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MANAGEMENT SUMMARY

Blue Sky Towers, LLC proposes to construct a new telecommunications facility (Site Name: Mashpee Fire Station #2, Site #: MA-5112) on the property of the Town of Mashpee, 101 Red Brook Road, Barnstable County, Mashpee, MA

In accordance with the *Federal Communications Commission Nationwide Programmatic Agreement for Review under the National Historic Preservation Act* (47 CFR 1, Appendix C), an assessment of archaeological potential within the Area of Potential Effects (APE) for direct effects was conducted in order to determine the need for further archaeological field investigation. The assessment of archaeological potential included documentary research, a walkover of the location of the proposed facility and recommendations for archaeological fieldwork in the form of a Phase IB archaeological survey, if necessary.

Environmental indicators (low-to-no slope, well-drained soils, and proximity to a water source), proximity to recorded pre-Contact sites and little-to-no ground disturbance suggests the potential for pre-Contact archaeological resources. While the proposed location of the Tower Site is relatively flat with well-drained soil it is not in proximity to a water source and the majority of pre-Contact sites in this area are located to the west clustered around Waquoit Bay and to the east along Ockway Bay and Popponosset Creek. A review of the historic development of the town as well as a review of historic maps and quadrangles suggests that the Tower Site witnessed little historic period activity and the population of the town through time has been minimal with the nearest historical period settlement to the southwest and west of Ockway Bay. Additionally an archaeological reconnaissance survey conducted for the town in 2011 (Herbster) determined that the location of the proposed Tower Site has a low sensitivity for both pre-Contact and historic period archaeological resources.

Therefore it has been determined that the proposed Tower Site has a low sensitivity for both pre-Contact and historic period archaeological resources. No further archaeological investigation is recommended.

1.0 INTRODUCTION

Blue Sky Towers, LLC proposes to construct a new telecommunications facility (Site Name: Mashpee Fire Station #2, Site No: MA-5112) on the property of the Town of Mashpee at 101 Red Brook Road, Barnstable County, Mashpee, MA (Figures 1 and 2). As defined in the *Federal Communications Commission Nationwide Programmatic Agreement for Review under the National Historic Preservation Act* (47 CFR 1, Appendix C), the Area of Potential Effects (APE) for direct effects is limited to the area of potential ground disturbance and any property, or portion thereof that will be physically altered or destroyed by the undertaking. The assessment of archaeological potential within the APE for (physical) effects determines the need for further archaeological field investigation.

The APE for direct effects, based upon proposed site plans include all areas of ground disturbance and vegetative clearing. Proposed plans include a 20 ft wide access and utility easement to the public right-of-way along an existing access and parking area, an overhead utility easement to the public right-of-way, a 15 ft long by 12 ft wide paved apron connection from the existing parking area to a 20 ft wide access and utility easement to the tower compound, and a 150 ft tall monopole tower within a 70 ft x 70 ft fenced compound within a 100 ft x 100 ft lease area (Figures 3 and 4).

The assessment of archaeological potential within the APE for direct effects for the proposed telecommunications tower site consisted of documentary research, a walkover of the location of the proposed facility and recommendations for an archaeological field investigation in the form of a Phase IB archaeological survey, if necessary.

2.0 RESULTS OF BACKGROUND RESEARCH

Background research included a review of the archaeological site files maintained by the Massachusetts Historical Commission (MHC) (the State Historic Preservation Office) to determine if there are any archaeological sites that are listed in the MHC Inventory or are National Register eligible within or immediately adjacent to the APE for direct effects.

Research also included examination of the historic files and previous archaeological survey reports at the MHC with additional documentary research conducted on the internet in order to assess the pre-Contact and historic archaeological potential of the proposed telecommunications tower site (hereafter Tower Site). Research of the geomorphology of the proposed location was conducted to determine if soils with the potential for containing cultural deposits are present.

2.1 Environmental Context

Mashpee lies within the Mashpee Outwash Plain, land surfaces are fairly level sloping to the south with elevations averaging 100 ft or less. Generally the best soils for cultivation are near and around large ponds. The town is wooded with pitch pine and some oak (Massachusetts Historical Commission 1984).

Drainage in Mashpee is generally from north to south through its numerous rivers, creeks, lakes, ponds and swamps. The town contains a number of ponds including John's, Ashumet and Santuit, the largest of which is the Mashpee/Wakeby Pond. There are two main harbors along its southern coastline, Popponesset Bay to the east and Waquoit Bay to the west (Massachusetts Historical Commission 1984). The Tower Site is located approximately 760 m westerly of Ockway Bay that projects southwesterly from Popponesset Bay, 1.2 km easterly of Red Brook, 457 m southerly from a cluster of wetlands, and 1.2 km northerly of Great River and Witch's Pond.

Soils within the APE for direct effects consist of Carver coarse sand, 0 to 3% slopes (252A) and Carver coarse sand, 3 to 8% slopes (252B). The Carver series are very deep, excessively drained sandy soils formed in glaciofluvial deposits of coarse and very coarse sands on outwash plains and moraines. They are found in mostly forested areas of scrub oak, pitch pine and eastern white pine (<http://websoilsurvey.nrcs.usda.gov>).

2.2 Known Archaeological Sites and Archaeological Survey Reports

Examination of the MHC archaeological site files determined that there are three pre-Contact period sites and one historic period site located within 1 km of the Tower Site. The three pre-Contact sites are find spots, one dating to the Early Archaic and one to the Late Archaic, that were located during archaeological surveys. The historic period site is associated with the site of a 19th-20th C school/chapel.

While there have been various archaeological surveys conducted in Mashpee, there was none in the MHC abstracts associated with the 2008 construction of Fire Station #2. In 2011 (Herbster) though, there was an archaeological reconnaissance survey conducted for the town that defined zones of high and moderate archaeological sensitivity for pre-Contact and historic period archaeological resources. The proposed

location of the Tower Site was not within either zone of archaeological sensitivity for both pre-Contact and historic period archaeological resources.

2.3 *Historic Context*

European land ownership in Mashpee began in 1661 when Richard Bourne purchased parcels from the natives on Waquoit Harbor and to the east and south of Mashpee Pond. Through Bourne's efforts Mashpee was established as a Native American Reservation or praying town in 1658 for what were then the South Seas Indians. In 1670 the Mashpee Church, which became the focal point of the community, was organized northeast of Santuit Pond. While hunting and fishing were the primary occupations of the native residents, there is little information regarding European tenants who lived in Mashpee at this time (Massachusetts Historical Commission 1984).

The population fluctuated between 200 and 300 or so during the eighteenth century with the Massachusetts Census of 1765 reporting 230 Indians, 31 Negroes and 77 whites. A dispersed settlement occurred with most native residents living on Great Neck between Popponesset Bay and Waquoit Bay. At this time the economy depended on hunting, fishing, whaling, cordwood, with some saltmaking. Small-scale industrial activity consisted of one gristmill on the Mashpee and one on the Santuit rivers. By the end of the century the number of EuroAmerican settlers doubled (Massachusetts Historical Commission 1984).

The nineteenth century saw little change in the town's population. A new settlement occurred south of Mashpee Pond that extended eastward towards the Santuit River and to the southwest of Ockway Bay. About 5,000 acres remained as common lands with most cleared land being located on necks, near harbors and on the banks of rivers and lakes. In 1842 common lands were partitioned among the adult proprietors with each being allotted 60 acres. By mid century cranberry bogs were developed and the short-lived Mashpee Manufacturing Company manufactured brooms. In 1870 Mashpee was incorporated as a town under the governance of the tribe. Between 1871 and 1878 all remaining common lands, with the exception of meadow and hay fields, were divided into 187 parcels and sold at auction resulting in large quantities of woodland, swamps, and ocean-front property being sold to outsiders who remained, absentee owners. This influx of outside interests led to a change in the town's economic base: new job opportunities (as guides, domestic workers, farm hands and cranberry pickers) led to a decline in traditional occupations (farming and fishing) (Deyo 1890; Simmons 1986; Massachusetts Historical Commission 1984).

During the early twentieth century Mashpee remained the smallest town in Barnstable County with the population reaching a low of 242 in 1920. The economy relied on the cultivation of cranberries and to a smaller extent on fishing herring and on growing fruits and vegetables. Land sales continued and by the 1930s over half of the original Mashpee land was owned by non-natives. As the number of summer residents grew, land development became a major factor in the town's economy (Thompson 1928, Massachusetts Historical Commission 1984).

The ***Tower Site*** is located in the southern section of Mashpee approximately midway between Popponesset Bay and Waquoit Bay. While there was no county road passing through the general area in 1794 (Anonymous), there was a grist mill located to the west along Red Brook to the north of Waquoit Bay (Figure 5, top). By 1831 (Hales) a road (presumably Red Brook Road) connected the mill site that was along Red Brook to the area south of Ockway Bay where there were two houses (Figure 5, bottom). At that time the proposed location of the Tower Site appears to be a wooded area. By the mid nineteenth century

there's a settlement cluster to the south of Ockway Bay along Red Brook Road/Wading Place (Figure 6, top). A 1877 (Cahoon) map of property boundaries and residences does not depict any residence in the parcel of the proposed location for the Tower Site (Figure 6, bottom). By 1880 (Anonymous) settlement has expanded to the southwest and west of Ockway Bay (Figure 7, top) and by 1949 only a few more residences appear along Red Brook Road to the east of the Tower Site, southwest of Ockway Bay (Figure 7, bottom).

3.0 WALKOVER RECONNAISSANCE

A walkover of the APE for direct effects for the Tower Site was conducted on October 19, 2017. The intent of the walkover was to conduct a non-invasive surface investigation to a) evaluate the topography and exposed soils; b) locate previously disturbed areas of the landscape; and c) identify areas of archaeological potential.

The Tower Site is located to the north of Red Brook Road. It is initially accessed from Red Brook Road over the existing paved drive/parking area of Mashpee Fire Station #2 that was constructed in 2008. After passing the fire station the existing paved drive/parking area turns to the east ending at a wooded area that forms the eastern boundary of the fire station section of the parcel (Plates 1 and 2). The land in the immediate area of the fire station has witnessed disturbance from construction-related activities and landscaping. A proposed 15 ft long and 12 ft wide paved apron will connect the existing parking area to a proposed 20 ft wide access and utility easement to the tower compound (Plates 3 and 4). The proposed location for the compound is forested with relatively young tree growth, has a thick leaf/pine needle overburden, and is fairly flat sloping slightly to the northeast and east by the parcel's northeastern and eastern boundaries (Plates 5-8). The proposed overhead utilities cross a section of the forested wooded area from a utility pole on Red Brook Road before following the eastern boundary of the fire station/wooded area northward (Plates 9 and 10). No historic features or artifacts and no areas of disturbance were noted within the wooded area.

4.0 CONCLUDING SUMMARY AND RECOMMENDATIONS

Environmental indicators (low-to-no slope, well-drained soils, and proximity to a water source), proximity to recorded pre-Contact sites and little-to-no ground disturbance suggests the potential for pre-Contact archaeological resources. While the proposed location of the Tower Site is relatively flat with well-drained soil it is not in proximity to a water source the closest being a cluster of wetlands approximately 475m to the north and Ockway Bay approximately 760m to the east. The majority of pre-Contact sites in this area are located to the west in Falmouth clustered around Waquoit Bay and to the east along Ockway Bay and Popponosset Creek. An archaeological reconnaissance survey conducted for the town in 2011 (Herbster) determined that the location of the proposed Tower Site has a low sensitivity for pre-Contact resources.

A review of the historic development of the town as well as a review of historic maps and quadrangles suggests that the Tower Site witnessed little historic period activity and the population of the town through time has been minimal. Historic period settlement occurred to the southwest and west of Ockway Bay. Again the 2011 (Herbster) archaeological reconnaissance survey conducted for the town determined that the location of the proposed Tower Site has a low sensitivity for historic period resources.

Therefore it has been determined that the proposed Tower Site has a low sensitivity for both pre-Contact and historic period archaeological resources. No further archaeological investigation is recommended.

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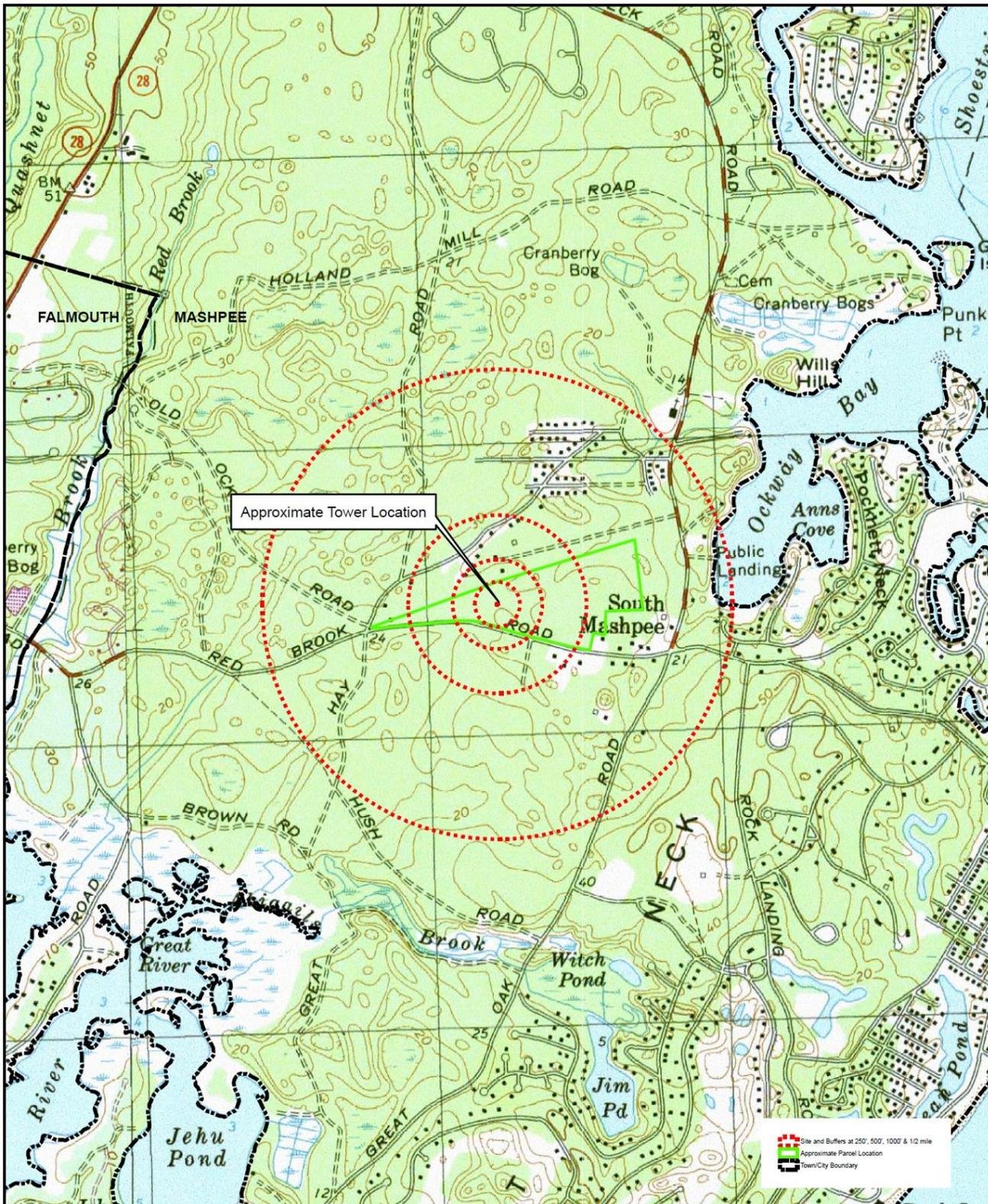
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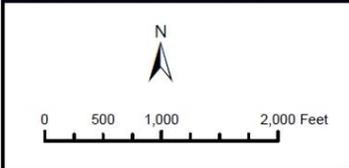
Websites:

<http://websoilsurvey.nrcs.usda.gov>

FIGURES



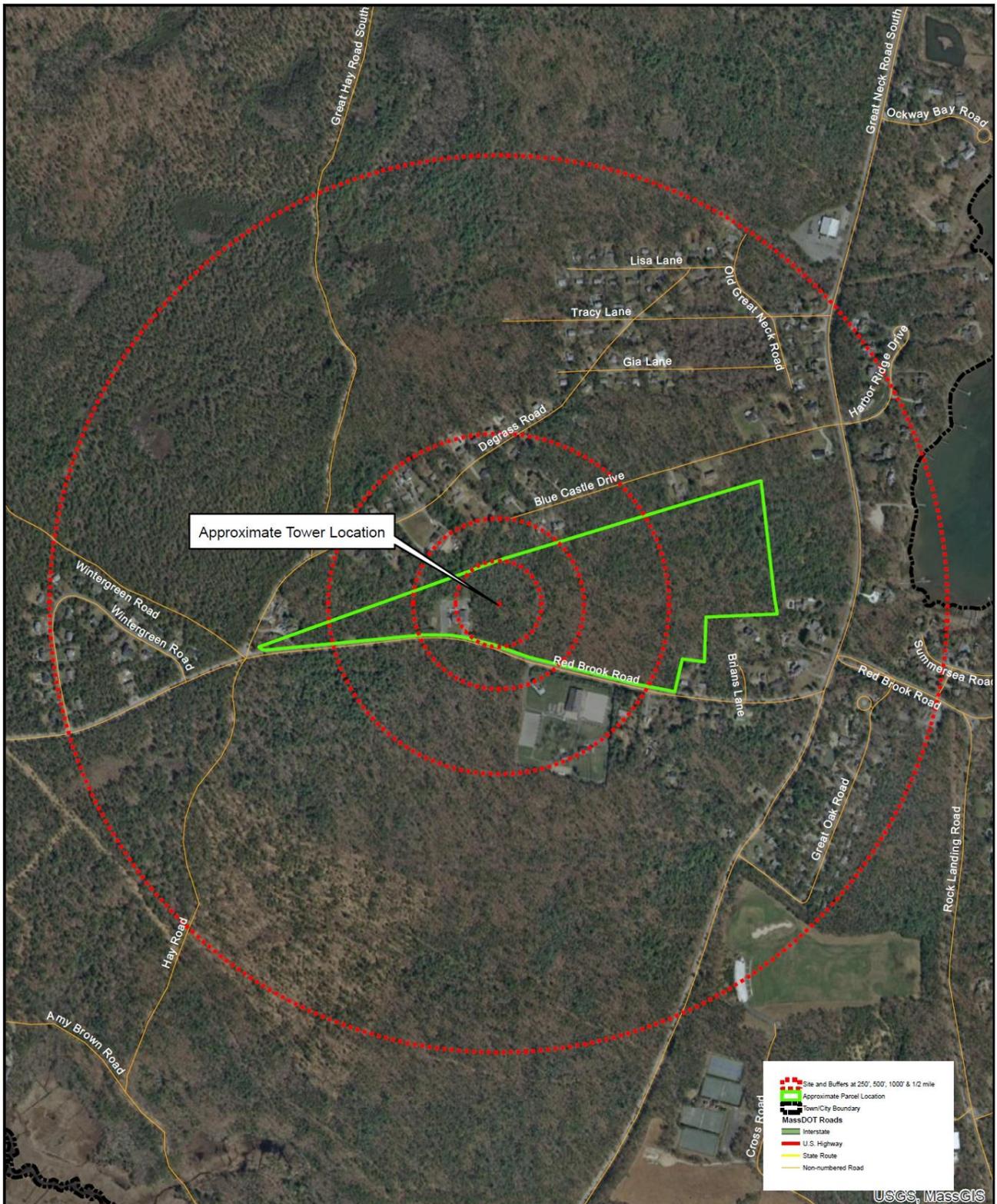
Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs; USGS Color Ortho Imagery - 30cm (2013/2014)



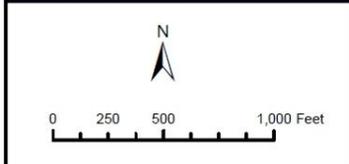
USGS Map
Telecommunications Facility
101 Red Brook Road
Mashpee, MA

FIGURE 1
 **LUCAS**
 ENVIRONMENTAL, LLC

Figure 1. U.S.G.S quadrangle.



Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs, USGS Color Ortho Imagery - 30cm (2013/2014)



Aerial Map
Telecommunications Facility
101 Red Brook Road
Mashpee, MA



Figure 2. Aerial View.

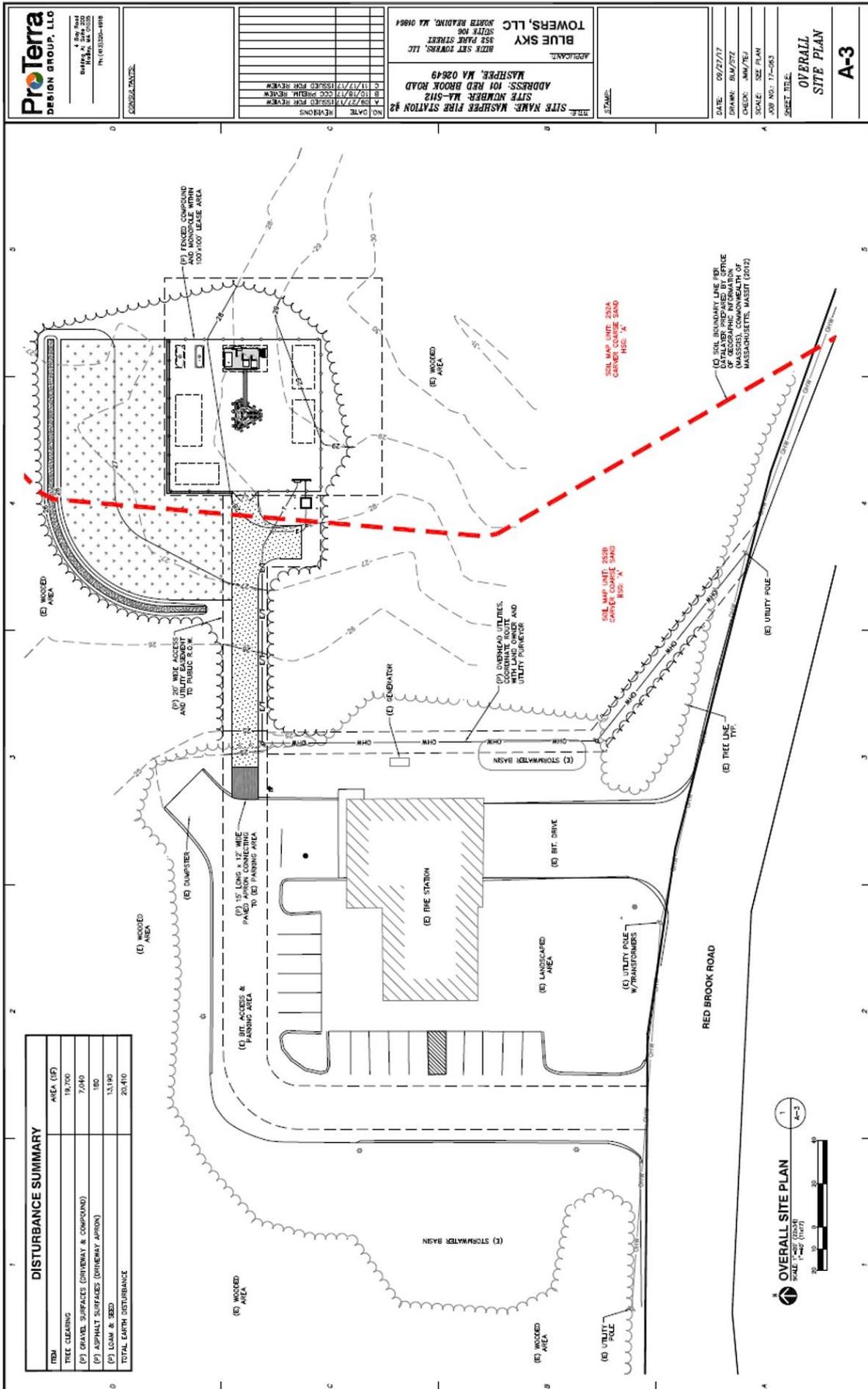


Figure 3. Overall Site Plan.

