1 black chert primary cobble core; undifferentiated shell (25 grams). | B 107 to >128: 2.5Y4/2 wet sandy clay, possible alluvium. | Not identified. |
| 113 | Massachusetts | N140 | West | Absent | 0 to 50 | A1 50 to 80: 5Y5/2 sandy clay, alluvium. A2 80 to 110: 2.5Y4/2 wet sand, probable alluvium, shell in profile. A3 110 to 140: 10YR2/1 wet humic sand, shell in profile. | B 140 to >170: 10YR5/1 wet sandy clay, possible alluvium. | Not identified. |
| 114 | Massachusetts | N145 | East | 0 to 8 | 8 to 60 | A1 60 to 70: 5Y5/1 wet sand, fill or slopewash. Artifacts: Precontact: 1 fire-cracked rock; undifferentiated large shells (301 grams). Historic: 1 coal cinder. A2 70 to 74: 5Y3/1 humic silt, topsoil. Soil sample. A3 74 to 94: 5Y5/1 sandy clay, plowzone or alluvium. | Absent. | C 94 to >109: 2.5Y6/4 wet sandy clay, subsoil. |

# Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 115 | Massachusetts | N150 | West | Absent | 0 to 120 | A 120 to 150: 5Y3/1 sandy clay, plowzone or alluvium. >140: water. | Not identified. | Not identified. |
| 116 | Massachusetts | N155 | East | 0 to 8 | 8 to 60 | A1 60 to 67: 5Y3/1 silty loam, topsoil. A2 67 to 95: 5Y5/1 sandy clay, plowzone or alluvium. | Absent. | C 67 to >109: 2.5Y6/4 wet sandy clay, subsoil. |
| 117 | Massachusetts | N160 | West | Absent | 0 to 100 | A1 100 to 107: 5Y3/1 silty loam, topsoil. A2 107 to >126: 5Y5/1 wet sand, plowzone or alluvium. >107: water. | Not identified. | Not identified. |
| 118 | Massachusetts | N165 | East | 0 to 8 | 8 to 63 | A1 63 to 67: 5Y3/1 wet silty loam, topsoil. A2 67 to 90: 5Y5/1 wet sandy clay with jasper pebbles, plowzone or alluvium. | Absent. | C 90 to >100: 2.5Y6/4 wet sandy clay, subsoil. |
| 119 | Massachusetts | N170 | West | Absent | 0 to 82 | A1 82 to 90: 5Y3/1 wet silty loam, topsoil. A2 90 to >121: 5Y5/1 wet sand, plowzone or alluvium. >109: water. | Not identified. | Not identified. |
| 120 | Massachusetts | N173 | East | 0 to 8 | 8 to 52 | A1 52 to 58: 5Y4/1 silty loam, topsoil. A2 58 to 71: 5Y5/1 wet sandy clay, plowzone or alluvium. | Absent. | C 71 to >91: mottled 5Y6/4 and 5Y5/6 wet sandy clay with sandstone, subsoil |
| 121 | Massachusetts | N180 | West | Absent | 0 to 50 | A1 50 to 57: 5Y3/1 silty loam, topsoil. A2 57 to 77: 5Y5/1 wet sand, plowzone or alluvium. | B 77 to >96: 2.5Y6/8 wet sand with gravel, possible alluvium. >95: water. | Not identified. |
| 122 | Massachusetts | N185 | East | 0 to 8 | 8 to 42 | A1 42 to 46: 5Y3/1 silt loam, topsoil. A2 46 to 67: 5Y5/1 sandy silt, plowzone or alluvium. | B 67 to >81: 2.5Y6/8 sand, possible alluvium. | Not identified. |
| 123 | Massachusetts | N190 | West | Absent | 0 to 40 | A1 40 to 44: 5Y3/1 silty loam with shell observed in profile, topsoil. A2 44 to 50: 5Y4/1 silty sand, plowzone. | B 50 to 70: 2.5Y6/8 wet sand, alluvium. | C 70 to >87: 7.5YR5/6 wet sand, subsoil. >85: water. |
| 124 | Massachusetts | N195 | East | 0 to 9 | 9 to 39 | A1 39 to 43: 5Y3/1 silty loam, topsoil: Artifacts: Precontact: 1 oyster shell (5 grams). Historic 1 olive-green bottle glass fragment. A2 43 to 59 5Y5/1 wet sand, plowzone or alluvium. | Absent. | C 59 to >74: mottled 5Y5/1 and 5Y5/4 silty clay with sandstone, subsoil. |
| 125 | Massachusetts | N200 | West | Absent | 0 to 60 | A1 60 to 62: 5Y2/1 silty loam, topsoil. A2 62 to 70 5Y4/1 wet sand, plowzone or alluvium. | Absent. | C 70 to >95: 7.5YR5/6 wet sand, subsoil. >95: water. |
| 126 | Massachusetts | N205 | East | 0 to 8 | 8 to 43 | A1 43 to 47: 10YR2/1 humic clay, topsoil. A2 47 to 80: 5Y3/1 sand, plowzone or alluvium. | B 80 to >93: mottled 5Y5/1 and 5Y5/4 silty loam, possible alluvium. | Not identified. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 127 | Massachusetts | N210 | West | Absent | 0 to 60 | A1 60 to 64: 5Y2/1 silty loam, topsoil. A2 64 to 84 5Y4/1 wet sand, plowzone or alluvium. | Absent. | C 84 to >104: 7.5YR5/6 wet sand, subsoil. |
| 128 | Massachusetts | N215 | East | 0 to 10 | 10 to 27 | A 27 to 46: 5T4/1 sandy loam, plowzone. Artifacts: Precontact: 1 fire-cracked rock. | Absent. | C 44 to >54: 10YR4/6 sandy clay, subsoil. |
| 129 | Massachusetts | N220 | West | Absent | 0 to 60 | A 60 to 64: 5Y3/1 silty loam, topsoil. 64 to 79 5Y4/1 wet sand, plowzone or alluvium. | Absent. | C 79 to >94: 7.5YR5/6 wet sand, subsoil. |
| 130 | Massachusetts | N225 | East | 0 to 10 | 10 to 30 | A 30 to 44: 5Y4/1 sandy clay, possible plowzone. | Absent. | C >44: mottled 5Y6/6 and 5Y4/1 sandy clay. |
| 131 | Massachusetts | N228 | West | Absent | 0 to 70 | A1 70 to 75: 5Y3/1 silty loam, topsoil. A2 75 to 95 5Y4/1 coarse sand, plowzone or alluvium. | B 95 to >102: mottled 5Y4/1 and 10YR4/6 silty sand, possible alluvium. | Not identified. |
| 132 | Hylan | W005 | South | 0 to 32 | 32 to 56 | A1 56 to 71: mottled 5Y3/1 and 10YR4/4 sandy clay, wetland soil. A2 101 to 113: 5Y5/1 sandy clay, with decayed plant matter, wetland soil. Soil sample. | B 101 to >113: 5Y5/1 wet sand, alluvium or leached subsoil. >107: water. | Not identified. |
| 133 | Hylan | W010 | Center | 0 to 36 | Absent | A 37 to 78: 5Y2.5/1 sandy clay with decayed plant matter, wetland soil. | B1 78 to 89: 5Y6/1 wet sand, alluvium or leached subsoil. B2 89 to >104: 5Y5/6 wet sand, alluvium or leached subsoil. >104: water. | Not identified. |
| 134 | Hylan | W015 | South | 0 to 37 | 37 to 56 | A 56 to 80: 5Y2.5/1 silty clay with decayed plant matter, wetland soil. | B1 80 to 106: 5Y6/1 wet sand, alluvium or leached subsoil. B2 106 to 117: 5Y5/6 wet sand, alluvium or leached subsoil. >107: water. | Not identified. |
| 135 | Hylan | W020 | Center | 0 to 41 | Absent | A 41 to 82: 5Y2.5/1 silty clay with decayed plant matter, wetland soil. | B1 82 to >98: 5Y6/1 wet sand, alluvium or leached subsoil. B2 98 to 107: 5Y5/6 wet sand, alluvium or leached subsoil. >98: water. | Not identified. |
| 136 | Hylan | W25 | South | 0 to 32 | 32 to 52 | A 52 to 74: 5Y2.5/1 silty clay with decayed plant matter, wetland soil. | B 74 to >100: 5Y6/1 wet sand, alluvium or leached subsoil. >100: water. | Not identified. |
| 137 | Hylan | W030 | Center | 0 to 38 | 38 to 50 | Removed. | Removed. | C 50 to >54: 10YR6/8 sand, subsoil, and natural gas line trench. |
| 138 | Hylan | W035 | South | 0 to 38 | Absent | Removed. | Removed. | C1 38 to 67 10YR6/8 sand, subsoil. C2 67 to 108: 2.5Y7/6 sand, subsoil. C3 108 to >126: 2.5Y6/6 sand, subsoil. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 139 | Satterlee | N015 | West | 0 to 9 | 9 to 36 | Removed. | Removed. | C 36 to >60: mottled 5Y6/6 anf 5Y3/1 sandy clay, subsoil. |
| 140 | Satterlee | N020 | Center | 0 to 9 | 9 to 26 | A 26 to 35: 10YR4/4 silty sand, with fragmentary burnt wood, plowzone. | B 35 to >38: mottled 2.5Y6/6 and 5Y3/1silty sand, possible subsoil. | Not identified. |
| 141 | Satterlee | N025 | West | 0 to 8 | 8 to 23 | A 23 to 38: 5Y4/3 sandy loam, plowzone. | B 38 to >62: mottled 5Y4/3, 5Y5/1 and 5Y6/6 compact silty loam, possble subsoil. | Not identified. |
| 142 | Satterlee | N030 | Center | 0 to 7 | 7 to 21 | A1 21 to 35: 5Y3/1 silty sand with decayed plant matter, topsoil. Artifacts: 1 clear bottle glass fragment. A2 35 to 50: 5Y4/1 sandy clay, possible plowzone. | Absent. | C 50 to >55: mottled 5Y6/1 and 5Y6/8 sandy clay, subsoil. |
| 143 | Satterlee | N035 | West | 0 to 15 | 15 to 30 | A 30 to 70: 5Y3/1 silty sand changing to 5Y4/1 sandy clay, possible plowzone. Artifacts: Precontact: 1 black chert primary flake. Historic: 4 brick fragments; 5 coal fragments. | B 70 to 83: 5Y5/1 compact sandy clay. | C >83: 5Y5/4 compact sandy clay, subsoil. |
| 144 | Satterlee | N045 | West | 0 to 10 | 10 to 37 | A 37 to 54: 5Y4/1 compact silty loam with coal and shell in profile, possible plowzone. | B 54 to >61: 5Y5/1 compact sandy clay. | Not identified. |
| 145 | Satterlee | N050 | Center | 0 to 13 | 13 to 32 | A 32 to 48: 5Y4/1 compact silty loam with decayed plant matter, possible plowzone. | Absent. | C 48 to >56: mottled 5Y6/1 and 5Y6/8 silty clay, subsoil. |
| 146 | Satterlee | N055 | West | 0 to 12 | 12 to 24 | A 24 to 32: 10YR3/4 medium sand, possible plowzone. | B 32 to 48: 2.5Y6/4 fine sand. | C >48: mottled 10YR4/6 and 7.5YR4/6 fine sand and gravel, subsoil. |
| 147 | Satterlee | N060 | Center | 0 to 7 | 7 to 33 | A 33 to 41: 5Y3/1 silty sand, possible topsoil. | Absent. | C 41 to 44: mottled 5Y6/1 and 5Y6/8 sandy clay, subsoil. |
| 148 | Satterlee | N065 | West | 0 to 7 | 7 to 32 | A1 32 to 40: 10YR4/2 silt loam, historic topsoil or slopewash. A2 40 to 43: 10YR2/1 silty sand, buried topsoil or midden. Artifacts: Precontact: undifferentiated shell (130 grams). | B1 43 to 51: 5YR4/6 sand.B2 61 to 65: 10YR4/4 sandy clay. | C 51 to >65: mottled 5Y6/1 and 7.5YR4/6 sandy clay, subsoil. |
| 149 | Satterlee | N070 | Center | 0 to 14 | 14 to 54 | A 54 to 64: 10YR4/4 silty sand, possible plowzone. Artifacts: Precontact: undifferentiated shell (35 grams). | Absent. | C 64 to >70: 5YR4/4 sandy clay with cobbles, subsoil. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 150 | Satterlee | N075 | West | 0 to 7 | 7 to 24 | A 24 to 60: mottled 10YR2/1 and 5YR4/6 silty sand, changing to 5YR4/6 sand, mixed topsoil and plowzone. Artifacts: Precontact: 1 fire-cracked rock; 1 possible cobble grinding-stone; undifferentiated shell (15 grams). Historic: 11 red earthenware sherds with clear lead glaze; 3 kaolin pipestem fragments, 6/64-inch bore diameter. | Absent. | C 60 to >80: mottled 5Y6/1 and 7.5YR4/6 sandy clay with sandstone, subsoil. |
| 151 | Satterlee | N080 | Center | 0 to 8 | 8 to 30 | A 30 to 50: 5Y3/1 silty sand with decayed plant matter, possible plowzone. | B1 50 to 57: 5Y4/6 coarse sand. B2 57 to 66: 5Y4/2 coarse sand. | C >68: mottled 5Y5/1 and 5Y6/6 sandy clay, subsoil. |
| 152 | Satterlee | N085 | West | 0 to 12 | 12 to 22 | A1 22 to 40: mixed 10YR4/6 and 10YR4/2 sand, disturbed topsoil. Artifacts: Precontact: 1 black chert chip; undifferentiated shelll (35 grams). A2 40 to 52: 2.5Y4/2 sand, plowzone. Artifacts: Precontact: undifferentiated shell (15 grams). | Absent. | C 52 to >55: 2.5Y5/4 clay, subsoil. |
| 153 | Satterlee | N090 | Center | 0 to 8 | 8 to 26 | A 26 to 40: 10YR4/4 silty sand, plowzone. Artifacts, brick fragments (not collected). | B 40 to 50: 2.5Y6/6 coarse sand. | C 50 to >55: 5Y4/4 sandy clay, suboil. |
| 154 | Satterlee | N095 | West | 0 to 7 | 7 to 27 | A 27 to 45: mottled 5Y4/1 and 10YR4/4 silty sand, plowzone. Artifacts: Precontact: 1 black chert tertiary flake; undifferentiated shell (10 grams). Historic: 1 coal cinder. | Absent. | C 45 to >56: mottled 5Y7/6, 5YR4/6 and 5Y6/1 sandy clay, subsoil. |
| 155 | Satterlee | N100 | Center | 0 to 9 | 9 to 40 | Removed. | B1 40 to 71: 2.5Y6/6 sand. B2 71 to 81: 2.5Y7/6 sand. | C 81 to >85: 5Y4/4 sandy clay with sandstone, subsoil. |
| 156 | Satterlee | N105 | West | 0 to 7 | 7 to 31 | Removed. | B 31 to 75: 7.5YR7/8 sand with shell in profile. | C 75 to >83: 5YR4/4 sandy clay, subsoil. |
| 157 | Satterlee | N110 | Center | 0 to 8 | 8 to 41 | Removed. | B 41 to 81: 2.5Y6/6 sand. | C 81 to >85: mottled 5Y7/1 and 5Y7/8 silty clay, subsoil. |
| 158 | Satterlee | N115 | West | 0 to 7 | 7 to 23 | A/B 23 to 30: mixed 10YR4/4 and 5YR4/6 silty sand and compact silt, disturbed A mixed with B horizons. | Disturbed. | C 30 to >44: 7.5YR6/8 silty clay and sandstone bedrock. |
| 159 | Satterlee | N120 | Center | 0 to 9 | 9 to 41 | Removed. | Removed. | C 41 to >82: 7.5YR4/6 silty clay, subsoil. |
| 160 | Satterlee | N125 | West | 0 to 7 | 7 to 35 | Removed. | Removed. | C 35 to >46: 2.5YR3/6 compact clay and gravel, subsoil. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 161 | Satterlee | N130 | Center | 0 to 7 | 7 to 21 | Removed. | B 21 to >38: 7.5YR4/6 coarse sand. | Not identified. |
| 162 | Satterlee | N135 | West | 0 to 7 | 7 to 42 | A 42 to 48: 5Y4/2 silty sand with shell in profile, plowzone. | B 48 to 55: 2.5Y7/8 coarse sand. | C 55 to >63: 2.5Y6/4 coarse sandy clay, subsoil. |
| 163 | Satterlee | N140 | Center | 0 to 7 | 7 to 32 | Removed. | Removed. | C 32 to >43: 7.5YR4/6 clay, subsoil. |
| 164 | Satterlee | N145 | West | 0 to 5 | 5 to 40 | Removed. | Removed. | C 40 to >60: 7.5YR4/6 fine sandy clay, subsoil. |
| 165 | Satterlee | N150 | Center | 0 to 6 | 6 to 21 | Removed. | Removed. | C 21 to >36: 7.5YR4/6 clay, subsoil. |
| 166 | Satterlee | N155 | West | 0 to 5 | 5 to 20 | A/B 20 to 27: mixed 10YR4/6 and 7.5YR4/6 sand and clay with shell in profile, disturbed A mixed with B horizons. | Disturbed. | C 27 to >40: 7.5YR4/6 clay, subsoil. |
| 167 | Satterlee | N160 | Center | 0 to 7 | 7 to 18 | A 18 to 31: 2.5Y3/3 sand, fill or plowzone. | Absent. | C 31 to >40: 7.5YR4/6 clay, subsoil. |
| 168 | Satterlee | N165 | West | 0 to 5 | 5 to 12 | A 12 to 28: 10YR4/6 silty sand, plowzone. Artifacts: Precontact: undifferentiated shell (15 grams). | Absent. | C 28 to >32: 10YR6/4 sandy clay, subsoil. |
| 169 | Satterlee | N170 | Center | 0 to 7 | 7 to 18 | A 18 to 33: mixed 10YR4/4, 7.5YR3/1 and 7.5YR4/4 sand, disturbed plowzone. Artifacts: Precontact: 1 quartz primary flake; undifferentiated shell (15 grams). | Absent. | C1 33 to 43: 2.5Y6/3 clay, subsoil. C2 43 to >53: 5YR4/6 clay, subsoil. |
| 170 | Satterlee | N175 | West | 0 to 4 | 4 to 15 | A 15 to 44: mixed 10YR4/6 and 10YR3/4 sand, disturbed plowzone. Artifacts: Precontact: 1 fire-cracked rock, undifferentiated shell (145 grams). Historic: 1 clear glass lightbulb fragment, 1 coal fragment. | B 44 to 55: 10YR5/6 sand, possible aolean or outwash deposit. | C >55: 10YR5/6 clay, subsoil. |
| 171 | Satterlee | N180 | Center | 0 to 20 | Absent | A 20 to 46: 10YR4/6 sand with occasional road gravel, disturbed plowzone. Artifacts: Precontact: undifferentiated shell (20 grams). | B 46 to >86: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |
| 172 | Satterlee | N185 | West | 0 to 9 | 9 to 19 | A 19 to 32: 10YR3/2 sand, occasional road gravel, disturbed plowzone. | B 32 to >60: 10YR5/6 sand, possible aolean or outwash. | Not identified. |
| 173 | Satterlee | N190 | Center | 0 to 7 | 7 to 17 | A 17 to 34: mixed 10YR4/6 and 10YR5/6 sand with occasional gravel, disturbed plowzone. Artifacts: Precontact: 2 reddish brown chert tertiary flakes, undifferentiated shell (250 grams). | B 32 to >60: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | Fill (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact Descriptions | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 174 | Satterlee | N195 | West | 0 to 5 | 5 to 19 | A 19 to 42: 10YR4/6 sand, with occasional road gravel, changing to 10YR3/2 sand, plowzone. Artifacts: Precontact: undifferentiated shell (100 grams). Historic: 1 coal cinder. | B 42 to >82: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |
| 175 | Satterlee | N200 | Center | 0 to 8 | 8 to 38 | A 38 to 50: 10YR3/3 sand, topsoil or midden. Artifacts: Precontact: 1 fire-cracked rock; undifferentiated shell (50 grams). Historic: 2 coal cinders. | B 50 to >77: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |
| 176 | Satterlee | N205 | West | 0 to 4 | 4 to 20 | A 20 to 30: 10YR4/4 sand with rare gravel, possible plowzone. Artifacts: Precontact: undifferentiated shell (125 grams). Historic: 2 coal cinders. 30 to 43: 10YR3/3 fine sand, shell midden. Artifacts: Precontact: 1 rhyolite tertiary flake; pottery, 1 grit tempered incised rim sherd, 35 unidentified sherds and crumbs; 4 bone fragments; undifferentiated shell (680 grams). Historic: 1 eroded red earthenware sherd; 4 undecorated whiteware sherds; 1 corroded cut or wrought nail; 15 coal fragments. | B 43 to >67: 10YR5/6 fine sand, possible aolean or outwash deposit. | Not identified. |
| 177 | Satterlee | N210 | Center | 0 to 7 | 7 to 20 | A 20 to 37: 10YR3/2 sand, topsoil and shell midden. Artifacts: Precontact: 1 yellow jasper primary flake; pottery, 42 unidentified crumbs; 2 bone fragments; undifferentiated shell (1130 grams). Historic: 43 coal cinders. | B 37 to >62: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |
| 178 | Satterlee | N215 | Center | 0 to 9 | 9 to 22 | A 22 to 44: 10YR4/4 silty sand, plow zone. Artifacts: Precontact: 1 black chert tertiary flake; pottery. 1 sand-tempered cord-marked sherd, 10 unidentified sherds and crumbs; undifferentiated shell (2144 grams). Historic: 18 coal cinders. | B 44 to >104: 10YR5/6 sand, possible aolean or outwash deposit. Artifacts 44 to 52: Precontact: 1 grey chert chip; 3 fire-cracked rocks; pottery, 11 unidentified crumbs; undifferentiated shell (280 grams). | Not identified. |

