STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:
REOPENING OF SBA TOWERS II, LLC APPLICATION FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE AND OPERATION OF A TELECOMMUNICATIONS FACILITY LOCATED AT 49 BRAINERD ROAD, NIANTIC (EAST LYME), CONNECTICUT.

DOCKET NO. 396

December 3, 2010

REOPENING PRE-HEARING QUESTIONS

Q1. Did New Cingular Wireless PCS, LLC (AT&T) have a search ring along Rt. 156 between the intersection of Black Point Rd. and west to the vicinity of Park Place? Explain why or why not. Explain whether a hypothetical tower in this location would achieve coverage equal to or better than coverage from the proposed location on Brainerd Rd.

A1. AT&T did not and does not have a search ring along Route 156 in the described vicinity. The location between the intersection of Black Point Road and west to Park Place is an area which is already very close to an existing site and an area of adequate service. Accordingly this would not be a suitable location for a search ring to accommodate network build out. A hypothetical tower in this location would be redundant with existing coverage and would not provide equal or better coverage to the proposed location on Brainerd Road.

Q2. Evaluate whether coverage objectives could be met with a hypothetical two-tower solution using two shorter towers, about 75' feet each, (assuming a tree canopy at 55'): one using town property in the middle of Black Point, the other using church property to northeast (Central Ave.) on Black Point.

A2. A two site solution at the locations cited at 75' AGL do not provide suitable replacement coverage. There are generally large areas in the Giant's Neck/Brainerd Road area that would have less than adequate coverage with this alternate solution. A total of 0.6 square miles would have less than acceptable in-building coverage that would otherwise be covered by the original proposed Brainerd Road site. Plots depicting predicted coverage in this area utilizing the described locations are included in Attachment 1.

Q3. If SBA were to use two shorter towers, comment on the effects on RF propagation due to possible stealth designs: at the church, a bell tower or a cross; at the town property, a tall yacht-club type mast or faux lighthouse.

A3. AT&T requires a total of 9 antennas which limits the use of certain designs. In either a "yacht-club type mast" or cross design, antennas would have to be flush mounted internally. This configuration/design typically accommodates only three antennas at any one level. A configuration of 9 antennas would have to be stacked vertically with the lowest antennas at the minimum height required to provide service. Such designs accordingly require significant vertical space to accommodate these antennas. This may also limit the potential for future collocation of additional antennas on any single wireless facility.

Depending on the design, a faux lighthouse or bell tower could better accommodate a full antenna array and avoid the "stacking" issues that result with a cross or mast design. Assuming they could be designed with a full platform and accommodate 9 antennas, a "bell tower" or "faux lighthouse" design should not have any effect on radio frequency propagation.

Q4. A distributed antenna system ("DAS") is generally a lower power, low gain system used in high traffic areas (i.e. capacity demand) which relies on a combination of fiber optics, transmitting antenna sites and a base station facility. Such low-tier systems cover a very limited distance from the network "nodes" and require equipment installations near any point requiring coverage. To service the Black Point peninsula, the number and location of DAS nodes and other infrastructure as well as associated costs would need to be examined to understand the full feasibility of such a system. While the Black Point peninsula is a relatively small area, rising topography does define the center of the peninsula. Even within this small area, ground elevations range from sea level along the coast to around 100 feet AMSL in the center which could have substantial impact on DAS node coverage footprints as it is not completely flat. In addition, while the peninsula itself is "linear", it is traversed by numerous streets in various orientations. These are factors which complicate the use of a DAS which is a primarily "line of sight" technology deployed along very linear infrastructure. As such, many of the homes, other buildings, and even some secondary streets will mostly likely have less than sufficient coverage from a DAS type solution.

While such a system could conceivably be designed to serve at least portions of Black Point, this would not provide the macro level coverage needed by AT&T in this area of East Lyme. AT&T needs to provide adequate coverage not only to Black Point, but also portions of 156, the area around Giants Neck and the Amtrak rail line. This equates to approximately 3.25 miles of area with currently unacceptable service. A DAS system on Black Point peninsula would not provide this coverage. In general, DAS is used to complement or augment existing macro coverage and it is best suited for small-scale systems inside commercial buildings, malls or tunnels or covering small sections of a roadway. Outdoor systems serving large areas and a large number of customers, while feasible, face many challenges which make this an entirely impractical method of full network deployment. Also, deployment of a DAS requires new poles for node deployment where there are buried power lines and no other utility poles available.