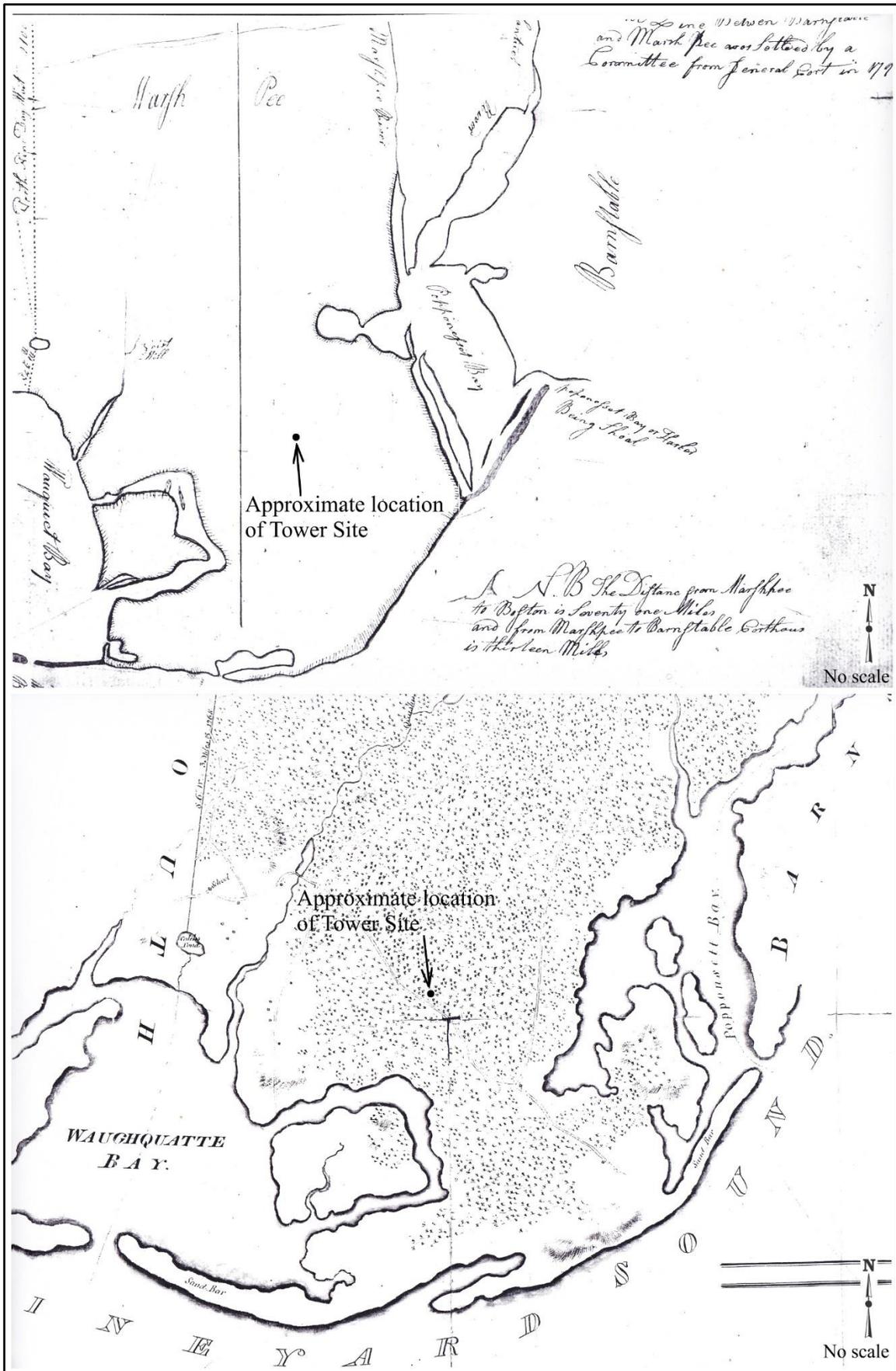


Figure 5. Detail of Mashpee in 1794 (Anonymous), top, and in 1831 (Hales), bottom.

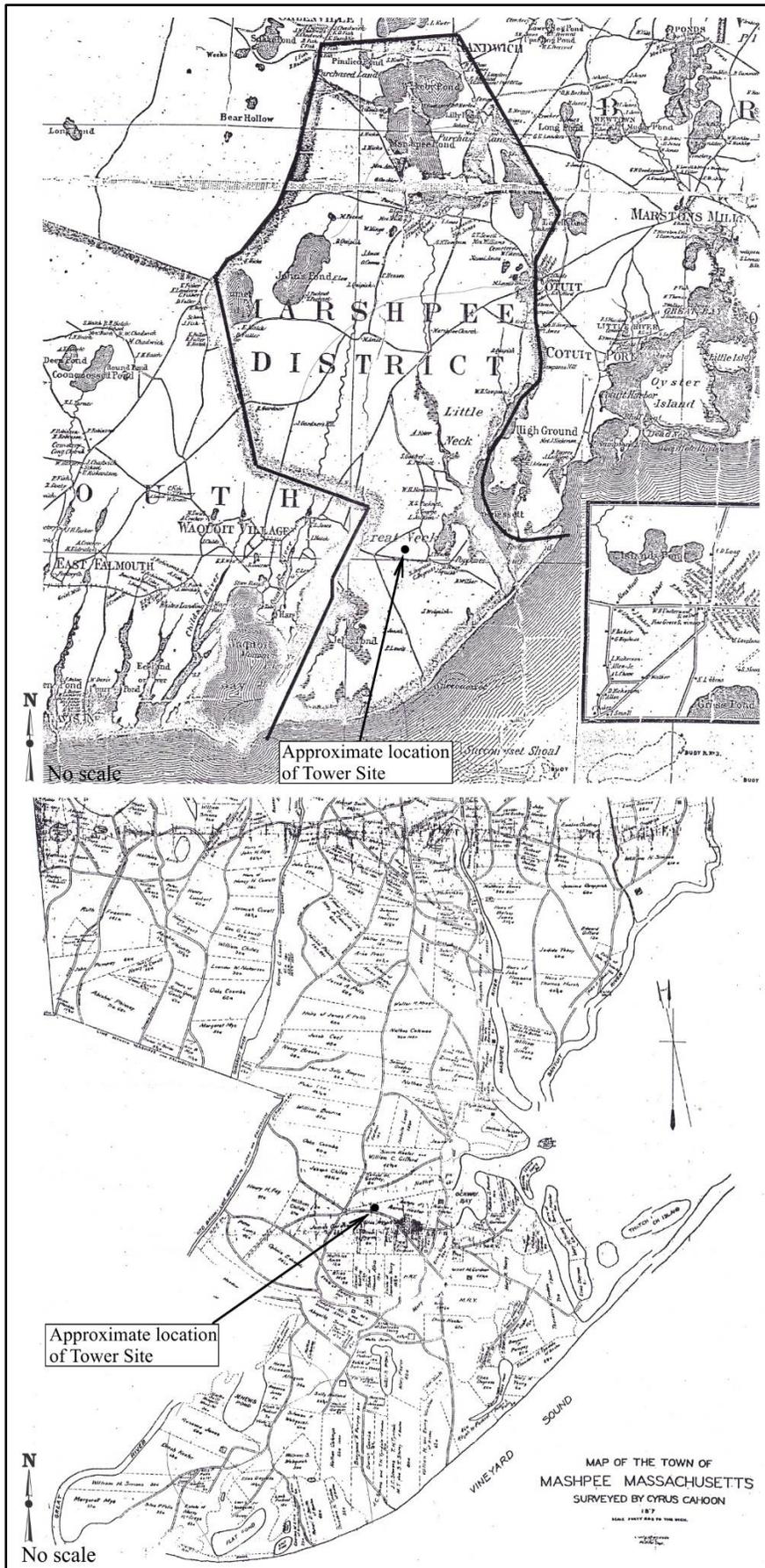


Figure 6. Detail of Mashpee in 1858 (Walling), top, and in 1870 (Cahoon) bottom.

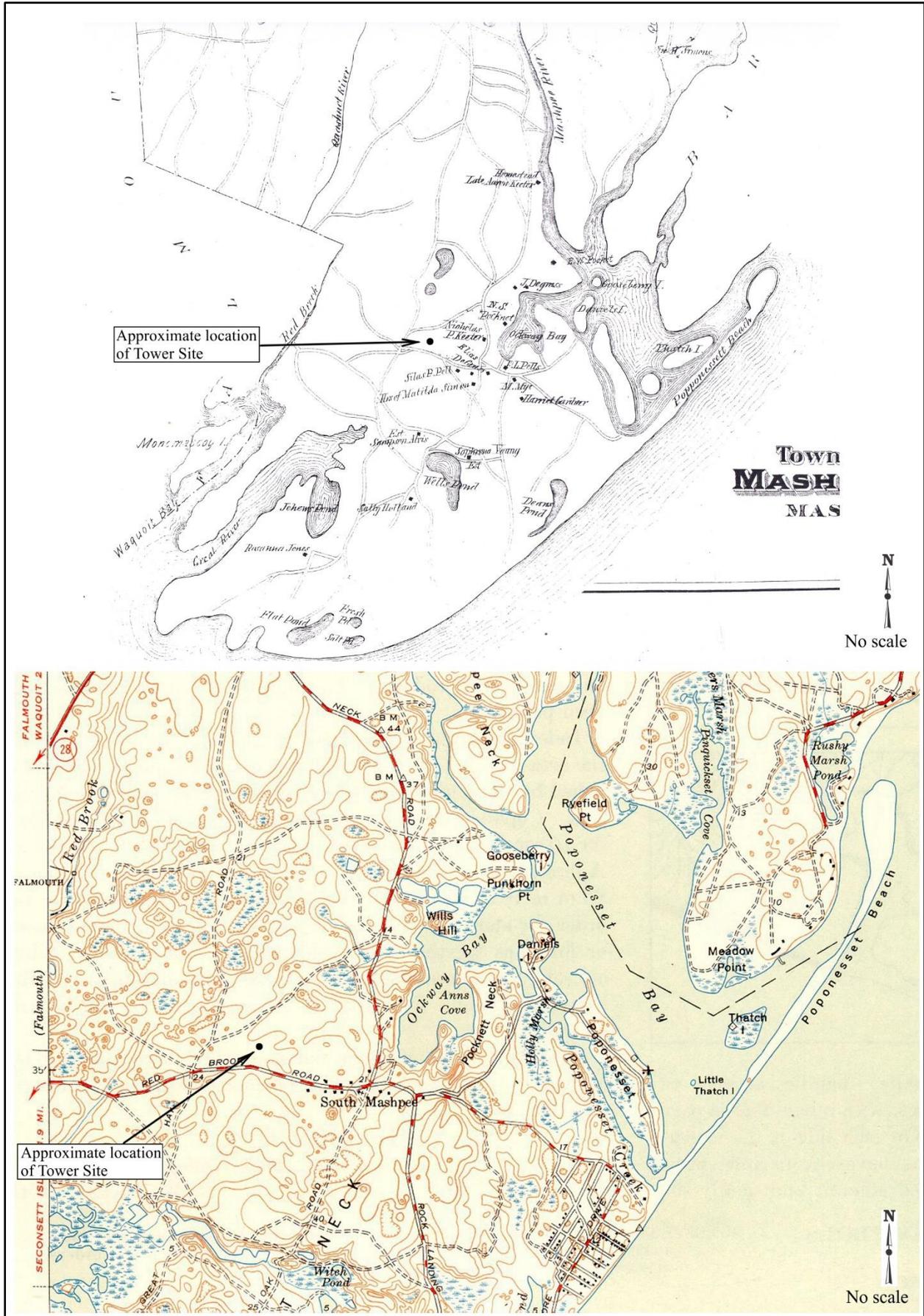


Figure 7. Detail of Mashpee in 1880 (Walker), top, and detail of Cotuit Quadrangle in 1949 (U.S.G.S.), bottom.

PLATES

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Plate 1. Looking northerly from Red Brook Road at existing paved driveway/parking area of Fire Station #2.



Plate 2. Looking easterly at existing paved driveway/parking area behind Fire Station #2.



Plate 3. Looking easterly by area of proposed paved apron.



Plate 4. Looking easterly along proposed 20 ft wide access and utility easement.



Plate 5. Looking north from proposed location of monopole.



Plate 6. Looking south from proposed location of monopole.



Plate 7. Looking east from proposed location of monopole.



Plate 8. Looking west from proposed location of monopole.



Plate 9. Looking southeasterly along proposed location of overhead utilities.



Plate 10. Looking northerly along proposed location of overhead utilities.

Phase I Intensive (Locational) Archaeological Survey
Blue Sky Towers Wireless Facility, 101 Red Brook Road
Mashpee, Massachusetts
Site #MA-5112

Prepared for

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North Reading, Massachusetts

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Archaeological Consulting Services

May 2018

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Abstract

An intensive (locational) archaeological survey was conducted for a proposed cell tower project at 101 Red Brook Road in Mashpee. The total project property is 36 acres, although proposed developments will be limited to a 40-meter long, four-meter wide access road and new 150-foot tall monopole with six-foot lightning rod and associated infrastructure. The short access road extends off an existing parking lot of the Mashpee Fire Station #2. The compound measures 30 meters square, and is set within an adjacent wooded area. Systematic testing was conducted in 7.5-meter intervals for 50cm-square shovel tests throughout the project area. There were 22 systematic tests conducted at 7.5-meter intervals, and no judgmentally placed tests. There were no artifacts or cultural feature contexts recorded during the survey.

Management Summary

ACS conducted an intensive (locational) archaeological survey at 101 Red Brook Road in Mashpee, Massachusetts. The total project property is 36 acres, where Blue Sky Towers II, LLC proposes to develop a 40-meter long, four-meter wide access road and new 150-foot tall monopole with six-foot lightning rod and associated infrastructure. The short access road extends off an existing parking lot of the Mashpee Fire Station #2. The compound measures 30 meters square, and is set within an adjacent wooded area. The project is subject to review by the Massachusetts Historical Commission based on the cell tower application, Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800), and M.G.L. Chapter 9, sections 26-27C (950 CMR 70 and 950 CMR 71). Systematic testing was conducted in 7.5-meter intervals for 50cm-square shovel tests throughout the project area. There were 22 systematic tests conducted at 7.5-meter intervals, and no judgmentally placed tests. There were no artifacts or cultural feature contexts recorded during the survey. ACS therefore recommends no further archaeological conservation efforts for the proposed project.

I. GENERAL INFORMATION

This report provides the results of a Phase I intensive (locational) archaeological survey of a planned wireless facility project by Blue Sky Towers II, LLC in Mashpee, Barnstable County, Massachusetts. The project area is at 101 Red Brook Road in the southern part of Mashpee (**Figures 1 and 2**). The proposed project area is on a 36-acre parcel (Map 104, Lot 2) owned by the Town of Mashpee, and is the site of Mashpee Fire Station #2. The project area consists of a 100-foot (ca. 30 meters) square compound area and 20-foot (ca. six meters) wide access and utility easement that utilizes the existing driveway and entrance of the fire station, but will be extended by approximately 40 meters along a 12-foot (ca. four meters) wide gravel path to the new compound area. The compound will have a 150-foot monopole with six-foot lightning rod and associated infrastructure that includes a six-foot chain link fence around the compound and a pad-mounted transformer to be located just outside the compound (**Figures 3 and 4**). The cell tower site number is MA-5112.

On behalf of Blue Sky Towers II, LLC, ACS received project maps from Lucas Environmental, LLC (LE), a land development and permitting firm based in Quincy, Massachusetts. Site plans were drafted by Pro Terra Design Group, LLC of Hadley, Massachusetts in 2017. A project notification (#162632) to the Federal Communications Commission's (FCC's) Tower Construction Notification System (TCNS) resulted in a response from the Mashpee Wampanoag Indian Tribe's Tribal Historic Preservation Office (THPO) that the proposed project has the potential to have adverse effects to historic or cultural resource important to the tribe. The tribe determined that the project area has a moderate sensitivity for pre-contact period Native American archaeological resources based on environmental parameters such as proximity to major wetlands bodies and well to excessively drained soils on relatively level uplands setting, and that South Mashpee generally is known through historic maps, oral history, and traditional cultural knowledge to have been a focus of Native American occupation and habitation for an extensive period of time. The determination that further archaeological evaluation was necessary was made despite a prior archaeological assessment survey of the property (Donohue 2017) that determined the project area to not be sensitive for potential archaeological resources, largely on the basis of distance to the nearest major water source. The opposing tribal determinations and recommendations were issued with a request for a tribally appointed entity to monitor archaeological fieldwork and construction. The tribal role in this process is in compliance with the National Historic Preservation Act (NHPA) of 1966 and subsequent amendments, particularly Section 106 of the act, and 36 CFR 800. ACS requested an archaeological survey permit from the Massachusetts Historical Commission (MHC) according to Massachusetts General Laws Chapter 9 Sections 26-27C (950 CMR 70-71).

Based on potential prehistoric sensitivity for archaeological resources as indicated by the Mashpee Wampanoag Indian Tribe, ACS conducted a saturated systematic subsurface testing strategy and pedestrian surface survey to identify any and all prehistoric and/or historic cultural resources located within the project area. The survey was performed in compliance with guidelines issued by MHC for conducting cultural resource management surveys in Massachusetts, under MHC permit #3820.

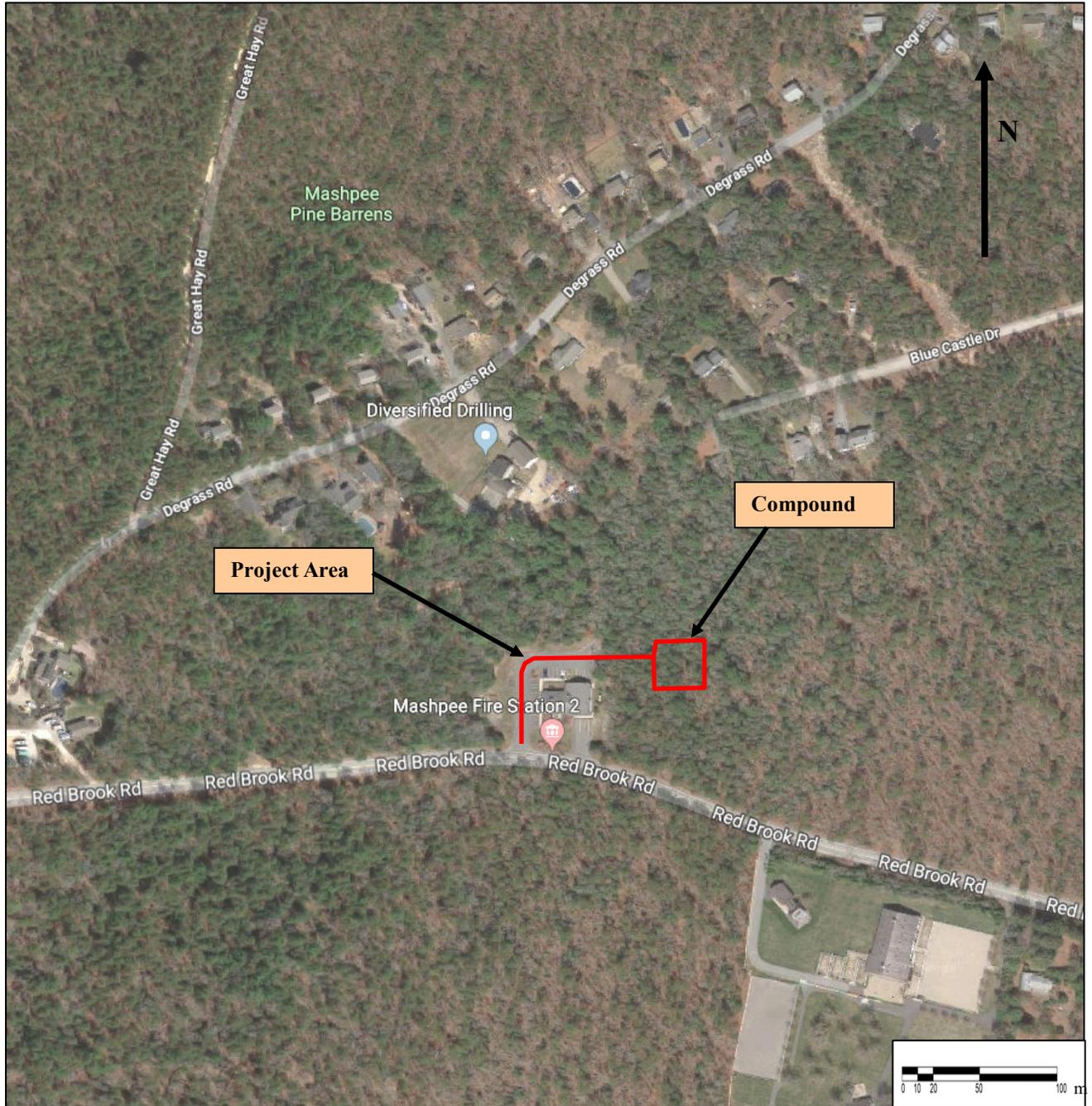


Figure 2: Aerial Map of the Project Area. 1:4,000 scale.