Appendix A. Conference House Park-South Richmond Drainage Phase 1B/2 Soils and Artifact Descriptions

| Cat. | Street | Location (meters) | Trench | Road (cm) | *Fill* (cm) | A Horizon (cm): Soil and Artifact Descriptions | B Horizon (cm): Soil and Artifact *Descriptions* | C Horizon (cm): Soil Description |
|---|---|---|---|---|---|---|---|---|
| 179 | Satterlee | N220 | Center | 0 to 12 | 12 to 25 | 25 to 54: 10YR4/2 silty sand, plowzone. Artifacts: Precontact: 1 gray chert chip; 1 quartzite fire-cracked rock; 35 unidentified pottery sherds and crumbs; 3 unidentified bone fragments; undifferentiated shell (1557 grams). Historic: 9 coal cinders. | 54 to >75: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |
| 180 | Satterlee | N225 | Center | 0 to 12 | 12 to 35 | A 35 to 79: 10YR4/4 silty sand with road gravel, plowzone. Artifacts: Precontact: pottery, 13 unidentified crumbs; undifferentiated shell (112 grams). Historic: 8 coal cinders. | B1 79 to >100: 10YR4/6 sand. B2 >100: 10YR5/6 sand, possible aolean or outwash deposit. | Not identified. |

**APPENDIX B**
**Conference House Park-**
**South Richmond Drainage Phase 3**
**Soil Descriptions and Artifact Summary**

# Appendix B. Conference House Park-South Richmond Drainage Phase 3 Soil Descriptions and Artifact Summary

| Cat. | Location (m) | Depth (cm) | Soil and Artifact Descriptions |
|---|---|---|---|
| **Massachusetts Street, Burial Ridge Site** | | | |
| 181 | N004, East Trench | 60-150 | Feature 1: Telephone pole hole, 70 cm N-S, 59 cm E-W, with parallel straight sides. 10YR3/4 sand and cobbles |
| 182 | N092, East Trench | 91-122 | Feature 2: Historic pit, approximately 100 cm diameter. 10YR2/2 wet silty sand. Artifacts include 20th-Century fill (e.g. stoneware, cold cream jar, condiment bottle, milk bottles, wood) with oyster shells |
| 183 | N055.9, West Trench | 30-49 | Feature 3: Precontact pit, circular, 20 cm diameter. 10YR2/1 silty sand, rare shell fragments, 3 cobbles in south side |
| **Satterlee Street Locus 1, Fenceline Site** | | | |
| 184 | N011.0 E3.8 | 42-52 | Feature 1: Historic posthole, 20 cm diameter. 2.5Y3/3 sand |
| 185 | N011.7 E3.8 | 42-49 | Feature 2: Historic posthole, irregular 20 cm N-S, 28 cm E-W. 2.5Y3/3 sand |
| 168 | N016.3 E3.77 | 29-45 | Feature 3: Historic posthole/mold, elliptical, 20 cm N-S, 30 cm E-W. 2.5Y3/2.5 sand with charcoal; postmold pointed in profile |
| 187 | N017.15 E3.7 | 30-55 | Feature 4: Historic posthole, elliptical, 24 cm N-S, 39 cm E-W. 2.5Y3/1 sand with charcoal from fence post mold, straight base in profile |
| 188 | N019.0 E3.26 | 38-60 | Feature 5: Historic posthole, elliptical, 24 cm N-S, 39 cm E-W. Hole 2.5Y 4/3 sand, and mold 2Y2/1 sand with wood and charcoal, mold pointed in profile |
| 189 | N020.0 E3.7 | 40-60 | Feature 6: Historic posthole, circular 30 cm diameter. 2.5Y2/1 sand with mold pointed in profile |
| 190 | N023.4 E3.92 | 52-80 | Feature 7: Historic posthole, elliptical 22 cm N-S, 30 cm E-W. 2,5Y3.2 sand mottled with 2.5Y2/1 sand and charcoal from mold |
| 191 | N023.9 E3.9 | 56-76 | Feature 8: Historic posthole, elliptical 30 cm N-S, 26 cm E-W. 2.5Y3/2 sand with no mold |
| 192 | N026.75 E3.94 | 57-72 | Feature 9: Historic posthole, elliptical, 21 cm N-S, 30 cm E-W. 2.5Y3/3 mottled with 2.5Y3/2 sand with wood and charcoal; mold 9 cm diameter, squared base |
| 193 | N027.15 E3.98 | 57-82 | Feature 10: Historic posthole, elliptical, 24 cm N-S, 37 cm E-W, 2.5YR3/3 sand with wood, rounded base |
| 194 | N030.3 E3.9 | 55-85 | Feature 11: Historic posthole, elliptical, 20 cm N-S, 33 cm E-W. 2.5Y3/1 sand and charcoal, sharp point |
| 195 | N030.5 E4.2 | 55-85 | Feature 12: Historic posthole, elliptical, 26 cm N-S, 29 cm E-W. 2.5Y3/1 sand and charcoal well defined post with squared base |
| 196 | N030.8 E4.2 | 55-70 | Feature 13: Historic posthole, elliptical, 24 cm N-S, 33 cm E-W. 2.5Y3/1 sand, well defined post mold with circular base |
| 197 | N034.0 E3.8 | 50-88 | Feature 14: Historic posthole, triangular, 20 cm N-S, 30 cm E-W. 2.5Y3/1 sand, well defined mold with square bottom |
| 198 | N034.5 E3.8 | 50-70 | Feature 15: Historic posthole, triangular, 39 cm N-S, 30 cm E-W. 2.5Y3/1 sand with chuck-rock, poorly defined mold |
| 199 | N037.6 E3.8 | 57 | Feature 16: Historic posthole, triangular, 20 cm N-S, 30 cm E-W. Mottled 2.5Y6/6 and 2.5Y3/3 sand, with charcoal |
| 200 | N038.0 E3.8 | 57 | Feature 17: Historic posthole, rectangular, 40 cm N-S, 30 cm E-W. 2.5Y3/3 sand in hole) and 2.5Y2/1 sand, wood and charcoal in mold, with red cedar post (collected) |
| 201 | N041.2 E4.05 | 47-78 | Feature 18: Historic posthole, elliptical, 45 cm N-S, 39 cm E-W. 2.5Y4/4 basin shaped 30-cm diameter possibly dressed chuck-rock in north end |
| 202 | N041.8 E4.1 | 47-70 | Feature 19: Historic posthole, elliptical, 40 cm N-S, 22 cm E-W. 2.5Y4/4 sand, mold 30-cm diameter possibly dressed chuck-rock in north end |
| 203 | N042.6 E4.1 | 51-79 | Feature 20: Historic posthole, rectangular, 25 cm N-S, 30 cm E-W. 2.5Y4/6 sand, profile pointed mold ending in clay |
| 204 | N044.9 E4.28 | 61-93 | Feature 21: Historic posthole, circular, 25 cm diameter: 2.5Y4/6 sand, mold pointed in profile, 17-cm diameter with large chuck cobble |
| 205 | N045.1 E4.05 | 61 | Feature 22: Historic posthole, elliptical, 34 cm N-S, 28 cm E-W. 2.5Y4/6 sand |
| 206 | N049.4 E4.13 | No Data | Feature 23: Historic posthole elliptical, 30 cm N-S, 27 cm E-W. No soil description, with red cedar post (collected) |
| 207 | N049.6 E4.21 | No Data | Feature 24: Historic posthole, elliptical, 22 cm N-S, 26 cm E-W. No soil description |
| 208 | N050.8 E4.23 | No Data | Feature 25: Historic posthole, elliptical, 20 cm N-S, 30 cm E-W. No soil description |
| 209 | N052.4 E4.15 | No Data | Feature 26: Historic posthole, circular, 33 cm diameter. No soil description |

# Appendix B. Conference House Park-South Richmond Drainage Phase 3 Soil Descriptions and Artifact Summary

| Cat. | Location (m) | Depth (cm) | Soil and Artifact Descriptions |
|---|---|---|---|
| **Satterlee Street, Locus 1 (continued)** | | | |
| 210.1 | N072 E1 | 18-30 | EU: Disturbed, 10YR2/1 with 10YR4/6 and 7.5YR5/8 silty sand with gravel and asphalt. Artifacts: Historic: 1 white porcelain sherd. |
| 210.2 | N072 E1 | 30-40 | EU: Disturbed, 10YR4/6 with 10YR2/1 mottled sand with asphalt. Artifacts: Precontact: 1 yellow jasper tertiary flake. |
| 210.3 | N072 E1 | 40-47 | EU: Disturbed, 2.5Y6/8 moist sand. Artifacts: Precontact: 1 yellow jasper heat-altered spall, 1 jasper heat-altered tertiary flake. Historic: 5 clear vessel glass fragments. |
| 210.4 | N072 E1 | 47 | EU: Disturbed, 5Y7/1 with 10YR5/8 and 10YR2/1 compact clay subsoil, unexcavated |
| 211.1 | N074 E1 | 28-42 | EU: Disturbed, 10YR4/2 with 10YR4/6 and 10YR5/6 mixed coarse sand |
| 211.2 | N074 E1 | 42-45 | EU: Disturbed, 10YR4/6 with 10YR2/1, 2.5YR2/5 and 5YR4/6 sand in west-half |
| 211.3 | N074 E1 | 45-55 | EU: Disturbed, west 1/3 organic rotted wood with shell 10YR4/6 sandy with solid thin gray inclusions. East 1/2 10YR4/6 moist sand with small pebble and gravel. Flat stones on east side at bottom of level. Artifacts: Historic: 2 flat glass fragments; oyster shells (8 grams), hard shell clams (10 grams). |
| **Satterlee Street Locus 2, Billops Ridge Site** | | | |
| 212 | N186 E0 | 33 | Feature 18: Precontact pit, circular, 70 cm diameter. 10YR2/2 sand, with occasional shells (24.60 kg/m3) |
| 213 | N188 E2 | 30-40 | Feature 14: Precontact pit, circular 30 cm diameter. 2 bone fragments and abundant shells (266.00 kg/m3) |
| 214.1 | N200 E1 | 27-40 | EU: A-horizon. 10YR3/2 with 10YR3/3 mottled moist fine silty sand, with 34 Precontact and 6 Historic artifacts, 47 bone fragments and common shells (65.17 kg/m3) |
| 214.2 | N200 E1 | 40-53 | EU: A/B-horizon. 10YR4/6 with 10YR3/2 mottled moist sand, with 19 Precontact and 6 Historic artifacts 5 bone fragments and rare shells (0.86 kg/m3) |
| 214.3 | N200 E1 | 53-67 | EU: B-horizon. 10YR4/6 moist sand, with 3 Precontact artifacts and no shells |
| 214.4 | N200 E1 | 67-77 | EU: B-horizon. 10YR4/6 moist sand, with 2 Precontact artifacts and no shells |
| 215.1 | N201 E1 | 20-40 | EU: A- horizon. 10YR2/3 silty sand, 8 Precontact and 1 historic artifacts, 5 bone fragments and common shells (60.34 kg/m3) |
| 215.2 | N201 E1 | 40-49 | EU: A/B-horizon. 10YR4/6 with 10YR2/3 sand, with 9 Precontact and 1 Historic artifacts and occasional shells (3.11 kg/m3) |
| 215.3 | N201 E1 | 49-56 | EU: B-horizon. 10YR4/6 sand, with 3 Precontact artifacts and no shells |
| 215.4 | N201 E1 | 56-70 | EU: B-horizon. 10YR4/6 sand, with 2 Precontact artifacts and no shells |
| 215.5 | N201.6 E1 | 32-60 | Feature 4, east half: Precontact pit in west wall, elliptical, 44 cm N-S, 10 cm from west wall. 10YR2/1 moist sand, with no artifacts or shells |
| 216.1 | N202. E1 | 23-40 | EU: A-horizon. 10YR 2/3 silty sand, with 21 Precontact and 20 Historic artifacts, 47 bone fragments, and common shells (61.60 kg/m3) |
| 216.2 | N202. E1 | 40-48 | EU: A/B-horizon. 10YR2/3 with 7.5YR4/6 moist sand, with 5 Precontact and 3 Historic artifacts, 2 bone fragments and occasional shells (3.63 kg/m3) |
| 216.3 | N202. E1 | 48-60 | EU: B-horizon. 7.5YR4/6 moist sand, with 11 Precontact artifacts, 3 bone fragments and no shells, FCR concentration in north wall below Level 2 interface |
| 216.4 | N202. E1 | 60-70 | EU: B-horizon, 7.5YR4/6 moist sand, no artifacts or shells |
| 216.5 | N202. E1 | 70-78 | EU north half: B-horizon. 5YR3/4 with 5YR6/1 very moist sand; no artifacts or shells |
| 217.1 | N202 E2 | 16-24 | EU: Shell Midden. 10YR3/2 silty sand, with 18 Precontact and 3 historic artifacts, 11 bone fragments and abundant shells (360.55 kg/m3) |
| 217.3 | N202 E2 | 24-33 | EU: A/B-horizon. 10YR4/6 mottled with 10YR3/2 sand, with 44 Precont artifacts, 5 bone fragments and occasional shells (5.59 kg/m3) |
| 217.4 | N202 E2 | 33-44 | EU: A/B-horizon. 10YR4/6 mottled with 10YR3/2 sand, with 17 Precontact artifacts, 1 bone fragment and rare shells (not sampled) |
| 217.5 | N202 E2 | 44-67 | EU: B-horizon. 10YR4/6 moist sand, with 7 Precontact artifacts and no shells |
| 217.6 | N202.5 E2.7 | 18-67 | Feature 5: Precontact pit, conical shell deposit in north half of EU. 10YR2/3 silty sand, with 7 Precontact artifacts, 4 bone fragments and abundant shells (154.82 kg/m3) |
| 218.1 | N202 E3 | 15-25 | EU: A-horizon. 10YR3/2 silty sand, with with 29 Precontact and 12 historic artifacts, 28 bone fragments and common shells (75.38 kg/m3) |
| 218.2 | N202 E3 | 25-40 | EU: A/B-horizon. 10YR3/2 mottled with 10YR4/6 sand, with 39 Precontact artifacts, 3 bone fragments, and rare shells (0.80 kg/m3) |
| 218.3 | N203 E3 | 40-58 | EU: B-horizon. 10YR4/6 sand, with 11 Precontact artifacts and no shells |

# Appendix B. Conference House Park-South Richmond Drainage Phase 3 Soil Descriptions and Artifact Summary

| Cat. | Location (m) | Depth (cm) | Soil and Artifact Descriptions |
|---|---|---|---|
| **Satterlee Street Locus 2, Billops Ridge Site (continued)** | | | |
| 218.4 | N203 E3 | 58-71 | EU: B-horizon. 10YR4/6 moist sand, with 1 Precontact artifact and no shells |
| 218.5 | N203 E3 | 71-81 | EU nw quad: B-horizon. 10YR4/6 wet sand, with 1 Precontact artifact and no shells |
| 219.1 | N202.5 E5 | 0-8 | ST: Road, asphalt |
| 219.2 | N202.5 E5 | 8-32 | ST: Fill, trap rock |
| 219.3 | N202.5 E5 | 32-46 | ST: A-horizon. 10YR3/4 coarse sand, no artifacts and occasional shells (1.35 kg/m3) |
| 219.4 | N202.5 E5 | 46-78 | ST: B horizon. 10YR 5/6 sand, no artifacts or shells |
| 220 | N203.9 E2 | 30-86 | Feature 17: Precontact pit, dense shell concentration southwest of Feature 5, 2 liter sample. 10YR3/2 silty sand, with 3 Precontact artifacts, 9 bone fragments and abundant shells (123.50 kg/m3) |
| 221.1 | N204 E3 | 13-24 | EU: A-horizon. 10YR3/4 coarse sand, with 29 Precontact and 12 Historic artifacts, 28 bone fragments and common shells (58.68 kg/m3) |
| 221.2 | N204 E3 | 24-44 | EU: A/B-horizon. 10YR3/4 mottled with 10YR5/6 moist sand, with 48 Precontact and 4 Historic artifacts, 15 bone fragments and occasional shells (12.00 kg/m3) |
| 221.3 | N204 E3 | 44-53 | EU: B-horizon. 10YR4/6 mottled with 10YR 5/6 sand, with 10 Precontact artifacts and no shells |
| 221.4 | N204 E3 | 53-68 | EU: B-horizon. 7.5YR5/8 wet sand, with 3 Precontact artifacts and no shells |
| 221.5 | N204 E3 | 68 | EU: B-horizon. 7.5YR 5/8 with 5YR 4/4 wet sand, not excavated |
| 221.6 | N204.15 E3.75 | 24-37 | Feature 1: Precontact pit, northwest quarter of basin-shaped depresssion in southeast corner, estimated total size 60 cm N-S and 80 cm E-W. 10YR3/4 mottled with 10YR5/6 sand, with 7 Precontact artifacts, 6 bone fragments and abundant shells (103.50 kg/m3) |
| 222.1 | N206 E2 | 21-39 | EU: A-horizon, disturbed by machine during ecxavation. 10YR3/3 sand with cobbles, with 14 Precontact and 3 Historic artifacts and common crushed shells (not sampled) |
| 222.2 | N206 E2 | 39-48 | EU: A/B-horizon. 10YR3/3 mottled with 7.5YR4/6 sand; with two small soil stains (6 cm diameters), not postholes when profiled. 5 Precontact and rare shells (not sampled) |
| 223.1 | N207 E3 | 17-25 | EU: A-horizon,10YR 3/4 silty sand, with 10 Precontact and 8 Historic artifacts and common shells (74.15 kg/m3) |
| 223.2 | N207 E3 | 25-42 | EU: A/B-horizon. 10YR5/6 mottled with 10YR3/4 moist sand, with 9 Precontact and 2 Historic artifacts, 1 bone fragments and occasional shells (1.07 kg/m3) |
| 223.3 | N207 E3 | 42-58 | EU: B-horizon. 7.5YR5/6 moist sand, no artifacts or shells |
| 224.1 | N207.5 E5 | 0-8 | ST: Road, asphalt |
| 224.2 | N207.5 E5 | 8-31 | ST: Fill, trap rock |
| 224.3 | N207.5 E5 | 31-41 | ST: A-horizon. 10YR4/2 sand, no artifacts and rare shells (0.64 kg/m3) |
| 224.4 | N207.5 E5 | 41-61 | ST: B-horizon. 10YR 5/8 sand, with no artifacts or shells |
| 225 | N207.8 E3 | 40-50 | Feature 15: Precontact pit, ellipical, basin-shaped depression, 30 cm N-S, 36 cm E-W. 2.5Y3/3 sand, with 1 Precontact artifact, 2 bone fragments and occasional shells (12.56 kg/m3) |
| 226 | N208.6 E3.2 | 40-52 | Feature 16: Precontact pit, elliptical, basin-shaped deperssion, 40 cm N-S, 30 cm E-W. 10YR3/3 sand with occasional shells (14.58 kg/m3) |
| 227.1 | N209 E2 | 31-38 | EU: A-horizon, disturbed by machine during excavation. 10YR3/3 sand, with 6 Precontact and 3 historic artifacts, 3 bone fragments, and common crushed shells (not sampled) |
| 227.2 | N209 E2 | 38-44 | EU: B-horizon. 7.5YR4/6 mottled sand, with 5 Precontact artifacts and no shells |
| 227.3 | N209.8 E2 | 36-55 | Feature 12: Precontact pit, southeast quarter of a basin-shaped pit in NW corner of EU, estimated total area of 80 cm N-S, 40 cm E-W. 10YR 3/3 sand, with 3 Precontact artifacts, 3 bone fragments and occasional shells (14 kg/m3) |
| 227.4 | N209.09 E2.7 | 37-81 | Feature 13: Precontact pit, north half of a conical pit in the SE corner of the EU, estimated total area 36 cm NS and 40 cm EW. 7.5YR 3/3 silty fine sand, with 2 Precontact artifacts, 2 bone fragments and occasional shells (6.15 kg/m3) |
| 228 | N209 E5.5 | 41-46 | Feature 6: Precontact pit/lens, 39 cm N-S, 18 cm E-W. 10YR3/2 sand, no artifacts and occasional shells (flotation sample) |
| 229.1 | N211 E3 | 15-30 | EU: A-horizon. 10YR3/4 silty sand, with 26 Precontact and 1 Historic artifacts, 14 bone fragments and occasional shells (48.64 kg/m3) |
| 229.2 | N211 E3 | 30-40 | EU: A/B-horizon. 10YR4/6 mottled with 10YR3/4 coarse sand, with 10 Precontact artifacts, 3 bone fragments and rare shells (0.96 kg/m3) |

