
RF Report

Proposed Wireless Facility
Site MA2712 Chappaquiddick
(14 Sampson Ave, Edgartown, MA)



June 9, 2017

TABLE OF CONTENTS

- 1. Overview 1
- 2. Introduction 1
- 3. The Proposed Facility 2
- 3. Coverage Objectives 3
- 4. Site Search, Selection Process and Alternate Candidates 4
- 5. Pertinent Site Data 5
- 6. Coverage Analysis and Propagation Plots 6
- 8. Feasibility of Alternative Technologies 7
- 9. Summary 8
- 10. Statement of Certification 8
- 11. Attachments 9

LIST OF TABLES

- Table 1: AT&T Site Information Used in Coverage Analysis 5

ATTACHMENTS

- Exhibit 1: MA2712 Chappaquiddick - Neighbor Sites
- Exhibit 2: MA2712 Chappaquiddick - AT&T 850 MHz Coverage without Proposed Facility
- Exhibit 3: MA2712 Chappaquiddick - AT&T 850 MHz UMTS Coverage with Proposed Site
- Exhibit 4: MA2712 Chappaquiddick – Area Terrain Map
- Exhibit 5: Terrain View – Existing, Proposed and Candidates Considered

1. Overview

This RF Report has been prepared on behalf of New Cingular Wireless PCS, LLC (“AT&T”) in support of its application to the Town of Edgartown Planning Board and the Martha’s Vineyard Commission, for approval to construct, operate and maintain a wireless telecommunications facility (“Facility”) on the property at 14 Sampson Avenue in Edgartown, MA (Parcel ID: Map 34, Lot 197), herein referred to as the “Site”. The proposed permanent facility will replace the temporary facility currently in operation and consists of a 115-foot monopole tower and externally mounted antennas. AT&T’s equipment will remain within the existing 24’ x 24’ outbuilding. The new tower will replace the existing 84-foot guyed tower and the 104-foot temporary ballast-mounted tower currently supporting AT&T’s internally-mounted antennas.

This report concludes that the proposed Sampson Road facility is needed in order for AT&T to replace and enhance the existing coverage in this area of Edgartown provided by AT&T’s existing temporary facility and confirms that there are no other suitable existing structures that meet AT&T’s coverage objective to provide reliable service to the subject area. The proposed “Facility” will fill coverage gaps and improve deficient areas of service that will otherwise exist in AT&T’s network on Chappaquiddick Island and the neighboring beaches in Edgartown.

Included in this package is: a brief summary of the site’s coverage objectives, maps showing AT&T’s current network plan, and predicted Radio Frequency coverage of the subject site and the surrounding sites in AT&T’s network.

2. Introduction

AT&T provides digital communications voice and data services using 3rd Generation (3G) UMTS technology in the 850 MHz and 1900 MHz frequency band, and is in the midst of deploying advanced 4th Generation (4G) data services over LTE technology in the 700 MHz, PCS, AWS and WCS frequency bands as licensed by the FCC. As part of their network expansion and enhancement in Massachusetts and elsewhere in the United States, the 4G LTE (Long Term Evolution) network rollout will build on the existing 3G data services that utilize UMTS technology. These data networks are used by mobile devices for fast web browsing, media streaming, high-definition voice calls, and other applications that require broadband connections. The mobile devices that benefit from these advanced data networks are not limited to basic handheld phones, but also include devices such as smartphones, PDA’s, tablets, and laptop air-cards. With the evolving rollout of 4G LTE services and devices, AT&T customers will have even faster connections to people, information, and entertainment.

To maintain a reliable and robust communications system for the residents, businesses, vacationers, public safety workers and others who use its network, AT&T deploys a network of cell sites (also called wireless communications facilities) throughout the areas in which it is licensed to provide service. These cell sites consist of antennas mounted on structures such as water tanks, buildings and towers and, related radio and power equipment.

Due to the terrain characteristics and the distances between AT&T’s existing sites and the targeted coverage area, AT&T’s options are quite limited to address the existing coverage gaps on Chappaquiddick and other areas of Edgartown that existed prior to the installation of the temporary facility.

AT&T’s network requires the strategic deployment of antenna structures throughout the area to be covered, which are connected to receivers and transmitters that operate in a limited geographic area known as a “cell.” Mobile subscriber handsets and wireless devices operate by transmitting and receiving low power radio frequency signals to and from these cell sites. The signals are transferred through ground telephone lines (or other means of backhaul transport) and routed to their destinations by sophisticated electronic equipment.

The size of the area served by each cell site is dependent on several factors including the number of antennas used, the height at which the antennas are deployed, the topography of the surrounding land, vegetative cover, and natural or man-made obstructions in the area. As customers move throughout the service area, the transmission from the portable device is automatically transferred to the AT&T facility having the best reception, without interruption in service, provided that there is overlapping coverage between the cells. The actual service area at any given time also depends on the number of customers who are on the network in range of the serving cell site.

In order for AT&T's network to function effectively, there must be adequate but not excessive overlapping coverage between the "serving cell" and adjoining cells. This not only allows access to the network, but once connected, allows for the transfer or "hand-off" of calls from one cell to another, and prevents unintended disconnections and slow data rates.

AT&T's antennas must also be located high enough above ground level to allow transmission (a.k.a. propagation) of the radio frequency signals above trees, buildings and other natural or man-made structures that may obstruct or diminish the signals. Areas without adequate radio frequency coverage have substandard service, characterized by poor voice quality, dropped and blocked calls, slow data connections and transmissions, or no wireless service at all. These areas are commonly referred to as "coverage gaps".

We have concluded that by installing the proposed facility at Sampson Road at an antenna centerline height of 113' above ground level (AGL), AT&T will be able to continue to fill a substantial gap in coverage that would otherwise exist on Chappaquiddick and continue to provide reliable coverage to many residents located within that coverage gap.