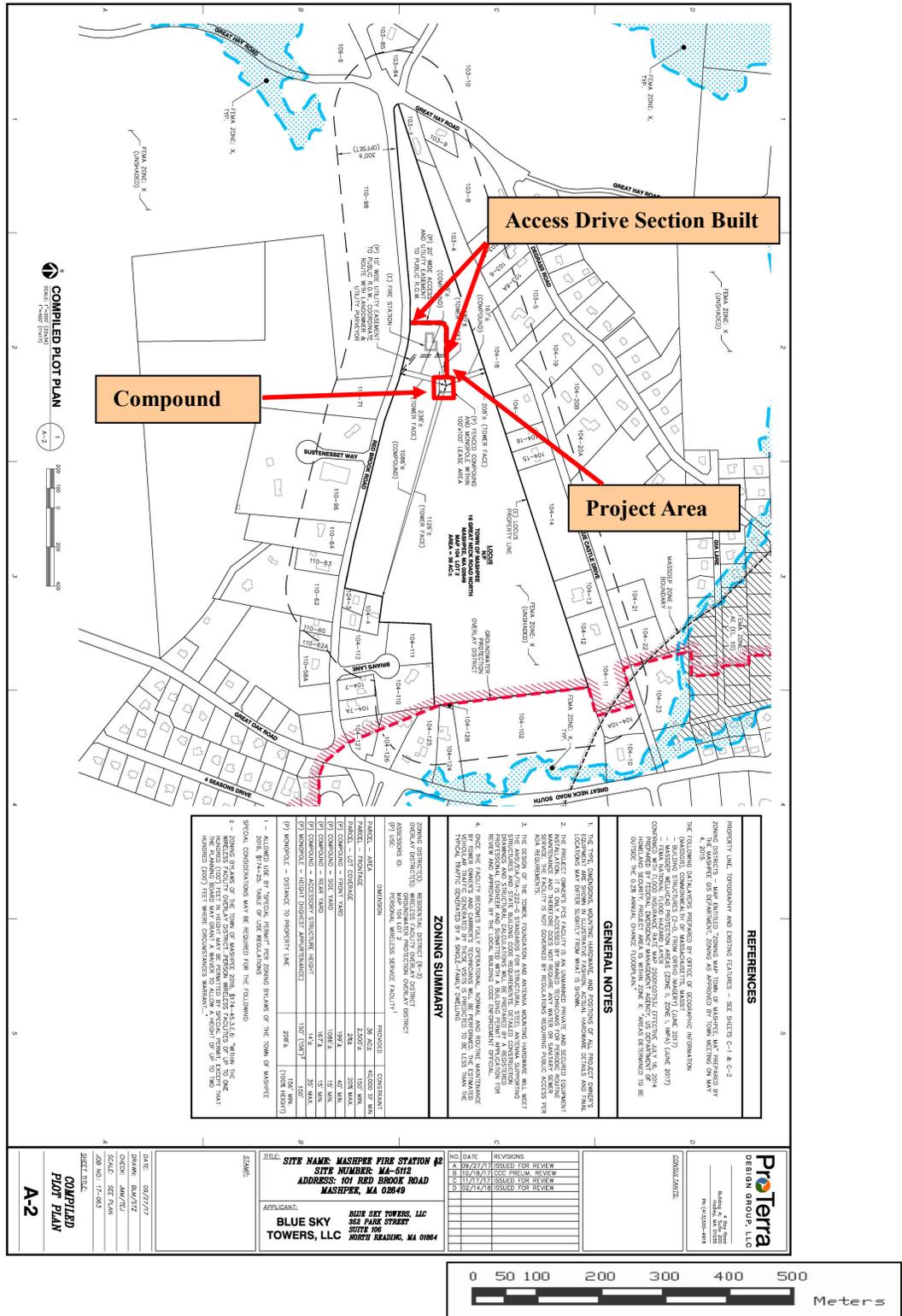


Figure 3: Compiled Plot Plan. 1:10,000 scale.

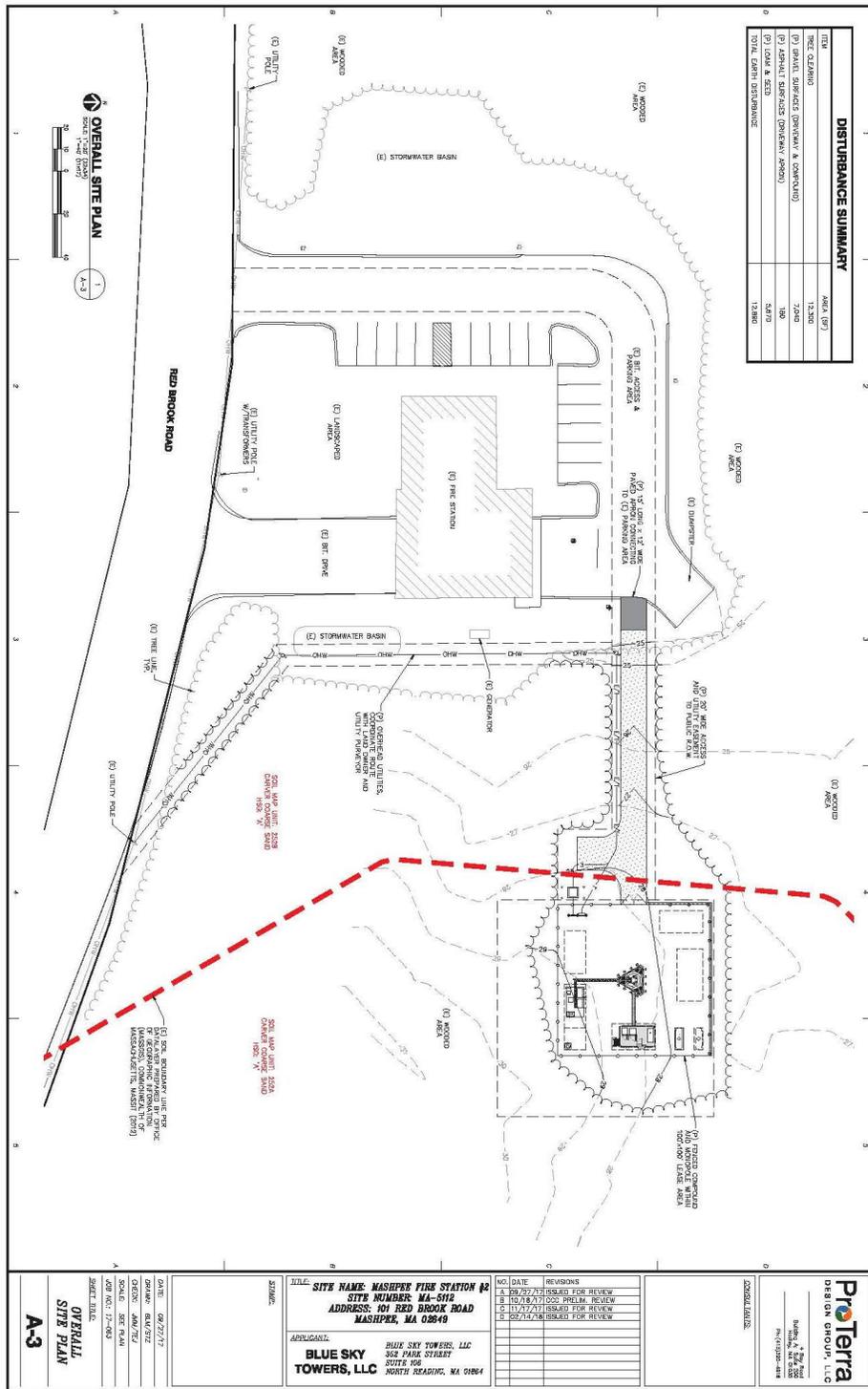


Figure 4: Overall Site Plan. 1:1,000 scale.

II. ENVIRONMENTAL CONTEXT

Mashpee is in southeast Massachusetts within the Cape Cod ecoregion. The site lies at 41 degrees, 35' 2.89" N Latitude, 70 degrees, 29' 3.08" W Longitude. The existing fire station includes two driveways, including the western drive that will be used for accessing the cell tower compound, associated parking, and other infrastructure. The entire Cape Cod ecoregion contains deep quaternary (post-Pleistocene) deposits, with no bedrock geological exposures. The entire project area is within units of Carver coarse sand (252A, 252B), with slopes ranging from zero to eight percent. Carver soils are deep and excessively drained, formed in glacio-fluvial settings representing the outwash plains and moraines left by retreating glaciers. Carver soil profiles typically include a black surface layer of coarse sand to 18 cm deep, followed by a dark gray layer of coarse sand to 25 cm, an upper subsoil of strong brown coarse sand to 38 cm, a middle subsoil layer of yellowish brown coarse sand to 71 cm, and a lower subsoil of brownish yellow coarse sand to 81 cm, overlying a substratum of light yellowish brown coarse sand to 170 cm or more. Cultivation of the soil is possible, but not ideal because of excessive drainage. Elevations of the project area vary from about 25 feet above mean sea level where the access drive is, to nearly 30 feet (ca. eight to nine meters) above mean sea level at the compound area. Major drainages in the Mashpee area flow from north to south, including Red Brook which is located just over one kilometer to the west of the project area. Large ponds also dominate the landscape, including John's and Mashpee within several kilometers to the northwest and north of the project area. Major bays of the Atlantic Ocean include Ockway located just under one kilometer to the east. The closest minor wetlands near the project area are located a few hundred meters to the west near Great Neck Road. The bulk of the parcel remains wooded, with pitch pine, white pine, and scrub oak being dominant trees in the town (MHC 1984).

III. PREHISTORIC CONTEXT

A. Prehistoric Background of the Region

New England's prehistory is poorly understood relative to that of other regions in North America. For most of the prehistory in the region, river drainages defined physiographic units within which human communities operated. This pattern follows from the longitudinal diversity of habitats that occur along drainages, forming ecologically unique wetland habitats, together with the transportation routes afforded by their watercourses. In the clearest examples, rivers provide access to maritime and upland resources at each end of the drainage, and to the diverse habitats in between. The exploitation of those habitats can be integrated into a seasonal round that differs at various historical moments.

The prehistory of southern New England is divided into seven periods, each identified by characteristic projectile points, pottery and other artifacts. These periods are the Paleo-Indian (13,000-10,000 BP), Early Archaic (10,000-8,000 BP), Middle Archaic (8,000-6,000 BP), Late Archaic (6,000-3,000 BP), Early Woodland (3,000-2,000 BP), Middle Woodland (2,000-1,000 BP) and Late Woodland (1,000-350 BP). These cultural periods also are distinguishable on the basis of changing patterns of site location, activities, and size.

Paleo-Indian (13,000-10,000 Years Ago)

Although there is new research continually being conducted, the present theory is that the people who first settled in New England arrived in the New World during the end of the Wisconsin ice age, approximately 13,000 years ago (Stone and Borns 1986; Braun and Braun 1994:14-15). Before this time, New England, and much of the northern half of the United States, was covered by a mile and a half thick sheets of ice as glaciers. Ice ages are part of the Earth's natural warming and cooling cycle. Approximately 60,000 years ago, the temperature dropped on Earth just a few degrees, just enough to cause the glaciers and ice caps located at the north and south poles to begin growing by removing water from the oceans. By approximately 20,000 years ago, the edge of the northern ice sheet had reached its maximum extent, at present-day Martha's Vineyard and Nantucket, and then began to recede. As the glaciers melted, they dropped millions of tons of sand, gravel, and boulders that had accumulated during their journey southward. All this material - the moraine and outwash soils, became the sandy hills, the drumlins, eskers and kames, and basically all the lower layers of soil that make up our landscape today. Mixed in with the moraine and outwash were glacial erratics - these are the large boulders, like Plymouth Rock, that dot our landscape today.

Following the retreat of the glaciers, the climate in southern New England was southern tundra. It was cold, windy, and barren, and the land was covered with large areas of wetlands. Scattered intermittently across the landscape were patches of grasses, shrubs such as sedge, alder and willow, and small stunted trees including spruce followed by birch and pine. There was also a lot more landscape than there is today, because the oceans were approximately 300 to 400 feet lower. In New England, this meant that the coastline was up to 50 miles to the east of its present position. This left exposed large portions of land, like George's Banks, that are today underwater. The islands that we see today in many coastal harbors were at this time hills on a barren landscape, and many of the rivers that we know today were nothing more than springs or small streams (Braun and Braun 1994:3).

The types of animals that were present at this time included some of the smaller species such as foxes and rabbits, but megafauna were also present. Megafauna is a term that describes the large breeds of animals that were present in New England after the last ice age. These include the mammoth, which existed on the tundra, the mastodon, which lived in the early forests, the horse, which later became extinct and was reintroduced by the Spanish in the 1500s, bears like the large Kodiak variety, giant beavers, bison, elk, caribou, and musk ox, which disappeared fairly early.

By the end of the Paleo-Indian Period, the environment in New England was stabilizing, and lifeways were becoming fairly distinct. The megafauna were extinct by 10,000 years ago, probably due to a combination of hunting by the first settlers and climactic change. The forests were beginning to change to more pine and nut-bearing hardwoods that created new habitats for animals and new food sources for people. The tundra gave way to spruce parkland by 9,000 BP and eventually became oak and hemlock by 7,000 BP. While the Paleo-Indian Period can be seen as a time of initial colonization, the next period, the Early Archaic, can be viewed as a time of settling in and accommodation to life in New England.

The Paleo-Indian and Early Archaic periods are sparsely represented on Cape Cod, often being represented by surface finds from interior riverine locations on the Mid-Cape (MHC 1987).

Evidence for the former, in the form of single projectile point finds, include the Hathaway Pond I site (19-BN-623), the Bells Neck Road I Site in West Harwich, and the Bass River Site (19-BN-41) in Yarmouth (Davin and Gallagher 1989; Mahlstedt 1985). It appears that Paleo-Indian populations preferred ponds and inland river sites. One possible Late Paleo-Indian Dalton projectile point was recovered from just south of the project area during Davin's 1990 survey at Bufflehead Bay (Davin 1990).

Early Archaic (10,000-8,000 Years Ago)

The extinction of the megafauna and the changing climate led to a revamping of the Native American way of life around 10,000 years ago. The environment in the Early Archaic had warmed slightly, and as a result, trees such as oaks, pitch pines, beeches, and hazel began to flourish. It was during this time that the major rivers which are around today began to form, and anadromous fish species like salmon and herring began to run up the rivers. This would have provided another food source for the inhabitants of New England. As New England began to become more forested, new mammalian species also would have moved into the area. These species would have included black bear, deer, and moose.

The Early Archaic is one of the little understood and most elusive periods of New England prehistory. Early Archaic sites tend to occur on a wide range of settings including hill sides with slopes over 15 degrees, as well as hilltops. Some sites are situated on the same locations as Paleo-Indian sites, while others appear isolated. Homes at this time have been theorized as being either longhouse-shaped, as have been identified in Taunton, Massachusetts at the Titicut site, or as small pits dug into the sides of hills as have been identified in Connecticut and northern Massachusetts (Braun and Braun 1994: 35; Dudek 2005: 12). It is unknown if the two forms of houses occurred simultaneously, were seasonally determined, or represent different building traditions by different populations.

Evidence of the Early Archaic peoples' process of "settling in" is evidenced in their use of local volcanic materials such as rhyolite and felsite for tools and projectile points, and their possible use of quartz for quick, expendable tools (Dincauze 1980, Meltzer 1988). Hunting during this period may have taken the form of spear-throwing with the use of the atlatl, a weighted stick that was held in the hand and onto which a long spear was placed and launched. The atlatl was basically an extension of the thrower's arm, and it effectively increased the distance, force, and accuracy of the throw.

Early Archaic diagnostic points include Bifurcate-Base points, Kirk Stemmed, and Kirk Corner-Notched points. The materials for these types of points generally do not include the exotic lithics characteristic of the Paleo-Indian period, but tend to be local rhyolites and quartz. There has also been a noted occurrence of quartz technology in the form of bifaces and unifaces without any of the usual temporally diagnostic points being present (Forrest 2000).

A number of Early Archaic sites identified in Massachusetts contained evidence that suggests small hunting groups returned to camps with seasonal regularity. These sites contained stone tools diagnostic of the Early Archaic Period, radiocarbon age determinations, or both. Sites from the Early Archaic period are perhaps best known in southeastern Massachusetts, especially in the Taunton River drainage (Dincauze and Mulholland 1977; Thorbahn 1982; Taylor 1976). Evidence for the Early Archaic has been recorded at Marshfield, Taunton, and Carver,

Massachusetts, with an especially large concentration of sites in Taunton on the Taunton River. The types of artifacts recovered from the Early Archaic period at these sites include Dalton-like points and Eden lanceolate points (Johnson and Mahlstedt 1984). The Titicut site is the largest identified from the Early Archaic period. It has been interpreted as a base camp for several families. Another site of the region had deep pit features, interpreted as pit houses, with an abundance of charred hazelnut shells (Forrest 2000).

The Early Archaic Period is more sparsely represented in the Cape region, with isolated point finds from the Herring River in the Mid-Cape area and Indian Rock on the Outer Cape (Mahlstedt 1985; Towle 1984). Dunford also recorded possible Early Archaic components from sites on the Bass River in Dennis and Stoney Brook Valley in Brewster (Dunford 1987).

Middle Archaic (8,000-6,000 Years Ago)

While the Early Archaic was a time of transition from the Paleo-Indian way of life to a more localized and permanent situation, the Middle Archaic can be seen as a time of more normality and permanence. It still was a time of many changes, though. Oceans remained lower than they are today, but the rate of rise had slowed enough for estuaries to begin forming, which led to the establishment and proliferation of shellfish beds. Shellfish first settled in the warmer southern waters, and eventually moved northward as the sea level rise slowed and waters warmed.

By 7,000 years ago, forests with the same basic composition as today began to be established (Dincauze 1976:119). Evidence of site differentiation and a more complexly ordered social landscape can be extrapolated on the basis of a number of large Middle Archaic sites containing a variety of features. The use of heavy stone tools such as axes, adzes, and gouges increased during this period, possibly indicating the construction of log canoes or at least an increase in woodworking. Evidence for hunting using atlatls first appears at this time as well. In fact, the oldest burial in New England, 7,570 +/- 150 to 7,660 +/- 110 years ago, was located in Carver, Massachusetts, and contained two atlatl weights of the whale-tail variety (Doucette 2005: 24).

Sites from this period are fairly common, indicating that people had begun to spread out over larger areas. They have been found on the margins of bogs, swamps, rivers, lakes, and ponds, and on the present day coasts, with sites of differing size possibly based on site function reflecting seasonal rounds or scheduled subsistence activities, as was the case at the time of European contact (Dincauze and Mulholland 1977). Substantial base camps along rivers, streams, or wetlands; smaller special-purpose camps in uplands or near wetlands; and rock shelters, stone quarries, and workshop areas have all been identified in southeastern Massachusetts (Bussey et al. 1992). The wide variety of sites and the common occurrence of projectile points from this period probably indicate that there were more people living in Massachusetts than ever before. Artifacts recovered from sites of this period include stemmed projectile points of the Neville, Neville-like, and Stark varieties; atlatl (spear-thrower) weights; pecked, ground, and polished woodworking tools such as axes, adzes and celts; and plant processing tools such as mortars, pestles, grinding stones, and nutting stones.

The Middle Archaic Period is well-represented in the Mid-Cape, with a high percentage of the recovered points coming from the Bass and Herring rivers on the Mid-Cape in a variety of environmental settings. A total of 56 Middle Archaic style points were recovered from the Bells

Neck Road I (West Harwich), Swan River (Dennis), and Blue Rock (Yarmouth) sites (Mahlstedt 1985). Isolated Middle Archaic finds have been made at the Hathaway I and II sites in Barnstable, the Fox 4 and 5 sites in Mashpee, and the Round Swan Site in Bourne (Davin 1989; Shaw and Sauvalis 1988; Davin and Gallagher 1987). Little evidence for the Middle Archaic period has been found on the Outer Cape.

Late Archaic (6,000-3,000 Years Ago)

The Late Archaic represents the period with the most identified and recorded archaeological sites in Massachusetts. This has been interpreted by many as indicating a very large number of people living in the area during this period, although archaeologists are not sure why this happened. The case may also be made that this proliferation of stone tools and sites may be more related to a wider variety of stone tools being manufactured for specific purposes and a wider variety of habitats being exploited as opposed to a population boom. The Late Archaic is also a time of greater diversification and specialization than was evident in the earlier periods. The tool kits of the people living on the south coast and its coastal forests differed from that of the people in Maine and further north. This in turn was similar but distinct from the inhabitants of the strictly boreal forests such as those in New York and inland Massachusetts.

Along coastal Massachusetts, the combination of stabilizing sea levels and estuary formation led to significant runs of anadromous fish by the Late Archaic. As a way of taking maximum advantage of these fish runs, Native people began using weirs in the rivers, streams, and bays. Weirs were undoubtedly employed in most of the bays, rivers, and larger streams in southeastern Massachusetts (Johnson 1942, Johnson 1949). Late Archaic populations appear to have settled into narrow foraging territories defined by drainages, and were highly specialized to the habitats within these drainages where activities focused around the seasonal cycle. Sites are found in the same locations as those of the Middle Archaic, with some greater focus on inland/ upland locales. The variety of site sizes suggests use of a radiating, seasonally dynamic settlement pattern (Dincauze 1974, 1975, 1980; Thorbahn and Cox 1984).

The pattern of a riverine-uplands subsistence settlement system apparently emerged during the Middle Holocene, between 6,000 and 5,000 BP, when the climax oak-hickory forest had matured and population levels increased, leading to regional Late Archaic strategies of extensive and intensive resource exploitation (Dincauze 1974). In southeastern Massachusetts, the number and diversity of Late Archaic sites, and their distribution in riverine and inter-riverine, upland settings suggest a broad-base collecting approach to resource-use, and considerable attention to small scale environmental features, including bogs and kettle-hole swamps (Binford 1980).

Another significant development in the Late Archaic was the use of bowls carved out of soapstone (steatite). The actual carving of the bowls was probably not a significant development in itself, but what these bowls represented is significant. The raw material for the bowls, soapstone, is found only in certain deposits in Rhode Island, Massachusetts, and Connecticut. As a result, the recovery of soapstone fragments on the coast indicates either that these items were being traded in an exchange system, or that people were traveling fairly significant distances to quarry this stone. From the coast, the quarries could have been reached in approximately two to three days. The stone would then have to be quarried, worked into shape, and then carried back to the homesite. These bowls are not small affairs by any means, some weighing up to 60

pounds. It is believed that the effort expended to acquire these bowls as well as their weightiness must mean that they were fairly important to the people. Before these bowls were used, food was probably either roasted or boiled in skin lined pits in the ground through the use of hot stones. The soapstone bowls allowed for cooking directly on the fire, a change in cooking technology that eventually led to the use of pottery in southern New England. These appear to have been used only in the Late Archaic, and do not appear in more recent periods. Artifacts from this period include a wide variety of projectile points that some archaeologists believe relate to the movements of southern or western people's into New England. Projectile points and tool traditions represented in Massachusetts include Laurentian (Brewerton), Narrow Point (Small-Stemmed), and Broadpoint (Susquehanna or Wayland Notched) (Johnson and Mahlstedt 1984).