Included in Attachment 2 please find a DAS Suitability Analysis prepared by C-Squared Systems which reviews the technical requirements and challenges of DAS deployment.

Q5. Since the coverage from the proposed Brainerd Rd. site (see transparency sent to the Council with cover letter dated 3-18-10) still leaves a lot of the eastern side of Black Point at

either yellow or red, the railroad at the north of Black Point mostly yellow, and a large swath of Rt. 156 just above the north end of Black Point at red, how does AT&T plan to cover these gaps?

A5. The transparency plots included in the March 17, 2010 submission to the Siting Council were provided in response to interrogatory question 63 submitted by the Friends of Pattagansett Trust. Those responses included one transparency/plot of the coverage from the proposed Brainerd Road site alone without coverage from any surrounding sites. See "Coverage from the Proposed Site", AT&T's Responses to Pattagansett's Interrogatories 03/17/2010 Attachment 2. That submission also included one transparency/plot depicting coverage from the proposed Brainerd Road site together with surrounding sites. See "Current coverage plus proposed Sites S2284, S2285, and S2286", AT&T's Responses to Pattagansett's Interrogatories 03/17/2010 Attachment 3. For the Council's convenience those plots are resubmitted here as Attachment 3.

The coverage from the proposed site alone as depicted in the "Coverage from the Proposed Site" transparency/plot does in fact leave "a lot of the eastern side of Black Point at either yellow or red, the railroad at the north of Black Point mostly yellow, and a large swath of Rt. 156 just above the north end of Black Point at red". However, this is only coverage from the proposed site alone and does not include coverage from surrounding AT&T sites.

Once the coverage from surrounding sites is factored in, as depicted in the plot marked "Current coverage plus proposed Sites S2284, S2285, and S2286", the railroad, Route 156 and portion of the eastern side of Black Point are served with in-vehicle coverage. In short the noted gaps in coverage largely do not exist when the coverage provided by the local network as a whole is considered. Nevertheless, a small portion of Black Point, specifically the southeastern point is still left with inadequate coverage. AT&T's original search ring was centered on the Black Point peninsula with an objective of providing full coverage to that area. AT&T moved to support the SBA site at Brainerd Road despite this potential deficiency in light of the difficult siting opportunities on Black Point. Assuming coverage from the proposed SBA site at Brainerd Road AT&T would continue to have a small deficiency in the noted area based on the terrain features on Black point itself which may have to be addressed at some future time.

Q6. Please explain why these gaps couldn't be covered by the two-tower solution described in Q2.

A6. As noted in A5, the proposed site and existing network coverage provide much of the coverage to the gaps described and depicted on the plot marked "Coverage from the Proposed Site" together with the coverage of AT&T's existing sites in the area.

Q7. Could two towers (at least 20 to 30 feet shorter than the proposed tower) be used in the following configuration: one in the vicinity of Giant's Neck and one at Black Point to adequately achieve AT&T's coverage objectives?

A7. The Giant's Neck area is very close to an existing AT&T site located at 15 Liberty Way in East Lyme. A potential location identified by SBA (coordinates 41-18-40.1898 / -72-14-5.5284) is approximately 0.7 miles from AT&T's existing Liberty Way facility. As such it is important to note that the Giants Neck location is primarily redundant with the existing AT&T

facility at 15 Liberty Way to the north/northwest. Accordingly, AT&T would not propose to install a facility at this location.

Nevertheless, a tower approximately 140' in height on Black Point in combination with a 140' tower in Giants Neck would not provide the coverage needed to adequately service the coverage objective. Included as Attachment 4 is a coverage map demonstrating the service that could be provided by a 140' tower located at a Town owned sited identified by SBA on Cottage Road on Black Point Peninsula along with coverage from a 140' tower on Giants Neck. While this solution provides some improved coverage areas on the Black Point peninsula, in-building coverage is lost in the areas along route 156, Fairhaven Road, Black Point Road, and Huntley Court that equates to approximately 0.8 square miles. Included as Attachment 5 is a coverage map demonstrating the service that could be provided by a 140' tower located at the St. Francis Church property identified in Question 2 along with coverage from a 140' tower on Giants Neck. Again, much of the coverage in Giants Neck would be redundant with the AT&T rooftop site at 15 Liberty Way. Overall this two tower solution would provide at least 0.2 square miles less coverage than the single proposed tower location on Brainerd Road.