3. The Proposed Facility

As shown on the plans submitted with the zoning application, AT&T's proposal consists principally of the following elements:

- 1) A 115' self-support monopole tower within the leased area;
- 2) AT&T equipment cabinets within the leased area of an existing outbuilding;
- 3) Coaxial cable and fiber running in underground conduits from outbuilding to the new monopole tower;
- 4) Nine 8-foot tall panel antennas (three per sector) at an antenna centerline height of 113' above ground level (AGL), mounted on a V-frame structure at the top of the monopole tower;
- 5) Remote Radio Heads (RRH's) with accessory junction boxes and surge suppressors mounted behind the antennas;
- 6) Installation of 6' tall stockade fence around HVAC condenser units adjacent to the existing outbuilding;
- 7) Removal of the temporary ballast-mounted tower and associated stockade fence upon completion of the proposed monopole tower;
- 8) Relocation of all antennas from the existing MV WiFi guyed tower to the proposed tower and subsequent removal of guyed tower upon completion of tower construction and antenna relocations;

3. Coverage Objectives

As mentioned above, AT&T provides 3G digital cellular communications service and wireless data services using UMTS technology in the 850 MHz and 1900 MHz frequency bands and is in the process of deploying its 4G LTE service in the 700 MHz, 1900 MHz, AWS and WCS frequency bands, as licensed by the FCC. AT&T's 4G LTE service offers high-definition voice calls along with high-speed wireless broadband and data at 4G LTE speeds. AT&T is expanding and enhancing their wireless services throughout New England by filling in existing coverage gaps and addressing capacity, interference, and high-speed broadband issues. As part of this effort, AT&T determined that significant coverage gaps exist in the Town of Edgartown and on Chappaquiddick Island. Specifically, AT&T confirmed through baseline drive testing that most of Chappaquiddick Island lacks reliable coverage and furthermore, that only peripheral coastal coverage exists from sites located in Oak Bluffs and other areas of Edgartown.

A permanent site strategically situated on Chappaquiddick is needed to address this deficiency in service. The proposed facility will provide coverage to a substantial area of Chappaquiddick including:

- Chappaquiddick/Dike Road and the roads and areas between Chappaquiddick Road and Pocha Road,
- Narragansett Ave, Litchfield and Pocha Roads, Jeffers Lane, Lighthouse Road, the beaches, and the residential and community areas in the vicinity of the above noted roads.

The proposed permanent facility will provide improved call quality and data reliability for AT&T's existing 3G platform and will enable the deployment of their 4G LTE services for both residential and seasonal users residing or traveling through the aforementioned areas.

As noted in the introduction, wireless communications is no longer limited to just providing mobility for voice services. It has evolved into a wider range of advanced services to include high definition voice, video calls, and broadband wireless data, all in a mobile environment. In order for AT&T to offer these competitive services to more residents, businesses and commuters traveling in and through Edgartown and Chappaquiddick, they need to first improve the quality of their coverage by filling in as many of the existing gaps as possible with signal strengths conducive to "reliable in-building" service.

While AT&T holds licenses in the 700 MHz, 850 MHz (Cellular), 1900 MHz (PCS), AWS and WCS bands in Duke County, for simplicity, this report focuses on the 850 MHz UMTS coverage since it is this layer that is currently in operation at the temporary facility and is providing AT&T service for subscribers in the area. Once the permanent facility is constructed, AT&T plans to deploy additional spectrum layers to accommodate the demand from summer traffic to Chappaquiddick and the neighboring beaches in Edgartown.

It should be noted that in addition to providing the needed fill-in network coverage and connectivity, AT&T is providing enhanced services for Public Safety and meeting E911 compliance for the Commonwealth of Massachusetts.

It is worthy to note here that according to the CDC, nearly one-half of American homes (49.3%) had only wireless telephones (aka: cell phones) during the first half of 2016, an increase of almost 2.0 percentage points since the first half of 2015.¹ It is also important to note that 70% of all 911 calls are placed from wireless phones.

¹ Taken from Center for Disease Control (CDC) National Health Interview Survey Early Release Program <https://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless201612.pdf>

4. Site Search, Selection Process and Alternate Candidates

To find a site that provides acceptable service and fills the gaps in coverage, computer modeling software is used to define a search area. The search ring identifies the area within which a site could be located (assuming that sufficient height is used) that would have a high probability of meeting the coverage and capacity objectives established by the AT&T RF (Radio Frequency) engineers.

Once a search ring is determined, AT&T's real estate specialists search within the defined area for existing buildings, smokestacks, towers and other structures of sufficient height that would meet the defined objectives. If none are found, then the focus shifts to "raw land" sites. Even if a site meets the technical objectives established by the RF engineers it can still be rejected if it does not meet the requirements of AT&T's Real Estate and Construction departments. Every effort is made to use existing structures before pursuing a "raw land" build to minimize the number of towers throughout the towns being serviced. AT&T currently utilizes existing structures within Edgartown and the surrounding towns on the Martha's Vineyard for their wireless facilities.

AT&T's search of the area identified the existing MV WiFi (a/k/a Chappy WISP) tower as the only structure on Chappaquiddick of any substantial height that might perhaps be capable of meeting AT&T's coverage objectives for the area.

Upon further investigation of the Chappy WISP tower and a subsequent structural analysis, it was determined that the existing 84-foot guyed tower was not structurally capable of supporting the proposed 10-foot extension and AT&T's antennas, coaxial cables and associated equipment. The Edgartown Planning Board approved the installation of the existing temporary facility, consisting of a 104' ballast-mounted guyed tower and associated equipment, as an interim solution until a permanent solution could be identified, designed, permitted and constructed.

Toward this effort, predictive analyses were run on 139 three and three-plus acre parcels to determine which parcels could potentially meet AT&T's coverage objectives for the target area. The analysis found 56 parcels that could potentially meet AT&T's coverage objective, assuming a "raw land" tower build was feasible on any one of the parcels approved by the RF analysis. Certified letters were then submitted by AT&T's real estate specialists to 52 of the property owners identified and one was contacted by telephone. (Three of the 56 parcels identified had common owners.) Upon the receipt of all responses and the subsequent submittal of proposals to the interested parties, only three owners opted to negotiate terms. Of those three properties, one was excluded based upon a lack of viable access. AT&T has fully executed leases for the remaining two properties, in addition to 14 Sampson Avenue: 2 Majane Lane and 14 Jeremiah Road. However, because of the existing use of the property for wireless communications purposes, the opportunity to replace the existing Chappy WISP tower (thereby minimizing the number of towers within Edgartown and Chappaquiddick), and that a facility at this location would provide adequate coverage to AT&T's substantial gap in its wireless network, AT&T determined that a facility at 14 Sampson Avenue achieved the greatest balance between the purpose and intent of the Town of Edgartown Zoning Bylaw while also meeting AT&T's need to provide adequate coverage to the Coverage Objectives.

5. Pertinent Site Data

Table 2 below details the site-specific information used to perform the coverage analysis and generate the coverage plots provided herein.