Sites dating from the Late Archaic period are common in the Mid-Cape, being the most common type encountered and occurring in a wide variety of environmental settings (Mahlstedt 1985). Late Archaic points associated with the Small Stemmed Tradition were recovered from the Parcel 1 (19-BN-671) and Parcel 9B (19-BN-668) sites, and from the Hathaway Pond I and II sites (19-BN-623 and 624) (Doucette et al. 1990; and Davin 1989). Other sites dating to this period were found by Herbster during her survey of Camp Edwards, including quartz chipping debris, Small Stemmed, and Brewerton points (Herbster 2005). Sites yielding points associated with the Susquehanna Tradition are common on riverine sites such as the Bass River and Blue Rock sites in Yarmouth, but are poorly represented on the Herring River (Mahlstedt 1985; Mahlstedt 1987). One Susquehanna Tradition site that yielded a rhyolite Atlantic point is the Upper Gate Pond Site (19-BN-827) (Binzen and Chapman 2002).

Early Woodland (3,000-2,000 B.P.)

The main distinction between the Archaic and Woodland Periods is the use of pottery. As far as we know right now, pottery was not made in New England during the Archaic period, and soapstone was not used as widespread as it was during the Archaic. When and where and even why pottery was first manufactured in southeastern Massachusetts is a mystery to archaeologists. Pottery is more fragile, but lighter than soapstone, and the raw material is readily available and easily acquired, but not as valuable as soapstone. The switch from soapstone to pottery was neither immediate nor widespread, but eventually it did occur everywhere in southeastern Massachusetts. It may have been a product of increasing sedentism and larger community size. In this case, because people were not moving around as much, there was less of an occasion for the pottery to be broken during transport, and more people began to make it. The earliest pottery in southeastern Massachusetts dates from approximately 3,000 BP (Braun and Braun 1994:65). This pottery, identified as Vinette 1, has thick walls tempered with a great deal of crushed rock temper and little decoration. These pots are believed to have been suitable for simmering but not boiling. The use of pottery may be related to an increased utilization of nuts and the removal of oils thorough boiling. Pottery may have also been used to render fat to grease in much the same way.

This period is marked by basic technological and economic changes such as the production and use of pottery and a gradual shift to food production (maize, beans, squash, sunflower, and other vegetables). The latter trend is documented by ca. 1,100 BP on Martha's Vineyard (Ritchie 1969), but perhaps began by ca. 2,000 BP (Thorbahn 1982). Other identified changes from the Late

Archaic include the formation of stable estuaries with tidal flats (Cross 1996:5-6) and an apparent increase in the amount of exotic raw materials used such as jasper, chert, and copper. This increase in exotic goods may reflect an increase in trade and communication. Sites dating to this period have been found around large wetlands and lakes, along large river valleys, and on the coasts at the mouth of rivers and streams.

This period is marked by a decrease in the number of exotic finished goods indicative of long-distance trade, and by changes in mortuary practice (increase in secondary interments, less use of ocher, fewer grave goods, more variation in preparation of the dead). While the roots of ceramic and lithic variability are found in the preceding periods, more rapid variation in sequence through time and more regional variation characterize this period. Ceramics vary more in decoration and form. Lithic projectile points are less important in the tool kit, and bone and antler tools are preserved at some sites where matrix conditions are appropriate (Shaw 1996a:84-87). By the end of the period, there is evidence of maize horticulture (Thorbahn 1982).

Artifacts attributable to the Early Woodland include side-notched bifaces, lobate-stemmed Adena, Small Stemmed, Orient Fishtail, Meadowood and Rossville projectile points, as well as cache blades. Smoking pipes, possibly used for the ritual smoking of tobacco, but also for the smoking of other plants such as pokeweed or mint, began to be present in the archaeological record.

The Early Woodland Period is poorly represented in the Mid-Cape area. A slight concentration of Early Woodland sites are located in the Herring River area; at least seven Early Woodland sites have been identified in Harwich; and isolated points have been recovered from the Round Swamp and Fox 3 Site in Mashpee (Mahlstedt 1985; Davin and Gallagher 1987; Shaw and Sauvalis 1988). Herring River appeared to have one of the highest concentrations of Early Woodland sites in the region (Mahlstedt 1987: 72).

Middle Woodland (2,000-1,000 B.P.)

Settlement and subsistence are similar to those of the Early Woodland period, with the main difference being lengthened stays at large sites along waterways, but with a continuation of the use of upland areas for short-term resource procurement. Long-distance communication and exchange appear to shut down by the end of the period.

During this period, there is a marked decrease in the number of exotic finished goods, and changes in mortuary practice to an increase in secondary interments and less use of ocher. Ceramics vary more in decoration and form, with more occurrences of smoothed surfaces and the beginning of the use of shell temper. The decrease in the variety of projectile points may be evidence that these were now less important in the tool kit, although this issue is still being studied. Typical projectile points include Fox Creek and Steubenville points, and in the later Middle Woodland, Jack's Reef points. While the amount of exotic finished goods decreased, the amount of exotic raw lithic materials increased, with Jack's Reef points often being made of non-local chert (Shaw 1996b: 92-93). Some projectile point types from the Early Woodland, such as Rossville and Small Stemmed, continue into the Middle Woodland (Shaw 1996b:90; Hasenstab et al. 1990).

Middle Woodland Period sites are relatively numerous with several sites on the Herring and Bass rivers, especially at the Blue Rock Site in Yarmouth (Mahlstedt 1985). Other sites with Middle Woodland components are the Fox 5 Site in Mashpee, the Round Swamp and Orchard Road sites in Bourne, and the Hathaway Pond II site to the east of the project area in Barnstable (Shaw and Sauvalis 1988; Davin and Gallagher 1987; Davin 1989). The Santuit River I site also yielded a Fox Creek-like point (Ingham et al 2001).

Late Woodland (1,000-350 B.P.)

This is the period just prior to European contact, and as a result, many of the historical reports written by the early explorers of New England (e.g. Verrazanno, Gosnold, Pring, Smith) present one way of understanding the late Late Woodland period. Some of their observations may be able to be extrapolated back into the prehistoric past through the use of ethnographic analogy. These analogies can be created with more confidence as pertaining to the culture of the Late Woodland period than any earlier one.

Ethnohistorically, it was recorded that the Native people lived within a community territory that for the most part supplied their own needs. Being on the coast or within a coastal environment, the Native people of Cape Cod and southeastern Massachusetts participated in a seasonal migration that was probably very similar to that which they had done for centuries.

The seventeenth century Wampanoag were practicing what is well known to anthropologists as a mobile economy. These people were seasonally migrational, so they moved from place to place throughout the year to coordinate the resources of their territory. The resources they were using were ill-distributed, and as a result, they had developed a specialized economy that maintained higher population numbers than could be done if those resources were gathered in isolation by specialized groups (Higgs and Vita-Finzi 1982:28). Their system was not as unique among peoples as some researchers believe (Dunford 1992: 23). In Frederick Dunford's view, the Cape Cod and southeastern Massachusetts Natives practiced a unique human adaptation to the environment that he termed "conditional sedentism" (Bragdon 1996:58). This adaptation had the estuary as its primary focus, with its human community "joining and splitting like quicksilver in a fluid pattern within its bounds." (Bragdon 1996:59).

The Cape Cod Wampanoag exploited a diffuse range of plants and animals, and coordinated their gathering so that as each species came into season, it was intensively harvested and stored for the winter. In order to do this, the people would split up during the spring, summer, and early fall, and each family would venture out to their planting fields, which became their seasonal bases. They would then move out from these to exploit various resources. In the fall, they would all join up again, and move as a community to a sheltered valley or into the woods and establish a winter seasonal base from which to venture out and exploit winter resources. At spring, the entire process would begin again. (Nanapashamet 1996).

The ceramics of the Late Woodland period are often shell-tempered or made with fine grit temper and have thinner bodies and a more globular form than the earlier ceramics. The diagnostic projectile point of the Late Woodland period is the triangular Levanna point and occasionally the elongated Madison form. This period is marked by an increasing importance in

horticulture (maize, beans, squash, sunflower, and other vegetables) in coastal or riverine zones, which begins by ca. 1,100 BP on Martha's Vineyard (Ritchie 1969).

The decrease in projectile point styles and the increase in the reliance on horticultural crops may be attributed to increasing numbers and densities of population at larger sites. While the occurrence of the "village" in southeastern Massachusetts continues to be debated, the effects of an increased reliance on corn, beans, squash and to a lesser degree gourds, sunflowers and tobacco, definitely led to a degree of sedentism not seen prior to this time (Hasenstab 1999; Kerber 1988; Luedtke 1988; Thorbahn 1988).

The Late Woodland Period dominates Cape Cod in terms of distribution and evidence of occupation, with the Levanna point being the single most common artifact found on Cape Cod (McManamon 1984). Levanna points are common in the Mid-Cape area, but not as common as on the Outer Cape. Sandy Neck in Barnstable appears to have been one of the most utilized sites on Cape Cod during the Middle to Late Woodland periods (Dunford 1997). Ingham identified a Late Woodland shell midden and Levanna point at the Santuit River I site, and Late Woodland material was recovered from sites on Washburn Island and along Child's River in Falmouth (Ingham et al 201; Mahlstedt 1985).

B. Known Prehistoric Sites

The town-wide reconnaissance survey conducted by the Public Archaeology Lab Inc. in 2011 found that, of the 26 known prehistoric sites in Mashpee, the majority were small, isolated lithic scatters, although a variety of site types was present (Herbster 2011:74). Areas of high prehistoric sensitivity were identified in areas surrounding wetlands, with major sites on the margins of Popponesset Bay and the larger town ponds (Herbster 2011:76). The sensitivity maps generated for the reconnaissance survey gave the current project area a low sensitivity rating for both prehistoric and historic archaeological resources.

The majority of the sites identified within 2 km of the project area (**Table 1**) represent findspots of isolated projectile points and single pieces of debitage. This may indicate the predominant use of the area as hunting ground, where the points represent items lost during the hunt and the isolated debitage represent very limited reduction or finishing of bifaces into projectile point for use during the hunt. The "Large Site" was identified by Frank Kremp of the Massachusetts Archaeological Society, but since no further information is provided, it is not known if it represents a multi-component base camp or just a single large site. The shell midden indicates the processing of shellfish along the shore at some point in the past.

The Public Archaeology Lab. Inc. conducted an Intensive (locational) Archaeological Survey on 420 acres of land at Bufflehead Bay in 1990. The land was proposed to be developed into New Seabury, a 500+ lot residential development with golf course and sewage plant. The northern edge of this survey was located just south of the current project area on the south side of Red Brook Road. The property was divided into zones of sensitivity for the survey: 100 acres were determined highly sensitive due to the presence of small knolls with level terraces and well-drained Carver sands; 120 acres of moderate sensitivity were principally based on the distance of

over 150 m. from fresh or salt water sources; and 200 acres had low sensitivity due to the presence of poorly-drained soils, water, and disturbance (Davin 1990: 1). The north end of the project area just south of the area for the current proposed cell tower was given a moderate sensitivity rating. Testing consisted of the excavation of 715 50-cm-square shovel test pits in 30-m. square block test patterns, with 12 array pits around test pits containing potentially significant finds, and 33 judgmental test pits spaced 10-m. apart on transects. Recovered prehistoric artifacts consisted of findspots of a quartz Late Archaic stemmed point, a chert possible Late Paleoindian/Early Archaic Dalton point, and a single chert flake, all from separate test pits. Testing at the Bufflehead Bay project area indicates that prehistoric sites expected to be encountered would consist of small sites occupied for short periods of time and with low artifact densities.

Table 1. Prehistoric Sites Within 2 km of the Project Area

Site	Type	Period	Artifacts	Nearest Water
19-BN-28	“Large Site”	Unknown	Unknown	Ann's Cove
19-BN-246	Shell Midden	Unknown	Unknown	Ockway Bay
19-BN-627	Find Spot	Unknown	1 Brown Chert CD	Unnamed Wetland
19-BN-628	Find Spot	Early Archaic	Chert Hardaway Dalton Point	Dutchman's Brook
19-BN-629	Find Spot	Late Archaic	Quartz Archaic Stemmed Point	Dutchman's Brook
19-BN-816	Find Spot	Unknown	1 Quartz Shatter	Spinnacker Cove
19-BN-817	Find Spot	Unknown	1 Quartz CD	Spinnacker Cove

C. Prehistoric Archaeological Potential

Archaeological sites are found in a wide variety of environmental settings, with new settings and locations of sites in areas not usually tested by cultural resource management surveys coming to light each year. The majority of sites, though, are to be found in particular environmental contexts (Funk 1972; Root 1978; Thorbahn et al. 1980; McManamon 1984; Mulholland 1984; Thorbahn 1984; Nicholas 1990). By using the contexts of known sites, archaeological sensitivity models can be developed to predict the potential locations of archaeological sites.

Sites in southern New England appear to be linked to three variables: topography, soil characteristics, and proximity to water, resulting in the general predictive model of a predominance of sites on flat to low slopes and on well-drained soils near fresh or salt water. These factors can be combined with the proximity to natural resources (clay, lithic raw materials, and seasonal foods) and the use of transportation routes via waterways or land trails.

Pre-contact Archaeological potential can be stratified as follows:

High potential: <300 m. from a water source on a <8% slope with excessively well drained soils and minimal site disturbance.

Medium potential: 300-400 m. from a water source on an 8%-15% slope with well-drained soils and moderate site disturbance.

Low Potential: >400 m. from a water source, >15% slope on poorly drained soil and heavily disturbed.

The project area is in a nearly level to gently sloping setting on deep, excessively drained soil, which would have been conducive to prehistoric Native American use and settlement. There are wetlands within a few hundred meters to the west, although these are relatively minor, with the nearest major water source being Ockway Bay nearly one kilometer to the east. The distance to substantial bodies of water would have greatly limited the intensive use of the project area, although these types of settings were conducive to short term occupations and task-specific resource extraction. Based on the pre-contact archaeological potential model described above, the project area is designated as having a moderate sensitivity for potential prehistoric cultural resources.

The small to medium sized sites of the area are expected to relate to resource procurement activity and the harvesting of faunal resources such as deer, fish, and small mammals, or the collection of floral resources such as medicinal plants, or other raw materials. Occupation evidence is expected to take the form of hearths and activity areas related to all phases of lithic reduction, as well possibly food processing and domestic activities.

Larger sites of the broader area may yield evidence of multiple hearths, features related to house construction such as post molds, and storage and refuse pits. A wide range of activities may be expected to be evidenced at sites such as these. Artifacts expected at such sites may include pottery, steatite, a wide range of lithic tools, and evidence of lithic reduction. Faunal and floral remains may be recovered. Fewer large sites, however, are expected to be encountered in the project area or similar settings at considerable distances to larger bodies of water. If a larger site was present, it is expected that it would cover a greater area and be more visible archaeologically than the smaller sites.

According to the Donohue (2017:6) report, the project area bears a low sensitivity for potential prehistoric cultural resources because of distance to the nearest major wetlands cluster to the north, at 475 meters, and since the majority of sites in the region are clustered around Waquoit Bay to the west and Ockway Bay to the east. The assessment survey report further cites Herbster (2011) indicating a low sensitivity for the project area. However, the rare recovery of a Late Paleoindian to Early Archaic Dalton point in the Bufflehead Bay survey immediately to the south of the project area elevates the sensitivity of the project area. Also, the determination of low versus moderate sensitivity in the analysis of the project area ultimately resides in the scale of wetlands size that one uses to measure distance to nearest water, with the current determination providing the more conservative criteria for dismissing a project area from further archaeological evaluation.

IV. Historic Context

A. Historic Background of the Mashpee Area

Occupation during the **Contact Period (1500-1620)** is believed to have clustered at Waquoit and Popponeset bays on the south shore of the town, with smaller centers along major rivers and at lake and pond shores (MHC 1984: 2). Known trails that connected the populations with the wider Cape Cod area ran from Cape Cod Bay to Shawme Lake, following what is now Sandwich-Cotuit Road; along what is now Route 130 with a branch extending along Falmouth-Sandwich Road; between the Quashnet and Mashpee Rivers to Great Neck and Ockway Bay along Lovells-Waquoit-Great Neck Roads; and Old Barnstable Road to an abandoned way along the Quashnet River north of Johns Pond (MHC 1984: 2). Little else is known about the populations who lived in the area at this time. It is assumed that they hunted, fished, and collected shellfish along the shores, as well as engaged in horticulture. Communities may have moved from the shores to more protected inland areas around the ponds during the fall and winter, returning to planting fields along the shore in spring.

The **Plantation Period (1620-1675)** saw a continuation of the use of established trails and lifeways, with European diseases possibly affecting the populations to an unknown degree. Much of Mashpee may have been under the leadership of Poupmunnuch, the sachem of Cotacheset (Oyster Island in south Barnstable) (MHC 1984: 5). The first European owner of land in the town was Richard Bourne, who had come to preach to the “South Sea Indians” in 1658 and who purchased land at Waquoit Harbor and to the east and south of Mashpee Pond in 1661 (MHC 1984: 5). Bourne continued to live in Sandwich after the purchase. Bourne was ordained as pastor of the Mashpee Indian Church in 1670, with plans to make the church, located northeast of Santuit Pond, the focal point of a Christian Indian Community (MHC 1984: 5). Bourne was instrumental in having Mashpee set apart as reserved land for the Native people, with all lands being held in common. The population of the town was reported as 237 in 1672, with 90 persons being baptized two years later.

Early trails and roads established before European contact continued in use during the **Colonial Period (1675-1775)**. A meetinghouse was established in 1684 in the eastern part of the town on the road from Cotuit to Sandwich. This building was subsequently moved in 1717 to its present location along the Mashpee River and enlarged there. Settlement in town then began to be focused around this meetinghouse after the move. In 1685, the Massachusetts General Court ruled that no land could be sold by Natives without the permission of the court, and guardians were appointed to the town in 1693 (MHC 1984: 6). Conditions under guardianship were less than ideal, and in 1760 a Mashpee Native traveled to England to plead his case before the King. This resulted in permission being granted by the Crown for Mashpee to elect its own officers (MHC 1984: 7). Legislation was passed by the Massachusetts colonial government in 1763, conferring district status to the town and opening settlement in the town to outsiders (MHC 1984: 6). This resulted in the number of whites in the town to double between 1765 and 1790. Generally, the population remained small, but stable, between 1685 and 1765 (141 individuals over 12 years old in 1685 to 230 Natives, 31 “Negroes” and 77 whites in 1765) (MHC 1984: 6). Most of the inhabitants continued to live in traditional style homes (“wigwams”) until 1725 when inhabitants were allowed to hire carpenters from outside of the community to build English-style

homes. By 1767, there were 21 shingled homes and 52 traditional-style homes. The ratio of English-style to traditional-style homes continued to increase throughout the period. By 1776, the presence of English versus traditional-style homes were almost evenly split (42 to 39), and by 1800, there were 80 English-style houses with only a handful of traditional-style homes remaining (MHC 1984: 7).

Statistics for the **Federal Period (1775-1830)** show a stable population numbering in the 300s for the entire period (MHC 1984: 7). Settlement continued to be dispersed, with the greatest concentration of Native homes being located on Great Neck between Popponeset and Waquoit Bays. Two gristmills were present in the town by 1794, possibly having been built by non-natives once the area had been opened to settlement by outsiders in 1763. While traditional lifeways focused on hunting, fishing, horticulture, and resource collecting continued to form the basis of the household economic lives of inhabitants, cordwood appears to have been the chief export from Mashpee in this period (MHC 1984: 8). Service on board whale ships was another popular occupation by the town's male inhabitants.

Unlike many other towns, no rail lines connected Mashpee to other communities during the **Early Industrial Period (1830-1870)**. The population remained stable (between 309 and 348 for the period) but the ratio of whites to nonwhites continued to increase from 1:20 in 1840 to 1:8 by 1870 (MHC 1984: 9). A resurgence in the Baptist faith occurred after 1830 thanks as a result of preaching by Blind Joe Amos and Pequot William Apes. Apes also was a staunch advocate for greater independence in the governing of affairs for the Mashpee people. The town was returned to the status of a district in 1834. This resulted in a return of many former inhabitants, and consequently land scarcity. In order to preserve the land rights of the inhabitants, much of the open land was divided into 40-acre lots in 1841-42, and assigned to specific families (MHC 1984: 9). A total of 5,000 acres was retained as common land. Settlement in the town remained dispersed during this period with a focus being south of Mashpee Pond and extending east toward the Santuit River mill (MHC 1984: 9). Smaller settlement concentrations were located to the southwest of Ockway Bay; the east side of Johns Pond; the southeast shore of Ashumet Pond; and the northeast shore of Wakeby Pond. Cordwood manufacture continued as one of the most important economic outputs of the town, but cranberry production was established after the 1830s, and in 1834 the Mashpee Manufacturing Company was established by local Natives to promote broom sales. The property was eventually sold to outsiders, and the land was used for cranberry bogs (MHC 1984: 9). Mashpee was incorporated as town in 1870.

Roads that followed the ancient Native trails continued in use in the **Late Industrial Period (1870-1915)**. Restrictions on land sales to outsiders were removed in 1870, which led to the purchase of large tracts of woodland, swamps, and oceanfront property soon thereafter. This led to more intensive linear development of cottages along Sandwich-Cotuit Road and the development of large cranberry bogs. The cottages, which were associated with the developing tourist industry, and the cranberry bogs, led to new sources of job opportunities for residents as hunting and fishing guides and workers in the cranberry industry (MHC 1984: 10). The population saw a slight decline in this period from 348 to 263 by the end of the period, with an increase in the ratio of non-Native to Native inhabitants to 1:4.

Improvements to the roads finally occurred in the town during the **Early Modern Period (1915-1940)** due to the increase in automobile traffic associated with more tourists and summer

residents. Falmouth Road was improved by the mid-1920s as part of Route 28, and Forestdale Road was upgraded to Route 130 (MHC 1984: 11). The town still remained the smallest in the county, and it experienced a slight population decline between 1905 and 1920 (n=242 by 1920). This trend was reversed between 1930 and 1940 (n=434 by 1940) due to the increase in accessibility to the area by automobile. The increase in population was accompanied by an increase in the ratio of non-Native to Native inhabitants (1:3 in the 1930s). More cottages were built in the town during this period along the southeastern shore of Mashpee Pond; along Nantucket Sound at Rock Landing; along Shore Drive; to the south and southeast of Dean Pond; and to south of Popponeset Creek (MHC 1984: 11).

B. Project Area Background History

The proposed tower is located approximately midway between Popponeset Bay and Waquoit Bay. No road is shown passing through the area on the 1794 map (**Figure 5**), but there was a grist mill located to the west along Red Brook to the north of Waquoit Bay. A road (Red Brook Road) is shown on the 1831 map (**Figure 6**), connecting the mill along Red Brook to the area south of Ockway Bay where two houses are shown. The project area itself appears to have been wooded at the time. An 1877 map of Mashpee shows that the project area was in a parcel owned by the Keeter family. The 1877, 1880, and 1949 maps (**Figures 7-9**) do not show any structures on the property, although by 1880, settlement is present near Ockway Bay, and by 1949 residences appear on Red Brook Road east of the project area and southwest of Ockway Bay.