# Appendix B. Conference House Park-South Richmond Drainage Phase 3 Soil Descriptions and Artifact Summary

| Cat. | Location (m) | Depth (cm) | Soil and Artifact Descriptions |
|---|---|---|---|
| **Satterlee Street Locus 2, Billops Ridge Site (continued)** | | | |
| 229.3 | N211 E3 | 40-58 | EU: B-horizon. 10YR5/6 coarse sand, with 3 Precontact artifacts and rare shells (0.04 kg/m3) |
| 230.1 | N212 E2 | 27-38 | EU: A-horizon, disturbed by machine during excavation. 10YR3/3 sand, with 20 Precontact and 9 historic artifacts, 7 bone fragments, and occasional crushed shells (not sampled) |
| 230.2 | N212 E2 | 38-48 | EU: A/B-horizon. 10YR3/3 mottled with 10YR3/4 and 10YR5/8 sand, with 9 Precontact artifacts, 2 bone fragments and rare shells (0.40 kg/m3) |
| 230.3 | N212 E2 | 48-59 | EU: B-horizon. 7.5YR4/4 mottled with 10YR5/8 sand, with no artifacts or shells |
| 230.4 | N212.7 E2.27 | 38-76 | Feature 9: Precontact pit, bell-shaped, 35 cm N-S, 39 cm E-W. 10YR3/3 sand, with 8 Precontact artifacts, 8 bone fragments and common shells (66.95 kg/m3) |
| 230.5 | N212.94 E2.87 | 37-57 | Feature 10: Precontact pit, southwest quarter of a basin-shaped pit in the NE corner of the EU, with a complete area estimated as 42 cm N-S, 50 cm E-W. 10YR3/3 sand with 1 Precontact artifact and occasional shells (30.50 kg/m3) |
| 230.6 | N212.2 E2.5 | 38-66 | Feature 11: Precontact pit, north two-thirds of a straight-sided basin extending from the south wall of the EU, with of complete area 59 cm N-S and 42 cm E-W. 10YR3/3 sand with 4 Precontact and 3 Historic artifacts, 16 bone fagments and common shells (60.76 kg/m3) |
| 231.1 | N212.5 E5 | 0-8 | ST: Road, asphalt |
| 231.2 | N212.5 E5 | 8-40 | ST: Fill, trap rock |
| 231.3 | N212.5 E5 | 40-50 | ST: A-horizon. 10YR4/2 sand, with no artifacts and occasional shells (3.96 kg/m3) |
| 231.4 | N212.5 E5 | 50-74 | ST: B-horizon. 10YR5/8 sand, with no artifacts or shells |
| 232.1 | N213 E3 | 18-29 | EU: A-horizon. 10YR3/3 sand, with 7 Precontact and 4 Historic artifacts, 5 bone fragments and common shells (87.36 kg/m3) |
| 232.2 | N213 E3 | 29-40 | EU: A/B-horizon. 10YR3/4 with 10YR5/6 mottled sand, with 6 Precontact artifacts, 2 bone fragments and occasional shells (1.64 kg/m3) |
| 232.3 | N213 E3 | 40-62 | EU: B-horizon. 10YR5/6 coarse sand, with 9 Precontact artifacts and no shells |
| 233.1 | N215 E2 | 21-32 | EU: A-horizon, disturbed during machine excavation. 5YR2.5/2 sand, with 19 Precontact and 17 Historic artifacts, 14 bone fragments and occasional crushed shells (not sampled) |
| 233.2 | N215 E2 | 32-42 | EU: A/B-horizon, possibly disturbed. 10YR4/6 mottled with 5YR2.5/2 sand, with 14 Precontact and 11 Historic artifacts, 6 bone fragments and rare crushed shells (not sampled) |
| 233.3 | N215 E2 | 42-60 | EU: A/B-horizon, possibly disturbed. 10YR4/6 mottled with 5YR2.5/2 sand, with 7 Precontact and 2 Historic artifacts, 1 bone fragment and rare crushed shells (not sampled) |
| 234.1 | N216 E3 | 16-21 | EU: Shell midden. 10YR3/3 sandy silt and gravel, with 7 Precontact and 1 Historic artifacts, 5 bone fragments and abundant shells (180.98 kg/m3) |
| 234.2 | N216 E3 | 21-31 | EU: Shell midden. 10YR3/2 mottled with 7.5YR4/4 sand, with 21 Precontact and 1 Historic artifacts, 5 bone fragments and abundant shells (152.92 kg/m3) |
| 234.3 | N216 E3 | 31-47 | EU: A/B-horizon. 5YR4/4 mottled with 10YR3/2 sand, with 3 Precontact artifacts and occasional shells (11.27 kg/m3) |
| 234.4 | N216 E3 | 47-58 | EU: B-horizon. 10YR5/6 sand, with no artifacts or shells |
| 234.5 | N216 E3 | 58-74 | EU: B-horizon. 10YR5/6 sand, with no artifacts or shells |
| 234.6 | N216.23 E3.5 | 27-47 | Feature 2: Precontact pit, irregular and bell-shaped, 48 cm N-S, 42 cm E-W. 10YR3/2 silty sand, with 5 Precontact artifacts, 5 bone fragments and occasional shells (17.21 kg/m3) |
| 234.7 | N216.26 E3.8 | 25-37 | Feature 3: Depression in NE corner of EU (probably natural). 10YR3/2 sand with occasional shells (flotation sample) |
| 235.1 | N217.5 E3 | 20-35 | EU: Shell midden. 10YR3/3 coarse sand, with 13 Precontact and 5 Historic artifacts, 6 bone fragments and abundant shells (102.11 kg/m3) |
| 235.2 | N217.5 E3 | 35-46 | EU: A/B-horizon. 10YR3/4 mottled with 10YR5/6 sand, with 3 Precontact artifacts, 2 bone fragments and occasional shells (2.04 kg/m3) |
| 235.3 | N217.5 E3 | 46-59 | EU: B-horizon. 10YR5/6 sand, with 5 Precontact artifacts and no shells |
| 235.4 | N217.5 E3 | 59-72 | EU: B-horizon. 10YR5/6 sand, with 4 Precontact artifacts and no shells |
| 236.1 | N217.5 E5 | 0-8 | ST: Road, asphalt |
| **Satterlee Street Locus 2, Billops Ridge Site (continued)** | | | |

# Appendix B. Conference House Park-South Richmond Drainage Phase 3 Soil Descriptions and Artifact Summary

| Cat. | Location (m) | Depth (cm) | Soil and Artifact Descriptions |
|---|---|---|---|
| 236.2 | N217.5 E5 | 8-37 | ST: Fill, trap rock |
| 236.3 | N217.5 E5 | 37-69 | ST: A-horizon. 10YR4/2 sand, with 1 Historic artifact and occasional shells (5.3 kg/m3) |
| 236.4 | N217.5 E5 | 69-88 | ST: B-horizon. 10YR5/8 sand |
| 237.1 | N221 E3 | 20-30 | EU: Shell midden. 10YR3/3 coarse sand and occasional gravel, with 3 Precontact and 10 Historic artifacts, 6 bone fragments and abundant shells (113.72 kg/m3) |
| 237.2 | N221 E3 | 30-46 | EU: A-horizon. 10YR3/3 silty sand, with 3 Precontact and 1 Historic artifacts, 7 bone fragments and common shells (65.88 kg/m3) |
| 237.3 | N221 E3 | 46-63 | EU: A/B-horizon. 10YR3/4 mottled with 10YR5/6 coarse sand, with 26 Precontact artifacts, 2 bone fragments and rare shells (0.64 kg/m3) |
| 237.4 | N221 E3 | 63-74 | EU: B-horizon. 10YR5/6 sand, with 5 Precontact artifacts and no shells |
| 237.5 | N221 E3 | 74-94 | EU: B-horizon. 10YR5/6 sand, with 2 Precontact artifacts and no shells |
| 238.1 | N222.5 E5 | 0-8 | ST: Road, asphalt |
| 238.2 | N222.5 E5 | 8-37 | ST: Fill, trap rock |
| 238.3 | N222.5 E5 | 37-63 | ST: A-horizon. 10YR4/2 sand, with 18 Historic artifacts and occasional shells (6.08 kg/m3) |
| 238.4 | N222.5 E5 | 63-92 | B-horizon, 10YR5/8 sand, with no artifacts or shells |
| 239 | N224 E5.5 | 66-76 | Feature 7: Depresson, east half of from East Trench wall, approximately 0. m diameter. 10YR3/2 mottled with 10YR3/4 sand, with 1 one fragment and occasional shells (4.68 kg/m3) |
| 240.1 | N226 E3 | 33-36 | EU: Fill. 10YR5/4 silty sand with modern artifacts (discarded in field) and rare shells (not sampled) |
| 240.2 | N226 E3 | 36-38 | EU: Fill, water main trench in SE corner of EU: 10YR2/1 mottled silty sand, with 2 Precontact and 9 Historic artifacts and occasional shells (not sampled) |
| 240.3 | N226 E3 | 38-56 | EU: A-horizon, mixed, water main trench in SE corner of EU: 10YR3/1 sand, with 11 Precontact and 17 Historic artifacts, 7 bone fragment and occasional shells (not sampled) |
| 240.4 | N226 E3 | 56-68 | EU: Shell midden, water main trench in SE corner of EU. 10YR2/1 sand, with 37 Precontact and 4 Historic artifacts, 105 bone fragments and abundant shells (312.47 kg/m3) |
| 240.5 | N226 E3 | 68-78 | EU: Shell midden, water main trench in SE corner of EU. 10YR2/1 sand, with 17 Precontact and 3 Historic artifacts, 26 bone fragments and common shells (69.29 kg/m3) |
| 240.6 | N226 E3 | 78-89 | EU: B-horizon, water main trench in SE corner of EU. 10YR5/8 sand, with 6 Precontact artifacts and rare shells (not sampled) |
| 241 | N227 E5.8 | 63-83 | Feature 8: Precontact pit, east half of circular pit 60 cm diameter feom east wall of East Trench. 10YR3/4 mottled with 10YR3/3 sand, with no artifacts and occasional shells (11.77 kg/m3) |
| 242.1 | N229 E3 | 39-52 | EU: Fill. 10YR5/4 mixed with 10YR3/2 silty sand, with 2 Precontact and 11 Historic artifacts and rare shells (not sampled) |
| 242.2 | N229 E3 | 52-68 | EU: Mixed fill and A-horizon. 10YR5/4 and 10YR3/2 silty sand, with 11 Precontact and 4 Historic artifacts, 3 bone fragments and occasional shells (not sampled) |
| 242.3 | N229 E3 | 68-70 | EU: Shell midden. 10YR2/1 silty sand with 48 Precontact and 2 Historic artifacts, 19 bone fragments and abundant shells (206.80 kg/m3) |
| 242.4 | N229 E3 | 70-89 | EU: B-horizon. 10YR5/8 sand with 22 Precontact artifacts and occasional shells (not sampled) |
| 242.5 | N229 E3 | 89-98 | EU: B-horizon. 10YR5/8 sand with 6 Precontact artifacts and rare shells (not sampled) |

# Appendix C
# Satterlee Street Locus 2: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 212 | N186 E0 | Feature 18 | 1/8 | - | | | 58 | 32 | 0 | 0 | 0 | 33 | |
| 213 | N188 E2 | Fearure 14 | 1/8 | - | | 2 (0.1 g) | 150 | 88 | 0 | 0 | 0 | 294 | |
| 214.1.01 | N200 E1 | EU/sw | 1/8 | 1 FCR. Lithics: 1 yellow jasper tertiary, 2 red jasper chips, 1 gray chert tertiary flakes, 8 chert chips, 1 quartz primary shatter. Pottery: 1 sherd, 10 crumbs | wire, ferrous fragments, coal, burned coal, brick, 1 whiteware blue underglaze, 1round trade bead | 44 | 585 | 217 | 0 | 0 | 1 | 1315 | 1 oyster drill |
| 214.1.02 | N200 E1 | EU/se | 1/4 | 2 FCR. Lithics: 2 chert tertiary flakes, 1 rhyolite Fox Creek Stemmed, resharpened | 1 copper chain with green patina, 2 burned coal, 1 nail fragment | 2 bone, 1 tooth | | | | | | | No shell collected |
| 214.1.03 | N200 E1 | EU/nw | 1/4 | 1 FCR. Lithics: 1 chert primary, 1 chert tertiary flakes; 1 chert Fox Creek Lanceolate base. Pottery: 1 sherd | 1 clear bottle glass with raised letters OW or MO, 1 redware rim sherd with clear lead glaze | | | | | | | | No shell collected |
| 214.1.04 | N200 E1 | EU/ne | 1/4 | Lithic: 1 red jasper tertiary flake | | | | | | | | | No shell collected |
| 214.2.01 | N200 E1 | EU/sw | 1/8 | 1 FCR. Lithics: 1 quartzite tertiary, 2 yellow jasper tertiary flakes. Pottery: 11 crumbs | 6 ferrous fragments | 3 calcined, 2 charred | 5 | 3 | 0 | 0 | 0 | 20 | 2 fired clay lumps |
| 214.2.02 | N200 E1 | EU/se | 1/4 | 2 FCR | | | | | | | | | No shell collected |
| 214.2.03 | N200 E1 | EU/nw | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 214.2.04 | N200 E1 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary flake | | | | | | | | | No shell collected |
| 214.3.01 | N200 E1 | EU/sw | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 214.3.02 | N200 E1 | EU/se | 1/4 | Lithics: 1 chert secondary flake, 1 chert shatter | | | | | | | | | No shell collected |
| 214.4.03 | N200 E1 | EU/nw | 1/4 | 1 FCR. Lithics: 1 chert primary block | | | | | | | | | No shell collected |
| 215.1.01 | N201 E1 | EU/sw | 1/8 | Lithics: 1 chert tertiary, 2 chert chips, 1 yellow jasper tertiary flakes, 1 yellow jasper chip, 1 red jasper tertiary flake | - | 3 (0.4 g) | 536 | 450 | 4 | 2 | 0 | 2027 | |
| 215.1.03 | N201 E1 | EU/nw | 1/4 | - | 1 Westerwald salt-glazed stoneware | | | | | | | | No shell collected |
| 215.1.04 | N201 E1 | EU/ne | 1/4 | Lithics: 2 red jasper tertiary flakes | | | | | | | | | No shell collected |
| 215.2.01 | N201 E1 | EU/sw | 1/8 | Lithics: 2 yellow jasper tertiary flakes | | | 16 | 9 | 0 | 0 | 0 | 45 | |
| 215.2.02 | N201 E1 | EU/se | 1/4 | Lithics: 1 slate secondary, 1 quartzite tertiary flakes | | | | | | | | | No shell collected |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 215.2.03 | N201 E1 | EU/nw | 1/4 | Lithics: 1 yellow jasper secondary flake | | | | | | | | | No shell collected |
| 215.2.04 | N201 E1 | EU/ne | 1/4 | Lithics: 1 chert tertiary, 1 yellow jasper tertiary, 1 red jasper tertiary, 1 quartzite tertiary flakes | | | | | | | | | No shell collected |
| 215.3.04 | N201 E1 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary, 1 chert tertiary flakes | | | | | | | | | No shell collected |
| 215.5 | N201.6 E1 | Feature 4 | 1/8 | - | | | 10 | 6 | 0 | 0 | 0 | 27 | |
| 216.1.01 | N202 E1 | EU/sw | 1/8 | 4 FCR. Lithics: 1 chert tertiary flake, 4 chert chips, 1 red jasper tertiary flake, 1 red jasper chip, 3 yellow jasper chips. P/G: 1 possible hammerstone. Pottery: 23 crumbs | 12 ferrous fragments, 1 round bead, 12 coal, 2 slag, 1 brick, 1 bronze "s" hook, glass: 1 frosted chimney, 1 flat clear, 1 curved clear | 43 | 765 | 315 | 5 | 5 | 0.1 | 1528 | 13 snails, 1 chiton fragment, 1 New England Dog Whelk |
| 216.1.02 | N202 E1 | EU/se | 1/4 | Lithics: 1 yellow jasper refined bifacial blade fragment, 1 chert secondary flake | 1 clay pipe stem fragment, 1 coal | | | | | | | | No shell collected |
| 216.1.03 | N202 E1 | EU/sw | 1/4 | - | | 1 | | | | | | | No shell collected |
| 216.1.04 | N202 E1 | EU/ne | 1/4 | Lithics: 1 chert secondary flake, 1 chert core. Pottery: 1 sherd | 1 redware clear lead glaze | 2 | | | | | | | No shell collected |
| 216.1.05 | N202 E1 | EU/clean | 1/4 | Lithics: 1 yellow jasper tertiary flake | | 1 | | | | | | | No shell collected |
| 216.2.01 | N202 E1 | EU/sw | 1/8 | Lithics: 1chert tertiary flake, 2 chert chips. Pottery: 2 crumbs | 2 unglazed redware, 1 clear glass chip | 2 | 15 | 5 | 0.5 | 0 | 0 | 50 | |
| 216.2.02 | N202 E1 | EU/se | 1/4 | Pottery: 1 sherd | | | | | | | | | No shell collected |
| 216.2.04 | N202 E1 | EU/ne | 1/4 | 1 FCR (spall) | | | | | | | | | No shell collected |
| 216.3.02 | N202 E1 | EU/se | 1/4 | 3 FCR | | 3 | | | | | | | No shell collected |
| 216.3.03 | N202 E1 | EU/nw | 1/4 | 1 FCR. Lithics: 1 red jasper tertiary flake, 1 chert tertiary flake. P/G: 1 ground stone fragment | | | | | | | | | No shell collected |
| 216.3.04 | N202 E1 | EU/nw | 1/4 | 4 FCR | | | | | | | | | No shell collected |
| 217.1.01 | N202 E2 | EU/sw | 1/8 | Lithics: 1 quartz primary, 6 chert tertiary, 3 chert block, 2 red jasper tertiary, 4 yellow jasper tertiary flakes | 1 curved glass | 10 (7 g) | 2085 | 1624 | 2 | 28 | 1 | 3471 | |
| 217.1.02 | N202 E2 | EU/se | 1/4 | - | | 1 (5 g) | | | | | | | No shell collected |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 217.1.04 | N202 E2 | EU/ne | 1/4 | Lithics: 1 chert tertiary flake. Pottery: 1 unfired (?) sherd | 1 nail, 1 glazed redware, 1 brick | | | | | | | | No shell collected |
| 217.3.01 | N202 E2 | EU/sw | 1/8 | Lithics: 11 yellow jasper tertiary flakes | | 3 (1.1 g) | 175 | 417 | 2 | 2 | 0 | 214 | |
| 217.3.02 | N202 E2 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert secondary, 1 yellow jasper tertiary, 2 chert tertiary, 1 slate (?) tertiary flakes | | | | | | | | | No shell collected |
| 217.3.03 | N202 E2 | EU/nw | 1/4 | Lithics: 1 chert tertiary flake | | 2 (0.7 g) | | | | | | | No shell collected |
| 217.3.04 | N202 E2 | EU/ne | 1/4 | 1 FCR. Lithics: 1 quartzite tertiary, 1 red jasper tertiary, 22 chert tertiary flakes. Pottery: 1 sherd | | | | | | | | | No shell collected |
| 217.4.01 | N202 E2 | EU/sw | 1/4 | 1 FCR. Lithics: 1 yellow jasper tertiary, 12 chert tertiary flakes | | | | | | | | | No shell collected |
| 217.4.03 | N202 E2 | EU/nw | 1/4 | Lithics: 2 chert tertiary flakes | | 1 rodent mandible | | | | | | | No shell collected |
| 217.4.04 | N202 E2 | EU/ne | 1/4 | Lithics: 1 chert primary flake | | | | | | | | | No shell collected |
| 217.5.01 | N202 E2 | EU/sw | 1/4 | Lithics: 2 yellow jasper tertiary flakes | | | | | | | | | No shell collected |
| 217.5.02 | N202 E2 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert tertiary flake, 1 chert block | | | | | | | | | No shell collected |
| 217.5.04 | N202 E2 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary, 1 chert tertiary flakes | | | | | | | | | No shell collected |
| 217.6 | N202 E2 | Feature 5 | | - | | | | | | | | | No shell collected |
| 217.6.02 | N202 E2 | Feature 5 | 1/8 | Lithics: 1 red jasper tertiary flake | | 1 (0.9 g) | 2156 | 41 | 0 | 0 | 0 | 24 | |
| 217.6..03 | N202 E2 | Feature 5 | 1/8 | Lithics: 1 chert tertiary, 1 yellow jasper tertiary flakes, 1 yellow jasper chip, 1 chert chunk | | 1 (0.6 g) | 5399 | 810 | 32 | 22 | 0 | 2621 | |
| 217.6.04 | N202 E2 | Feature 5 | 1/8 | - | | | 2364 | 0 | 0 | 0 | 0 | 50 | |
| 217.6.08 | N202 E2 | Feature 5 | 1/8 | - | | | 833 | 4 | 0 | 0 | 0 | 13 | |
| 217.6.07 | N202 E2 | Feature 5 | 1/8 | Lithics: 1 chert tertiary, 1 yellow jasper tertiary flakes | | 2 (8.2 g) | 5 | 0 | 6 | 18 | 0 | 0 | |
| 218.1.01 | N 202 E3 | EU/sw | 1/8 | 5 FCR. Lithics: 6 chert tertiary, 1 yellow jasper tertiary, 1 quartzite tertiary flakes, 4 chert chips, 1 yellow jasper chip. Pottery: 2 sherds, 21 crumbs | 1 blue-green glass, 2 amber glass,2 anthracite coal, 1 burned coal, 1 ferrous fragment, 1 earthenware with yellow glaze, 2 unglazed redware, | 7 | 435 | 235 | 0.2 | 0.3 | 0 | 1214 | |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 218.1.03 | N 202 E3 | EU/nw | 1/4 | 1 FCR | 1 asphalt, 1blue-green curved glass | 1 | | | | | | | No shell collected |
| 218.1.04 | N 202 E3 | EU/ne | 1/4 | Lithics: 1 quarztite tertiary, 1 yellow jasper tertiary flakes | | | | | | | | | No shell collected |
| 218.2.01 | N 202 E3 | EU/sw | 1/8 | 2 FCR. Lithics: 5 chert tertiary, 1 chert primary shatter, 1 quartzite tertiary flakes, 6 chert chips, 1 chert tertiary shatter, 1 red jasper chip. Pottery: 4 crumbs | | 3 | 15 | 5 | 0 | 0 | 0 | 10 | |
| 218.2..02 | N202 E3 | EU/se | 1/4 | 1 FCR. Lithics: 2 chert tertiary flakes. Pottery: 2 fired clay fragments with clamshell impressions | | | | | | | | | No shell collected |
| 218.2.03 | N202 E3 | EU/nw | 1/4 | 1 FCR. Lithics: 4 yellow jasper tertiary, 11 chert tertiary flakes | | | | | | | | | No shell collected |
| 218.2.04 | N202 E3 | EU/ne | 1/4 | Lithics: 1 chert secondary, 1 chert tertiary flakes. Pottery: 1 sherd | | | | | | | | | No shell collected |
| 218.3.01 | N202 E3 | EU/sw | 1/4 | 1 FCR. Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 218.3.02 | N202 E3 | EU/se | 1/4 | Lithics: 6 chert tertiary, 1 yellow jasper tertiary flakes, 1 quartz potlid | | | | | | | | | No shell collected |
| 218.3.03 | N202 E3 | EU/nw | 1/4 | Lithics: 1 quartz flake | | | | | | | | | No shell collected |
| 218.4.03 | N202 E3 | EU/nw | 1/4 | Lithics: 1 yellow jasper flake | | | | | | | | | No shell collected |
| 218.5.04 | N202 E3 | EU/ne | 1/4 | Lithics: 1 chert secondary flake | | | | | | | | | No shell collected |
| 219 | N202.5 E5 | ST | 1/4 | - | | | 25 | 16 | 0 | 0 | 0 | 13 | |
| 220 | N204 E1 | Feature 17 | 1/8 | 1 FCR. Lithics: 2 red jasper tertiary flakes | | 9 (17.7 g) | 1442 | 464 | 0 | 81 | 0 | 483 | |
| 221.1.01 | N204 E3 | EU/sw | 1/8 | 1 FCR. Lithics: 3 yellow jasper tertiary, 5 chert tertiary flakes, 4 chert chips, 1 quartzite secondary shatter, 1 chert tertiary block. Pottery: 2 sherds, 10 crumbs | 2 staples, 1 whiteware, 2 coal, 2 green glass, 2 amber glass, 4 unglazed redware, 1 slag, 10 burned coal | 27 | 460 | 165 | 0.4 | 0 | 0.2 | 988 | |
| 221.1.02 | N204 E3 | EU/se | 1/4 | 2 FCR. Lithics: 2 chert tertiary, 2 yellow jasper tertiary flakes. Pottery: 1 sherd | | 5 | | | | | | | No shell collected |
| 221.1.03 | N204 E3 | EU/nw | 1/4 | 1 FCR. Lithics: 1 chert tertiary, 1 yellow jasper secondary flakes | 1 green glass | | | | | | | | No shell collected |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 221.1.04 | N204 E3 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary flake, 1 yellow jasper corner-notched projectile point-broken base, asymmetrical blade | | | | | | | | | No shell collected |
| 221.2.01 | N204 E3 | EU/sw | 1/8 | Lithics: 1 chert primary, 4 chert tertiary, 3 yellow jasper tertiary flakes, 11 chert, 10 yellow jasper, 2 red jasper, 1 quartz *secondary chips*. Pottery: 15 crumbs | 1 staple, 2 plastic fragments, 1 brick | 11 bone, 2 calcined bone | 415 | 30 | 0 | 0 | 0 | 95 | |
| 221.2.02 | N204 E3 | EU/se | 1/4 | Lithics: 2 chert tertiary, 1 quartzite tertiary flakes | | 1 tooth | | | | | | | No shell collected |
| 221.2.03 | N204 E3 | EU/nw | 1/4 | Lithics: 4 chert tertiary, 1 yellow jasper tertiary flakes | | 1 | | | | | | | No shell collected |
| 221.2.04 | N204 E3 | EU/ne | 1/4 | 1 FCR. Lithics: 6 chert tertiary flakes, 1 chert tertiary block, 1 chert chip | | | | | | | | | No shell collected |
| 221.3.02 | N204 E3 | EU/se | 1/4 | Lithics: 4 chert tertiary flakes | | | | | | | | | No shell collected |
| 221.3.03 | N204 E3 | EU/nw | 1/4 | 1 FCR. Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 221.3.04 | N204 E3 | EU/ne | 1/4 | Lithics: 3 chert tertiary, 1 red jasper tertiary flakes | | | | | | | | | No shell collected |
| 221.4.01 | N204 E3 | EU/sw | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 221.4.02 | N204 E3 | EU/se | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 221.4.03 | N204 E3 | EU/nw | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 221.6 | N204.15 E3.75 | Feature 1 | 1/8 | Lithics: 6 chert chips, 1 chert tertiary shatter | | 6 | 595 | 130 | 0 | 0 | 0 | 100 | 3 snails |
| 222.1.01 | N206 E2 | EU/sw | 1/4 | 5 FCR | | | | | | | | | No shell collected |
| 222.1.02 | N206 E2 | EU/se | 1/4 | 3 FCR. Lithics: 1 chert tertiary flake | 1 clear curved glass | | | | | | | | No shell collected |
| 222.1.03 | N206 E2 | EU/nw | 1/4 | 3 FCR. Lithics: 1 yellow jasper primary flake | 1 clear curved glass, 1 asphalt | | | | | | | | No shell collected |
| 222.1.04 | N206 E2 | EU/ne | 1/4 | Lithics: 1 chert tertiary flake | 1 brick fragment with mortar stain | | | | | | | | No shell collected |
| 222.2.01 | N206 E2 | EU/sw | 1/4 | Lithics: 1 quartz tertiary flake | | | | | | | | | No shell collected |
| 222.2.02 | N206 E2 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert tertiary shatter | | | | | | | | | No shell collected |
| 222.2.03 | N206 E2 | EU/nw | 1/4 | Lithics: 1 quartzite second. block | | | | | | | | | No shell collected |
| 222.2.04 | N206 E2 | EU/ne | 1/4 | Natural: 1 cracked quartz cobble | | | | | | | | | No shell collected |

Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 223.1.01 | N207 E3 | EU/sw | 1/8 | Lithics: 1 chert tertiary, 1 chert secondary flakes, 1 yellow jasper chip, 1 red jasper chip, 3 quartz shatter. Pottery: 6 crumbs | 16 burned coal, 3 slag, 2 brick, 2 ferrous fragments, 1 brown glass, 1 curved clear glass | 8 | 315 | 495 | 5 | 5 | 0 | 663 | |
| 223.1.02 | N207 E3 | EU/se | 1/4 | Lithics: 2 chert tertiary flakes | | | | | | | | | No shell collected |
| 223.1.04 | N207 E3 | EU/ne | 1/8 | Lithics: 1 yellow jasper tertiary flake, possibly utilized | 2 anthracite coal, Stoneware with buff paste and clear glaze: 1 body sherd, 1 basal sherd with black substance adhering to interior | | | | | | | | No shell collected |
| 223.2.01 | N207 E3 | EU/sw | 1/8 | 1 FCR. Lithics: 1 chert tertiary flake, 1 chert tertiary block, 1 chert chip, 1 quartz chip | 1 ferrous fragment, 1 brick, 1 coal, 1 pebble with red paint | 1 | 20 | 20 | 0.3 | 0 | 0 | 5 | |
| 223.2.03 | N207 E3 | EU/nw | 1/4 | Lithics: 1 chert secondary, 1 red jasper secondary, 1 quartz tertiary flakes | | | | | | | | | No shell collected |
| 223.2.04 | N207 E3 | 1x1 m | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 224 | N207.5 E5 | ST | 1/8 | - | | | 2 | 3 | 0 | 0 | 0 | 11 | |
| 225 | N207.8 E3 | Feature 15 | 1/4 | Lithics: 1 yellow jasper tertiary flake | | 2 (0.1 g) | 69 | 59 | 0 | 0 | 0 | 98 | |
| 226 | N208.6 E3.2 | Feature 16 | 1/8 | - | | | 106 | 70 | 0 | 0 | 0 | 177 | |
| 227.1.02 | N209 E2 | EU/se | 1/4 | 2 FCR. Pottery 1 sherd | 1 red earthenware, eroded glaze; 1 coal | | | | | | | | No shell collected |
| 227.1.03 | N209 E2 | EU/nw | 1/4 | P/G: 1 quartzite cobble hammerstone. Pottery: 2 sherds | | 3 | | | | | | | No shell collected |
| 227.1.04 | N209 E2 | EU/ne | 1/4 | - | 1 red earthenware, eroded glaze; 1 buff earthenware, brown glaze | | | | | | | | No shell collected |
| 227.2.02 | N209 E2 | EU/se | 1/4 | 4 FCR | | | | | | | | | No shell collected |
| 227.2.03 | N209 E2 | EU/nw | 1/4 | Lithics: 1 yellow jasper chip | | | | | | | | | No shell collected |
| 227.2.04 | N209 E2 | EU/ne | 1/4 | - | | | | | | | | | No shell collected |
| 227.3 | N209.8 E2 | Feature 12 | 1/8 | 3 FCR. Pottery: 19 crumbs | | 2 bone, 1 fish scale | 125 | 60 | 0 | 0 | 0 | 480 | |
| 227.4 | N209 E2 | Feature 13 | 1/8 | Lithics: 1 yellow jasper tertiary flake, 1 heat-altered jasper chip. Pottery: 1 crumb | | 1 (0.1 g), 1 tooth fragment | 138 | 76 | 1 | 0 | 0 | 105 | |
| 228 | N209 E5.5 | Feature 6 | Not | | | | | | | | | | Flotation |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 229.1.01 | N211 E3 | EU/sw | 1/8 | 1 FCR. Lithics: 1 quartz block, 6 chert tertiary, 2 red jasper tertiary flakes, 1 red jasper chip, | | 7 | 399 | 217 | 0 | 0 | 0 | 1208 | |
| 229.1.02 | N211 E3 | EU/se | 1/4 | Lithics: 3 chert tertiary flakes | 1 curved glass | 1 | | | | | | | No shell collected |
| 229.1.03 | N211 E3 | EU/nw | 1/4 | Lithics: 6 chert tertiary, 1 chert secondary flakes | | 5 | | | | | | | No shell collected |
| 229.1.04 | N211 E3 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary core; flakes: 1 black chert tertiary, 3 basalt tertiary flakes | | 1 | | | | | | | No shell collected |
| 229.2.01 | N211 E3 | EU/sw | 1/8 | 1 FCR | | | 8 | 16 | 0 | 0 | 0 | 0 | |
| 229.2.02 | N211 E3 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert tertiary core, 1 chert block | | | | | | | | | No shell collected |
| 229.2.03 | N211 E3 | EU/nw | 1/4 | Lithics: 2 chert tertiary flakes | | 3 | | | | | | | No shell collected |
| 229.2.04 | N211 E3 | EU/ne | 1/4 | 1 FCR. Lithics: 3 chert tertiary flakes | | | | | | | | | No shell collected |
| 229.3.01 | N211 E3 | EU/sw | 1/8 | - | | | 0 | 0 | 0 | 0 | 0 | 2 | |
| 229.3.03 | N211 E3 | EU/nw | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 229.3.04 | N211 E3 | EU/ne | 1/4 | Lithics: 1 basalt tertiary, 1 chert secondary flakes | | | | | | | | | No shell collected |
| 230.1.01 | N212 E2 | EU/sw | 1/4 | 2 FCR. Lithics: 2 chert tertiary, 1 yellow jasper tertiary, 1 unidentified tertiary flakes | 1 brick, 1 coal, 1 20d wrought iron nail | 1 | | | | | | | No shell collected |
| 230.1.02 | N212 E2 | EU/se | 1/4 | 2 FCR. Lithics: 1 chert tertiary block, 1 chert tertiary, 1 yellow jasper tertiary flakes | 1 nail, 1 clear flat glass, 3 unglazed redware | 2 | | | | | | | No shell collected |
| 230.1.03 | N212 E2 | EU/nw | 1/4 | 2 FCR. Lithics: 1 chert tertiary, 1 yellow jasper tertiary flakes | 1 ferrous fragment, 1 coal | 3 | | | | | | | No shell collected |
| 230.1.04 | N212 E2 | EU/ne | 1/4 | 2 FCR. Lithics: 2 chert tertiary, 1 yellow jasper tertiary flakes | 1 16d wrought iron nail | 1 | | | | | | | No shell collected |
| 230.2.01 | N212 E2 | EU/sw | 1/4 | 1 FCR | | | 10 | 0 | 0 | 0 | 0 | 0 | |
| 230.2.02 | N212 E2 | EU/se | 1/4 | 3 FCR | | 2 | | | | | | | No shell collected |
| 230.2.03 | N212 E2 | EU/nw | 1/4 | 2 FCR | | | | | | | | | No shell collected |
| 230.2.04 | N212 E2 | EU/ne | 1/4 | 3 FCR | | | | | | | | | No shell collected |
| 230.4 | N212.7 E2.27 | Feature 9 | 1/8 | 1 FCR. Lithics: 1 yellow jasper tertiary, 1 chert tertiary flakes. P/G: 1 possible anvil stone, 3 hammerstones. Pottery: 1 sherd | | 8 (3.5 g), 1 tooth | 570 | 167 | 0 | 0 | 0 | 1941 | |
| 230.5 | N212.94 E2.87 | Feature 10 | 1/8 | Lithics: 1 chert tertiary flake | | | 82 | 30 | 0 | 0 | 0 | 498 | |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 230.6 | N212.2 E2.5 | Feature 11 | 1/8 | Lithics: 1 quartzite secondary core/chopper, 1 chert tertiary, 1 yellow jasper tertiary flakes, 1 chert chip | 1 square nail, 2 small brick fragments | 16 (10.8 g) | 1122 | 465 | 0 | 1 | 0 | 3028 | |
| 231 | N212.5 E5 | ST | 1/4 | - | | | 41 | 9 | 0 | 0 | 0 | 49 | |
| 232.1.01 | N213 E3 | EU/sw | 1/8 | Lithics: 1 basalt secondary, 2 quartzite tertiary flakes | 1 flint ballast spall | | 227 | 681 | 0 | 0.4 | 0 | 1494 | |
| 232.1.02 | N213 E3 | EU/se | 1/4 | Pottery: 1 shell-tempered, cord-marked | 1 misc. metal, 1 redware, 1 curved glass | 4 | | | | | | | No shell collected |
| 232.1.03 | N213 E3 | EU/nw | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 232.1.04 | N213 E3 | EU/ne | 1/4 | 2 FCR | | 1 | | | | | | | No shell collected |
| 232.2.01 | N213 E3 | EU/sw | 1/8 | Lithics: 1 chert secondary block | | | 0 | 15 | 1 | 0 | 0 | 29 | |
| 232.2.02 | N213 E3 | EU/se | 1/4 | - | | 1 | | | | | | | No shell collected |
| 232.2.03 | N213 E3 | EU/nw | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 232.2.04 | N213 E3 | EU/ne | 1/4 | 4 FCR | | 1 | | | | | | | No shell collected |
| 232.3.04 | N213 E3 | EU/ne | 1/4 | 1 FCR. Lithics: 1 argillite primary flake, 1 yellow jasper block, 5 chert tertiary, 1 red jasper tertiary flakes | | | | | | | | | No shell collected |
| 233.1.01 | N215 E2 | EU/sw | 1/4 | Lithics: 1 chert secondary core, 1 chert tertiary core; flakes: 1 chert utilized, 2 chert tertiary, 1 yellow jasper tertiary, 1 quartzite secondary flakes | 1 coal, 1 unidentified ferrous, 1 nail, 1burned coal,, 2 brick, 1 polychrome whiteware, 1 unglazed redware | 9 | | | | | | | No shell collected |
| 233.1.02 | N215 E2 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert tertiary flake, 1 quartz secondary block | 1 clay pipe bowl fragment, 3 brick, 1 furnace ash, 1 unglazed redware, 2 burned coal, 1 anthracite coal | | | | | | | | No shell collected |
| 233.1.03 | N215 E2 | EU/nw | 1/4 | 4 FCR. Lithics: 1 chert primary, 1 chert tertiary flakes | 3 burned coal, 1 redware with clear lead glaze | 2 | | | | | | | No shell collected, charcoal |
| 233.1.04 | N215 E2 | EU/ne | 1/4 | Lithics: 1 chert refined biface fragment, 2 chert tertiary flakes | 2 burned coal, 3 brick, 1 blue transfer-print whiteware with floral decoration, 1 furnace slag | 3 | | | | | | | No shell collected |
| 233.2.01 | N215 E2 | EU/sw | 1/4 | 4 FCR | 4 brick, 4 unglazed redware | | | | | | | 0.1 | No shell collected |
| 233.2.02 | N215 E2 | EU/se | 1/4 | 1 FCR | 1 brick | | | | | | | | No shell collected |
| 233.2.03 | N215 E2 | EU/nw | 1/4 | 2 FCR | 2 unglazed redware | 5 | | | | | | | No shell collected |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233.2.04 | N215 E2 | EU/ne | 1/4 | 4 FCR. Lithics: 1 chert tertiary flake, 1 chert chip, 1 chert block | | 1 | | | | | | | 2 barnacles, other shell not collected, charcoal |
| 233.3.01 | N215 E2 | EU/sw | 1/4 | - | 1 brick | | | | | | | | No shell collected |
| 233.3.02 | N215 E2 | EU/se | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 233.3.03 | N215 E2 | EU/nw | 1/4 | 2 FCR. Lithics: 1 chert secondary chunk | | | | | | | | | No shell collected |
| 233.3.04 | N215 E2 | EU/ne | 1/4 | 1 FCR. Lithics: 1 chert tertiary, 1 yellow jasper tertiary flakes | 1 unglazed redware | 1 | | | | | | | No shell collected |
| 234.1.01 | N216 E3 | EU/sw | 1/8 | Lithics: 1 chert tertiary flake, 3 chert chips, 1 quartzite chip | 1 clear curved glass | 5 (1.5 g) | 538 | 181 | 1 | 0 | 0.3 | 1542 | |
| 234.1.02 | N216 E3 | EU/se | 1/4 | Lithics: 1 fine-grained chert utilized flake | | | | | | | | | No shell collected |
| 234.1.04 | N216 E3 | EU/ne | 1/4 | Lithics: 1 red jasper tertiary flake | | | | | | | | | No shell collected |
| 234.2.01 | N216 E3 | EU/sw | 1/8 | Lithics: 4 chert tertiary flakes, 3 chert chips, 2 red jasper tertiary flakes | | 5 (1.1 g) | 1808 | 318 | 2 | 1 | 1 | 1693 | |
| 234.2.02 | N216 E3 | EU/se | 1/4 | Lithics: 1 chert chunk, 2 chert tertiary flakes. P/G: 2 possible hammerstones, | | | | | | | | | No shell collected |
| 234.2.03 | N216 E3 | EU/nw | 1/4 | Lithics: 2 chert tertiary flakes, 1 chert chip | 1 whiteware | | | | | | | | No shell collected |
| 234.2.04 | N216 E3 | EU/ne | 1/4 | Lithics: 1 chert secondary, 2 chert tertiary, 1 chert primary flakes | | | | | | | | | No shell collected |
| 234.3.02 | N216 E3 | EU/se | 1/4 | Lithics: 1 red jasper tertiary flake | | | | | | | | | No shell collected |
| 234.3.01 | N216 E3 | EU/sw | 1/8 | 1 FCR. Lithics: 1 chert chip | | | 273 | 6 | 0 | 0 | 0 | 59 | |
| 234.4.02 | N216 E3 | EU/se | 1/4 | Lithics: 1 red jasper tertiary flake | | 1 (1.6 g) | | | | | | | No shell collected |
| 234.4.03 | N216 E3 | EU/nw | 1/4 | Lithics: 2 heat-altered chert spalls | | | | | | | | | No shell collected |
| 234.5.01 | N216 E3 | EU/sw | 1/4 | 1 FCR. Lithics: 1 heat-altered chert tertiary flake | | | | | | | | | No shell collected |
| 234.5.02 | N216 E3 | EU/se | 1/4 | Lithics: 1 chert potlid | | | | | | | | | No shell collected |
| 234.5.03 | N216 E3 | EU/nw | 1/4 | Lithics: 1 chert chunk, 1 red jasper tertiary, 1 heat-altered chert tertiary, 1 yellow jasper secondary flakes. Natural: 1 unmodified yellow jasper cobble | | | | | | | | | No shell collected |

# Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 234.6 | N216.23 E3.5 | Feature 2 | 1/8 | 1 FCR. Lithics: 1 yellow jasper tertiary flake, 2 chert, 1 red jasper chips | | 5 (2.1 g) | 498 | 95 | 0.4 | 0 | 0 | 543 | |
| 234.7 | N216.26 E3.8 | Feature 3 | 1/4 | - | | | | | | | | | No shell collected |
| 235.1.01 | N217.5 E3 | EU/sw | 1/8 | Lithics: 1 yellow jasper tertiary, 1 red jasper tertiary,1 argillite tertiary, 3 chert tertiary flakes | 1 brad | 4 (1.4 g) | 701 | 211 | 10 | 2 | 0 | 2905 | charcoal |
| 235.1.02 | N217.5 E3 | EU/se | 1/4 | 1 FCR. Lithics: 1 chert tertiary flake | 1 curved glass, 1 unident nail | 2 (2.4 g) | | | | | | | No shell collected |
| 235.1.03 | N217.5 E3 | EU/nw | 1/4 | Pottery: 1 shell and grit tempered sherd | 1 unident nail | | | | | | | | No shell collected |
| 235.1.04 | N217.5 E3 | EU/ne | 1/4 | 1 FCR. Lithics: 1 speckeled jasper tertiary, 1 chert tertiary flakes. Pottery: 1 shell tempered, cord-marked sherd | 1 nail | | | | | | | | No shell collected |
| 235.2.01 | N217.5 E3 | EU/sw | 1/8 | 1 FCR | | 1 (0.1 g) | 8 | 12 | 0 | 0 | 0 | 36 | |
| 235.2.02 | N217.5E3 | EU/se | 1/4 | Pottery: 1 crushed quartz/grit tempered sherd | | 1 (1 g) | | | | | | | No shell collected |
| 235.2.03 | N217.5E3 | EU/nw | 1/4 | 1 FCR | | | | | | | | | No shell collected |
| 235.2.04 | N217.5E3 | EU/ne | 1/4 | - | | 1 (1 g) | | | | | | | No shell collected |
| 235.3.01 | N217.5E3 | EU/sw | 1/4 | Lithics: 1 reddened chert potlid, 1 chert tertiary flake | | | | | | | | | No shell collected |
| 235.3.02 | N217.5E3 | EU/se | 1/4 | Lithics: 1 reddened chert potlid | | | | | | | | | No shell collected |
| 235.3.03 | N217.5E3 | EU/nw | 1/4 | Lithics: 2 red jasper tertiary flakes | | | | | | | | | No shell collected |
| 235.4.02 | N217.5E3 | EU/se | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 235.4.03 | N217.5E3 | EU/nw | 1/4 | Lithics: 1 chert secondary, 1 chert tertiary flakes | | | | | | | | | No shell collected |
| 235.4.04 | N217.5E3 | EU/ne | 1/4 | 1 chert potlid | | | | | | | | | No shell collected |
| 236 | N217.5 E5 | ST | 1/4 | - | 1 kaolin pipe stem | | 90 | 27 | 0 | 0 | 0 | 112 | |
| 237.1.01 | N221 E3 | EU/sw | 1/8 | 1 FCR. Lithics: 2 chert tertiary flakes | 2 unident nails, 1 brad, 1 curved glass, 1 whiteware, 3 lead shot | 6 (1.4 g) | 643 | 233 | 2 | 0 | 0 | 1965 | Charcoal |
| 237.1.03 | N221 E3 | EU/nw | 1/4 | - | 1 iron pipe segment, 1 misc. metal | | | | | | | | No shell collected |
| 237.2.01 | N221 E3 | EU/sw | 1/8 | Lithics: 1 red jasper chip, 2 chert tertiary flake | 1 lead shot | 7 (9.7 g) | 512 | 406 | 2 | 7 | 0 | 1708 | |

Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 237.3.01 | N221 E3 | EU/sw | 1/8 | 6 FCR. Lithics: 1 yellow jasper tertiary flake, 1 yellow jasper chip, 1 silaceous chert tertiary flake, 1 chert chip | | 2 (1.3 g) | 1 | 3 | 0 | 0 | 0 | 23 | |
| 237.3.02 | N221 E3 | EU/se | 1/4 | Lithics: 1 yellow jasper primary flake | | | | | | | | | No shell collected |
| 237.3.03 | N221 E3 | EU/nw | 1/4 | 8 FCR | | | | | | | | | No shell collected |
| 237.3.04 | N221 E3 | EU/ne | 1/4 | 7 FCR | | | | | | | | | No shell collected |
| 237.4.01 | N221 E3 | EU/sw | 1/4 | Lithics: 1 chert tertiary flake | | | | | | | | | No shell collected |
| 237.4.02 | N221 E3 | EU/se | 1/4 | Lithics: 1 yellow jasper projectile point with lateral and basal fractures | | | | | | | | | No shell collected |
| 237.4.03 | N221 E3 | EU/nw | 1/4 | Lithics: flakes: 1 yellow jasper primary, 1 yellow jasper tertiary flakes, 1 chert shatter | | | | | | | | | No shell collected |
| 237.5.01 | N221 E3 | EU/sw | 1/4 | Lithics: 1 red jasper tertiary flake | | | | | | | | | No shell collected |
| 237.5.03 | N221 E3 | EU/nw | 1/4 | Lithics: 1 chert potlid | | | | | | | | | No shell collected |
| 238 | N222.5 E5 | ST | 1/4 | - | 18 fragments 20th cent. bottle glass | 1 (0.2 g) | 218 | 33 | 0 | 0 | 0 | 173 | |
| 239 | N224 E5.5 | Feature 7 | 1/8 | - | | 1 (1 g) | 97 | 32 | 0 | 0 | 0 | 105 | |
| 240.1.03 | N226 E3 | EU/nw | 1/4 | - | | | | | | | | | No shell collected |
| 240.2.01 | N226 E3 | EU/sw | 1/4 | Pottery: 1 sherd | | | | | | | | | No shell collected |
| 240.2.02 | N226 E3 | EU/se | 1/4 | - | 3 ferrous fragments, 2 brick, 1 clear curved glass with patina | | | | | | | | No shell collected |
| 240.2.04 | N226 E3 | EU/ne | 1/4 | Lithics: 1 chert tertiary flake | 2 nails, 1 ferrous fragment, 1 burned coal | | | | | | | | No shell collected |
| 240.3.01 | N226 E3 | EU/sw | 1/4 | 4 FCR | 4 brick, 1 ferrous spike, 2 nail fragments | 2 | | | | | | | 1 New England Dog Whelk, 1 slipper shell, other shell not collected, charcoal |
| 240.3.02 | N226 E3 | EU/se | 1/4 | 4 FCR: Lithics: 1 red jasper utilized tertiary flake | 1 coal, 1 brick | 2 | | | | | | | charcoal |
| 240.3.03 | N226 E3 | EU/nw | 1/4 | Lithics: 1 chert biface Rossville projectile point base with lateral balde fractures | 1 wrought iron nail fragment, 6 ferrous fragments, 2 coal | 1 burned, 1 polished | | | | | | | No shell collected |
| 240.3.04 | N226 E3 | EU/ne | 1/4 | Pottery: 1 sherd, 1 crumb | 1 redware with dark glaze, 1 brick | 2 | | | | | | | No shell collected |

Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 240.4.01 | N226 E3 | EU/sw | 1/8 | 5 FCR. Lithics: 4 chert chips. P/G: 1 siltstone cobble section with possible notch. Pottery: 8 sherds, 49 crumbs. Natural: 1 quartzite nodule | 1 brick, 1 coal, 1 ferrous fragment, earthenware with buff paste and yellow glaze | 82 bone, 2 teeth | 3910 | 555 | 65 | 0 | 0.6 | 2500 | 1 New England Dog Whelk, 7 slipper shells, 15 snail, charcoal |
| 240.4.02 | N226 E3 | EU/se | 1/4 | Natural: 1 breccia nodule | | 5 | | | | | | | 1 oyster drill, other shell not collected, charcoal |
| 240.4.04 | N226 E3 | EU/ne | 1/4 | 11 FCR. Lithics: 2 red jasper tertiary flakes; 2 red jasper unifaces | | 11 | | | | | | | 2 snails, other shell not collected |
| 240.4/5.03 | N226 E3 | EU/nw | 1/4 | 4 FCR. Lithics: 1 chert tertiary flake. Pottery: 3 sherds | | 4 bone, 1 tooth | | | | | | | 2 snails, 1 oyster drill, 1 slipper shell, other shell not collected |
| 240.5.01 | N226 E3 | EU/sw | 1/8 | 2 FCR. Lithics: 1 siltstone tertiary flake, 1 unidentified chip. Pottery: 4 sherds, 16 crumbs | 1 furnace scale | 15 | 625 | 310 | 15 | 0 | 0 | 609 | Charcoal |
| 240.5.02 | N226 E3 | EU/se | 1/4 | 3 FCR | 1 unglazed redware | 5 | | | | | | | No shell collected, burned wood |
| 240.5.04 | N226 E3 | EU/ne | 1/4 | 3 FCR. Lithics: 2 chert tertiary flakes. Pottery: 1 sherd | 1 unglazed redware | 6 | | | | | | | 4 snails, other shell not collected, charcoal |
| 240.6.02 | N226 E3 | EU/se | 1/4 | 1 FCR | | 1 | | | | | | | No shell collected |
| 240.6.03 | N226 E3 | EU/nw | 1/4 | 1 FCR. P/G: 1 hammerstone | | 3 | | | | | | | No shell collected |
| 240.6.04 | N226 E3 | EU/ne | 1/4 | 2 FCR | | 3 | | | | | | | 1 snail, other shell not collected |
| 241 | N227 E5.8 | Feature 8 | 1/8 | - | | | 343 | 44 | 0 | 0 | 0 | 319 | |
| 242.1.01 | N229 E3 | EU/sw | 1/4 | - | 2 nails, 4 ferrous fragments | | | | | | | | No shell collected |
| 242.1.02 | N229 E3 | EU/se | 1/4 | - | 1 nail | | | | | | | | No shell collected |
| 242.1.03 | N229 E3 | EU/nw | 1/4 | P/G: 1 siltstone slab, possibly utilized | 1 nail, 1 coal | | | | | | | | No shell collected |
| 242.1.04 | N229 E3 | EU/ne | 1/4 | Pottery: 1 sherd | 2 ferrous fragments, 1 clear glass | | | | | | | | No shell collected |
| 242.2.01 | N229 E3 | EU/sw | 1/4 | 2 FCR. Lithics: 1 quartz shatter. Pottery: 1 sherd | 1 nail, 1brick | | | | | | | | No shell collected |
| 242.2.02 | N229 E3 | EU/se | 1/4 | - | 1 ferrous fragment, 1 clear bottle glass rim | | | | | | | | No shell collected |

Appendix C. Conference House Park-South Richmond Drainage: Billops Ridge Site, Phase 3 Artifact and Shell Descriptions

| Cat. | Location (m) | Unit/Quad Feature | Screen (in) | Precontact Artifacts | Historic Artifacts | Bone | Oyster (g) | HS Clam (g) | SS Clam (g) | Whelk (g) | Scallop (g) | Residual Shell (g) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 242.2.03 | N229 E3 | EU/nw | 1/4 | Lithics: 1 yellow jasper tertiary flake with unifacial retouch, 1 chert secondary block, 1 red jasper tertiary shatter | 1 clear, flat glass with patina | 3 | | | | | | | No shell collected |
| 242.2.04 | N229 E3 | EU/ne | 1/4 | 3 FCR. Lithics: 1 chert tertiary flake | | | | | | | | | 4 land snails, other shell not collected |
| 242.3.01 | N229 E3 | EU/sw | 1/8 | 2 FCR. Lithics: 13 chert tertiary flakes, 3 chert chips, 1 quartz shatter. Pottery: 15 sherds, 99 crumbs | | 16 | 455 | 120 | 2 | 0 | 0 | 457 | 1 wood, charcoal |
| 242.3.03 | N229 E3 | EU/nw | 1/4 | 1 FCR. Lithics: 8 chert tertiary flakes. Pottery 1 crumb | | 3 | | | | | | | No shell collected, charcoal |
| 242.3 | N229 E3 | EU/clean | 1/4 | Lithics: 1 chert tertiary flake. Pottery: 5 sherds | 1 coal, 2 furnace scale | | | | | | | | No shell collected |
| 242.4.01 | N229 E3 | EU/sw | 1/4 | 1 FCR. Lithics: 8 chert tertiary, 1 chert primary flakes, 1 quartz drill. Pottery: 1 sherd | | | | | | | | | No shell collected |
| 242.4.02 | N229 E3 | EU/se | 1/4 | Lithics: 1 chert tertiary block, 1 chert tertiary shatter, 3 chert tertiary flakes, 1 chert chip | | | | | | | | | No shell collected |
| 242.4.03 | N229 E3 | EU/nw | 1/4 | Lithics: 1 chert tertiary flake. Natural:1 fossil | | | | | | | | | No shell collected |
| 242.4.04 | N229 E3 | EU/ne | 1/4 | Lithics: 2 chert tertiary flakes | | | | | | | | | No shell collected |
| 242.5.01 | N229 E3 | EU/sw | 1/4 | Lithics: 1 yellow jasper tertiary core | | | | | | | | | No shell collected |
| 242.5.02 | N229 E3 | EU/se | 1/4 | 3 FCR. Lithics: 1 chert tertiary flake. Pottery: 1 sherd | | | | | | | | | No shell collected |
| 242.5.04 | N229 E3 | EU/ne | 1/4 | Lithics: 1 yellow jasper tertiary, 1 red jasper tertiary flakes | | | | | | | | | No shell collected |

# Appendix D

## Satterlee Street Locus 2
## Billops Ridge Site Oyster Shell Analysis

Appendix D. Billops Ridge Site Oyster Shell Data

| No | Cat. | Grid North | Stratum/ Feature | Site Area | Height (mm) | Length (mm) | H/L Ratio | *Cliona trutti* | *Cliona celata* | Polychaete Worms | Boring Bivalves |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 217.1.01 | 202 | A Midden | South | 43 | 22 | 2.0 | | | | |
| 2 | 217.1.01 | 202 | A Midden | South | 37 | 19 | 1.9 | | | | |
| 3 | 217.1.01 | 202 | A Midden | South | 59 | 33 | 1.8 | | | | |
| 4 | 217.1.01 | 202 | A Midden | South | 48 | 27 | 1.8 | | | | |
| 5 | 217.1.01 | 202 | A Midden | South | 44 | 26 | 1.7 | | | present | |
| 6 | 217.1.01 | 202 | A Midden | South | 55 | 35 | 1.6 | present | | | |
| 7 | 217.1.01 | 202 | A Midden | South | 55 | 35 | 1.6 | | present | | |
| 8 | 217.1.01 | 202 | A Midden | South | 65 | 43 | 1.5 | present | | | |
| 9 | 217.1.01 | 202 | A Midden | South | 60 | 40 | 1.5 | | | | |
| 10 | 217.1.01 | 202 | A Midden | South | 70 | 47 | 1.5 | | | | |
| 11 | 217.1.01 | 202 | A Midden | South | 61 | 41 | 1.5 | | | | |
| 12 | 217.1.01 | 202 | A Midden | South | 55 | 37 | 1.5 | present | | | |
| 13 | 217.1.01 | 202 | A Midden | South | 35 | 24 | 1.5 | | | | |
| 14 | 217.1.01 | 202 | A Midden | South | 39 | 27 | 1.5 | | | | |
| 15 | 217.1.01 | 202 | A Midden | South | 43 | 30 | 1.4 | | | | |
| 16 | 217.1.01 | 202 | A Midden | South | 45 | 33 | 1.4 | present | | | |
| 17 | 217.1.01 | 202 | A Midden | South | 41 | 32 | 1.4 | present | | | |
| 18 | 217.1.01 | 202 | A Midden | South | 43 | 34 | 1.3 | | | | |
| 19 | 217.1.01 | 202 | A Midden | South | 29 | 24 | 1.2 | | | | |
| 20 | 217.1.01 | 202 | A Midden | South | 54 | 45 | 1.2 | | | | |
| 144 | 217.6.03 | 202 | Feature 5 | South | 113 | 37 | 3.1 | | | | |
| 145 | 217.6.03 | 202 | Feature 5 | South | 103 | 49 | 2.1 | | | | |
| 146 | 217.6.03 | 202 | Feature 5 | South | 84 | 42 | 2.0 | | | | |
| 147 | 217.6.03 | 202 | Feature 5 | South | 113 | 60 | 1.9 | | | present | |
| 148 | 217.6.03 | 202 | Feature 5 | South | 101 | 60 | 1.7 | present | | present | |
| 149 | 217.6.03 | 202 | Feature 5 | South | 52 | 31 | 1.7 | present | | | |
| 150 | 217.6.03 | 202 | Feature 5 | South | 67 | 42 | 1.6 | | | | |
| 151 | 217.6.03 | 202 | Feature 5 | South | 95 | 61 | 1.6 | | | | |
| 152 | 217.6.03 | 202 | Feature 5 | South | 97 | 65 | 1.5 | | | present | |
| 153 | 217.6.03 | 202 | Feature 5 | South | 92 | 62 | 1.5 | | | present | |
| 154 | 217.6.03 | 202 | Feature 5 | South | 77 | 52 | 1.5 | | | | |
| 155 | 217.6.03 | 202 | Feature 5 | South | 59 | 41 | 1.4 | | | | |
| 156 | 217.6.03 | 202 | Feature 5 | South | 64 | 46 | 1.4 | | | | |
| 157 | 217.6.03 | 202 | Feature 5 | South | 50 | 36 | 1.4 | | | | |
| 158 | 217.6.03 | 202 | Feature 5 | South | 26 | 20 | 1.3 | | | | |
| 159 | 217.6.03 | 202 | Feature 5 | South | 60 | 47 | 1.3 | | | | |
| 160 | 217.6.03 | 202 | Feature 5 | South | 30 | 25 | 1.2 | | | | |
| 161 | 217.6.03 | 202 | Feature 5 | South | 49 | 42 | 1.2 | | | | |
| 162 | 217.6.03 | 202 | Feature 5 | South | 43 | 39 | 1.1 | | | | |
| 163 | 217.6.03 | 202 | Feature 5 | South | 25 | 24 | 1.0 | | | | |
| 127 | 220 | 203 | Feature 17 | South | 94 | 45 | 2.1 | | | | present |
| 128 | 220 | 203 | Feature 17 | South | 78 | 41 | 1.9 | | | | |
| 129 | 220 | 203 | Feature 17 | South | 70 | 40 | 1.8 | | | | |
| 130 | 220 | 203 | Feature 17 | South | 79 | 46 | 1.7 | | | | |
| 131 | 220 | 203 | Feature 17 | South | 53 | 32 | 1.7 | | | | |
| 132 | 220 | 203 | Feature 17 | South | 61 | 40 | 1.5 | | | present | |
| 133 | 220 | 203 | Feature 17 | South | 64 | 42 | 1.5 | | | | |
| 134 | 220 | 203 | Feature 17 | South | 43 | 29 | 1.5 | | | | |