Site ID	Latitude	Longitude	Antenna Hgt (Ft)	Sector ID	Antenna Azimuth	Antenna Model	Antenna Mech. DT	Propagation Distance (mi.)	ERP
MAU1038	41.4201	-70.5917	118	Alpha	30	80010764_0866-MHz_P45pol_02DT	-2	8	47.42
MAU1038	41.4201	-70.5917	118	Beta	150	80010764_0866-MHz_P45pol_02DT	-2	8	47.42
MAU1038	41.4201	-70.5917	118	Gamma	270	80010764_0866-MHz_P45pol_02DT	-2	8	47.42
MAU1169	41.4548	-70.5947	39	Alpha	90	SBNHH-1D65A_0850_02DT	0	8	46.3
MAU1169	41.4548	-70.5947	39	Beta	210	SBNHH-1D65A_0850_02DT	0	8	46.3
MAU1169	41.4548	-70.5947	39	Gamma	330	SBNHH-1D65A_0850_02DT	0	8	46.3
MAV1132	41.3844	-70.5245	156	Alpha	30	80010122_0850-MHz_M45pol_08DT	0	8	45.93
MAV1132	41.3844	-70.5245	156	Beta	150	80010122_0850-MHz_M45pol_10DT	0	8	45.81
MAV1132	41.3844	-70.5245	156	Gamma	270	80010122_0850-MHz_M45pol_04DT	0	8	46
MAU1221	41.4401	-70.5799	62	Alpha	30	742264V01_0862-MHz_P45pol_14DT	0	8	46.42
MAU1221	41.4401	-70.5799	62	Beta	150	742264V01_0862-MHz_P45pol_14DT	0	8	46.35
MAU1221	41.4401	-70.5799	62	Gamma	270	742264V01_0862-MHz_P45pol_10DT	0	8	46.77
MAV1264	41.4015	-70.6705	65	Alpha	30	80010121_0850-MHz_P45pol_0DT	0	8	46.21
MAV1264	41.4015	-70.6705	65	Beta	150	80010121_0850-MHz_P45pol_0DT	0	8	46.21
MAV1264	41.4015	-70.6705	65	Gamma	270	80010121_0850-MHz_P45pol_0DT	0	8	46.21
MAV1265	41.3862	-70.6116	70.8	Alpha	30	80010122_0850-MHz_M45pol_0DT	0	8	47.54
MAV1265	41.3862	-70.6116	70.8	Beta	150	80010122_0850-MHz_M45pol_0DT	0	8	47.54
MAV1265	41.3862	-70.6116	70.8	Gamma	270	80010122_0850-MHz_M45pol_02DT	0	8	47.62
MAV1289	41.4454	-70.6135	58	Alpha	30	80010121_0850-MHz_M45pol_12DT	0	8	45.65
MAV1289	41.4454	-70.6135	58	Beta	150	80010121_0850-MHz_M45pol_02DT	0	8	46.35
MAV1289	41.4454	-70.6135	58	Gamma	270	80010121_0850-MHz_M45pol_08DT	0	8	46.56
MAV1374	41.4568	-70.5602	53	Alpha	20	80010121_0850-MHz_M45pol_05DT	0	10	46.89
MAV1374	41.4568	-70.5602	53	Beta	75	80010121_0850-MHz_M45pol_05DT	0	10	46.89
MAV1374	41.4568	-70.5602	53	Gamma	290	80010121_0850-MHz_M45pol_04DT	0	10	46.86
MAV1133	41.6037	-70.4887	220	Alpha	30	80010121_0850-MHz_M45pol_02DT	-5	20	44.25
MAV1133	41.6037	-70.4887	220	Beta	150	80010121_0850-MHz_M45pol_03DT	-4	20	44.08
MAV1133	41.6037	-70.4887	220	Gamma	270	80010121_0850-MHz_M45pol_00DT	-5	20	44.25
MAV1121	41.5589	-70.5956	334	Alpha	30	80010122_0850-MHz_M45pol_08DT	0	20	46.35
MAV1121	41.5589	-70.5956	334	Beta	150	80010122_0850-MHz_M45pol_06DT	0	20	46.39
MAV1121	41.5589	-70.5956	334	Gamma	270	80010122_0850-MHz_M45pol_08DT	0	20	46.35
MA2712	41.3724	-70.4707	113	Alpha	30	HPA_65R_BUU_H8_65pol_0DT	0	8	42.95
MA2712	41.3724	-70.4707	113	Beta	170	HPA_65R_BUU_H8_65pol_0DT	0	8	42.95
MA2712	41.3724	-70.4707	113	Gamma	270	HPA_65R_BUU_H8_65pol_0DT	0	8	42.95

Table 1: AT&T Site Information Used in Coverage Analysis²

² Some sites listed in this table are outside the plot view but are included for completeness of information.

6. Coverage Analysis and Propagation Plots

The signal propagation coverage plots provided in this report show coverage for the 850 MHz frequency range and were produced using deciBel Planner™, a Windows-based RF propagation computer modeling program and network planning tool. The software takes into account the geographical features of an area (terrain and land cover), antenna models, antenna heights, RF transmitting frequencies and power, and receiver thresholds to predict coverage and other related RF parameters used in site design and wireless network expansion. The propagation models used to generate the predictive coverage plots contained within this report are based on actual drive test data for the subject area and resultant tuned propagation models.

On February 3, 2016 baseline and CW (continuous wave) drive tests were performed on Chappaquiddick Island to collect the data needed to validate and potentially “tune” the propagation models used for the predictive analyses. A DB586-XC omnidirectional antenna was mounted to the top of the existing Chappy WISP tower at a height of 91 feet above ground level (AGL). A test signal of known frequency and power was broadcast from a portable test transmitter and antenna via coaxial cable to the antenna. Signal strength data was measured and recorded over approximately 28 miles of pre-defined roads within the target area.

Concurrent with the CW data collection, baseline data of AT&T’s existing 850 MHz UMTS network was recorded along the same roads. The baseline data was used to both validate the 850 MHz model tuned from the CW drive test and, to verify the extent of the coverage gaps on Chappaquiddick. The subsequent coverage plots provided in this report have been generated using the tuned model from the February 3, 2016 CW data collection.³

The coverage plots show coverage based on the minimum required signal strength needed to support AT&T’s 3G service offerings (represented by the areas shown in green and orange). All other areas (depicted in red and white) are below AT&T’s design criteria for reliable service for this area. While network connections may be possible in the areas depicted as white, service may be characterized by poor voice and data quality, slow data speeds, and the substantial likelihood of unreliable service or complete inability to connect to the network.

The plots included as attachments show coverage based on RSRP signal strengths of -75 dBm, -85 dBm and -90 dBm. All other areas (depicted in white) fall within coverage areas characterized by poor service quality, low data throughput, and the substantial likelihood of unreliable service. The star symbols represent existing, proposed, and planned AT&T site locations.