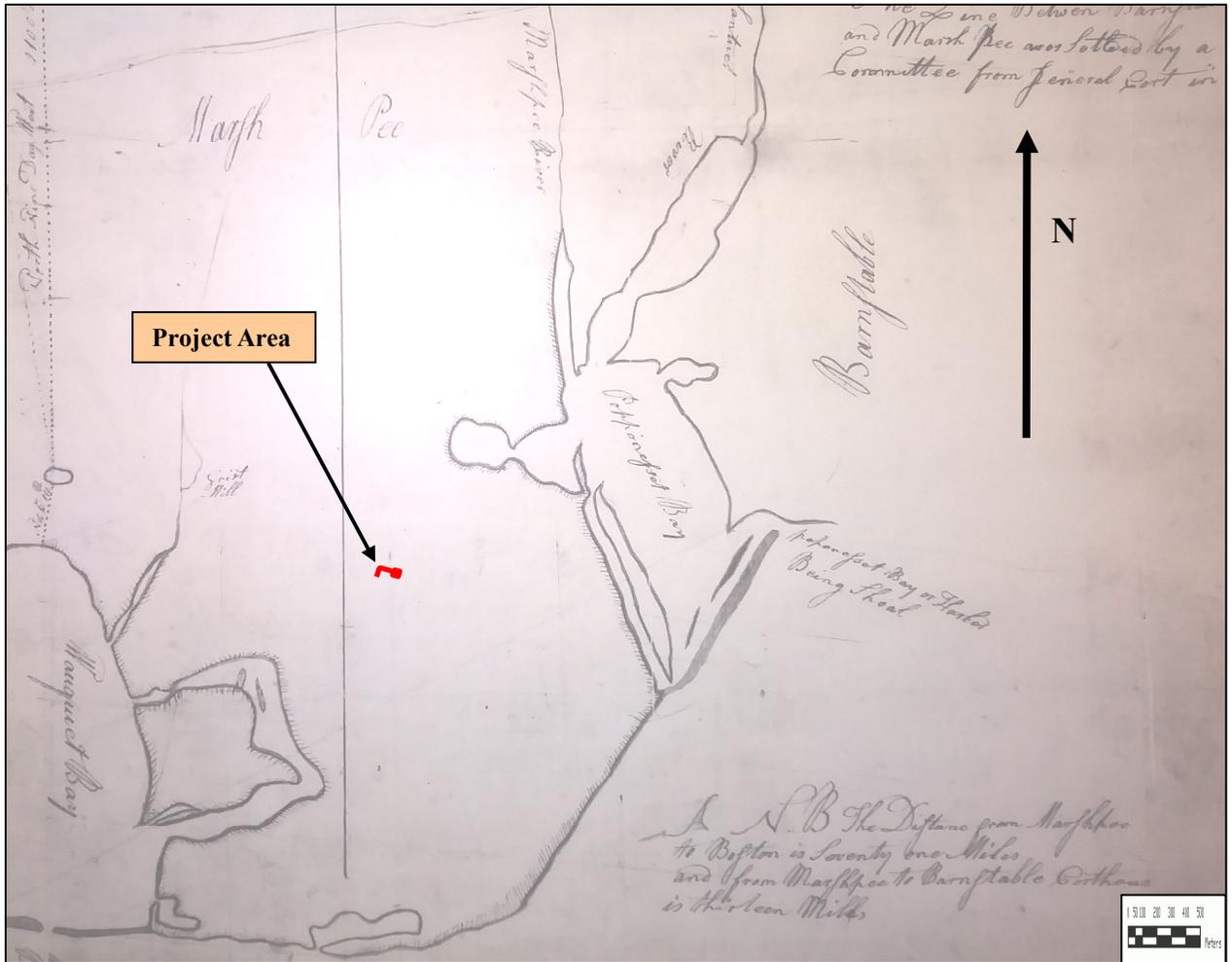


Figure 5. 1794 Map of Mashpee.

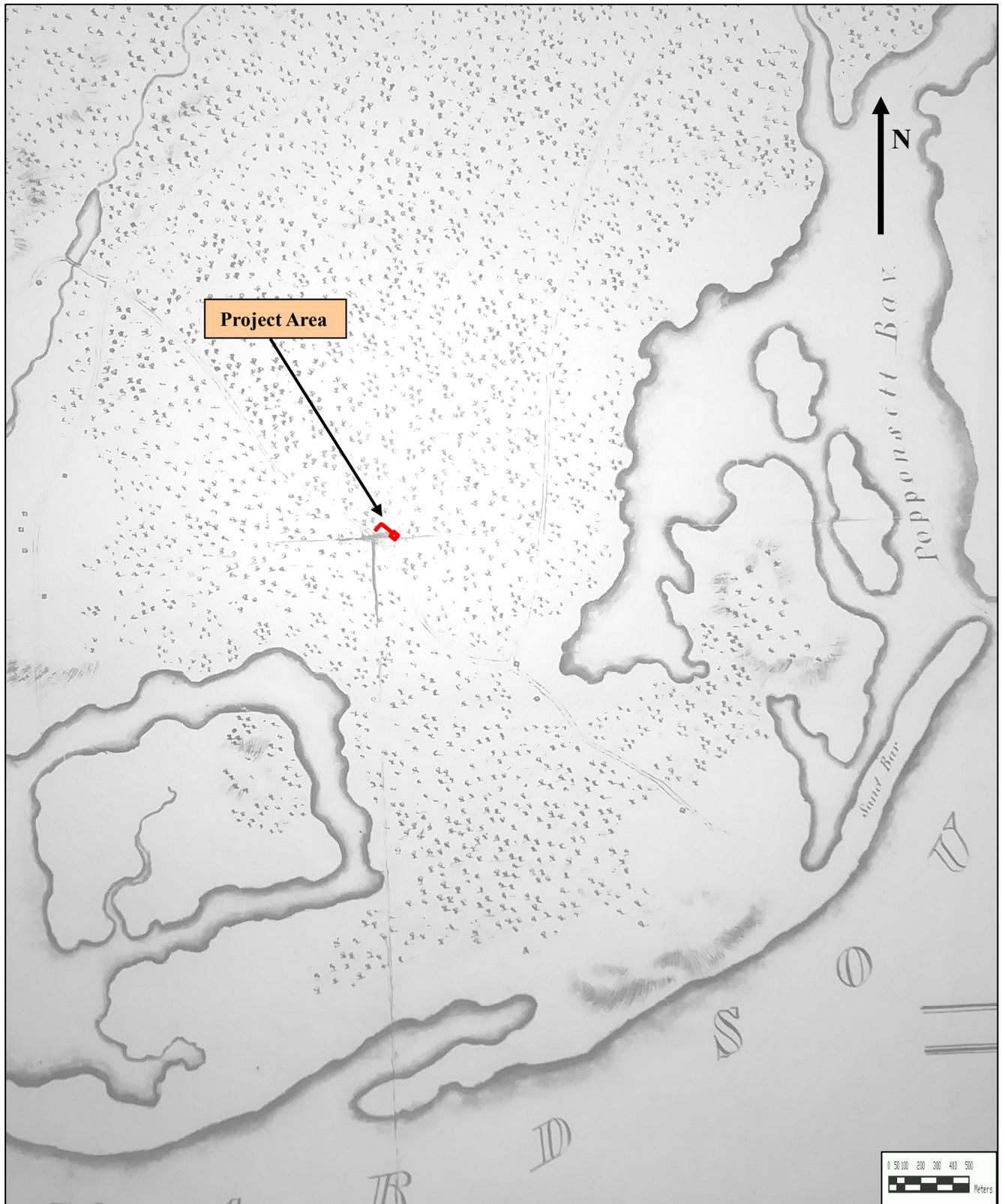


Figure 6. 1831 Hales Map in the County of Barnstable, Massachusetts.

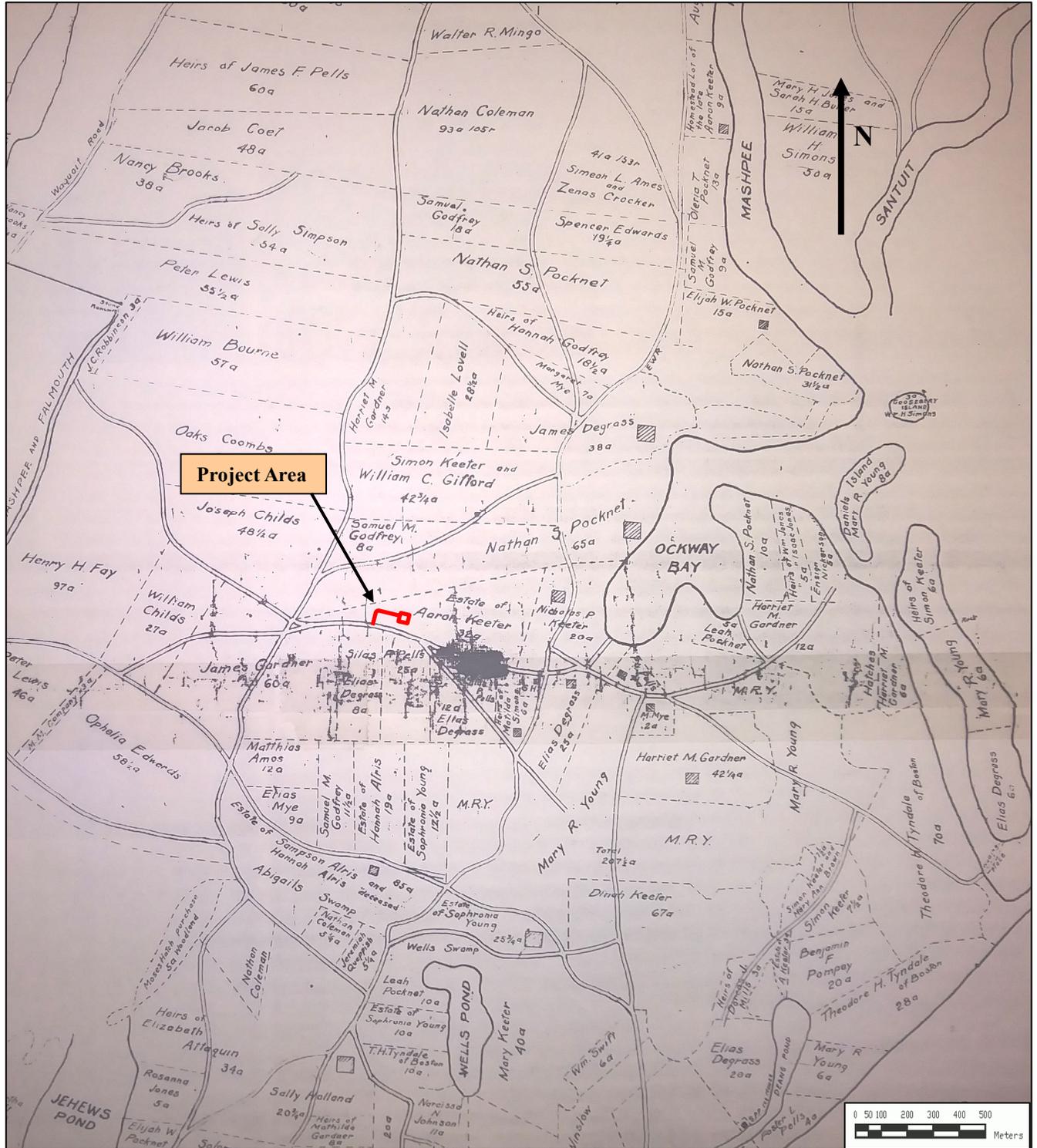


Figure 7. 1877 Cahoon Map of the Town of Mashpee Massachusetts.

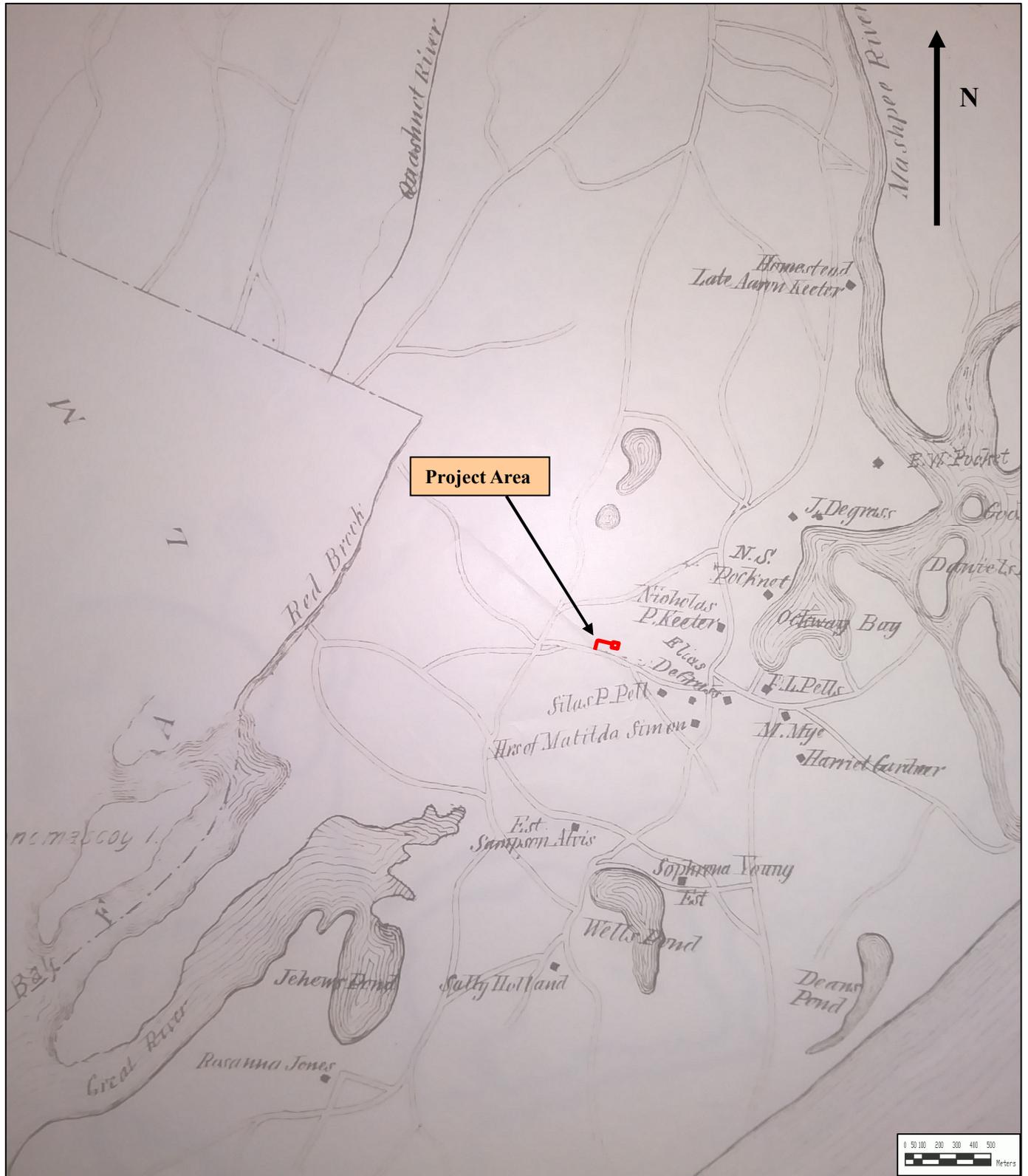


Figure 8. Walker 1880 Map of the Town of Mashpee.



Figure 9. 1949 USGS 7.5' Topographic Map, Cotuit Quadrangle.

C. Known Historic Archaeological Sites

The historic sites within 2 km of the project area represent the use of this part of Mashpee by the Mashpee Wampanoags in the 19th century. A variety of sites representing many of the everyday locales that would be present in such a community have been identified: homesites (HA-21 and 22), a school/ chapel (HA-12), traditional cultural property (the largest piece of land that was continually held by the Mashpee Wampanoag- HA-19), and burial grounds (HA-11 and 16). The presence of such a wide variety of Mashpee Wampanoag sites within a relatively small distance around the project area makes it more likely that it was utilized to some degree at least in the 19th century by Mashpee Wampanoag.

Historic material was found to be associated with another nearby Mashpee Native family homesite (HA-13) that had been predicted based on the 1877 map of the town and may be typical of other homesites in the area. The site was located in close proximity to Abigail Brook and to historic trails. Artifacts included historic ceramics (creamware, pearlware, American Jackfield, Rockingham, redware) tobacco pipe fragment, a 1749 copper coin, faunal remains (bone and shell), architectural debris (brick, hand-wrought and machine-cut nails, and window glass), and a few personal items (copper spoon, buttons, and fragment of a writing slate). These artifacts were associated with a plowzone and raised earthen platform. The platform was hypothesized to have been associated with the nineteenth century Native house, possibly indicating that it was of similar construction to some identified elsewhere on Cape Cod and the Islands (Davin 1990: 60).

Table 2. Historic Sites Within 2 km of the Project Area

Site	Name	Type	Date
HA-11	Punkhorn Point Cemetery	Burial Ground	19 th century
HA-12	S. Mashpee School/Ockway Chapel	School/ Chapel	19 th century
HA-16	Heron Way Site	Redeposited Burial Ground	19 th century
HA-19	The 55 Acres	Traditional Cultural Property	19 th to 20 th century
HA-21	Bourne/ Avant House	Standing House	19 th to 20 th century
HA-22	Sophonria Young Homesite	Homesite	19 th century

D. Historic Archaeological Potential

General historic settlement patterns have been developed for historical resources in New England, and these can be used to help predict where historic archaeological sites may be found (Handsman 1981; Paynter 1982; Waldbauer 1986; Wood 1978). Economic geographers have also formulated models on historic settlement that take into account variables such as proximity to bodies of water, arable soils, granite outcrops, and gravel and clay beds (Haggett et al. 1977). Proximity to settlement concentrations, freshwater springs, streams, and sources of waterpower also affect where people will settle.

Historic Archaeological potential can be stratified as follows:

High/ Moderate potential: Within 100 m. of a major transportation network, within 100 m. of fresh water and within 1000 m. of a settlement concentration

Low Potential: >100 m. of a major transportation network, >100 m. of fresh water, and >1000 m. of a settlement concentration

The project area is predicted to have a moderate probability for containing historic remains. There do not appear to be any major historic developments at or near the project area according to late 18th through 20th century historic maps, although Red Brook Road as a major traveled route was in existence since at least 1831. Early historic accounts and the distribution of Mashpee Wampanoag sites within a couple of kilometers of the project area make it clear that the broader area was intensively occupied and utilized by the Mashpee Wampanoags during the Contact period and the time to follow prior to the first available historic maps. In addition, the Calhoun map from 1877 (**see Figure 7**) indicates the project area was part of a parcel owned by Aaron Keeter, with the Keeter family being well known in the history of the Mashpee Wampanoag tribe.

As with subsequent Euroamerican occupations, early historic Wampanoag settlement was concentrated around the major bays to the east and west, although areas further inland were likely utilized for agriculture and the procurement of wild resources. Any discovered historic archaeological remains would therefore likely be in the form of Contact period to post-Contact Native American settlement and resource procurement activity, and could therefore include a mix of more durable prehistoric and historic materials types, particularly aboriginal lithic remains and early Euroamerican ceramics, and possibly feature contexts such as hearths, earthfast structural traces, and burial remains. Alternatively, historic remains are likely to include incidental materials related to the use of the adjacent road since the early 19th Century, including but not limited to bottle glass, household ceramic fragments, and modern materials.

V. METHODS

A. Statement of Purpose and Justification

The research design for the Intensive (Locational) Survey was designed to examine the natural and historical aspects of the project area and to place the project area within a prehistoric and historic context associated with the Town of Mashpee and the broader Southeastern Massachusetts region. The data collected through the analysis of environmental factors associated with the project area (soil types, topographical conditions, fresh and salt water resources), when combined with an examination of the known Native and historic archaeological resources in the Town of Mashpee, and the wider Cape Cod area, allows archaeological models to be developed that can help predict the likelihood of Native and historic resources within the project area.

The project area has a moderate potential for ancient Native American archaeological resources given its nearly level to gently sloping setting with excessively drained soils. The project area is relatively distant to the nearest major water sources, such as Ockway Bay, but is within several

hundred meters of much smaller wetlands that could have attracted resource procurement and hunting activities. Further, early historic occupations by Euroamericans could have prompted more intensive Contact period and post-Contact Native American occupations further inland, with the known distribution of historic Mashpee Wampanoag sites being widespread and diverse within a couple of kilometers of the project area. While a prior professional archaeological assessment survey concluded no further archaeological evaluation was required, correspondences from the Mashpee Wampanoags responding to the assessment survey report indicated the need for further evaluation based on the considerations given above.

The project area features a lower potential for significant Euroamerican cultural resources. Historic maps reveal no substantial use of this area, until the construction of the Mashpee fire station building. Red Brook Road, however, does appear on historic maps as early as 1831, and there is some chance that particular uses of the property were not recorded on the maps, which could include late historic Mashpee Wamapanoag sites, or more likely, incidental debris from the use of the road through time.

B. Research Design

1. Theory

Archaeological Consulting Services (ACS) was contracted by Lucas Environmental, LLC of Quincy, Massachusetts, on behalf of Blue Sky Towers, LLC, to conduct an intensive (locational) archaeological survey of the project area for a proposed access road and cell tower.

The prehistoric archaeological potential of the project area was developed by analyzing all the environmental and topographic characteristics of the area, recorded archaeological sites, the distribution of identified prehistoric resources within two km of the project area, and the documentary records relating to the town and more specifically to the project area. A predictive model for the probability of encountering prehistoric archaeological resources was developed, based upon proximity to water, soil characteristics and drainage, slope, and disturbance.

This model relies on site characteristics identified by Dincauze and Meyer, who in 1977 compiled data on site locations in Essex and Middlesex Counties, and found that 47% and 76%, respectively, of the identified sites occupy land with less than an 8% slope on excessively well-drained soils; whereas 10-20% lie on well-drained soils on 8-15% slopes. In 1983, Kenyon and McDowell studied the distribution of sites along the Merrimack River drainage basin and found 30% of sites on alluvial deposits, 40% on river terraces, and 20% on fluvial glacial deltas, outwash, and lakebeds (Kenyon and McDowell 1983). Almost 90% of the sites were situated within 1000 m of the river, with 60% situated within 200 m, and 75% of these at no more than 20 m in elevation above the river. This latter study concluded that during both the Archaic and Woodland eras, sites were situated close to the river on alluvial or terrace settings.

The coarse model that is used in this study to establish prehistoric sensitivity for the project area indicates a moderate sensitivity ranking, given nearly level to gently sloping land and

excessively drained soil contexts. However, the nearest water sources are minor wetlands at a relatively great distance to the project area.

Prehistoric archaeological remains are likely to be in the form of a hunting camp or resource extraction site. Feature contexts could include post-molds, shell middens, trash pits, or storage pits indicative of longer term occupations, although these are less likely than short-term hearth features. Artifact classes could include lithic tools and debitage, and possibly ritual groundstone items, but are not likely to include pottery or other materials indicative of longer term occupations. Any charcoal deposits or other organic materials offer the ability to assign or confirm chronological designations based on diagnostic artifacts.