Appendix D. Billops Ridge Site Oyster Shell Data

| No | Cat. | Grid North | Stratum/ Feature | Site Area | Height (mm) | Length (mm) | H/L Ratio | *Cliona trutti* | *Cliona celata* | Polychaete Worms | Boring Bivalves |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 135 | 220 | 203 | Feature 17 | South | 65 | 44 | 1.5 | | | | |
| 136 | 220 | 203 | Feature 17 | South | 65 | 45 | 1.4 | | | | |
| 137 | 220 | 203 | Feature 17 | South | 54 | 40 | 1.4 | | | | |
| 138 | 220 | 203 | Feature 17 | South | 44 | 33 | 1.3 | | | | |
| 139 | 220 | 203 | Feature 17 | South | 51 | 39 | 1.3 | | | | |
| 140 | 220 | 203 | Feature 17 | South | 51 | 42 | 1.2 | | | | |
| 141 | 220 | 203 | Feature 17 | South | 63 | 52 | 1.2 | | | | |
| 142 | 220 | 203 | Feature 17 | South | 42 | 35 | 1.2 | | | | |
| 143 | 220 | 203 | Feature 17 | South | 39 | 36 | 1.1 | | | | |
| 89 | 221.2.01 | 204 | A/B | South | 46 | 23 | 2.0 | | | | |
| 90 | 221.2.01 | 204 | A/B | South | 41 | 22 | 1.9 | | | | |
| 91 | 221.2.01 | 204 | A/B | South | 41 | 23 | 1.8 | | | | |
| 92 | 221.2.01 | 204 | A/B | South | 43 | 25 | 1.7 | | | | |
| 93 | 221.2.01 | 204 | A/B | South | 43 | 25 | 1.7 | | | | |
| 94 | 221.2.01 | 204 | A/B | South | 37 | 23 | 1.7 | | | | |
| 95 | 221.2.01 | 204 | A/B | South | 62 | 40 | 1.6 | | | | |
| 96 | 221.2.01 | 204 | A/B | South | 77 | 50 | 1.5 | | | | |
| 97 | 221.2.01 | 204 | A/B | South | 45 | 31 | 1.5 | | | | |
| 98 | 221.2.01 | 204 | A/B | South | 31 | 22 | 1.4 | | | | |
| 99 | 221.2.01 | 204 | A/B | South | 46 | 33 | 1.4 | | | | |
| 100 | 221.2.01 | 204 | A/B | South | 31 | 23 | 1.3 | | | | |
| 101 | 221.2.01 | 204 | A/B | South | 39 | 29 | 1.3 | | | | |
| 102 | 221.2.01 | 204 | A/B | South | 41 | 34 | 1.2 | | | | |
| 103 | 221.2.01 | 204 | A/B | South | 47 | 42 | 1.1 | | | | |
| 104 | 221.2.01 | 204 | A/B | South | 45 | 45 | 1.0 | | | | |
| 77 | 221.6 | 204 | Feature 1 | South | 67 | 33 | 2.0 | | | | |
| 78 | 221.6 | 204 | Feature 1 | South | 77 | 45 | 1.7 | present | | | |
| 79 | 221.6 | 204 | Feature 1 | South | 91 | 55 | 1.7 | | | | |
| 80 | 221.6 | 204 | Feature 1 | South | 34 | 21 | 1.6 | | | | |
| 81 | 221.6 | 204 | Feature 1 | South | 61 | 39 | 1.6 | | present | | |
| 82 | 221.6 | 204 | Feature 1 | South | 71 | 46 | 1.5 | | | | |
| 83 | 221.6 | 204 | Feature 1 | South | 41 | 29 | 1.4 | | | | |
| 84 | 221.6 | 204 | Feature 1 | South | 46 | 34 | 1.4 | | | | |
| 85 | 221.6 | 204 | Feature 1 | South | 48 | 36 | 1.3 | | | | |
| 86 | 221.6 | 204 | Feature 1 | South | 50 | 38 | 1.3 | | | | |
| 87 | 221.6 | 204 | Feature 1 | South | 59 | 45 | 1.3 | | | | present |
| 88 | 221.6 | 204 | Feature 1 | South | 65 | 50 | 1.3 | | | | |
| 41 | 230.6 | 212 | Feature 11 | Central | 41 | 20 | 2.1 | | | | |
| 42 | 230.6 | 212 | Feature 11 | Central | 41 | 20 | 2.1 | | | | |
| 43 | 230.6 | 212 | Feature 11 | Central | 40 | 21 | 1.9 | | | | |
| 44 | 230.6 | 212 | Feature 11 | Central | 39 | 21 | 1.9 | | | | |
| 45 | 230.6 | 212 | Feature 11 | Central | 41 | 24 | 1.7 | | | | |
| 46 | 230.6 | 212 | Feature 11 | Central | 36 | 22 | 1.6 | | | | |
| 47 | 230.6 | 212 | Feature 11 | Central | 37 | 23 | 1.6 | | | | |
| 48 | 230.6 | 212 | Feature 11 | Central | 30 | 19 | 1.6 | | | | |
| 49 | 230.6 | 212 | Feature 11 | Central | 37 | 24 | 1.5 | | | | |
| 50 | 230.6 | 212 | Feature 11 | Central | 42 | 30 | 1.4 | | | | |
| 51 | 230.6 | 212 | Feature 11 | Central | 57 | 41 | 1.4 | | | | |

Appendix D. Billops Ridge Site Oyster Shell Data

| No | Cat. | Grid North | Stratum/ Feature | Site Area | Height (mm) | Length (mm) | H/L Ratio | *Cliona trutti* | *Cliona celata* | Polychaete Worms | Boring Bivalves |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52 | 230.4 | 212 | Feature 11 | Central | 45 | 33 | 1.4 | | | | |
| 53 | 230.4 | 212 | Feature 11 | Central | 36 | 27 | 1.3 | | | | |
| 54 | 230.4 | 212 | Feature 11 | Central | 34 | 27 | 1.3 | | | | |
| 55 | 230.4 | 212 | Feature 11 | Central | 43 | 35 | 1.2 | | | | |
| 56 | 230.4 | 212 | Feature 11 | Central | 39 | 33 | 1.2 | | | | |
| 57 | 230.4 | 212 | Feature 11 | Central | 35 | 30 | 1.2 | | | | |
| 58 | 234.2.01 | 216 | A Midden | North | 29 | 15 | 1.9 | | | | |
| 59 | 234.2.01 | 216 | A Midden | North | 73 | 41 | 1.8 | | | | |
| 60 | 234.2.01 | 216 | A Midden | North | 69 | 39 | 1.8 | | | | |
| 61 | 234.2.01 | 216 | A Midden | North | 50 | 29 | 1.7 | | | | |
| 62 | 234.2.01 | 216 | A Midden | North | 36 | 22 | 1.6 | | | | |
| 63 | 234.2.01 | 216 | A Midden | North | 64 | 40 | 1.6 | | | | |
| 64 | 234.2.01 | 216 | A Midden | North | 41 | 26 | 1.6 | | | | |
| 65 | 234.2.01 | 216 | A Midden | North | 64 | 41 | 1.6 | | | | |
| 66 | 234.2.01 | 216 | A Midden | North | 38 | 25 | 1.5 | | | | |
| 67 | 234.2.01 | 216 | A Midden | North | 42 | 28 | 1.5 | | | | |
| 68 | 234.2.01 | 216 | A Midden | North | 55 | 37 | 1.5 | | | | |
| 69 | 234.2.01 | 216 | A Midden | North | 63 | 43 | 1.5 | | | | |
| 70 | 234.2.01 | 216 | A Midden | North | 44 | 32 | 1.4 | | | | |
| 71 | 234.2.01 | 216 | A Midden | North | 81 | 63 | 1.3 | | | | |
| 72 | 234.2.01 | 216 | A Midden | North | 56 | 44 | 1.3 | | | present | |
| 73 | 234.2.01 | 216 | A Midden | North | 41 | 33 | 1.2 | | | | |
| 74 | 234.2.01 | 216 | A Midden | North | 55 | 45 | 1.2 | | | | |
| 75 | 234.2.01 | 216 | A Midden | North | 39 | 34 | 1.1 | | | | |
| 76 | 234.2.01 | 216 | A Midden | North | 39 | 35 | 1.1 | | | | |
| 21 | 240.4.01 | 226 | A Midden | North | 43 | 19 | 2.3 | | | | |
| 22 | 240.4.01 | 226 | A Midden | North | 54 | 30 | 1.8 | | | | |
| 23 | 240.4.01 | 226 | A Midden | North | 25 | 14 | 1.8 | | | | |
| 24 | 240.4.01 | 226 | A Midden | North | 33 | 19 | 1.7 | | | | |
| 25 | 240.4.01 | 226 | A Midden | North | 44 | 26 | 1.7 | | | | |
| 26 | 240.4.01 | 226 | A Midden | North | 15 | 9 | 1.7 | | | | |
| 27 | 240.4.01 | 226 | A Midden | North | 32 | 20 | 1.6 | | | | |
| 28 | 240.4.01 | 226 | A Midden | North | 57 | 36 | 1.6 | | | | |
| 29 | 240.4.01 | 226 | A Midden | North | 29 | 19 | 1.5 | | | | |
| 30 | 240.4.01 | 226 | A Midden | North | 67 | 44 | 1.5 | | | | |
| 31 | 240.4.01 | 226 | A Midden | North | 43 | 30 | 1.4 | | | | |
| 32 | 240.4.01 | 226 | A Midden | North | 35 | 25 | 1.4 | | | | |
| 33 | 240.4.01 | 226 | A Midden | North | 46 | 33 | 1.4 | | | | |
| 34 | 240.4.01 | 226 | A Midden | North | 58 | 42 | 1.4 | | | | |
| 35 | 240.4.01 | 226 | A Midden | North | 39 | 29 | 1.3 | | | | |
| 36 | 240.4.01 | 226 | A Midden | North | 57 | 43 | 1.3 | | | | |
| 37 | 240.4.01 | 226 | A Midden | North | 43 | 34 | 1.3 | | | | |
| 38 | 240.4.01 | 226 | A Midden | North | 43 | 35 | 1.2 | | | | |
| 39 | 240.4.01 | 226 | A Midden | North | 71 | 58 | 1.2 | | | | |
| 40 | 240.4.01 | 226 | A Midden | North | 35 | 32 | 1.1 | | | | |
| 116 | 240.5.01 | 226 | A Midden | North | 67 | 23 | 2.9 | | | | |
| 117 | 240.5.01 | 226 | A Midden | North | 41 | 20 | 2.1 | | | | |
| 118 | 240.5.01 | 226 | A Midden | North | 51 | 26 | 2.0 | | | | |

Appendix D. Billops Ridge Site Oyster Shell Data

| No | Cat. | Grid North | Stratum/ Feature | Site Area | Height (mm) | Length (mm) | H/L Ratio | *Cliona trutti* | *Cliona celata* | Polychaete Worms | Boring Bivalves |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 119 | 240.5.01 | 226 | A Midden | North | 54 | 32 | 1.7 | | | | |
| 120 | 240.5.01 | 226 | A Midden | North | 40 | 24 | 1.7 | | | | |
| 121 | 240.5.01 | 226 | A Midden | North | 36 | 22 | 1.6 | | | | |
| 122 | 240.5.01 | 226 | A Midden | North | 50 | 34 | 1.5 | | | | |
| 123 | 240.5.01 | 226 | A Midden | North | 47 | 33 | 1.4 | | | | |
| 124 | 240.5.01 | 226 | A Midden | North | 88 | 63 | 1.4 | | | present | |
| 125 | 240.5.01 | 226 | A Midden | North | 54 | 40 | 1.4 | | | | |
| 126 | 240.5.01 | 226 | A Midden | North | 40 | 32 | 1.3 | | | | |
| 105 | 242.3.01 | 229 | A Midden | North | 52 | 31 | 1.7 | | | | |
| 106 | 242.3.01 | 229 | A Midden | North | 51 | 31 | 1.6 | | | | |
| 107 | 242.3.01 | 229 | A Midden | North | 45 | 28 | 1.6 | present | | | |
| 108 | 242.3.01 | 229 | A Midden | North | 46 | 29 | 1.6 | | | | |
| 109 | 242.3.01 | 229 | A Midden | North | 33 | 22 | 1.5 | | | | |
| 110 | 242.3.01 | 229 | A Midden | North | 56 | 38 | 1.5 | | | | |
| 111 | 242.3.01 | 229 | A Midden | North | 39 | 27 | 1.4 | | | | |
| 112 | 242.3.01 | 229 | A Midden | North | 46 | 33 | 1.4 | | | | |
| 113 | 242.3.01 | 229 | A Midden | North | 53 | 39 | 1.4 | | | | |
| 114 | 242.3.01 | 229 | A Midden | North | 41 | 32 | 1.3 | | | | |
| 115 | 242.3.01 | 229 | A Midden | North | 34 | 29 | 1.2 | | | | |

**APPENDIX E**

Conference House
Park Site Photo Log

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Photo** | | | | | |
| 2 | | | | | | |
| 3 | **frame no.** | **street** | **unit/trench** | **description** | **direction** | **date** |
| 4 | | | | | | |
| 8 | | | | | | |
| 9 | 6 | Satterlee | N207 E3 | north wall | north | 9/29/2004 |
| 10 | 7 | Satterlee | N207 E3 | east wall | east | 9/29/2004 |
| 11 | 8 | Satterlee | N204 E3 | south wall | south | 9/29/2004 |
| 12 | 9 | Satterlee | N204 E3 | west wall | west | 9/29/2004 |
| 13 | 10 | Satterlee | N211 E3 | west wall | west | 9/30/2004 |
| 14 | 11 | Satterlee | N211 E3 | north wall | north | 9/30/2004 |
| 15 | 12 | Satterlee | N74 E1 | east wall | east | 10/1/2004 |
| 16 | 13 | Satterlee | N74 E1 | north wall | north | 10/1/2004 |
| 17 | 14 | Satterlee | N72 E1 | east wall | east | 10/1/2004 |
| 18 | 15 | Satterlee | N72 E1 | south wall | south | 10/1/2004 |
| 19 | 16 | Satterlee | N213 E3 | east wall | east | 10/4/2004 |
| 20 | 17 | Satterlee | N213 E3 | north wall | north | 10/4/2004 |
| 21 | 18 | Satterlee | N217.5 E3 | east wall | east | 10/4/2004 |
| 22 | 19 | Satterlee | N217.5 E3 | north wall | north | 10/4/2004 |
| 23 | 20 | Satterlee | N216 E3 | Feature 2 | south | 10/4/2004 |
| 24 | 21 | Satterlee | N216 E3 | Feature 3 | east | 10/5/2004 |
| 25 | 22 | Satterlee | N216 E3 | Feature 3 | east | 10/5/2004 |
| 26 | 23 | Satterlee | N221 E3 | east wall | east | 10/5/2004 |
| 27 | 24 | Satterlee | N221 E3 | north wall | north | 10/5/2004 |
| 28 | 25 | Satterlee | N216 E3 | south wall | south | 10/5/2004 |
| 29 | 26 | Satterlee | N216 E3 | south wall | south | 10/5/2004 |
| 30 | 27 | Satterlee | N216 E3 | west wall | west | 10/5/2004 |
| 31 | 28 | Satterlee | N216 E3 | west wall | west | 10/5/2004 |
| 32 | 29 | Satterlee | N216 E3 | west wall | west | 10/5/2004 |
| 33 | 30 | Satterlee | N216 E3 | west wall | west | 10/5/2004 |
| 34 | 31 | Satterlee | N202 E1 | north wall | north | 10/6/2004 |
| 35 | 32 | Satterlee | N202 E1 | north wall | north | 10/6/2004 |
| 36 | 33 | Satterlee | N202 E1 | north wall | north | 10/6/2004 |
| 37 | 34 | Satterlee | N202 E1 | east wall | east | 10/6/2004 |
| 38 | 35 | Satterlee | N202 E1 | east wall | east | 10/6/2004 |
| 39 | 36 | Satterlee | N200 E1 | east wall | east | 10/6/2004 |
| 40 | 37 | Satterlee | N200 E1 | east wall | east | 10/6/2004 |
| 41 | 38 | Satterlee | N200 E1 | north wall | north | 10/6/2004 |
| 42 | 39 | Satterlee | N200 E1 | north wall | north | 10/6/2004 |
| 43 | 40 | Satterlee | N201 E1 | Feature 4 | west | 10/7/2004 |
| 44 | 41 | Satterlee | N201 E1 | Feature 4 | west | 10/7/2004 |
| 45 | 42 | Satterlee | N201 E1 | west wall | west | 10/7/2004 |
| 46 | 43 | Satterlee | N201 E1 | west wall | west | 10/7/2004 |
| 47 | 44 | Satterlee | N202 E1-3 | Feature 5 profile | northeast | 10/8/2004 |
| 48 | 45 | Satterlee | N202 E1-3 | Feature 5 profile | north | 10/8/2004 |
| 49 | 46 | Satterlee | N202 E1-3 | Feature 5 profile | north | 10/8/2004 |
| 50 | 47 | Satterlee | N202 E1-3 | Feature 5 profile | north | 10/8/2004 |
| 51 | 48 | Satterlee | N202 E1-3 | Feature 5 profile | northeast | 10/8/2004 |
| 52 | 49 | Satterlee | N202 E1-3 | base of excavation | east | 10/8/2004 |
| 53 | 50 | Satterlee | N202 E1-3 | Feature 5 profile | northeast | 10/8/2004 |

Conference House
Park Site Photo Log

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 3 | frame no. | street | unit/trench | description | direction | date |
| 54 | 51 | Satterlee | N201 E1 | east wall | east | 10/8/2004 |
| 55 | 52 | Satterlee | N201 E1 | east wall | east | 10/8/2004 |
| 56 | 53 | Satterlee | N200-201 E1 | east wall | southeast | 10/8/2004 |
| 57 | 54 | Satterlee | N200-201 E1 | east wall | east | 10/8/2004 |
| 58 | 55 | Satterlee | - | Feature 5 vicinity | east | 10/8/2004 |
| 59 | 56 | Satterlee | - | Feature 5 vicinity | north | 10/8/2004 |
| 60 | 57 | Satterlee | - | Feature 5 vicinity | southeast | 10/8/2004 |
| 61 | 58 | Satterlee | - | Feature 5 vicinity | east | 10/8/2004 |
| 62 | 59 | Satterlee | - | Feature 5 vicinity | south | 10/8/2004 |
| 63 | 60 | Satterlee | N202 E1-3 | base of excavation | west | 10/8/2004 |
| 64 | 61 | Satterlee | - | Feature 5 vicinity | northwest | 10/8/2004 |
| 65 | 62 | Satterlee | - | Feature 5 vicinity | northwest | 10/8/2004 |
| 66 | 63 | Satterlee | - | Feature 5 vicinity | north | 10/8/2004 |
| 67 | 64 | Satterlee | - | Feature 5 vicinity | northeast | 10/8/2004 |
| 68 | 65 | Satterlee | - | Feature 5 vicinity | northeast | 10/8/2004 |
| 69 | 66 | Satterlee | - | Feature 5 vicinity | northeast | 10/8/2004 |
| 70 | 67 | Satterlee | N209 E2 | Feature 6 | overhead | 10/12/2004 |
| 71 | 68 | Satterlee | N209 E2 | Feature 6 | overhead | 10/12/2004 |
| 72 | 69 | Satterlee | N209 E2 | Feature 6 | overhead | 10/12/2004 |
| 73 | 70 | Satterlee | east trench | Feature 7 | overhead | 10/12/2004 |
| 74 | 71 | Satterlee | east trench | Feature 7 | overhead | 10/12/2004 |
| 75 | 72 | Satterlee | east trench | Feature 8 | overhead | 10/12/2004 |
| 76 | 73 | Satterlee | east trench | Feature 8 | overhead | 10/12/2004 |
| 77 | 74 | | | backhoe trenching | | |
| 78 | 75 | | | open pipe trench | | |
| 79 | 76 | | | open pipe trench | | |
| 80 | 77 | | | backhoe trenching | | |
| 81 | 78 | | | trench work | | |
| 82 | 79 | | | trench wall | | |
| 83 | 80 | | | water pipe installation | | |
| 84 | 81 | | | trench work | | |
| 85 | 82 | | | trench work | | |
| 86 | 83 | | | trench work | | |
| 87 | 84 | | | trench work | | |
| 88 | 85 | | | trench work | | |
| 89 | 86 | | | trench work | | |
| 90 | 87 | | | trench work | | |
| 91 | 88 | | | flooded trench | | |
| 92 | 89 | | | frame out of focus | | |
| 93 | 90 | | | flooded trench | | |
| 94 | 91 | | | trench post-flood | | |
| 95 | 92 | | | trench post-flood | | |
| 96 | 93 | | | trench post-flood | | |
| 97 | 94 | | | trench post-flood | | |
| 98 | 95 | | | trench post-flood | | |
| 99 | 96 | | | trench work | | |
| 100 | 97 | | | de-watering trench | | |
| 101 | 98 | | | de-watering trench | | |
| 102 | 99 | | | backhoe trenching | | |