Exhibits 1 through 5 are included as attachments to this report are discussed below:

- **Exhibit 1** titled: “MA2712 Chappaquiddick - Neighbor Sites” provides a “zoomed-out” view showing the locations of AT&T’s existing sites in Edgartown and Oak Bluffs relative to the proposed site. Other existing AT&T sites in neighboring towns that may be contributing to the aggregate coverage within Chappaquiddick are outside the plot view of this exhibit. On this plot are shown two existing AT&T sites; one in Edgartown and one in Oak Bluffs, along with a planned future AT&T site at the

³ It is important to note that winter drive test data is not optimal for propagation model tuning due to the lack of foliage. For this reason, minimal adjustments were made to the model where applicable. These adjustments are based on reasonable and standard engineering in the wireless industry. It is important to note that where the predictive coverage is based on full foliage conditions, winter drive test data will typically show comparatively stronger signal strengths.

Katama Farms Silo. It should also be noted that the existing sites are between three and 7.5 miles away from the proposed "Site".

- **Exhibit 2** titled: "MA2712 Chappaquiddick - AT&T 850 MHz Coverage without Proposed Facility" shows the 850 MHz coverage on Chappaquiddick without the coverage from temporary facility or the proposed site. As shown in this plot and described in the Coverage Objectives section of this report, without the temporary or proposed permanent facility at the proposed location, there is a substantial gap in coverage on Chappaquiddick and other areas of Edgartown.
- **Exhibit 3** titled: "MA2712 Chappaquiddick - AT&T 850 MHz UMTS Coverage with Proposed Site" shows the composite coverage of the proposed "Facility" combined with the coverage from the existing AT&T neighboring sites. In comparison with **Exhibit 2**, this plot shows the areas of improvement based on AT&T's coverage thresholds. As can be seen, the proposed site will bring the much needed coverage to a substantial portion of Chappaquiddick and the areas described in **Section 3** – "Coverage Objective".
- **Exhibit 4:** titled: "MA2712 Chappaquiddick – Existing AT&T 850 MHz UMTS Coverage with Phone Baseline Drive Data" provides measured verification of the coverage deficiency on Chappaquiddick. Each colored point represents a 30-square-meter bin where multiple samples were collected and recorded. This plot validates the predictive models used in the analysis and shows that AT&T service is either deficient or completely unavailable for the majority of roads tested.
- **Exhibit 5** titled: "MA2712 Chappaquiddick – Area Terrain Map" details the terrain features of the area which play a key role in determining site locations and defining the unique coverage achieved from a given location. The significance of this exhibit is the location of the proposed site and the relative ground elevation of the surrounding topography, and the "Coverage Objectives".

8. Feasibility of Alternative Technologies

The area where service is needed in this application is a wide area of poor or no service. Microcells or repeaters are better suited to small areas for fill in use and/or commercial in-building service, such as stadiums, large office complexes, university campuses and transportation tunnels. Repeaters offer no added capacity for the network, and require a line of site donor facility which can be difficult in the defining terrain of the area.

With respect to distributed antennas systems ("DAS"), we note that these are generally lower power, low gain systems used in high traffic areas (i.e. capacity demand) which rely on a combination of fiber optics, transmitting antenna sites and a base station facility. The service requirements in this area of Edgartown relate to coverage on a macro level as opposed to a discrete system such as a DAS network. Based on the overall lack of coverage in and near Chappaquiddick, the size of the geographic area sought to be covered, terrain, vegetation, and other obstructions, and lack of existing infrastructure upon which DAS nodes could be mounted in large areas of the Coverage Objective, a DAS is not an appropriate solution to address this significant gap in AT&T's wireless network coverage.

9. Summary

AT&T has determined that significant gaps exist within its network in much of Edgartown and especially on Chappaquiddick Island. In order to minimize the number of new towers in the area, during its search for a viable site AT&T focused on the one parcel on Chappaquiddick with an existing tower. While there may be other locations that could theoretically meet AT&T's coverage and capacity objectives, the selection of any other location site would mean an additional tower on Chappaquiddick in addition to the existing Chappy WISP Tower.

Given the topographical features of the area and the location of the surrounding facilities, AT&T determined the proposed 115' tower at the Sampson Road location (the "Site") to be the most feasible solution to meeting its network needs for the target area. The "Site" is uniquely suited because of; the existing use of the Site for wireless communications purposes, the opportunity to replace the existing Chappy WISP tower (thereby minimizing the number of towers within Edgartown and Chappaquiddick), its location relative to the targeted coverage areas, the surrounding topography and neighboring AT&T sites. As discussed in this report and shown in the accompanying maps, the proposed facility will provide much of the fill-in coverage needed for the previously defined "Coverage Objectives". Without a wireless facility comparable to the proposed "Site" significant gaps in service will exist on Chappaquiddick and other areas of Edgartown. AT&T therefore requests that the Town of Edgartown and the Martha's Vineyard Commission grant the relief requested in its application.

10. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate.