The historic sensitivity of the property is more directly established through historic records and maps. Historic maps indicate no structures on the project property until recently. However, the intensive use of the broader area by Mashpee Wampanoag well into the historic era increases the likelihood that inland areas such as that represented by the project area were utilized in support of more major settlements located closer to the major bays and rivers. Early historic Mashpee Wampanoag remains could include those related to shorter-term occupations, such as a mix of aboriginal lithic material and early historic Euroamerican ceramics, as well as traces of earthfast structures, hearths, and isolated burials. More likely, the project area may reveal late historic debris related to the use of Red Brook Road that appears on early 19th Century maps, and modern materials.

2. Testing Strategy

A testing strategy utilizing systematic 7.5-meter shovel testing was proposed within the compound area and surrounding area of potential affect (APE), including the unpaved portion of the proposed access route (**Figure 10**). A fully saturated systematic testing grid was established in 7.5 m intervals. No tests were conducted along the first part of the proposed access, which is through the existing driveway and parking lot of the fire station. Prehistoric sites as well as predicted historic activity areas are often fairly small, and a 7.5 m sampling interval will typically yield a very high probability for locating sites 12 m or more in diameter, using 30 x 30 cm shovel test pits (Lightfoot 1986: 493-494). Increasing the test pit size to 50 x 50 cm and/or decreasing the distance between test pits increases the likelihood of identifying sites smaller than 12 m. Kintigh (1988:702-703) noted that small test pits were likely to yield artifacts on high-density sites, whereas larger test pits proved more favorable for artifact recovery on lower density sites, similar to those commonly found in New England (Kintigh 1988: 702-703). The types of potential prehistoric sites predicted for the project area, including small hunting camps or those related to resource extraction, have a high probability for being encountered by using this testing strategy of relatively tight intervals. The same testing density is sufficient for post-Contact historic sites. Fieldwork was directed by a Principal Investigator of ACS, which has the equipment necessary to successfully carry out the planned field work (transits, Brunton compasses, long measuring tapes, shovels, screens, tarps, soil sample and artifact collection bags, Munsell Soil Color charts, flagging tape).

Intensive (locational) survey testing (see Figure 10) consisted of twenty-two (22) 50-cm square systematic shovel tests within the project area, placed at 7.5-meter grid intersections in all non-disturbed portions of the project area to be impacted by construction. The excavation of these tests allowed for full coverage of the portions of the project area to be impacted bearing moderate to high sensitivity for prehistoric and historic cultural resources. There were also eight (8) more 50-cm square shovel tests reserved for delimiting any artifact find locations and further investigating any surface finds that may indicate subsurface cultural resources as a result of a pedestrian surface survey conducted along the length of the proposed access road route and within and around the compound area, although none were required.

In the event that any features are encountered, each feature is mapped and sketched in plan view, photographed, and then covered and backfilled for potential subsequent excavation. Archaeologists prepare photographs and measured drawings of any visible above-ground cultural features such as structures or structural remains, although none were recorded for the current survey.

If human remains are encountered, then the procedures outlined in Massachusetts Unmarked Burial Law (Massachusetts General Laws c.7, s.38A; c.38, s.6; c.9, ss.26A & 27C; and c.114, s.17; all as amended) are followed, as no State Archaeologist permittee is authorized to excavate human skeletal remains without obtaining a Special Permit (950 CMR 70.20). In the event that human skeletal remains are encountered, archaeologists cease excavation and consult first with the MHC, and then with the state medical examiner and project proponent as advised by the MHC about further procedures. There were no human remains encountered for the current project.

All shovel tests measured 50 x 50 cm. square and were excavated through the B2 subsoil to the C substratum horizon when possible. Archaeologists screen all soils through quarter-inch mesh screens to search for cultural material. Recovered materials are bagged, and recovery locations are documented for subsequent processing and analysis. The provenience of all recovered materials are recorded on individual bags. All shovel test locations, stratigraphy, and contents are recorded on standardized forms and maps. All soil colors are recorded using Munsell Soil Color Charts.

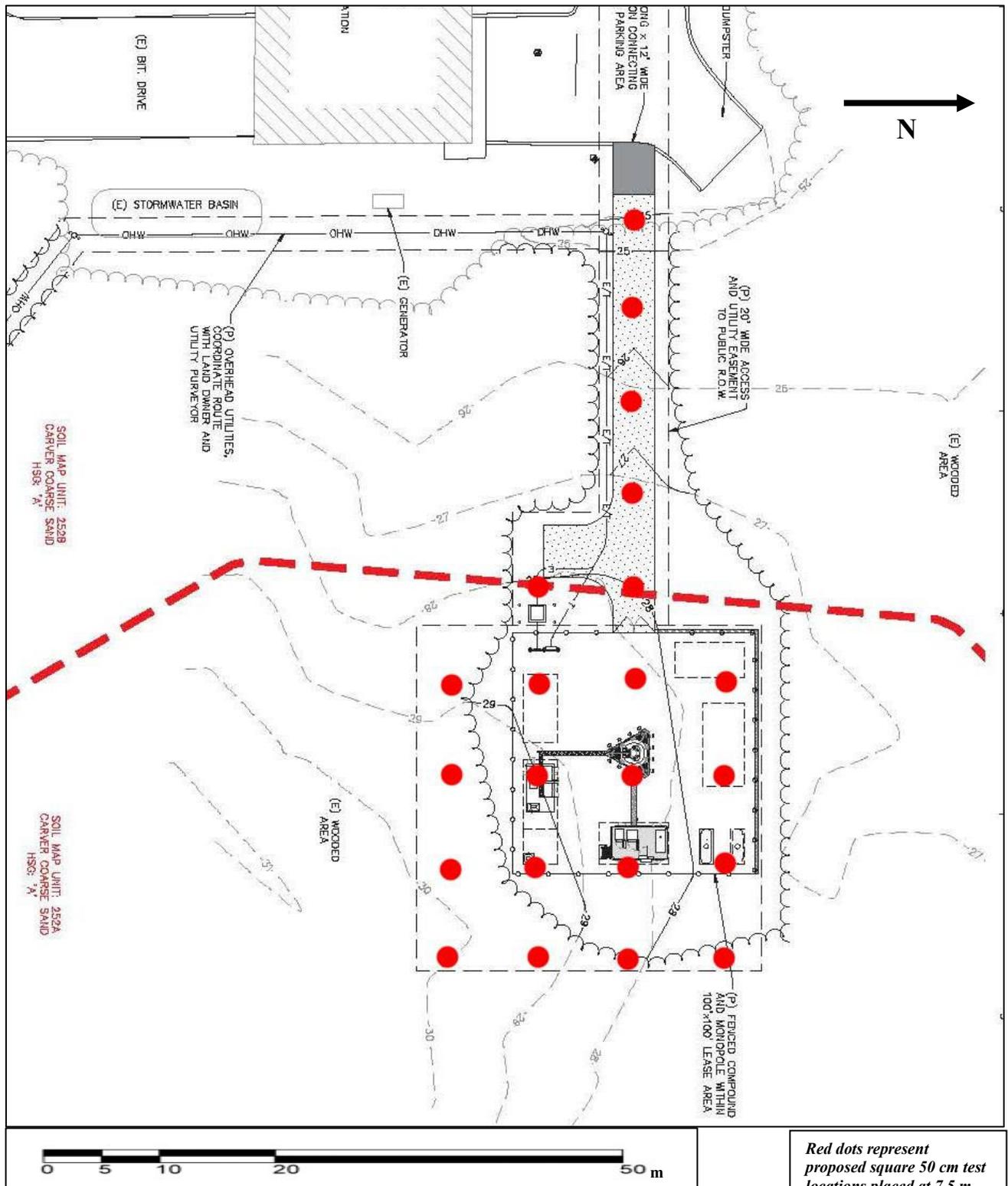


Figure 10. Proposed Intensive Survey Testing. 1:500 scale.

C. Laboratory Processing and Analysis

For laboratory processing, ACS (Archaeological Consulting Services) utilized an 850-square-foot facility with a climate-controlled and alarmed office / laboratory of ACS in a renovated historic commercial structure at 118 Whitfield Street in Guilford, Connecticut. All recovered cultural material was separated by provenience, cleaned, dried on drying racks, identified, described, and cataloged for analysis at the laboratory of ACS. Although none were found for the current survey, artifacts were planned to be placed in labeled acid-free plastic bags in acid-free boxes for curation at The Public Archaeology Laboratory (PAL) in Pawtucket, Rhode Island. When artifacts are found, the original excavation forms, maps, catalog sheets, and a copy of the final report accompany the assemblage to the curation facility. ACS retains copies of all documentary material on acid free archival quality paper.

Artifact analysis is focused on identifying the nature, period of manufacture, possible use, and interpretation of recovered materials. This analysis, along with the general findings from the intensive survey and background research, are used to determine if further testing of the project area in the form of a site examination is warranted.

The laboratory facilities are equipped with cataloging computers, word processing / graphic production computers, digital scales and metric calipers, 100x magnification lens, digital microscope, manual microscope, measuring tapes, digital and conventional photography stations, and a scanner.

VI. Results

A. Test Distribution and Stratigraphy

There was a total of 22 systematic shovel tests excavated for the Phase I intensive survey. Recall that the proposed compound is only about 30 meters (100 feet) square, with the 40 meter (120 feet) long, four meter (12-foot) wide access drive extending east from the northeast corner of an existing parking lot of the fire station house on the north side of Red Brook Road (**Figure 11**). The bulk of the project area where the compound will be located is wooded with a secondary forest cover consisting of a mix of white pine and deciduous trees (**Figure 12**). Surface visibility is good at the beginning of the access extension where there is just a maintained grass cover, but becomes limited within the wooded section where there is a generous leaf and pine needle cover. Scrub growth is low to moderate, as the secondary forest cover is fairly well developed. The project area is nearly level to gently sloping, with no visible signs of disturbance at the surface. The 22 subsurface shovel tests of the survey were placed within the pad area and along the proposed access extension at 7.5-meter intervals, with a datum of N0-E0 set close to the southeast corner of the 30-meter square compound area.

Recall that the proposed compound area and access road are in a setting projected by the USDA NRCS to have units of deep and excessively drained Carver coarse sand (252A, 252B), with slopes ranging from zero to eight percent. The typical Carver soil profiles have a black surface layer of coarse sand to 18 cm deep, followed by a dark gray layer of coarse sand to 25 cm, an upper subsoil of strong brown coarse sand to 38 cm, a middle subsoil layer of yellowish brown coarse sand to 71 cm, and a lower subsoil of brownish yellow coarse sand to 81 cm, overlying a substratum of light yellowish brown coarse sand to 170 cm or more.

Tests in the field revealed soil profiles somewhat matched to the Carver ideal type, with all layers typically consisting of coarse sand (**Figure 13**). Typical profiles included a mast cover to about 5 cm, followed by a dark grayish brown to light brownish gray (10YR 4/2 to 6/2) upper topsoil to about 12 cm, a dark yellowish brown (10YR 4/4 to 4/6) topsoil layer to about 18 or 20 cm, a strong brown to yellowish brown (7.5YR 5/6 to 10YR 5/8) upper subsoil to about 25 or 30 cm, a brownish yellow to strong brown (10YR 6/8 to 7.5YR 5/6) lower subsoil to about 45 to 50 cm or more, and an olive yellow (2.5Y 6/6) substratum to 60 cm or more below the surface. The basic trend of lighter soils with depth held as expected, with some variation in the form of iron staining in some tests and variable substratum colors. Most tests revealed a high gravel content, particularly in deeper layers.

B. Artifact Analysis

Despite the high density of subsurface shovel tests (n=22) placed at 7.5m intervals within the access road alignment and compound area, there were no prehistoric or historic artifacts recovered or subsurface cultural feature contexts identified (**Figure 14**).



Figure 11. Project Area (Access Road). East view.



Figure 12. Project Area (Pad Site). East view.

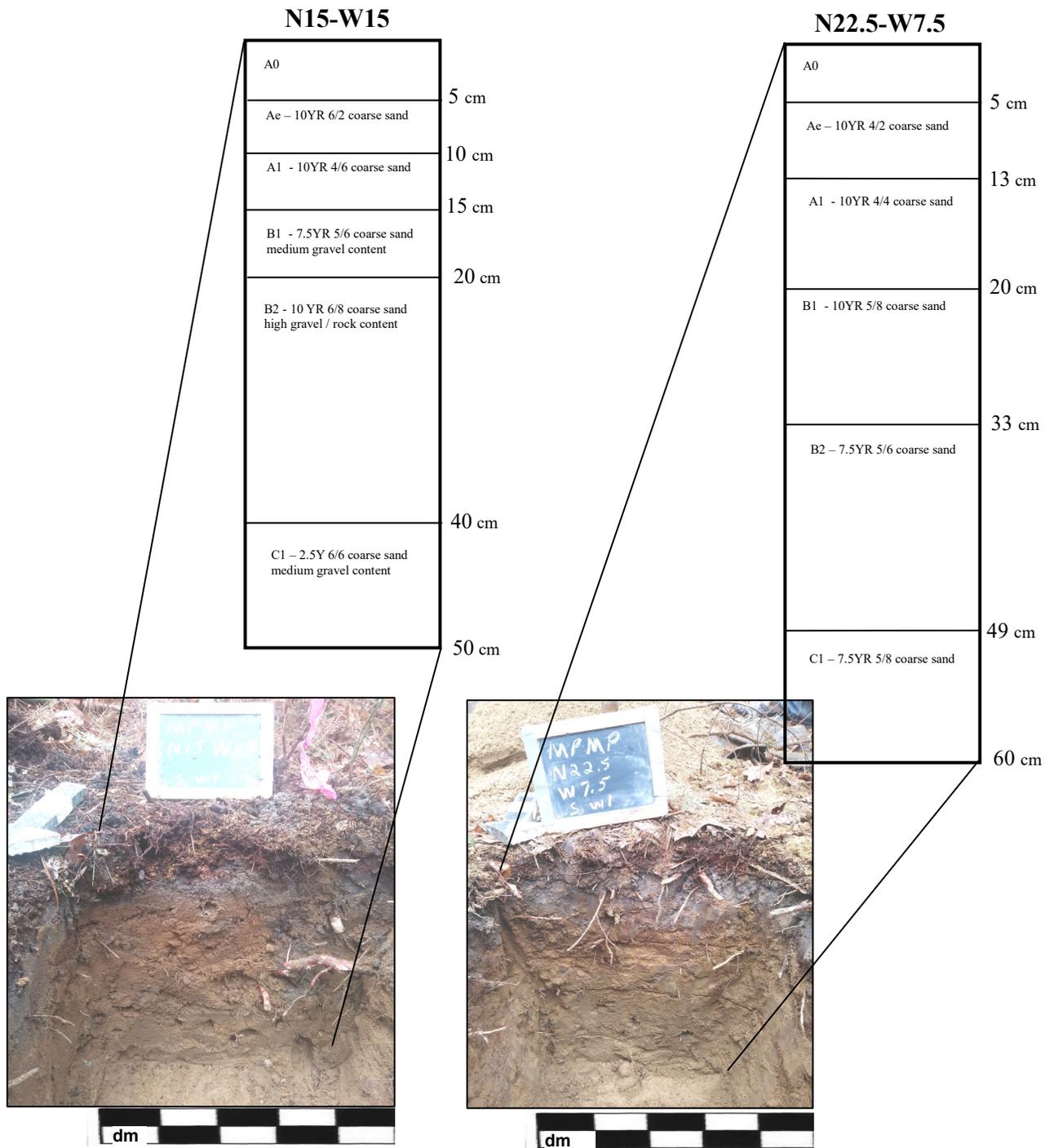


Figure 13: Stratigraphic Profiles. Stratigraphic profiles were relatively consistent throughout the project area. N15-W15 and N22.5-W7.5 represent typical profiles encountered during the survey, including mast cover to about 5 cm, followed by a dark grayish brown to light brownish gray (10YR 4/2 to 6/2) upper topsoil to about 12 cm, a dark yellowish brown (10YR 4/4 to 4/6) topsoil layer to about 18 or 20 cm, a strong brown to yellowish brown (7.5YR 5/6 to 10YR 5/8) upper subsoil to about 25 or 30 cm, a brownish yellow to strong brown (10YR 6/8 to 7.5YR 5/6) lower subsoil to about 45 to 50 cm or more, and an olive yellow (2.5Y 6/6) substratum to 60 cm or more below the surface.

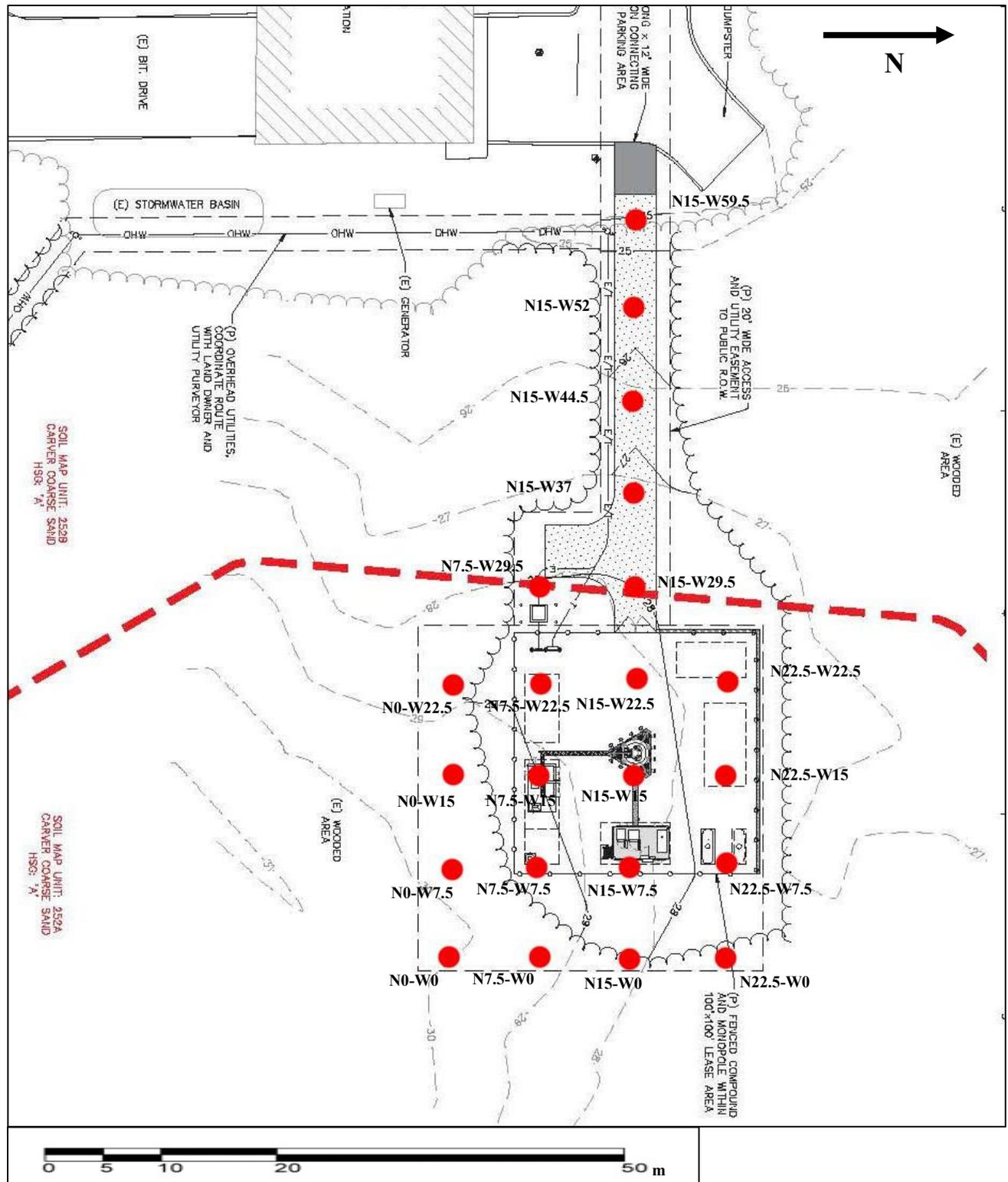


Figure 14: Distribution of Tests and Artifacts. 1:500 scale (20mm = 10m). Tests in graphic are not to scale – red dots show location of 50cm square tests at 7.5 meter intervals. No artifacts were recovered. Testing pattern depicted on the site plan drafted by Pro Terra Design Group, LLC of Hadley, Massachusetts, 2017 (see Figures 3 and 4 for larger project area context).

VII. Conclusion

A. Cultural Resource Summary

There were no cultural resources identified during the Phase I intensive (locational) archaeological survey of the project area. The excessively drained soils of the project area would have been highly conducive to prehistoric use and settlement, although the great distance to nearest substantial water source would have made intensive use less attractive. Historically, the project area was part of a larger lot belonging to the Keeter family, known to have associations with the Mashpee Wampanoags of the area, although no related artifacts or feature contexts were recorded. Despite relatively close proximity to the historic Red Brook Road that was laid out in the early 19th Century, there do not appear to have been historic developments within the project area.

B. Recommendations

In the absence of any cultural materials found within the proposed cell phone tower compound area and associated access road despite a high density of testing, ACS recommends no further archaeological conservation efforts for the proposed project. If site plans change substantially to include other parts of the larger project property, further survey work may be warranted following consultation with the Massachusetts Historical Commission (MHC).

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***Visual Impact Assessment of
Proposed Monopole Installation,
Mashpee, MA***

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April 17, 2018

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I. Project Purpose

As part of an effort to increase cellular telephone transmission and reception capabilities in lower Cape Cod, Blue Sky Towers, LLC has proposed the installation of a 150' monopole transmission tower in the Town of Mashpee to the rear of Fire station on Red Brook Road. The purpose of this historic property review was undertaken to determine if the proposed installation will have any visual impact or effect on 10 existing properties at the request of the Cape Cod Commission. A “visual impact” can be defined as any change in the visual environment, positive or negative, that influences a viewer’s ability to interpret the historic resource and the surrounding cultural landscape, whether it’s a building, an agricultural field, or a scenic view.

II. Methodology

Files at the Massachusetts Historic Commission (MHC) were reviewed to determine if any historic properties with the Area of Potential Effects (APE) had been previously identified. The presumed APE for visual effects for construction of new facilities from which the Tower will be visible is the area within a half mile from the tower site if the proposed Tower is 200 feet or less in overall height. Based on the proposed monopole height of 150', the visual APE for this undertaking is designated as 0.5 miles. The visual APE is shown on Figure 1.

Representative photographs were taken from the public right-of-way of properties within and outside of the 0.5 mile APE to determine if the monopole would be visible from the various resources. By assessing visual impact on identified properties within the APE, one can determine whether or not the proposed project would have a negative impact on those properties.