CERTIFICATE OF SERVICE

I hereby certify that on this day, a copy of the foregoing was sent electronically and by overnight mail to the Connecticut Siting Council with copy to:

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Dated: December 3, 2010

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Radu Alecsandru, AT&T
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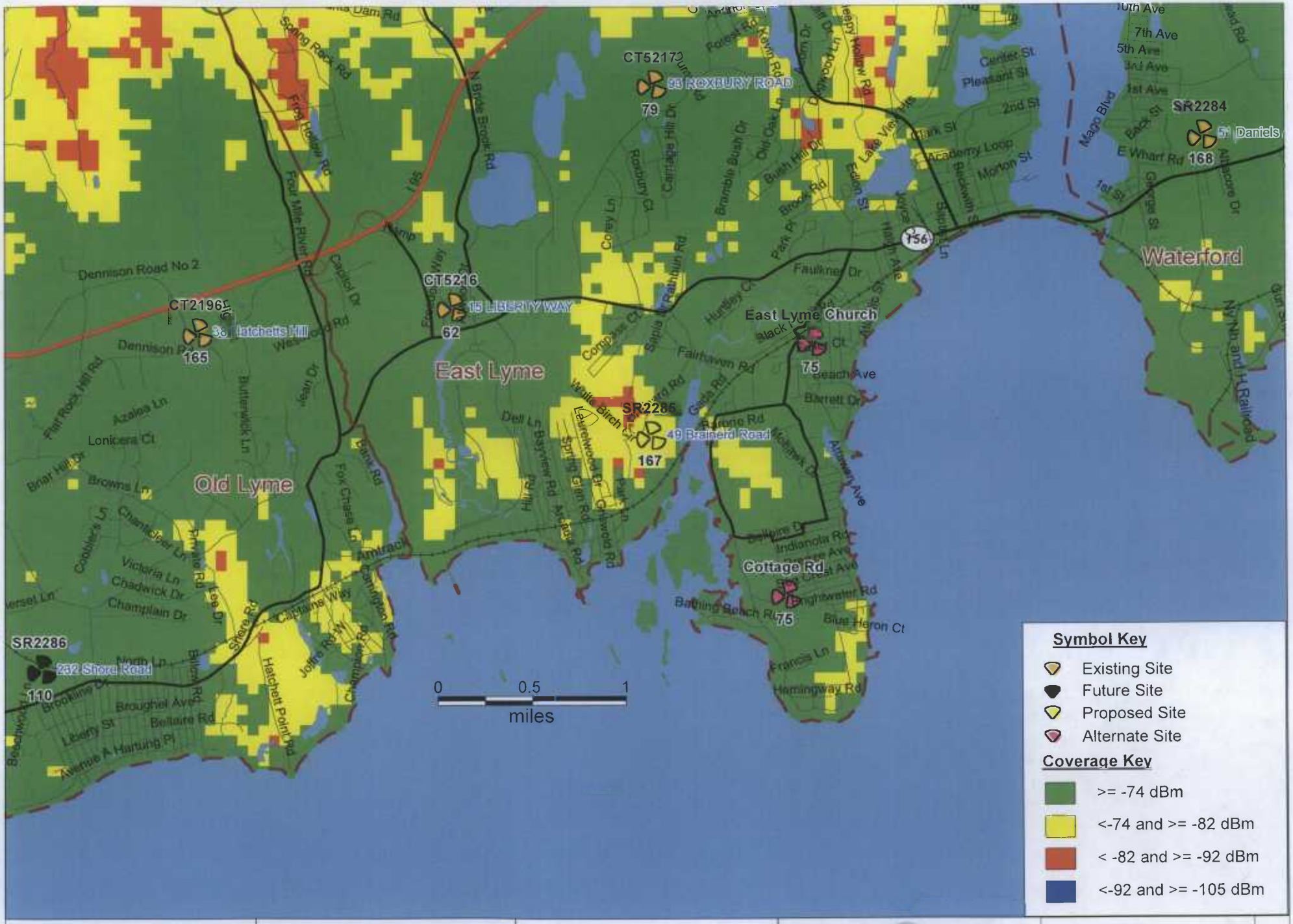