Dan Goulet
C Squared Systems, LLC

June 9, 2017

Date

11. Attachments

Exhibit 1: MA2712 Chappaquiddick - Neighbor Sites

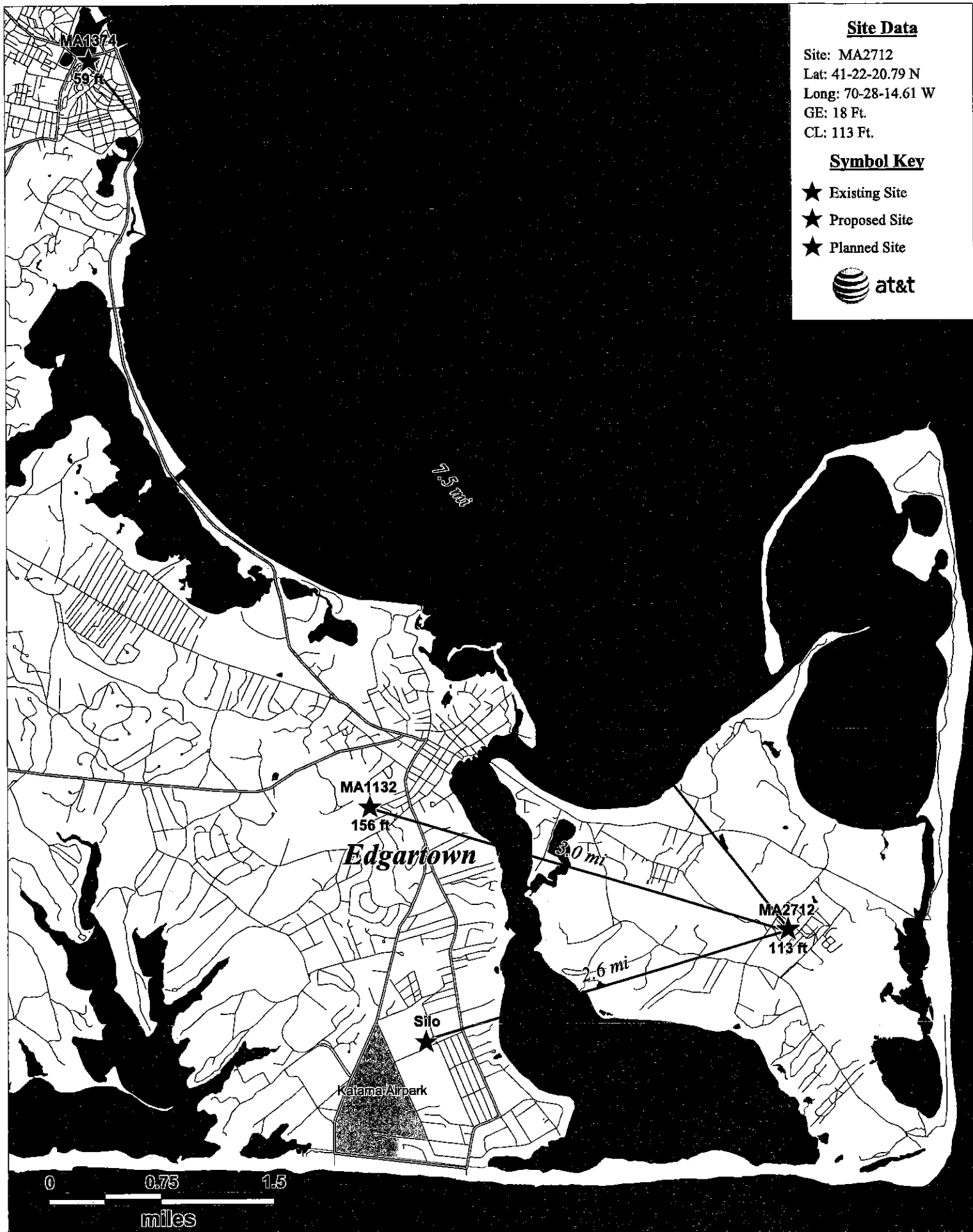


Exhibit 2: MA2712 Chappaquiddick - AT&T 850 MHz Coverage without Proposed Facility

Site Data

Site: MA5931
Lat: 41-22-20 N
Long: 70-28-14 W
GE: 22 Ft.
CL: 100 Ft.

Plot Information

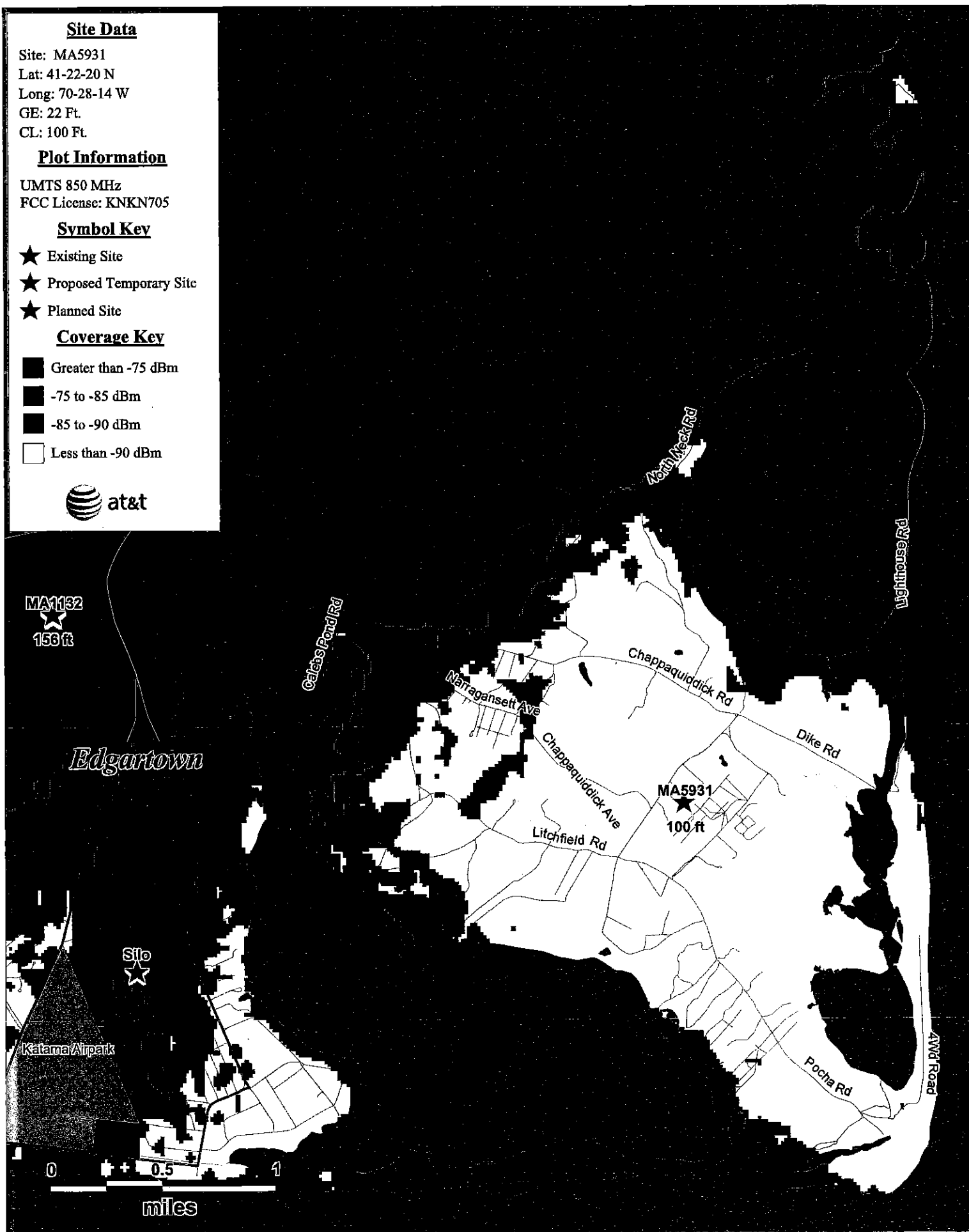
UMTS 850 MHz
FCC License: KNKN705

Symbol Key

- ★ Existing Site
- ★ Proposed Temporary Site
- ★ Planned Site

Coverage Key

- Greater than -75 dBm
- -75 to -85 dBm
- -85 to -90 dBm
- Less than -90 dBm



MA1132
★
153 ft

Edgartown

Sifo
★

Katama Airpark

0 + 0.5 1

miles

Exhibit 3: MA2712 Chappaquiddick - Existing AT&T 850 MHz UMTS Coverage with Proposed Site

Site Data

Site: MA2712
Lat: 41-22-20.79 N
Long: 70-28-14.61 W
GE: 18 Ft.
CL: 113 Ft.