III. Survey

Ten properties within the APE were surveyed at the request of the Cape Cod Commission and based upon the MHC file review. No further historic properties within the 0.5 mile APE were identified during survey.

The ten resources within the APE (Table 1) were surveyed and are described below:

The first property (Plate 1) is the Cape Cod Children's Museum, located at 577 Great Neck Road South. The No-style structure is a 1-1/2 stories tall. It rests on a poured concrete foundation, is clad with a combination of brick and board-and-batten wood. It is capped by a side gabled, standing seam metal roof. Three ventilators are located at the ridge line. A deep overhang protects the two entrance doors located on the facade. According to the Town of Mashpee's Assessor records, the structure was built in 1960, and therefore potentially eligible for listing in the State and/or National Registers. The balloon test float was not visible from this location.

The second property (Plate 2) is a roadway and adjacent parking lot at the entrance to the Ockway Bay Landing docks. There is no structure to survey at this property. The balloon test float was not visible from this location.

The third property (Plate 3) is the Horatio Amos House, located at 701 Great Neck Road South. The Second Empire-style structure is two stories tall. It rests on a granite foundation, is clad with wooden shingle, and topped with a wood-shingled Mansard roof. The house is lit by 6/6

double-hung windows. Windows on the second floor are set in projecting dormers and flanked by wood, ornamental shingles. The structure was built in 1890, and is therefore potentially eligible for listing in the State and/or National Registers. The balloon test float was not visible from this location.

The fourth property (Plate 4) is the intersection of Sipps Road and Great Oak Road. This property contains multiple, modern vacation rental structures to the rear of the street entrance. The structures are not over 50 years old and are therefore not eligible for listing in the State and/or National Registers. The balloon test float was not visible from this location.

The fifth property (Plate 5, 6) is the South Sandwich School, also known as the Second South Mashpee School. The Greek Revival structure is two-stories tall, rests on a granite foundation, is clad with wood shingles, and topped with an end-gable, wood shingled roof with eave returns. Replacement windows are 6/6 double-hung sash. A hipped roof addition spans the facade. The structure was built in 1850, and is therefore potentially eligible for listing in the State and/or National Registers. The balloon test float was not visible from this location.

The sixth property (Plate 7) is a No-style, 1-1/2 story, side gable structure. A garage is attached to the eastern elevation, and a deep eaved porch spans the facade. This structure was constructed in 2001 and sits in the location of the former Gertrude Allen House, since demolished. The structure is not over 50 years old and is therefore not eligible for listing in the State and/or National Registers. The potential impact of the proposed monopole was not assessed. This property was surveyed to confirm that the historic structure previously on the site was razed and replaced with a contemporary structure.

The seventh property (Plate 8) contains no structures. This view is to establish a sight-line view south of Red Brook Road from just south of the proposed monopole location.

The eighth property (Plate 9) is the Mashpee Fire and Rescue Station No. 2, located at 101 Red Brook Road. It is a No-style, 1-1/2 story, T-plan structure. It rests on a poured concrete foundation, is clad with wood shingles, and topped with an asphalt shingled roof. Ornamental wood shingles are located in the upper portion of the front facing gable above the paired garage doors. The structure was constructed in 2008, and is not over 50 years old, therefore not eligible for listing in the State and/or National Registers. The balloon test float was visible from this location.

The ninth surveyed location (Plate 10) is from the intersection of Red Brook Road and Great Hay Road, to the west of the proposed monopole location. The balloon test float was not visible from this location.

The tenth surveyed location is 57 Blue Castle Drive (Plate 11,12). This address is an undeveloped lot on a soon to be developed road and neighborhood. The balloon test float was visible from this location.

Table 1. Surveyed Resources

Property	Address	SR/NR	Distance from Project Site	Plate Number
Cape Cod Children's Museum	577 Great Neck Road South	No	0.5 mi	1
Ockway Bay Landing	Great Neck Road South, south of Harbor Ridge Road	No	0.4 mi	2
Horatio Amos House	701 Great Neck Road South	No	0.35 mi	3
Intersection of Sipps Road/Great Oak Road	Sipps Road at Great Oak Road	No	0.4 mi	4
South Sandwich School/Second South Mashpee School	65 Red Brook Road	No	0.3 mi	5,6
Contemporary structure	66 Red Brook Road	No	0.3 mi	7
Red Brook Road	South of site of proposed monopole	No	0.08 mi	8
Mashpee Fire and Rescue Station No. 2	101 Red Brook Road	No	0.05 mi	9
Intersection of Red Brook Road/Great Hay Road	Red Brook Road at Great Hay Road	No	0.3 mi	10
Undeveloped lot	57 Blue Castle Drive	No	0.25 mi	11, 12

IV. Proposed Telecom Monopole Visual Effects

Visual effects occur as a result of the introduction of visual elements that diminish the historic integrity of historical resources and view corridors. Visual effects also can be caused by changes to physical features within the setting of properties that contribute to their historical significance. In these instances, the visual effects to the historical resources would be considered adverse, as defined in 36 CFR Part 800.

To quantify and illustrate the proposed monopole's likely effects, Nicolas Avery took photographs of the ten properties located within the APE. A "visual impact" can be defined as any change in the visual environment, positive or negative, that influences a viewer's ability to interpret the historic resource and the surrounding cultural landscape, whether it's a building, an agricultural field, or a scenic view. There is no "minimum" number of properties within a historic district that must be affected by a proposed installation before a historical resource is considered impacted; a historical resource either is or is not affected, and if it is affected, the effect is either adverse or not adverse. The introduction of an element that is out of scale or out of character with the historical resource, such as the monopole, draws the attention of the viewer towards the out-of-scale element.

By ranking the level of visual effect, one can assess the level of effect the undertaking would have on the community, from "no effect" to "no adverse effect" to "adverse effect." This can be done by comparing the viewsheds in the existing environment to those viewsheds taken in the

direction of the proposed monopole and determining the level of contrast between the two. By comparing the visual contrast between the two views, one can determine the level of effect.

If the lead Federal agency, MHC, and State Historic Preservation Officer find no contrast between the images, it can be determined there will be no effect. This situation would only be found in the event that the monopole was not constructed. If it is found that there is a weak contrast between the before and after views, it can be said that there will be no adverse effect in the undertaking. It is when a moderate or strong contrast is created that the project would be found to have an adverse effect.

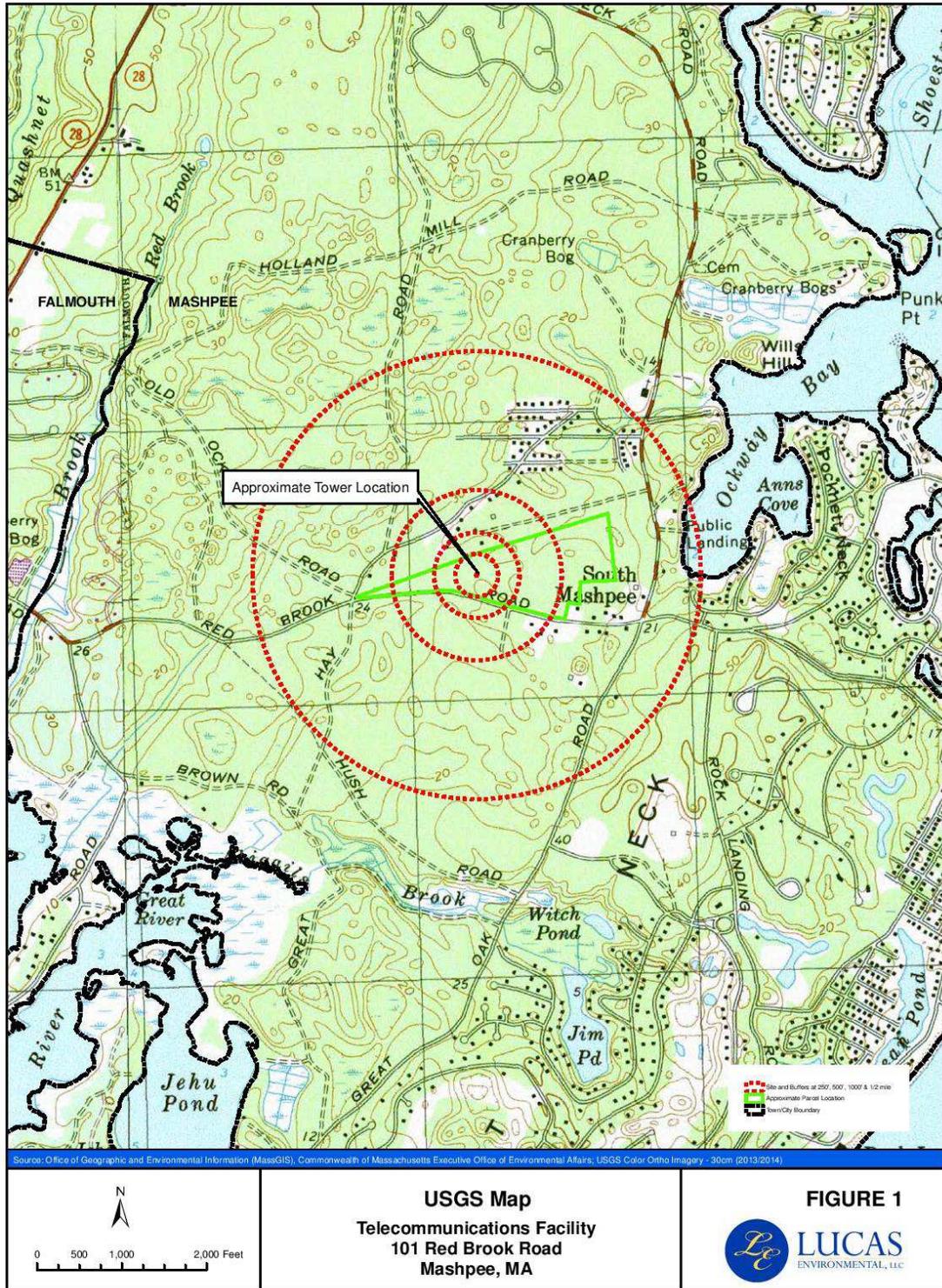
Based on photography and field survey, the proposed undertaking will be visible from two of the ten resources surveyed. See information in Table 2 below:

Table 2. Determination of Effect

Property	SR/NR	Determination	Explanation of Determination	Plate Number
Cape Cod Children's Museum	No	No adverse Effect	The structure is located within the APE. Due to vegetation and topography, the monopole will not be visible from the structure, therefore the installation will have no adverse effect on this resource.	1
Ockway Bay Landing	No	No adverse Effect	The property is located within the APE. There are no structures present. Due to vegetation and topography, the monopole will not be visible from the property, therefore the installation will have no adverse effect on this resource.	2
Horatio Amos House	No	No adverse Effect	The property is located within the APE. Due to vegetation and topography, the monopole will not be visible from the structure, therefore the installation will have no adverse effect on this resource.	3
Intersection Sipps Road/Great Oak Road	No	No adverse Effect	The property is located within the APE. There are no historic structures present. Due to vegetation and topography, the monopole will not be visible from the property, therefore the installation will have no adverse effect on this resource.	4
South Sandwich School/Second South Mashpee School	No	No adverse Effect	The property is located within the APE. Due to vegetation and topography, the monopole will not be visible from the structure, therefore the installation will have no adverse effect on this resource	5, 6
Contemporary structure	No	Not assessed	Not assessed	7
View south on Red Brook Road	No	No adverse Effect	The property is located within the APE. There are no structures present. Due to vegetation and topography, the monopole will not be visible from the property, therefore the installation will have no adverse effect on this resource.	8
Mashpee Fire and Rescue Station No. 2	No	No adverse Effect	The property is located within the APE. This is not a historic structure. The proposed monopole	9

Property	SR/NR	Determin- ation	Explanation of Determination	Plate Number
			installation is visible from this resource and therefore has the potential for effect.	
Intersection Red Brook Road/Great Hay Road	No	No adverse effect	The intersection is located within the APE. Due to vegetation and topography, the monopole will not be visible from this location, therefore the installation will have no adverse effect.	10
57 Blue Castle Road	No	No adverse Effect	The property is located within the APE. There are no historic structures present. The proposed monopole installation will be visible from this location and therefore has the potential for effect.	11, 12

Figure 1. Project Location and APE



USGS Map
Telecommunications Facility
101 Red Brook Road
Mashpee, MA

FIGURE 1
 **LUCAS**
 ENVIRONMENTAL, LLC

Figure 2. Resource Locations

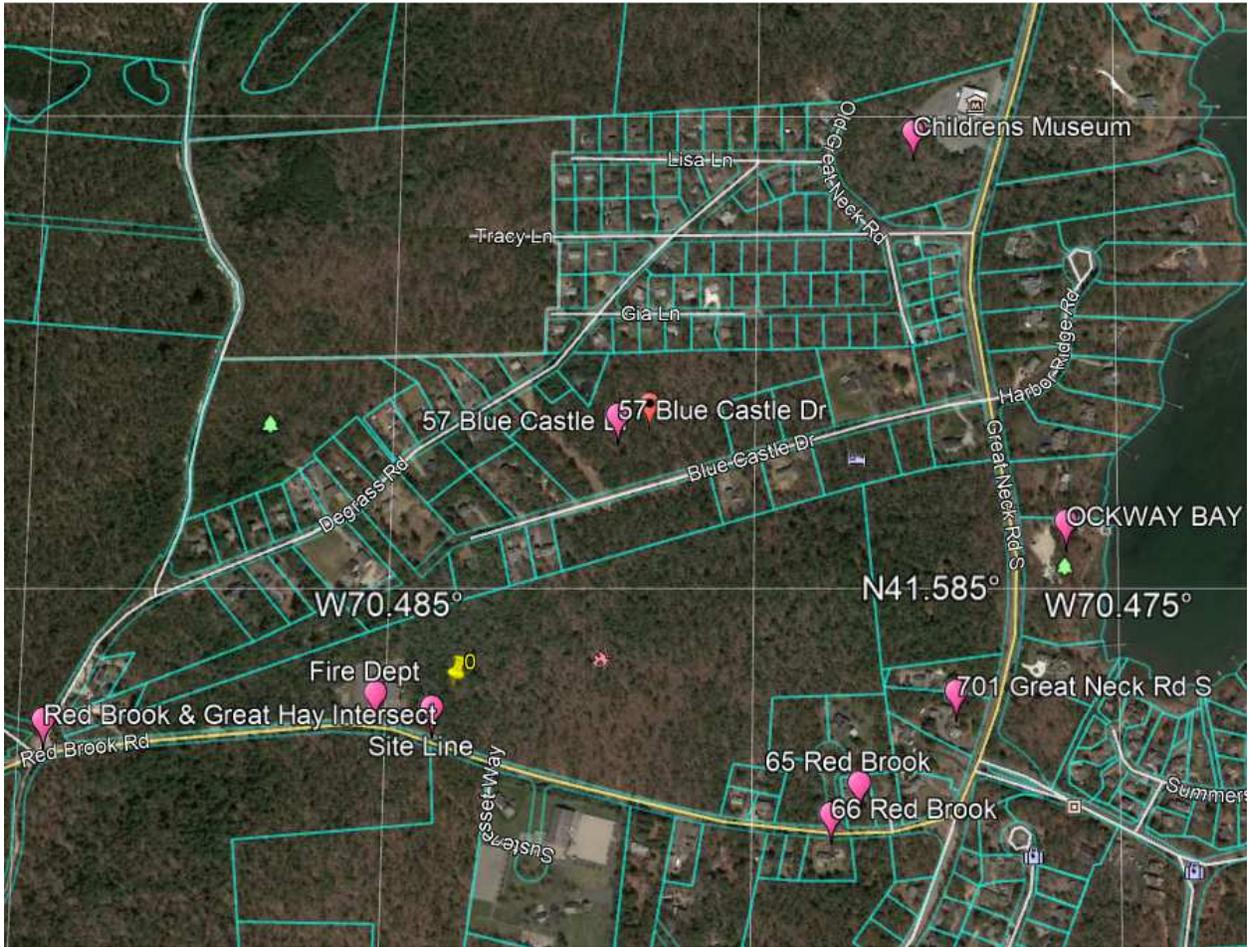


Figure 3. Photo Key

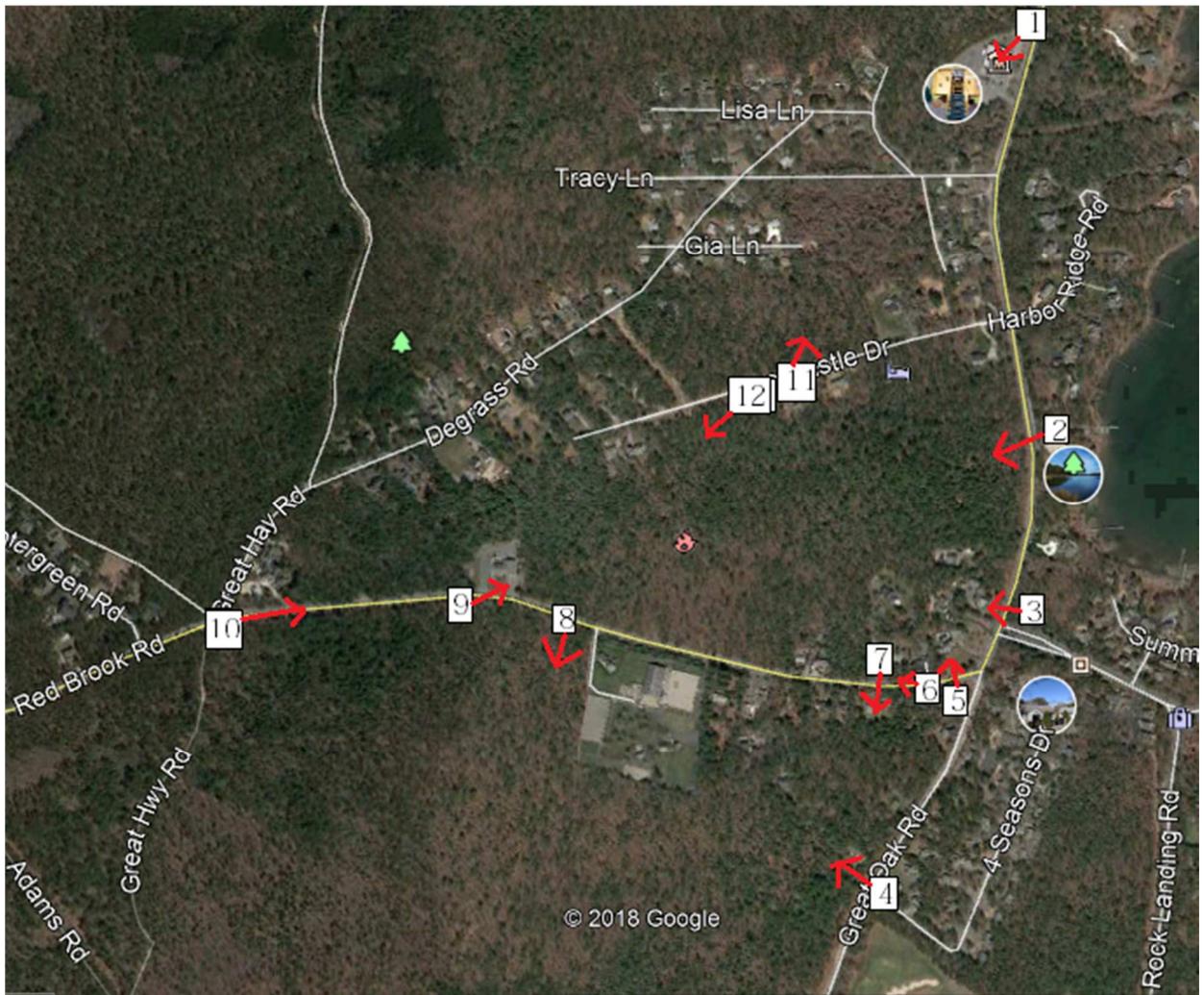


Plate 1. Cape Cod Children's Museum. View Southwest.



Plate 2. View from Ockway Bay Landing entrance. View Southwest.



Plate 3. Horatio Amos House. View West.



Plate 4. Intersection of Sipps Road and Great Oak Road. View Northwest.



Plate 5. South Sandwich School/Second South Mashpee School. View North.



Plate 6. View west from South Sandwich School/Second Sound Mashpee School toward proposed monopole location.



Plate 7. Contemporary structure on Red Brook Road.



Plate 8. Sight-line view south on Red Brook Road just south of proposed monopole location.



Plate 9. Mashpee Fire and Rescue Station No. 2. View Northeast.



Plate 10. Intersection of Red Brook Road and Great Hay Way. View East.



Plate 11. 57 Blue Castle Drive. View Northeast.



Plate 12. View toward balloon test float from 57 Blue Castle Drive. View southwest.



Sources

www.mashpeema.gov/assessing. Accessed 4/14/2018.