Conference House
Park Site Photo Log

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 3 | frame no. | street | unit/trench | description | direction | date |
| 103 | 100 | | | trench details | | |
| 104 | 101 | | | trench work | | |
| 105 | 102 | | | trench work | | |
| 106 | 103 | Massachusetts | east trench/ N4 | Feature 1 | east | 10/25/2004 |
| 107 | 104 | Massachusetts | east trench/ N4 | Feature 1 | overhead | 10/25/2004 |
| 108 | 105 | Massachusetts | east trench/ N4 | Feature 1 | overhead | 10/25/2004 |
| 109 | 106 | Massachusetts | east trench/ N35 | west wall | west | 10/26/2004 |
| 110 | 107 | Massachusetts | east trench/ N35 | west wall | northwest | 10/26/2004 |
| 111 | 108 | Massachusetts | east trench/ N40 | west wall | northwest | 10/26/2004 |
| 112 | 109 | Massachusetts | east trench/ N40 | west wall | west | 10/26/2004 |
| 113 | 110 | Massachusetts | east trench/ N45 | west wall | northwest | 10/26/2004 |
| 114 | 111 | Massachusetts | east trench/ N45 | west wall | northwest | 10/26/2004 |
| 115 | 112 | Massachusetts | east trench | backhoe trenching | north | 10/26/2004 |
| 116 | 113 | Massachusetts | east trench | backhoe trenching | north | 10/26/2004 |
| 117 | 114 | Massachusetts | east trench/ N50-55 | west wall | northwest | 10/26/2004 |
| 118 | 115 | Massachusetts | east trench/ N50-55 | west wall | northwest | 10/26/2004 |
| 119 | 116 | Massachusetts | east trench/ N50-55 | west wall | northwest | 10/26/2004 |
| 120 | 117 | Massachusetts | east trench | backhoe trenching | northwest | 10/26/2004 |
| 121 | 118 | Massachusetts | east trench | backhoe trenching | northwest | 10/26/2004 |
| 122 | 119 | Massachusetts | east trench/ N83-87 | west wall | northwest | 10/26/2004 |
| 123 | 120 | Massachusetts | east trench/ N83-87 | west wall | northwest | 10/26/2004 |
| 124 | 121 | Massachusetts | east trench/ N83-87 | west wall | west | 10/26/2004 |
| 125 | 122 | Massachusetts | east trench | Stu Reeve taking notes | northwest | 10/26/2004 |
| 126 | 123 | Massachusetts | east trench/ N97 | Feature 2 | southwest | 10/26/2004 |
| 127 | 124 | Massachusetts | east trench/ N97 | Feature 2 | south | 10/26/2004 |
| 128 | 125 | Massachusetts | east trench | trench work | west | 10/26/2004 |
| 129 | 126 | Massachusetts | east trench | trench work | west | 10/26/2004 |
| 130 | 127 | Massachusetts | east trench/ N130-135 | west wall | northwest | 10/26/2004 |
| 131 | 128 | Massachusetts | east trench/ N130-135 | west wall | west | 10/26/2004 |
| 132 | 129 | Massachusetts | east trench/ N145-150 | west wall | northwest | 10/26/2004 |
| 133 | 130 | Massachusetts | east trench/ N145-150 | west wall | northwest | 10/26/2004 |
| 134 | 131 | Massachusetts | east trench/ N160-165 | west wall | west | 10/26/2004 |
| 135 | 132 | Massachusetts | east trench/ N155-160 | west wall | west | 10/26/2004 |
| 136 | 133 | Massachusetts | east trench/ N170-175 | west wall | west | 10/28/2004 |
| 137 | 134 | Massachusetts | east trench/ N175-180 | west wall | west | 10/28/2004 |
| 138 | 135 | Massachusetts | east trench/ N180-185 | west wall | west | 10/28/2004 |
| 139 | 136 | Massachusetts | east trench/ N185-190 | west wall | west | 10/28/2004 |
| 140 | 137 | Massachusetts | east trench/ N200-205 | west wall | west | 10/28/2004 |
| 141 | 138 | Massachusetts | east trench/ N205-208 | west wall | west | 10/28/2004 |
| 142 | 139 | Massachusetts | east trench/ N205-208 | west wall | west | 10/28/2004 |
| 143 | 140 | Massachusetts | east trench/ N215-220 | west wall | west | 10/28/2004 |
| 144 | 141 | Massachusetts | east trench/ N220-225 | west wall | west | 10/28/2004 |
| 145 | 142 | Massachusetts | east trench/ N225-230 | west wall | west | 10/28/2004 |
| 146 | 143 | Massachusetts | east trench/ N225-230 | west wall | west | 10/28/2004 |
| 147 | 144 | Satterlee | center trench/ N10-15 | west wall | west | 10/29/2004 |
| 148 | 145 | Satterlee | center trench/ N10-15 | west wall | west | 10/29/2004 |
| 149 | 146 | Satterlee | center trench/ N15-20 | west wall | west | 10/29/2004 |
| 150 | 147 | Satterlee | center trench/ N15-20 | west wall | west | 10/29/2004 |
| 151 | 148 | Satterlee | center trench/ N15-20 | Features 3 & 4 | overhead | 10/29/2004 |

Conference House
Park Site Photo Log

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 3 | frame no. | street | unit/trench | description | direction | date |
| 152 | 149 | Satterlee | center trench/ N15-20 | Features 3 & 4 | overhead | 10/29/2004 |
| 153 | 150 | Satterlee | center trench/ N15-20 | Features 5 & 6 | overhead | 10/29/2004 |
| 154 | 151 | Satterlee | center trench/ N15-20 | Features 5 & 6 | overhead | 10/29/2004 |
| 155 | 152 | Satterlee | center trench/ N15-20 | Feature 3 | north | 10/29/2004 |
| 156 | 153 | Satterlee | center trench/ N15-20 | Feature 4 | east | 10/29/2004 |
| 157 | 154 | Satterlee | center trench/ N15-20 | Feature 5 | east | 10/29/2004 |
| 158 | 155 | Satterlee | center trench/ N15-20 | Feature 6 | east | 10/29/2004 |
| 159 | 156 | Satterlee | center trench/ N20-25 | Features 7 & 8 | west | 10/29/2004 |
| 160 | 157 | Satterlee | center trench/ N20-25 | Features 7 & 8 | east | 10/29/2004 |
| 161 | 158 | Satterlee | center trench/ N20-25 | Features 7 & 8 | east | 10/29/2004 |
| 162 | 159 | Satterlee | center trench/ N25-30 | Features 9 & 10 | west | 10/29/2004 |
| 163 | 160 | Satterlee | center trench/ N25-30 | Features 9 & 10 | west | 10/29/2004 |
| 164 | 161 | Satterlee | center trench/ N25-30 | west wall | west | 10/29/2004 |
| 165 | 162 | Satterlee | center trench/ N25-30 | Features 9 & 10 | east | 10/29/2004 |
| 166 | 163 | Satterlee | center trench/ N30-35 | Features 11, 12 & 13 | west | 10/29/2004 |
| 167 | 164 | Satterlee | center trench/ N30-35 | Features 11, 12 & 13 | west | 10/29/2004 |
| 168 | 165 | Satterlee | center trench/ N30-35 | Features 14 & 15 | overhead | 10/29/2004 |
| 169 | 166 | Satterlee | center trench/ N35-40 | Features 16 & 17 | overhead | 10/29/2004 |
| 170 | 167 | Satterlee | center trench/ N35-40 | Features 16 & 17 | overhead | 10/29/2004 |
| 171 | 168 | Satterlee | center trench/ N40-45 | Features 18, 19 & 20 | overhead | 11/1/2004 |
| 172 | 169 | Satterlee | center trench [unclear] | Features 21 & 22 [unclear] | overhead | 11/1/2004 |
| 173 | 170 | Satterlee | center trench/ N45-50 | Features 23 & 24 | overhead | 11/1/2004 |
| 174 | 171 | Satterlee | center trench/ N75-80 | west wall | west | 11/1/2004 |
| 175 | 172 | Satterlee | center trench/ N80-85 | west wall | west | 11/1/2004 |
| 176 | 173 | Satterlee | center trench/ N90-95 | west wall | west | 11/1/2004 |
| 177 | 174 | Satterlee | N212 E2 | base of level 1 | overhead | 11/2/2004 |
| 178 | 175 | Satterlee | N215 E2 | north wall | north | 11/2/2004 |
| 179 | 176 | Satterlee | N212 E2 | Features 9, 10 & 11 | overhead | 11/2/2004 |
| 180 | 177 | Satterlee | N212 E2 | Features 9, 10 & 11 | overhead | 11/2/2004 |
| 181 | 178 | Satterlee | N212 E2 | Feature 9 | overhead | 11/2/2004 |
| 182 | 179 | Satterlee | N212 E2 | Features 9, 10 & 11 | north | 11/2/2004 |
| 183 | 180 | Satterlee | N212 E2 | Features 9, 10 & 11 | north | 11/2/2004 |
| 184 | 181 | Satterlee | N212 E2 | Feature 9 - note tooth | overhead | 11/2/2004 |
| 185 | 182 | Satterlee | N212 E2 | east wall | east | 11/3/2004 |
| 186 | 183 | Satterlee | N212 E2 | east wall | east | 11/3/2004 |
| 187 | 184 | Satterlee | N212 E2 | south wall | south | 11/3/2004 |
| 188 | 185 | Satterlee | N209 E2 | base of excavation | west | 11/3/2004 |
| 189 | 186 | Satterlee | N209 E2 | east wall | east | 11/3/2004 |
| 190 | 187 | Satterlee | N209 E2 | east wall/ Feature 13 | east | 11/3/2004 |
| 191 | 188 | Satterlee | N209 E2 | south wall/ Feature 13 | south | 11/3/2004 |
| 192 | 189 | Satterlee | N206 E2 | west wall | west | 11/3/2004 |
| 193 | 190 | Satterlee | N206 E2 | north wall | north | 11/3/2004 |
| 194 | 191 | Satterlee | N226 E3 | south wall | south | 11/5/2004 |
| 195 | 192 | Satterlee | N226 E3 | west wall | west | 11/5/2004 |
| 196 | 193 | Satterlee | center trench/ N188 E3 | west wall | west | 11/5/2004 |
| 197 | 194 | Satterlee | center trench/ N203 E2 | west wall | west | 11/5/2004 |
| 198 | 195 | Satterlee | center trench/ N220-224 E2 | west wall | west | 11/5/2004 |
| 199 | 196 | Satterlee | center trench/ N220-224 E2 | west wall | southwest | 11/5/2004 |
| 200 | 197 | Satterlee | center trench/ N207.8-210 E3 | Feature 15 | north | 11/5/2004 |

Conference House
Park Site Photo Log

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 3 | frame no. | street | unit/trench | description | direction | date |
| 201 | 198 | Satterlee | center trench/ N207.8-210 E3 | Feature 16 | north | 11/5/2004 |
| 202 | 199 | Satterlee | center trench/ N207.8-210 E3 | Feature 13 | north | 11/5/2004 |
| 203 | 200 | Satterlee | center trench/ N204 E1 | Feature 17 | east | 11/5/2004 |
| 204 | 201 | Satterlee | center trench/ N204 E1 | Feature 17 | east | 11/5/2004 |
| 205 | 202 | Satterlee | N229 E3 | north wall | north | 11/5/2004 |
| 206 | 203 | Satterlee | N229 E3 | north wall | north | 11/5/2004 |
| 207 | 204 | Satterlee | N229 E3 | north wall | north | 11/5/2004 |
| 208 | 205 | Satterlee | N229 E3 | north wall | north | 11/5/2004 |
| 209 | 206 | Satterlee | N229 E3 | north wall | north | 11/5/2004 |
| 210 | 207 | Satterlee | west trench/ N186 E0 | Feature 18 | west | 11/8/2004 |
| 211 | 208 | Satterlee | west trench/ N186 E0 | Feature 18 | west | 11/8/2004 |
| 212 | 209 | Massachusetts | | backhoe trenching | | |
| 213 | 210 | Massachusetts | | backhoe trenching | | |
| 214 | 211 | Massachusetts | | backhoe trenching | | |
| 215 | 212 | Massachusetts | | backhoe trenching | | |
| 216 | 213 | Massachusetts | | backhoe trenching | | |
| 217 | 214 | Massachusetts | west trench/ N180-185 | west wall | northwest | 11/15/2004 |
| 218 | 215 | Massachusetts | west trench/ N180-185 | west wall | southwest | 11/15/2004 |
| 219 | 216 | Massachusetts | west trench/ N180-185 | west wall | southwest | 11/15/2004 |
| 220 | 217 | Massachusetts | west trench/ N75-80 | west wall | northwest | 11/15/2004 |
| 221 | 218 | Massachusetts | west trench/ N75-80 | west wall | northwest | 11/15/2004 |
| 222 | 219 | Massachusetts | west trench/ N75-80 | west wall | west | 11/15/2004 |
| 223 | 220 | Massachusetts | west trench/ N70-75 | west wall | west | 11/15/2004 |
| 224 | 221 | Massachusetts | west trench/ N70-75 | west wall | northwest | 11/15/2004 |
| 225 | 222 | Massachusetts | west trench [unclear] | west wall | west | 11/15/2004 |
| 226 | 223 | Massachusetts | west trench/ N65-70 | west wall | west | 11/15/2004 |
| 227 | 224 | Massachusetts | west trench/ N55 | Feature 19 | west | 11/15/2004 |
| 228 | 225 | Massachusetts | west trench/ N55 | west wall | west | 11/15/2004 |
| 229 | 226 | Massachusetts | west trench/ N55 | west wall | west | 11/15/2004 |
| 230 | 227 | Massachusetts | | backhoe trenching | | 11/15/2004 |
| 231 | 228 | Massachusetts | west trench/ N50 | west wall | northwest | 11/15/2004 |
| 232 | 229 | Massachusetts | west trench/ N50 | west wall | west | 11/15/2004 |
| 233 | 230 | Massachusetts | west trench/ N [unclear] | west wall | west | 11/15/2004 |
| 234 | 231 | Massachusetts | west trench/ N45 | west wall | northwest | 11/15/2004 |
| 235 | 232 | Massachusetts | west trench/ N40 | west wall | west | 11/15/2004 |
| 236 | 233 | Massachusetts | west trench/ N40 | west wall | southwest | 11/15/2004 |
| 237 | 234 | Massachusetts | west trench/ N40 | east wall | southeast | 11/15/2004 |
| 238 | 235 | Massachusetts | west trench/ N40 | east wall | east | 11/15/2004 |
| 239 | 236 | Massachusetts | west trench/ N20 | west wall | west | 11/15/2004 |
| 240 | 237 | Massachusetts | west trench/ N20 | west wall | northwest | 11/15/2004 |
| 241 | 238 | Massachusetts | west trench/ N15 | west wall | west | 11/15/2004 |
| 242 | 239 | Massachusetts | west trench/ N15 | west wall | northwest | 11/15/2004 |

Conference House Park Photo Log-Disc 2

| frame no. | street | trench | description | direction | date |
|---|---|---|---|---|---|
| 1 | Clermont | north | 20 west | west | 7/19/2004 |
| 2 | Clermont | north | 20 west | west | 7/19/2004 |
| 3 | Clermont | north | 300 west | south | 7/20/2004 |
| 4 | Clermont | north | 300 west | south | 7/20/2004 |
| 5 | Clermont | north | 360 west | south | 7/21/2004 |
| 6 | Clermont | north | 360 west | south | 7/21/2004 |
| 7 | Clermont | north | 390 west | south | 7/21/2004 |
| 8 | Clermont | north | 405 west | south | 7/21/2004 |
| 9 | Swinnerton | east | 10 north | north | 7/21/2004 |
| 10 | | | street scene | | |
| 11 | | | street scene | | |
| 12 | Clermont | south | 430 west | north | 7/26/2004 |
| 13 | Clermont | south | 445 west | north | 7/26/2004 |
| 14 | Massachusetts | east | 195 west | west | 8/2/2004 |
| 15 | Massachusetts | east | 195 west | west | 8/2/2004 |
| 16 | | | taking measurements | | |
| 17 | Massachusetts | east | 145 west | west | 8/2/2004 |
| 18 | Massachusetts | east | 75 north | west | 8/3/2004 |
| 19 | Massachusetts | east | 45 north | west | 8/3/2004 |
| 20 | | | street scene | | |
| 21 | | | street scene | | |
| 22 | Satterlee | west | 65 north | west | 8/11/2004 |
| 23 | Satterlee | center | 210 north | west | 8/13/2004 |
| 24 | Hylan Blvd. | south | 5 west | north | 8/17/2004 |

**APPENDIX F**
**OPRHP Archaeological Site Inventory Form**

CONFIDENTIAL

NEW YORK STATE PREHISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM

For Office Use Only - Site Identifier

Project Identifier Billops Ridge Site Date 4/6/2006

Your Name Cece Saunders
Address HPI, P. O. Box 3037, Westport, CT zip 06880

Organization (if any) Historical Perspectives, Inc.

1. Site Identifier(s) Billops Ridge Site-Satterlee Road.
2. County Richmond One of the following: City New York
   Township
   Incorporated Village
   Unincorporated Village or Hamlet Conference House Park
3. Present Owner New York City
   Address City of New York, Department of Design and Construction, 30-30 Thomson Avenue, Room 415, Long Island City, NY 11101.

4. Site Description (check all appropriate categories):

Site

| | | |
|---|---|---|
| __Stray find | __Cave/Rockshelter | __Workshop |
| __Pictograph | __Quarry | __Mound |
| __Burial | _X_Shell midden | __Village |
| __Surface evidence | __Camp | __Material in plow zone |
| __Material below plow zone | _X_Buried evidence | __Intact occupation floor |
| __Single component | _X_Evidence of features | __Stratified |
| | __Multicomponent | |

Location

| | | |
|---|---|---|
| __Under cultivation | _X_Never cultivated | __Previously cultivated |
| __Pastureland | __Woodland | __Floodplain |
| __Upland | | __Sustaining erosion |

Soil Drainage: excellent___ good___ fair X__ poor
Slope: flat___ gentle X__ moderate___ steep
Distance to nearest water from site (approx.) ___> 50 feet
Elevation 50 feet above mean sea level

5. Site Investigation (append additional sheets, if necessary):
Surface--date(s)
__Site Map (Submit with form*)
__Collection
Subsurface--date(s) July-November 2004
Testing: shovel X coring__ other__ unit size 50x50cm
no. of units 11 (Submit plan of units with form*)
Excavation: unit size 1x1m no. of units 18
(Submit plan of units with form*)
*Submission should be 8 1/2" x 11", if feasible.

Investigator Historical Perspectives, Inc., P. O. Box 3037
Westport, CT 06880
Manuscript or published report(s) (reference fully):

*Phase 1B/2 Archaeological Reconnaissance Survey and Phase 3 Archaeological Mitigation/Monitoring. Installation of Storm Water Drains, Sanitary Sewers, and Water Mains along Swinnerton Street, Clermont Avenue, Massachusetts Street, Hylan Boulevard and Satterlee Street, Richmond County, New York.* HPI, April 2006.

Present repository of materials HPI offices. By agreement, to be forwarded to the Staten Island Institute of Arts and Sciences, 75 Stuvyesant Place, Staten Island.

6. Component(s) (cultural affiliation/dates):

Early and Middle Woodland Periods, ca. 3000 to 1000 BP.