Plot Information

UMTS 850 MHz
FCC License: KNKN705

Symbol Key

- ★ Existing Site
- ★ Proposed Site
- ★ Planned Site

Coverage Key

- Greater than -75 dBm
- -75 to -85 dBm
- -85 to -90 dBm
- Less than -90 dBm

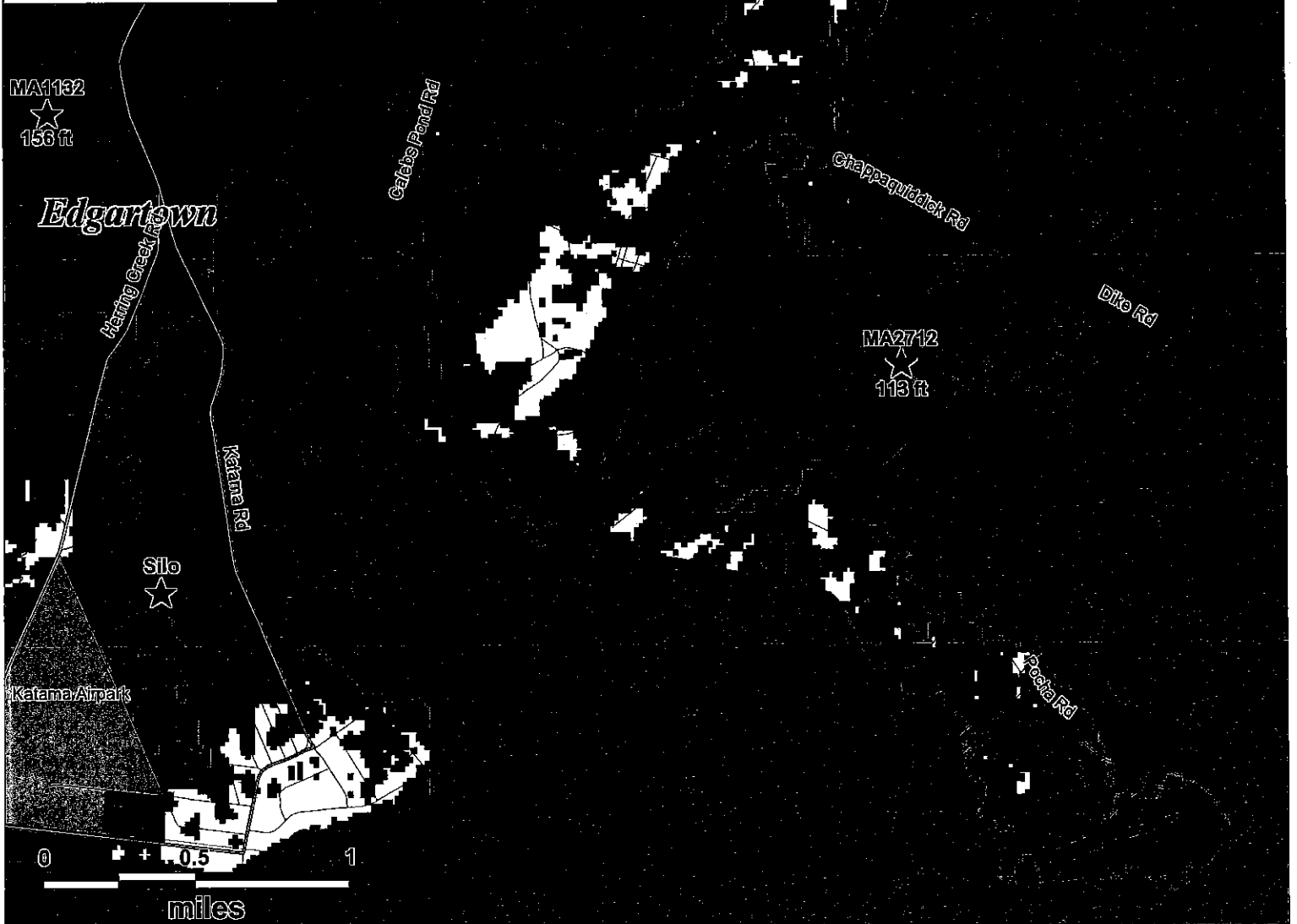


Exhibit 4: MA2712 Chappaquiddick: Existing 850 MHz UMTS Coverage with Phone Baseline Drive Data