Viewshed Mapping Package

Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2
101 Red Brook Road
Mashpee, MA 02649

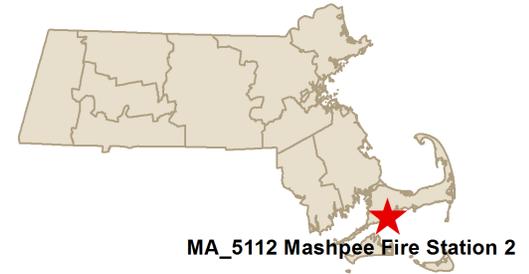
- Proposed new 150.0 ft AGL Monopole antenna structure
- Viewshed map completed 4/13/18
- Balloon test and viewshed verification completed 4/13/18

Package prepared by:

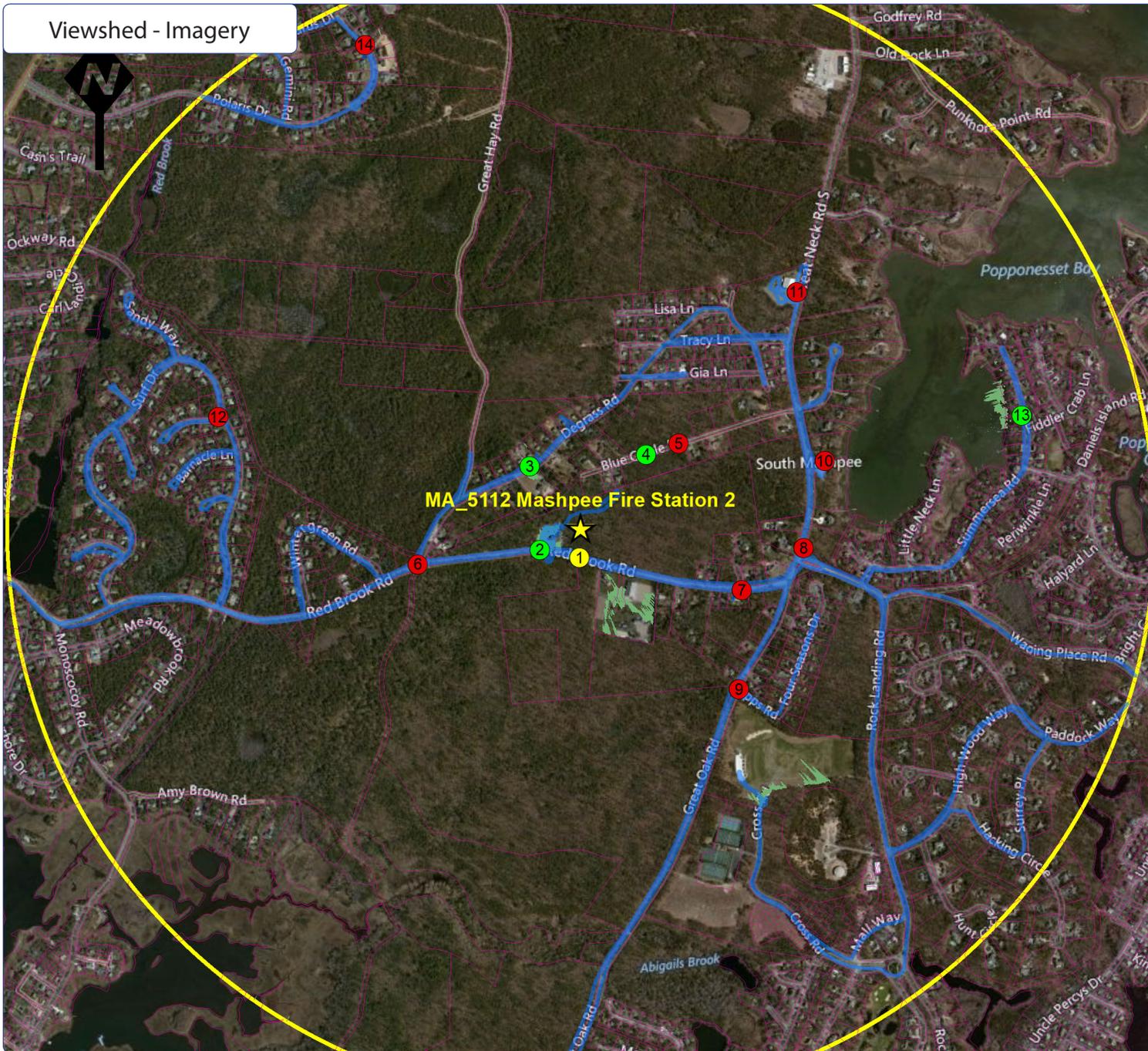
Virtual Site Simulations, LLC
28 Caswell Street
Suite 100
Narragansett, Rhode Island 02882

www.VirtualSiteSimulations.com
www.ThinkVSSFirst.com

Viewshed analysis maps and representations contained herein depict where proposed facility may potentially be visible based on the best data available and site conditions at the time data was collected. This study does not claim to depict all locations from where the facility may be potentially visible.



Viewshed - Imagery



Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2

101 Red Brook Road

Mashpee, MA 02649

Legend:

- Facility Location
- 1 Mile Radius
- Reconnaissance Track Log
- Photo location -Balloon visible
- Year Round Visibility
- Photo location -Balloon visible
- Obstructed Visibility
- Photo location -Balloon NOT visible
- Predicted Visibility Area

Statistics:

PROJ_DESC=Geographic (Lat/Long) / WGS84 / arc degrees
 PROJ_DATUM=WGS84 PROJ_UNITS=arc degrees
 PIXEL WIDTH=0.0000013 arc degrees (+/- .6 ft)
 PIXEL HEIGHT=0.0000014 arc degrees(+/- .6 ft)
 RADIUS (FT)= 1 Mile
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 RECEIVER_HEIGHT (Ft-AGL)= 5 Ft
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Notes:

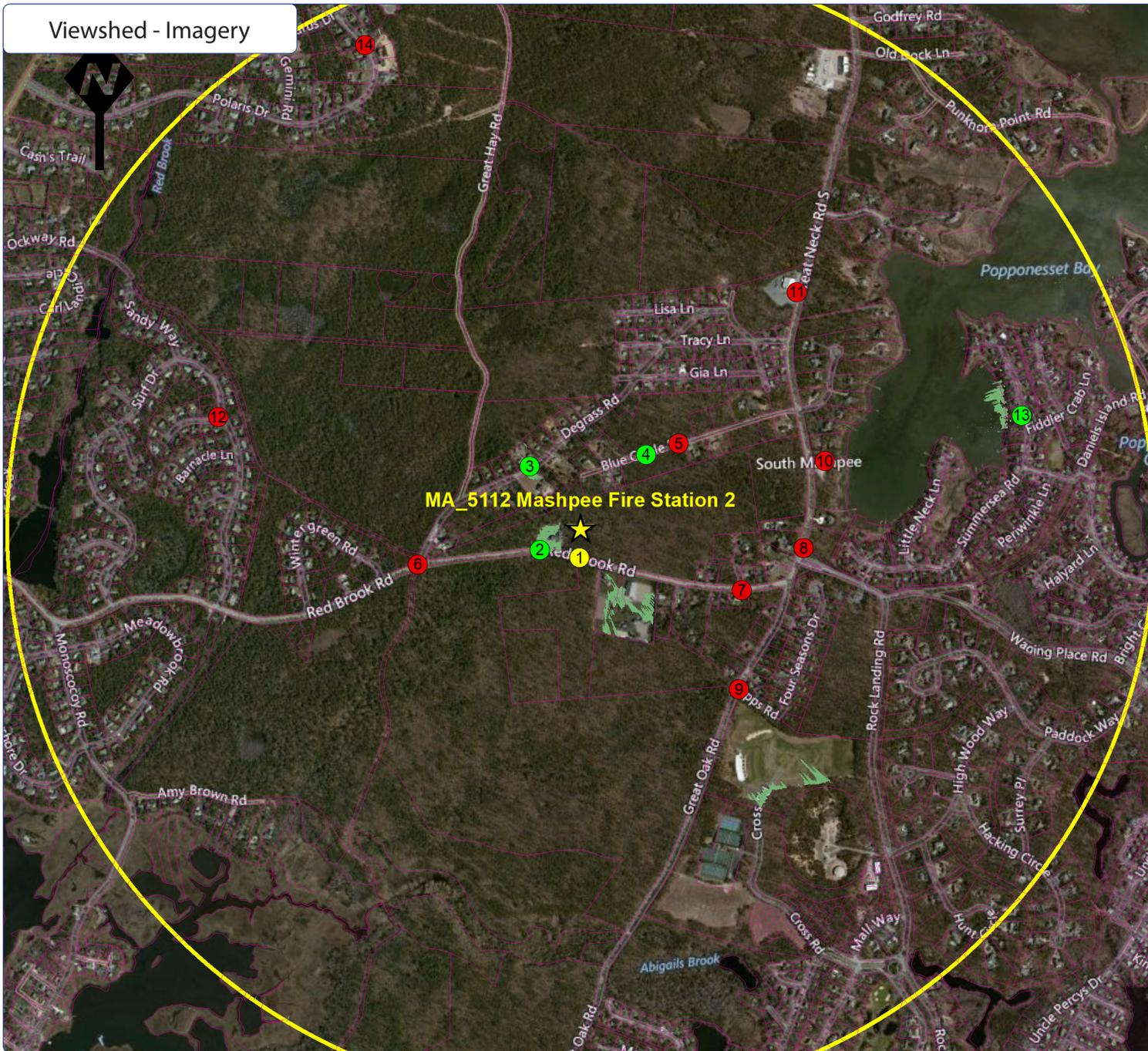
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- Tower location(lat/long NAD 83): 41.58414 -70.48419
- Data Sources noted on documentation page attached



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Viewshed - Imagery



Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2

101 Red Brook Road

Mashpee, MA 02649

Legend:

★ Facility Location ○ 1 Mile Radius

- ⊗ Photo location -Balloon visible
- Year Round Visibility
- ⊗ Photo location -Balloon visible
- Obstructed Visibility
- ⊗ Photo location -Balloon NOT visible

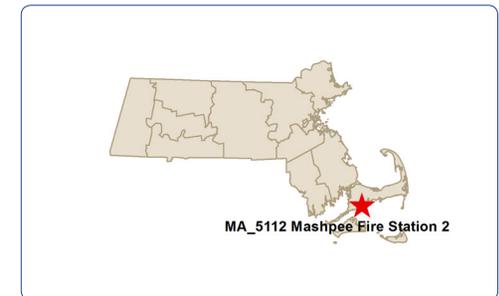
■ Predicted Visibility Area

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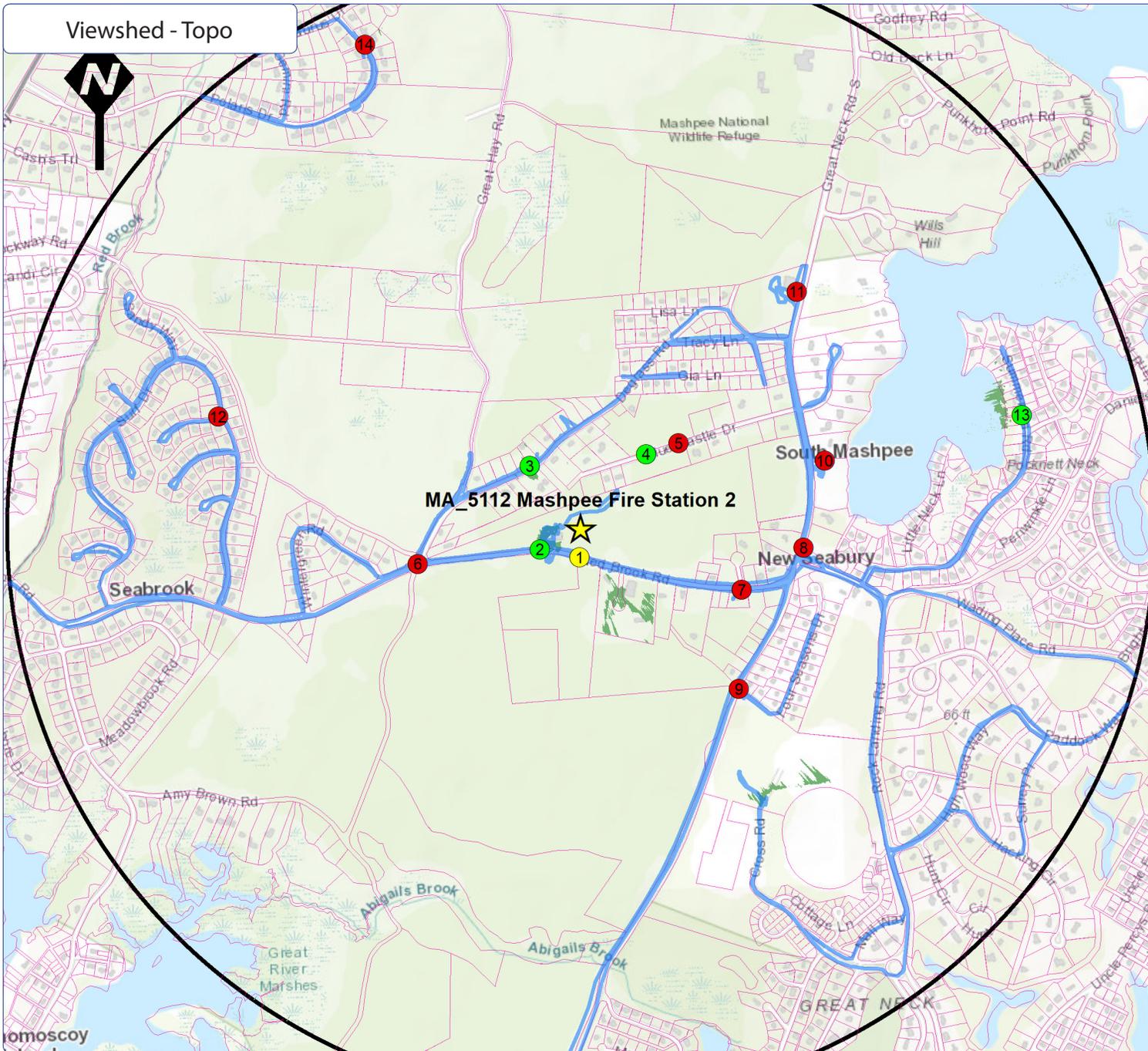
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Viewshed - Topo



Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2
 101 Red Brook Road
 Mashpee, MA 02649

Legend:

- Facility Location
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Notes:

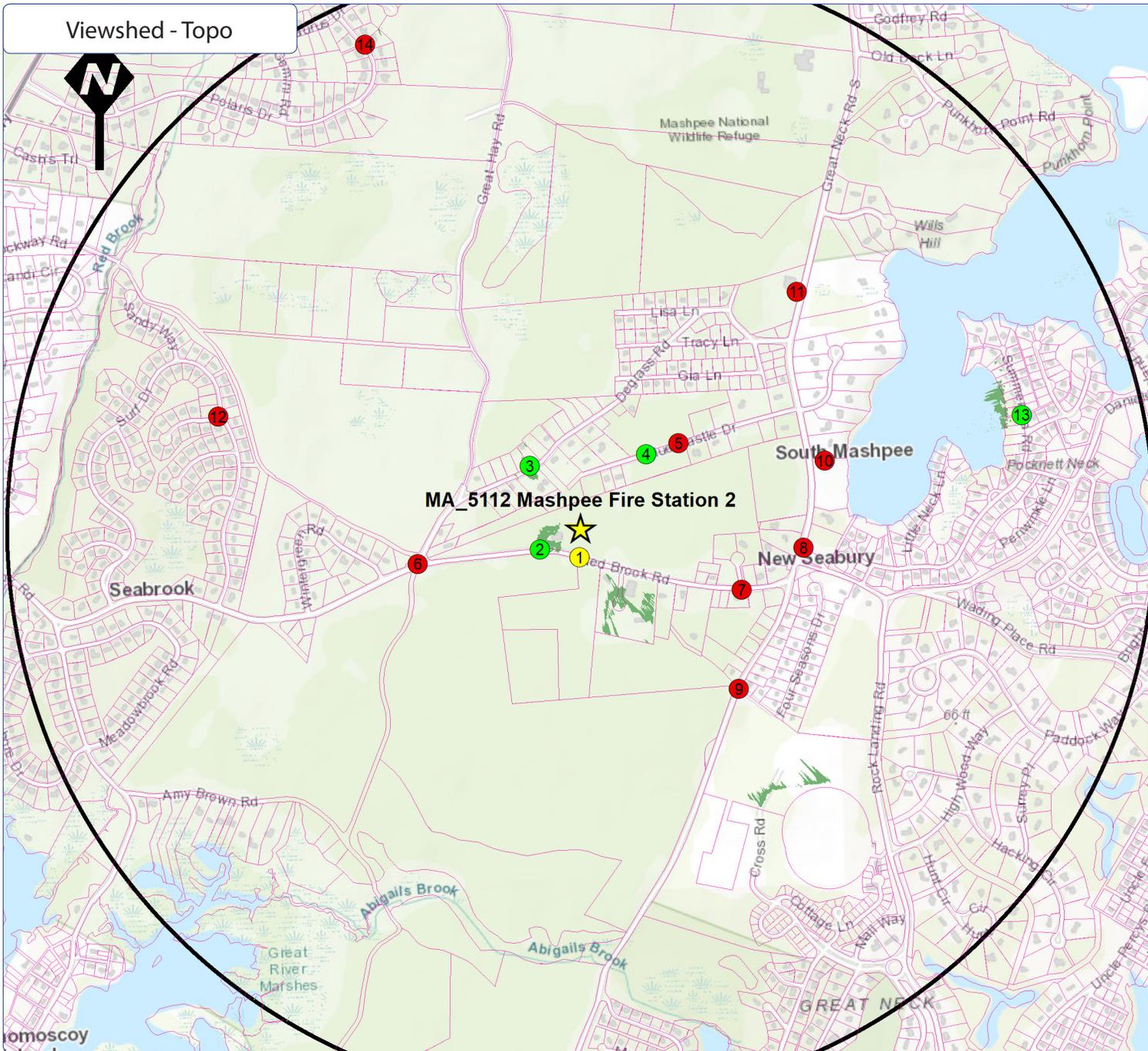
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Viewshed - Topo



Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2
 101 Red Brook Road
 Mashpee, MA 02649

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- Tower location(lat/long NAD 83): 41.58414 -70.48419
- Data Sources noted on documentation page attached



Viewshed analysis maps and representations contained herein depict where proposed facility may potentially be visible based on the best data available and site conditions at the time data was collected. This study does not claim to depict all locations from where the facility may be potentially visible.



Photographic Simulation Package

Proposed Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2
101 Red Brook Road
Mashpee, MA 02649

- Balloon Test Conducted 4/14/18
- Proposed New 150 foot Monopole

Package prepared by:

Virtual Site Simulations, LLC
28 Caswell Street
Suite 100
Narragansett, Rhode Island 02882

www.VirtualSiteSimulations.com
www.ThinkVSSFirst.com

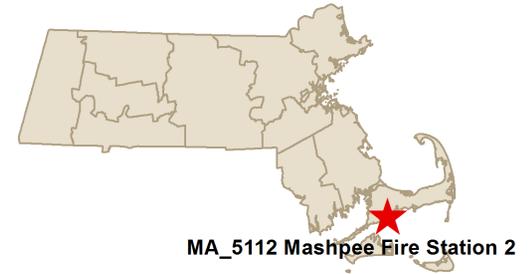
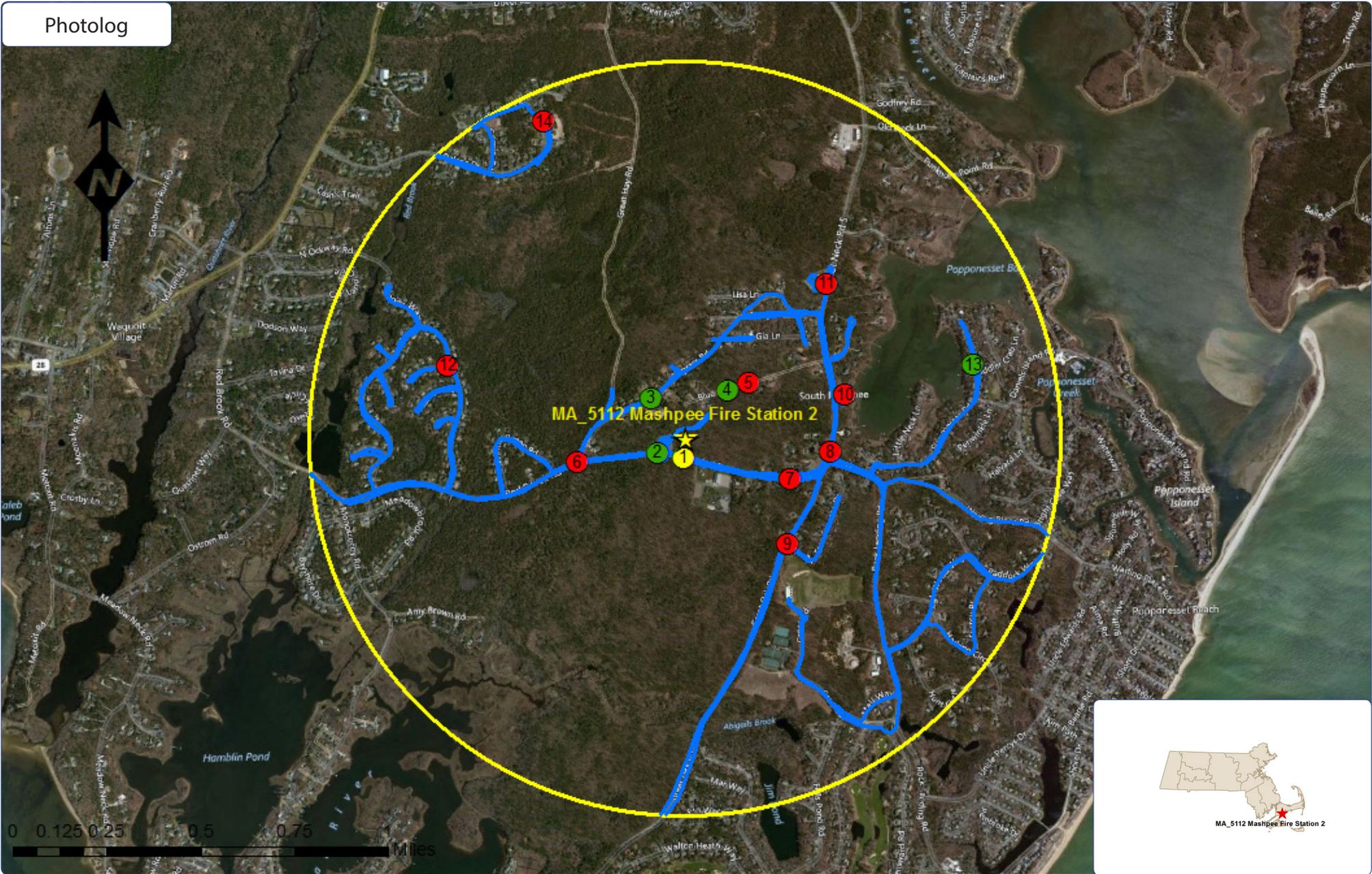


Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution





Wireless Telecommunications Facility:

MA_5112 Mashpee Fire Station 2
 101 Red Brook Road
 Mashpee, MA 02649

Legend:

- ★ Facility Location
- 1 Mile Radius
- Reconnaissance Track Log
- ⊗ Photo location - Balloon visible - Year Round Visibility
- ⊙ Photo location - Balloon visible - Obscured Visibility
- ⊗ Photo location - Balloon NOT visible

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
1	126-216 Red Brook Rd	41.5834 -70.48426	270.46 Feet	South	4	Obscured

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
1	126-216 Red Brook Rd	41.5834	-70.48426	270.46 Feet	South	4	Obscured

Site: MA-5112 Mashpee Fire Station 2

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
2	218-228 Red Brook Rd	41.58363 -70.48558	422.63 Feet	South-West	64	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
2	218-228 Red Brook Rd	41.58363 -70.48558	422.63 Feet	South-West	64	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
3	95-103 Degrass Rd	41.58574 -70.48585	0.14 Miles	North-West	142	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
3	95-103 Degrass Rd	41.58574 -70.48585	0.14 Miles	North-West	142	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
3	95-103 Degrass Rd	41.58574	-70.48585	0.14 Miles	North-West	142	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Existing



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
4	56 Blue Castle Dr	41.58596 -70.48193	0.17 Miles	North-East	223	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
4	56 Blue Castle Dr	41.58596 -70.48193	0.17 Miles	North-East	223	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Simulation



Photo #	Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
4	56 Blue Castle Dr	41.58596	-70.48193	0.17 Miles	North-East	223	Year Round

Site: MA-5112 Mashpee Fire Station 2

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Existing

Balloon not visible from this location



Photo #	Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
5	48-56 Blue Castle Dr	41.58621 -70.48083	0.23 Miles	North-East	230	Not Visible

Site: MA-5112 Mashpee Fire Station 2

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