7. List of material remains (be as specific as possible in identifying object and material):

Lithics: Chert and jasper flakes, fire cracked rock. Middle Woodland rhyolite Fox Creek Stemmed point; base of a Middle Woodland Greene or Fox Creek dark gray chert Lanceolate point or early Late Woodland Jack's Reef Pentagonal point; broken Early Woodland black chert Rossville contracting-stemmed point base; and a brownish yellow jasper resharpened blade of a corner-notched or side-notched hafted biface.
Shell: hard and soft shell clam, channel whelks, scallops, and few New England dog whelks and other marine taxa.
Pottery: Cord-marked, net impressed, and fabric impressed pottery analogous to Early to Middle Woodland ceramic types, including Vinette 1 and Matinnicock Stamped wares. One incised rim sherd

possibly part of a filled triangle or chevron design possibly dating to the Late Woodland. One thin, shell-tempered, cord-marked sherd that might date to the Late Woodland period.

If historic materials are evident, check here and fill out historic site form. X

8. Map references: Map or maps showing exact location and extent of site must accompany his form and must be identified by source and date. Keep this submission to 8 1/2" x 11", if possible.
USGS 71/2 Minute Series Quad. Name Arthur Kill NY-NJ

For Office Use Only - UTM Coordinates

9. Photography (optional for environmental impact survey): Please submit a 5" x 7" black and white print(s) showing the current state of the site. Provide a label for the print(s) on a separate sheet.

See attached pages.

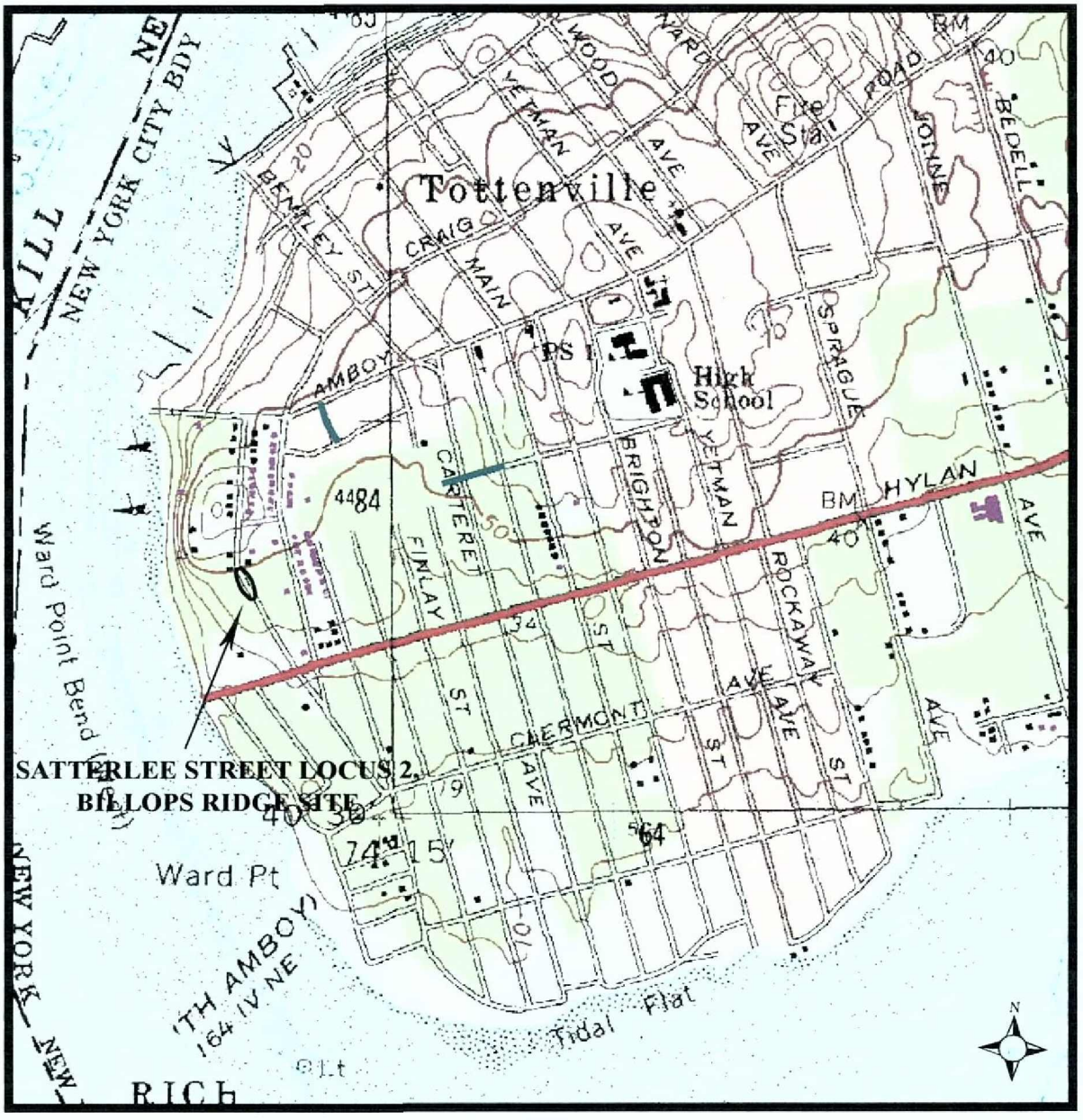



**Figure 1** **Location of Satterlee Street Locus 2, Billops Ridge Site identified during field testing in 2004 (USGS Quadrangles, 7.5' Series; Arthur Kill NY, NJ 1981)**

**Scale 1:24,000**

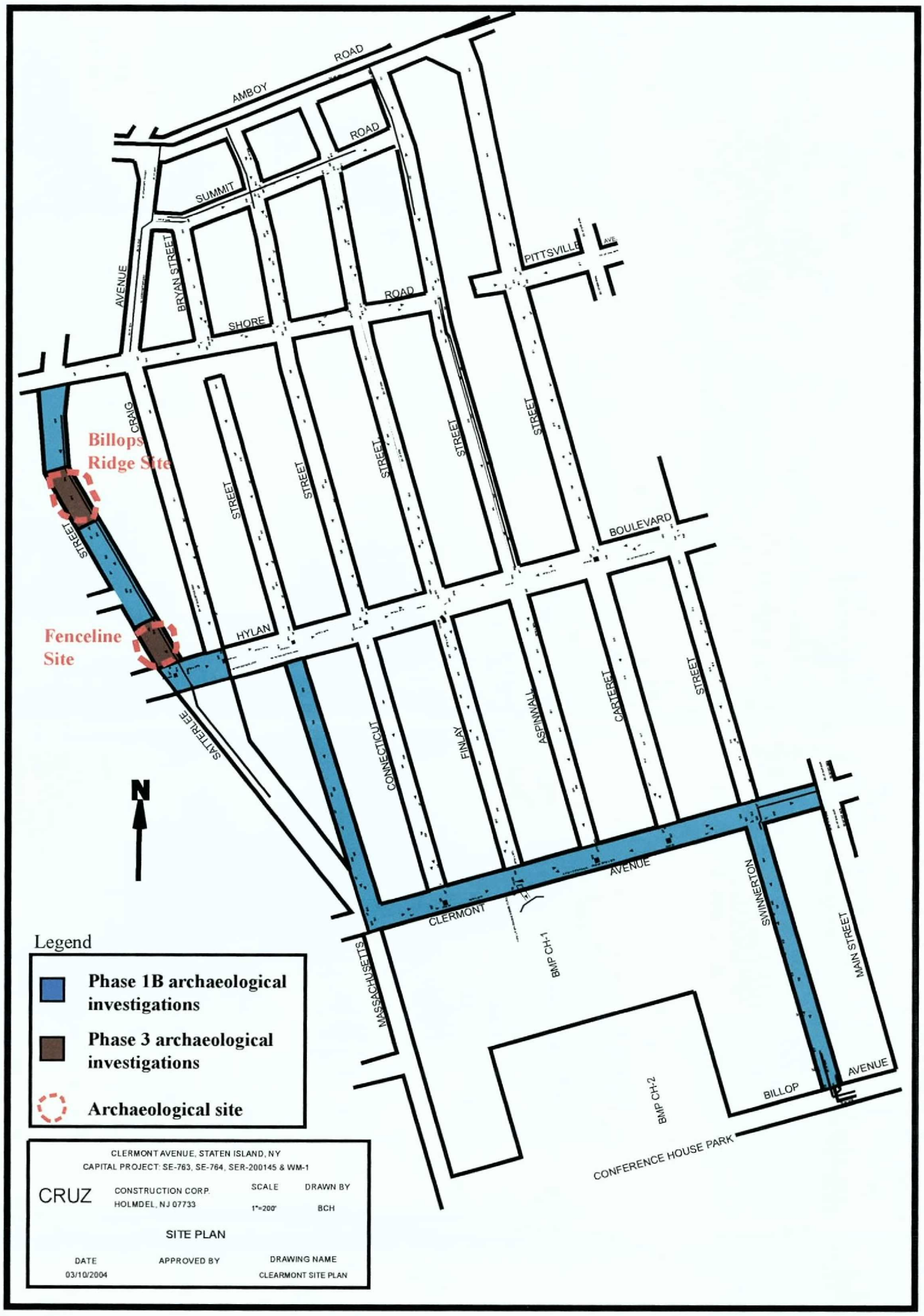
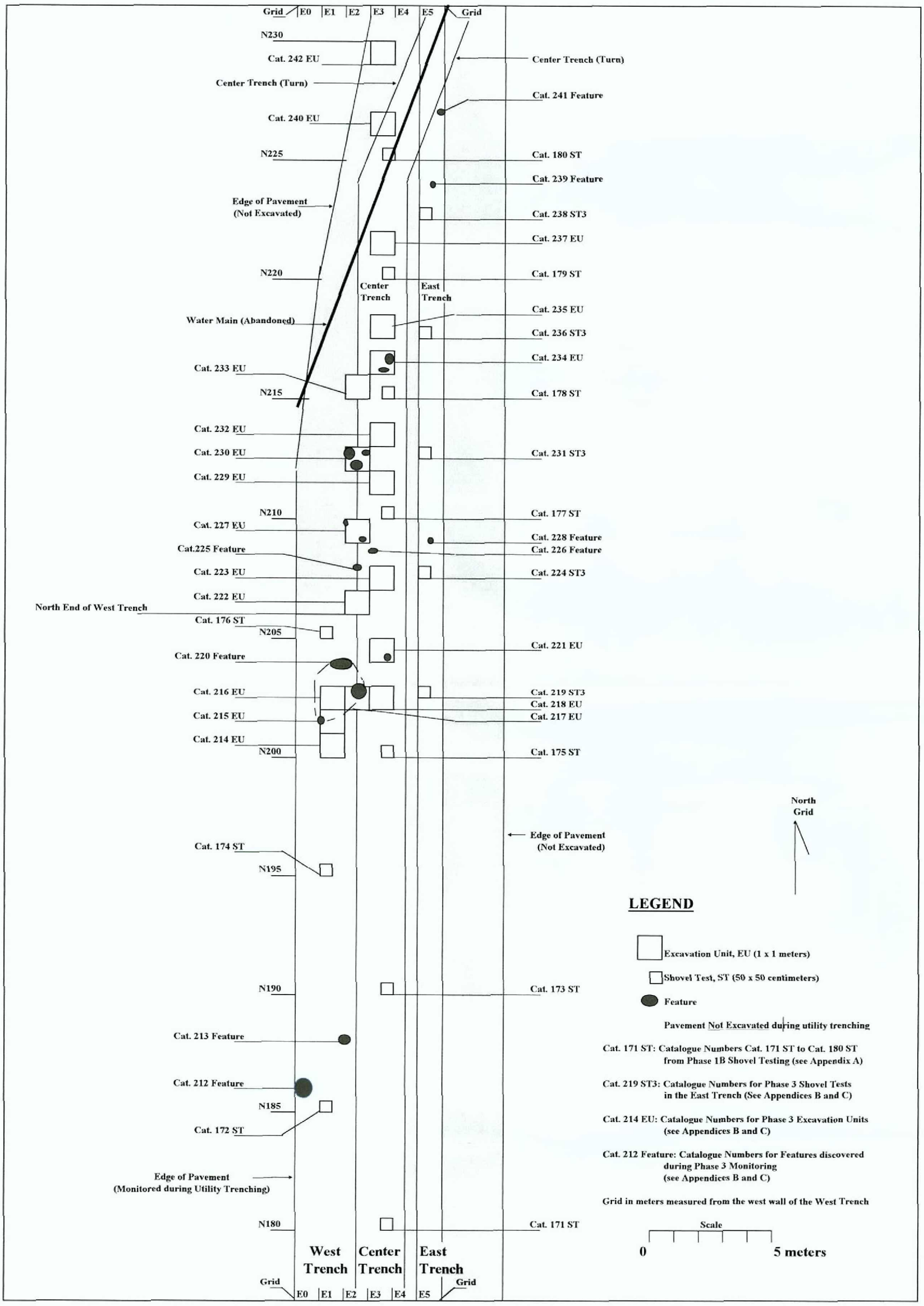



**Figure 1-2. Location of project site area and recorded archaeological sites.**

Figure 7-1. Satterlee Street Locus 2, the Billops Ridge Site Excavations and Features



# NEW YORK STATE HISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM



FOR OFFICE USE ONLY - - Site Identifier: _____ Date: 4/6/2006
Project Identifier: South Richmond Drainage, Conference House Park Watershed, CEQR No. 01 DEP 004R.

Your Name: Cece Saunders Phone: (203) 226 - 7654
Address: P. O. Box 3037
Westport, CT
Zip: 06880
Organization (if any): Historical Perspectives, Inc.,

1. Site Identifier(s): Fenceline Site, East Side Satterlee Road
2. County: Richmond One of the Following: City: New York
   Township: _____
   Incorporated Village:
   or Hamlet: _____
3. Present Owner: City of New York, Department of Design and Construction
   Address: 30-30 Thomson Avenue, Room 415, Long Island City, NY
   Zip: 11101
4. Site Description: (Check all appropriate categories) :
   Structure/Site: See attached sheet.
   Superstructure: __complete _partial ___collapsed _X_not evident
   Foundation: ___above ___below (ground level) __ not evident/ none
   ____Structural subdivisions apparent ___only surface traces visible
   _X_ buried traces detected **(Note: post holes)**
   List construction materials (be as specific as possible): red cedar
   Grounds:
   ___under cultivation ___sustaining erosion __woodland _x_upland
   _X_ never cultivated ___previously cultivated __flood plain ___pastureland
   Soil Drainage: ___excellent __good ___ fair _X_ poor
   Slope: __flat _X_ gentle ___moderate ___steep
   Distance to nearest water from structure (approx.): > 50 feet
   Elevation: 500'
5. Site Investigation (append additional sheets, if necessary): none
   SurfaceBdate(s): July-November, 2004
   _X_ Site Map (Submit with form*)
   ___Collection
   SubsurfaceBdate(s):
   Testing: _shovel __ coring ___other: monitoring utility trench excavations_ unit size:
   No. of units: _____ (Submit plan of units with form*)
   Excavation: unit size: 1x1m no. of units: 2
   (Submit plan of units with form, Submission should be 82≡x 11", if feasible.)
   Investigator: Stu Reeve, PhD., HPI
   Manuscript or published report(s) (reference fully): *Phase 1B/2 Archaeological Reconnaissance Survey and Phase 3 Archaeological Mitigation/Monitoring. Installation of Storm Water Drains, Sanitary Sewers, and Water Mains along Swinnerton Street, Clermont Avenue, Massachusetts Street, Hylan Boulevard and Satterlee Street, Richmond County, New York.* HPI, April 2006.

Present repository of materials: No Collection

6. Site Inventory:
   a. Date constructed or occupation period: Undated – probably 19th Century (?)
   b. Previous owners, if known: 18th c – Christopher/Thomas/Christopher (2)Billopp
      1781-1835 Samuel Ward; 1835-? Mary Grim
   c. Modifications, if known (append additional sheets, if necessary):
      Series of built and replaced split-rail fences.

7. Site Documentation (append additional sheets, if necessary): none
   a. Historic map references: none
      1) Name:_____ date:_____ source:_____
      Present location of original, if known: _____

   b. Representation in existing photography: see report
      1) Photo date:_____ where located:_____

   c. Primary and secondary source documentation (reference fully): See attached text and bibliography.

   d. Persons with memory of site:
      1) Name: _____ date:
      2) Name: _____ date:
      3) Name:_____ date:

8. List of material remains other than those used in construction (be as specific as possible in identifying object and material):

   16 post molds, some bearing evidence of decaying red cedar fence posts

   If prehistoric materials are evident, check here and fill out **PREHISTORIC SITE FORM**. X

9. Map References: Map or maps showing exact location and extent of site must accompany this form and must be identified by source and date. Keep this submission to 82≅x 11", if feasible. See attached.

   USGS 72 Minute Series Quad. Name: Arthur Kill, NY-NJ

   FOR OFFICE USE ONLY B UTM coordinates:

   _____

10. Photography (optional for environmental impact survey): see attached
    Please submit a 5"x 7" black and white print(s) showing the current state of the site. Provide a label for the print(s) on a separate sheet.

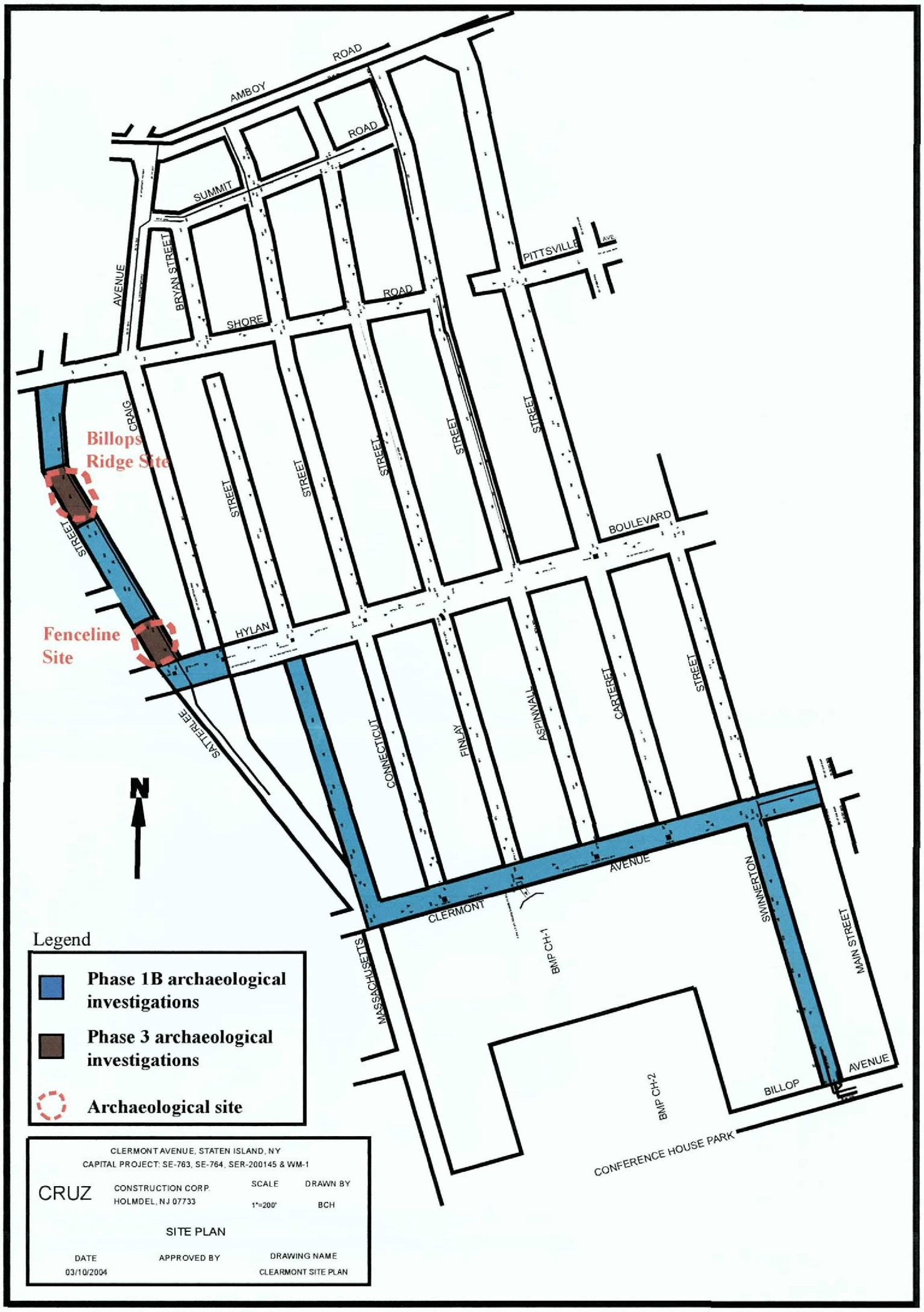



**Figure 1-2. Location of project site area and recorded archaeological sites.**

Figure 6-2. Satterlee Street Locus 1, Fenceline Site Shovel Tests and Features