Plot Information

UMTS 850 MHz
FCC License: KNKN705

Symbol Key

- ★ Existing Site
- ★ Proposed Temporary Site
- ★ Planned Site

Coverage Key

- Greater than -75 dBm
- -75 to -85 dBm
- -85 to -90 dBm
- Less than -90 dBm

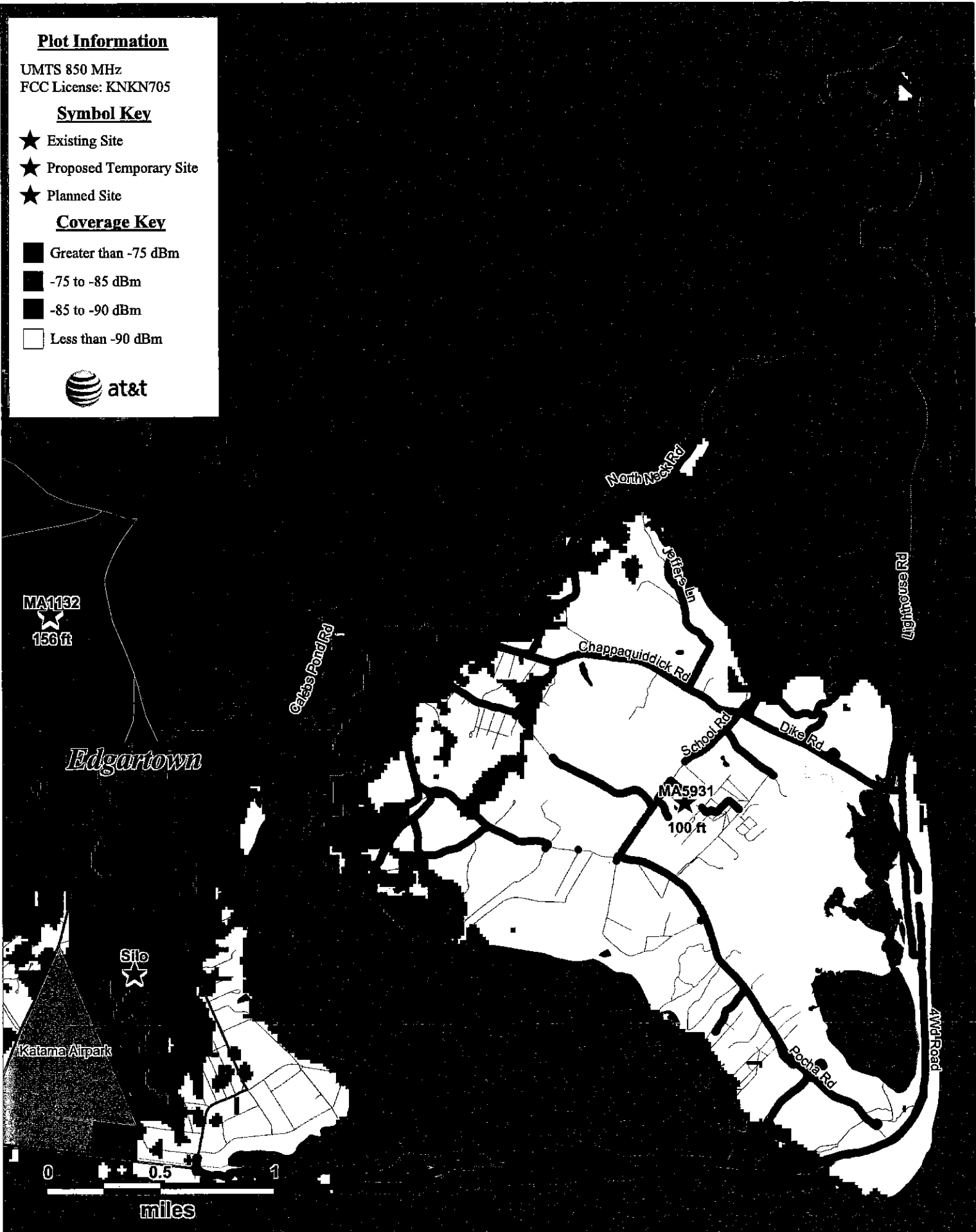


Exhibit 5: MA2712 Chappaquiddick - Area Terrain Map

Site Data

Site: MA2712
Lat: 41-22-20.79 N
Long: 70-28-14.61 W
GE: 18 Ft.
CL: 113 Ft.