Existing, Future & Alternate Coverage	East Lyme, CT	49 Brainerd Road East Lyme, CT	at&t	PREPARED ON DATE: 12/01/2010 REV

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DAS Suitability Analysis

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List of Figures

1. Introduction

C Squared Systems, LLC has been asked to consider the application of a Distributed Antenna System ("DAS") as an alternative to a more traditional tower facility ("macro-site") to serve and improve coverage needs. Presented below is a discussion of DAS in general, and its relation to the specific coverage objectives typically encountered as wireless service providers improve and expand coverage of their networks.

As the name implies, a DAS utilizes multiple antennas distributed over an area to provide coverage from one or multiple base stations. In order to connect the remote locations (nodes) to the centralized base station, these systems typically convert RF (radio frequency) signals into light signals, and use fiber optic cables as a means for transport throughout the system. The remote nodes consist of equipment needed to convert the optical signals back to RF, along with coaxial cables and antennas to transmit the RF into the surrounding area.

The DAS and associated equipment is usually designed and maintained by a neutral hosting company to support multiple wireless carriers interested in serving a given area. This is accomplished with a centralized Hub location where the various carriers install their base station and "plug" into the DAS.

A DAS is commonly used by the Cellular and PCS wireless carriers as a solution to serve discrete, hard to reach areas with large call volume that cannot be covered with traditional outdoor macro sites. Examples of such typical applications are stadiums, large office complexes, University campuses, and select portions of major roadways and transportation tunnels.

2. Wide Area Outdoor DAS Infrastructure Requirements

A wide area outdoor DAS introduces additional challenges over those presented in the typical DAS applications mentioned above. The DAS objective will be spread out over a greater region than a system designed to cover a concentrated area. Therefore, the remote node locations will range over a larger area and require both a support structure and rights to access/install the equipment at each location. Both of these challenges can be addressed by entering into an agreement with a municipality or utility company to make use of their existing public rights-of-way to mount the remote equipment directly onto support structures such as light poles or utility poles. In some cases, structurally insufficient utility poles may have to be replaced or new ones built in the right-of-way to accommodate the additional load of the DAS node equipment, coaxial cables, and antennas. Areas without utility poles would require new structures to support the equipment.

A centralized Hub location is also needed for locating the carrier base stations and DAS "head-end" equipment to distribute base station signals to the remote nodes.

In addition to securing access to appropriate Hub and node locations, fiber optic cable is needed to connect each remote unit to the Hub equipment. In many cases, fiber optic cable is not available; therefore new cable may need to be installed for the DAS.

3. Macro-Site Comparison to Theoretical DAS Applications

Macro sites are designed and deployed to to serve broad wireless coverage gaps in area. These facilities typically consists of a monopole or other support structure within a fenced compound designed to accommodate multiple wireless carriers serving the area. This type of installation is commonly referred to as a "macro-site" in the sense that a singular site is used to provide coverage over a broad area.

The central idea of an outdoor DAS is to utilize numerous smaller structures to provide comparable coverage to that of a taller macro-site. However, in some cases, limitations of an outdoor DAS will prevent it from providing the same coverage as a macro-site. As indicated above, a DAS will typically use utility structures to support the node equipment with antennas mounted to the top of the poles. Generally speaking, this limits the antenna height to approximately 30'-35' AGL. In most areas, this would place the antennas below the tree-line and drastically hinder the coverage provided from each node location. The utility and light poles are located directly along the roadways therefore, the coverage from each node would be somewhat restricted to line-of-sight areas along the roads only, and would be severely limited to homes and other buildings set back from the tree-lined roads.