Terrain Key

- 10 feet
- 20 feet
- 30 feet
- 40 feet
- 50 feet
- 60 feet
- 70 feet

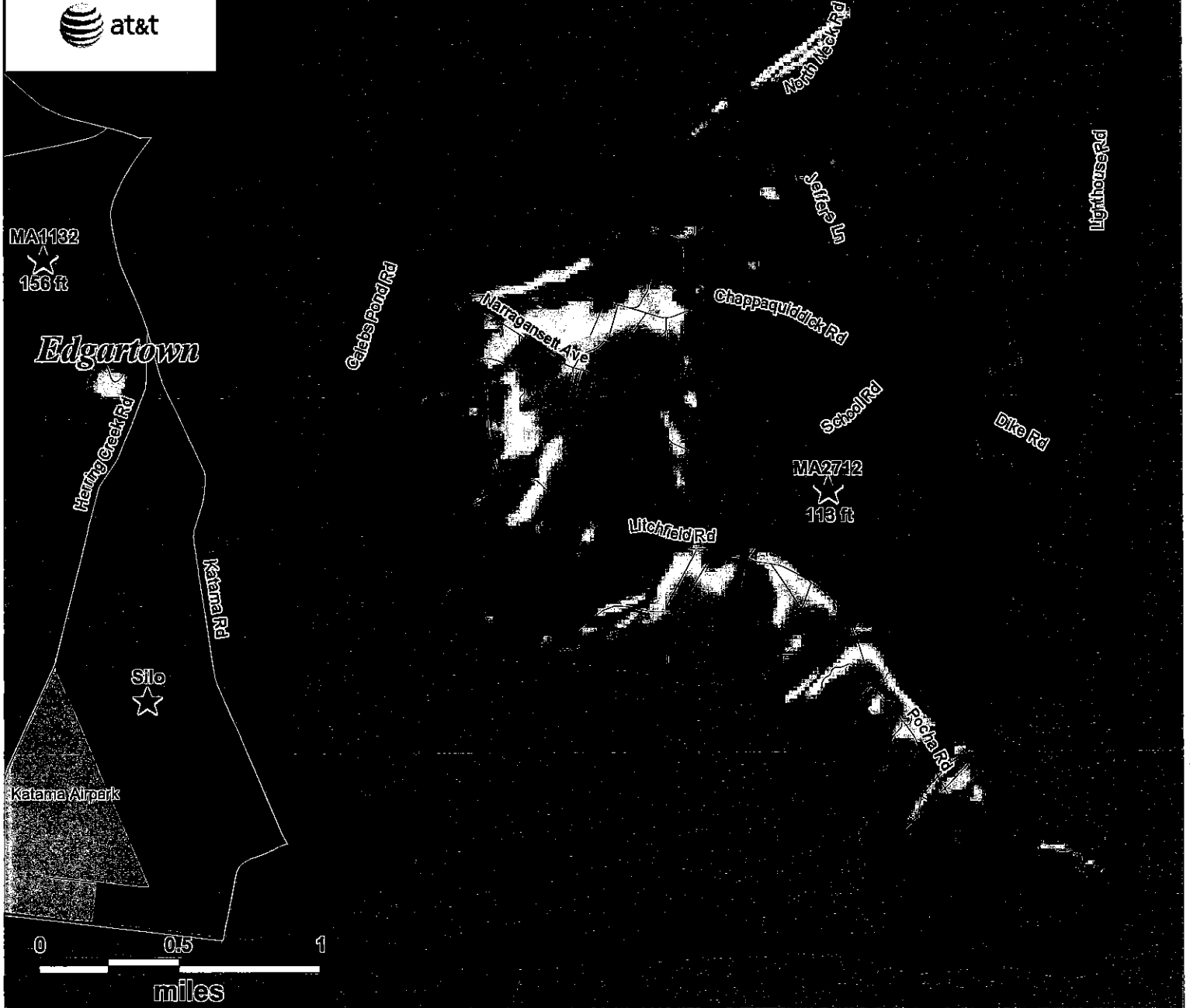


Exhibit 6: MA2712 Chappaquiddick – Candidates Evaluated

Candidate Designation	Map/Lot	Address	Lot Size	Lat	Long	GE
B10	Map 35/Lot 28	109 Litchfield Rd.	5.30	41.37276	-70.48518	80'
B5	Map 34/Lot 230.1	3 plp'n Cir.	3.10	41.36918	-70.46780	18
B8	Map 34/Lot 32.115	30 Ambers Way	4.49	41.37466	-70.47612	24'
C10	Map 34/Lot 8.3	121 Litchfield Rd.	3.30	41.37197	-70.48325	60'
C5	Map 34/Lot 225	4 MacGregor Ln.	3.00	41.36988	-70.46699	18'
C7	Map 34/Lot 54	12 Jason Dr.	3.00	41.36663	-70.47319	58'
C8	Map 34/Lot 245	24 Old Indian Tr.	3.70	41.37498	-70.47792	31'
D10	Map 34/Lot 8.2	119 Litchfield Rd.	3.00	41.37144	-70.48402	58'
D8	Map 34/Lot 246	20 Old Indian Trail	5.00	41.37397	-70.47661	22'
E10	Map 34/Lot 8.1	117 Litchfield Rd.	3.00	41.37084	-70.48473	56'
E7	Map 47/Lot 98.22	9 Windward Rd.	3.33	41.36544	-70.47316	55'
E8	Map 34/Lot 235.1	36 Old Indisn Tr.	3.92	41.37561	-70.48069	41'
F10	Map 34/Lot 9.1	127 Litchfield St.	3.00	41.37129	-70.48226	39'
G	Map 34/Lot 197	14 Sampson Avenue	0.53	41.37231	-70.47065	19'
G14	Map 47/Lot 98.1	4 Windward Rd.	9.30	41.36531	-70.47018	39'
H10	Map 34/Lot 10	135 Litchfield Rd.	4.80	41.37062	-70.48160	27'
H9	Map 34/Lot 15.1	142 Litchfield Rd.	3.10	41.36932	-70.48143	37'
I9	Map 34/Lot 15.2	3 Old Pocha Rd.	3.20	41.36851	-70.48200	38'
J9	Map 34/Lot 15.3	5 Old Pocha Rd.	5.40	41.36771	-70.48288	25'
K14	Map 34/Lot 230.5	31 Pocha Rd.	3.30	41.36771	-70.46994	28'
K7	Map 34/Lot 39	8 Quaxmox Rd.	5.93	41.36608	-70.47843	44'
L7	Map 34/Lot 37	19 Jerimiah Rd.	3.60	41.36602	-70.47996	45'
M	Map 31/Lot 169.1	155 Chappaquiddick	6.12	41.38231	-70.48189	44'
M7	Map 34/Lot 39.2	2 Quammox Rd.	9.29	41.36687	-70.47766	43'
N7	Map 34/Lot 39.3	5 Chasin Rd.	3.10	41.36784	-70.47860	46'
P4	Map 34/Lot 219	5 Forest Ave	3.70	41.3716	-70.46788	20'
Q8	Map 34/Lot 17.1	2 Majane Ln.	3.12	41.37263	-70.48213	56
Q9	Map 35/Lot 30	116 Litchfield Rd	5.20	41.37	-70.48632	47'
R12	Map 30/Lot 149.4	53 Chappaquiddick Ave.	4.00	41.37907	-70.48618	54'
R7	Map 34/Lot 52	4 Jason Dr.	3.00	41.36818	-70.47419	48'
R8	Map 34/Lot 17.2	3 Majane Ln.	3.11	41.37229	-70.48124	59'
S10	Map 34/Lot 4	37 old Indian Trail	3.40	41.37577	-70.48278	68'
S12	Map 30/Lot 149.3	11 N. Roger Rd.	3.20	41.3797	-70.48549	60'
S7	Map 34/Lot 40.1	343 Chappaquiddick Rd.	3.09	41.36834	-70.47540	37'
S8	Map 34/Lot 28.23	155 Litchfield Rd.	3.05	41.37186	-70.47973	31'
S9	Map 35/Lot 25	102 Litchfield Rd.	3.80	41.37115	-70.48822	53'
SS	Map 34/Lot 23.1	300 Chappaquiddick	3.00	41.37545	-70.47305	23'
T12	Map 31/Lot 103.1	20 Wood Ave.	3.18	41.37937	-70.48429	71'
T7	Map 34/Lot 40.3	21 Quammox Rd.	3.03	41.367	-70.47443	42'
T9	Map 35/Lot 26	103 Litchfield Rd.	4.6	41.37192	-70.48676	67'
TT	Map 34/Lot 23.2	302 Chappaquiddick	3.20	41.37485	-70.47258	14'
U8	Map 34/Lot 28.21	161 Litchfield Rd.	4.57	41.37078	-70.47829	32'
U9	Map 35/Lot 24	95 Litchfield Rd.	6.10	41.37246	-70.48777	69'
V9	Map 35/Lot 23	91 litchfield Rd.	4.90	41.37279	-70.48831	68'
W10	Map 31/Lot 166	72 Chappaquiddick Ave.	3.01	41.37712	-70.48358	83'
W12	Map 31/Lot 90	6 W. Cape Poge Ave.	3.04	41.38099	-70.48188	50'
W8	Map 34/Lot 28.3	6 Jeremiah Rd.	3.90	41.36876	-70.47916	42'
W9	Map 35/Lot 19.3	85 Litchfield Rd.	3.01	41.37381	-70.48788	70'
X7	Map 34/Lot 235.2	32 Old Indian Tr.	10.20	41.37658	-70.47962	39'
X8	Map 34/Lot 257	14 Jeremiah Rd.	3.10	41.36735	-70.48027	51
XX	Map 34/Lot 25.22	10 Old Indian Tr.	4.23	41.37365	-70.47436	25'
Y7	Map 34/Lot 7.2	10 CASSAT WAY	7.15	41.3746	-70.48365	79'
Y8	Map 34/Lot 249	33 Jeremiah Rd.	3.07	41.36609	-70.48190	48'
YY	Map 34/Lot 25.1	308 Chappaquiddick	3.00	41.37389	-70.47249	23'
Z7	Map 34/Lot 7.1	10 Cassat Way	7.15	41.37326	-70.48322	72'
H17	Map 35/ Lot 19.4	87 Litchfield Rd.	3.01	41.37316	-70.48908	66'