This height limitation becomes a key drawback to using a DAS as a substitute to a macro-site. A properly designed macro-site will be tall enough to support antennas at heights above the surrounding trees and other obstructions. This is necessary to cover a broad area by allowing the RF signals to reach distant areas without being attenuated by the nearby, surrounding obstructions. In the case of antennas mounted on utility poles in a suburban area, the typical tree heights and the heights of some structures will limit the coverage provided from the nodes to directions that are unobstructed, i.e. directly up and down the adjacent roadways.

Because the coverage objectives of typically proposed macro-sites is to provided needed service to a broad geographic area and not limited to just one or two roadways, a wide area DAS is likely to create coverage gaps to many residents throughout the coverage objective area, as well as secondary streets where the expected usage may not justify the financial burden of including additional nodes in the design to serve these areas.

In addition to the coverage differences, there is also the obvious trade-off in the overall visibility of the two different types of coverage solutions. As previously mentioned, each node requires its own set of equipment to convert the optical signals from the Hub, into the RF signals communicating with the end users. This equipment consists mainly of an equipment box typically mounted directly to the utility pole, one or multiple antennas mounted above the top of the pole, and coaxial cables connecting the transmitters in the equipment box to the antenna(s). Shown below in Figures 1 & 2 are photos from existing DAS nodes in Andover, MA and are representative of what these remote nodes typically look like. The particular set of equipment shown supports technologies at both cellular and PCS frequencies. As next generation networks such as WiMAX (Worldwide Interoperability for Microwave Access) and LTE (Long Term Evolution) are deployed at different frequency bands by the carriers, additional or larger boxes would be needed to support these services. Additionally, technologies such as LTE require multiple antennas in order to maximize the use of this technology. This could require either more nodes or antennas with significant separation on the pole.

Figure 1: Typical DAS Node[1]

[1] This installation includes 2 separate antennas for the tenants' different operating frequencies. Some DAS configurations may use a single, multi-band antenna to accommodate the different frequencies in use by the tenants.

Figure 2: Typical DAS Node Equipment

Due to the overall coverage limitations of the nodes created by the limited power and height, they must be strategically located to deliver the largest possible extent of coverage to the objective , while minimizing the overall number of nodes required in doing so. Depending on the specific area being covered, the nodes could be located anywhere from sparsely populated sections of the roadways of interest, to immediately adjacent to residential properties.

Other variables and criteria for the DAS could easily increase the number of nodes that are required. For example, including other frequency bands that are licensed by many of the major wireless providers will add more antenna nodes locations to overcome the higher path loss associated with PCS, AWS and WiMAX frequency bands. In addition, since the available power at each node needs to be shared by all carriers on the DAS, including other carriers that would be looking to provide service to this same area would drastically reduce the coverage range from each node; resulting in an even higher number of nodes being required. The uncertainty of these variables makes a DAS solution in most coverage areas an unrealistic option to satisfy the numerous coverage objectives.

While the tradeoff of numerous, smaller sized DAS nodes for one taller, macro-site may be preferred by some, it could clearly become a concern for others, depending on where each of the nodes happen to be located. A recent example of public displeasure over the development of DAS nodes occurred in Nassau County, Long Island which prompted various civic associations to demonstrate against a DAS[2] project. Residents and a homeowners association eventually filed a $100 million lawsuit against the Town of Hempstead, NextG Networks (neutral host), and MetroPCS (tenant carrier) in an attempt to halt the wireless DAS deployment.[3]

4. Summary

The coverage needs for typical macro site designs includes broad areas of major road, secondary streets, open spaces such as parks or trails, as well as the adjacent residential and commercial dwellings. As previously explained, a properly located macro-site can cover a wide range of these areas from one single location. Because of the coverage limitations inherent to typical outdoor DAS systems explained above, the resulting coverage provided would be mainly restricted to immediately along the roadways where the individual nodes are located. In light of these factors with respect to the broad area coverage requirements, it is our opinion that many alternate DAS solutions are not applicable stand alone replacement technologies to macro sites; but are instead compliments to existing Macro sites. They are better utilized to serve discreet, hard to reach areas with large call volume that cannot be covered with traditional outdoor macro sites. Examples of such typical applications are stadiums, large office complexes, University campuses, and select portions of major roadways and transportation tunnels.

5. Statement of Certification

I have reviewed this report and hereby certify that the methods used to produce the conclusions in this report are in accordance with standard industry practices.

December 1, 2010

Date

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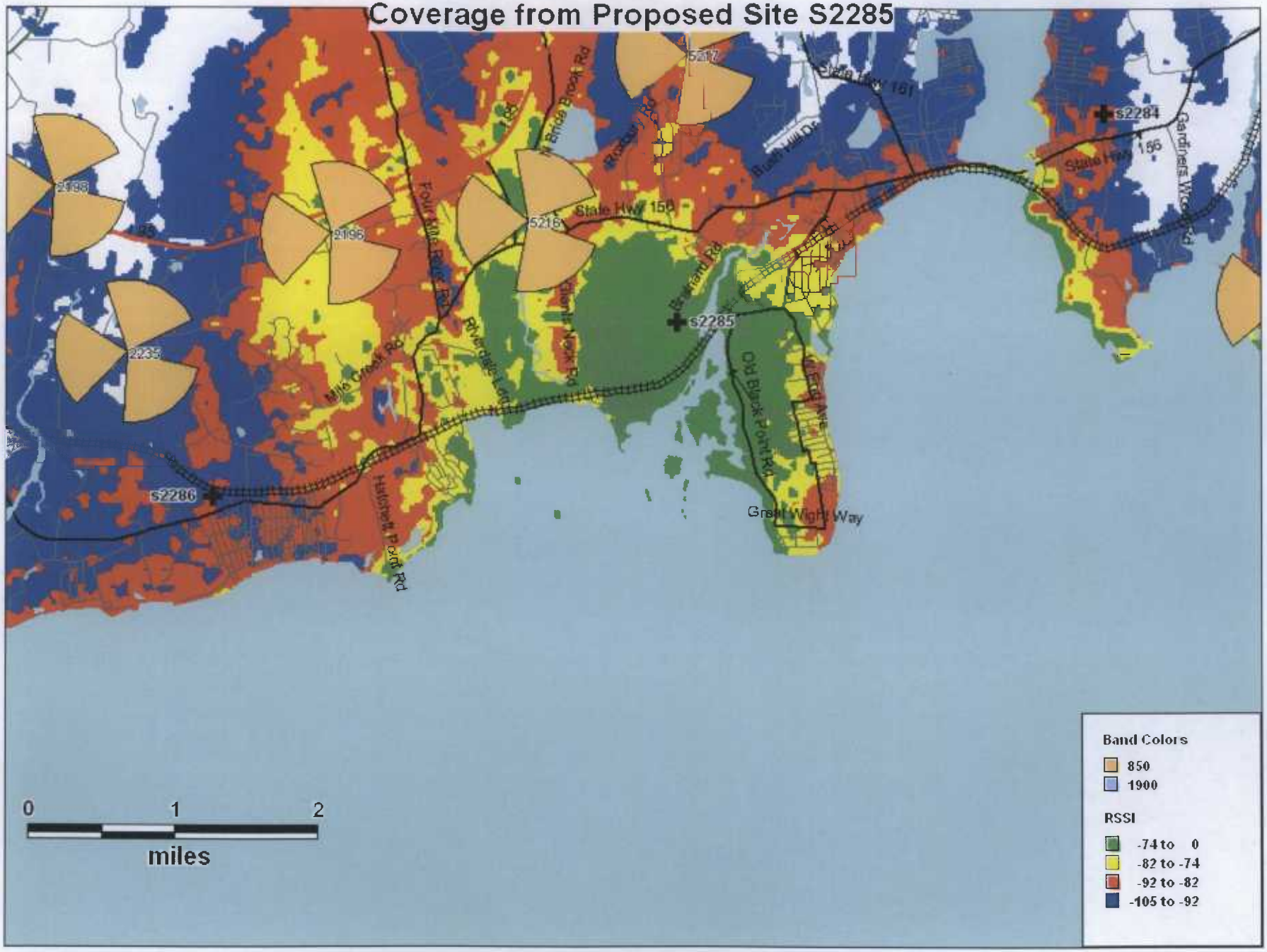
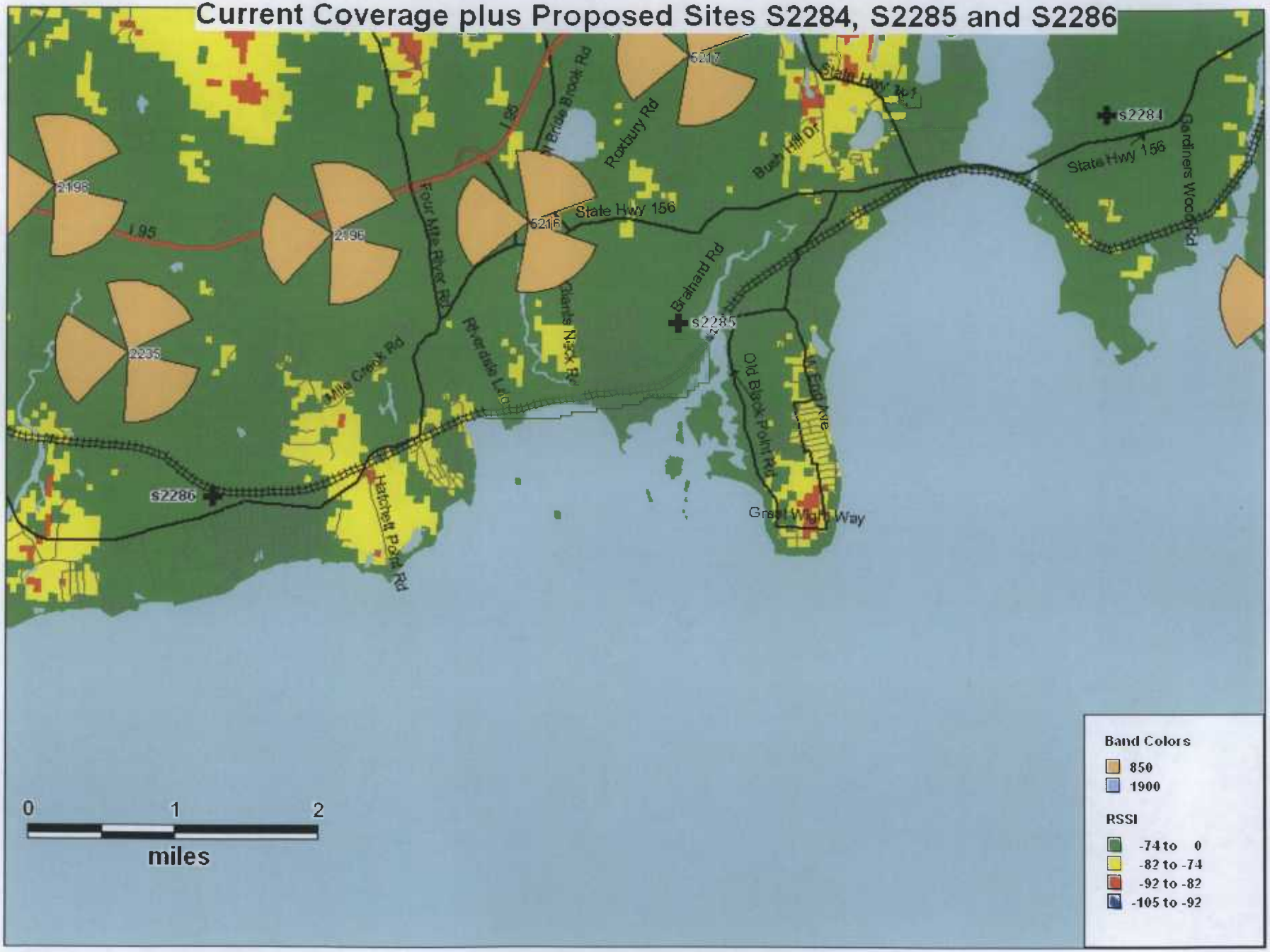
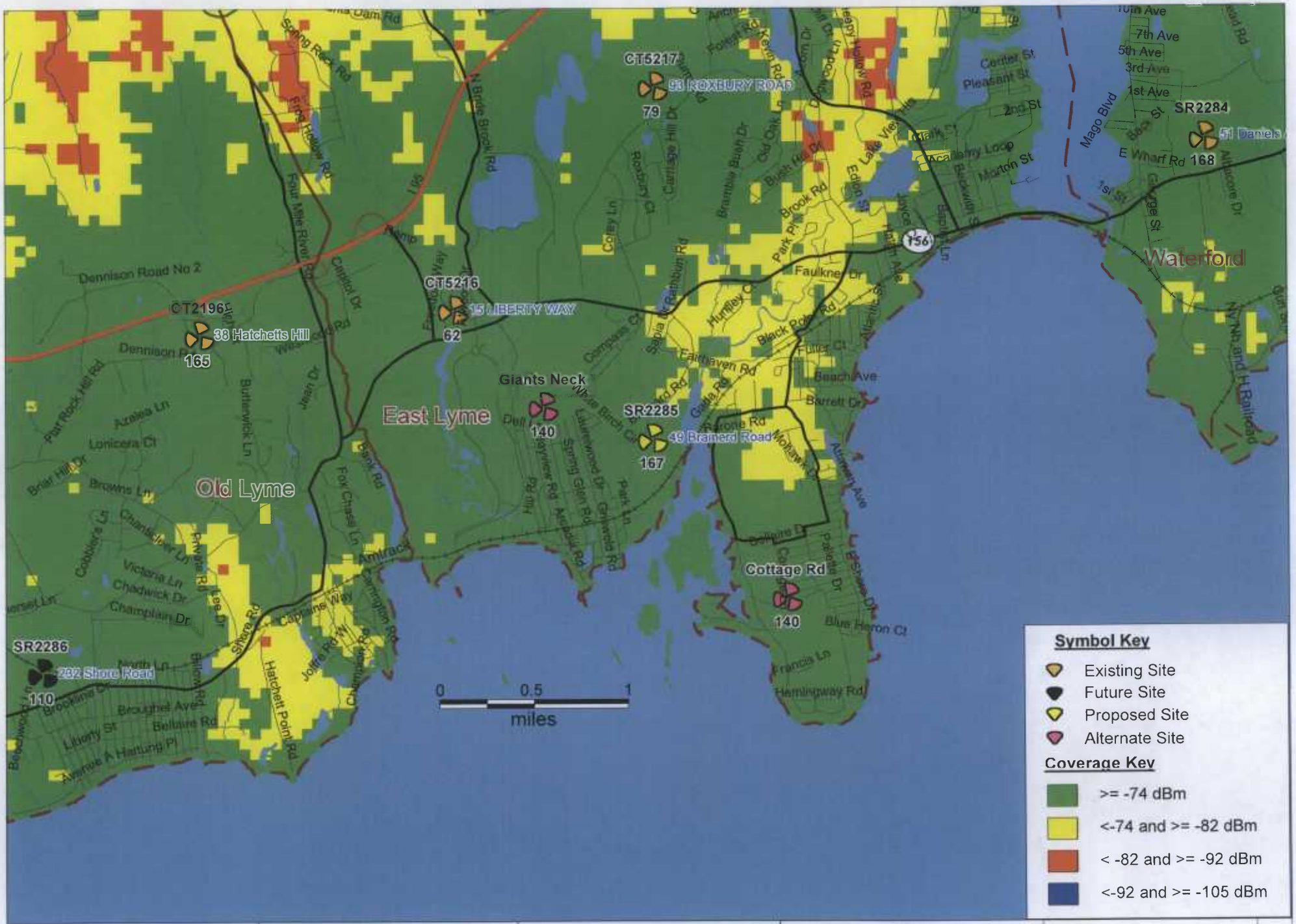
[2] Ziegler, Sari. "NextG War Rages On." *LIHerald* October 29, 2009. Web. January 6, 2010.

[3] Petrellese, Stephanie. "Mayor On Next G: Not A Done Deal." *The Garden City News Online* December 11, 2009. Web. January 6, 2010.


Coverage from Proposed Site S2285
s2284
s2285
s2286
5217
5216
2196
2235
State Hwy 156
Great Wight Way
Band Colors
850
1900
RSSI
-74 to 0
-82 to -74
-92 to -82
-105 to -92
0
1
2
miles

Current Coverage plus Proposed Sites S2284, S2285 and S2286





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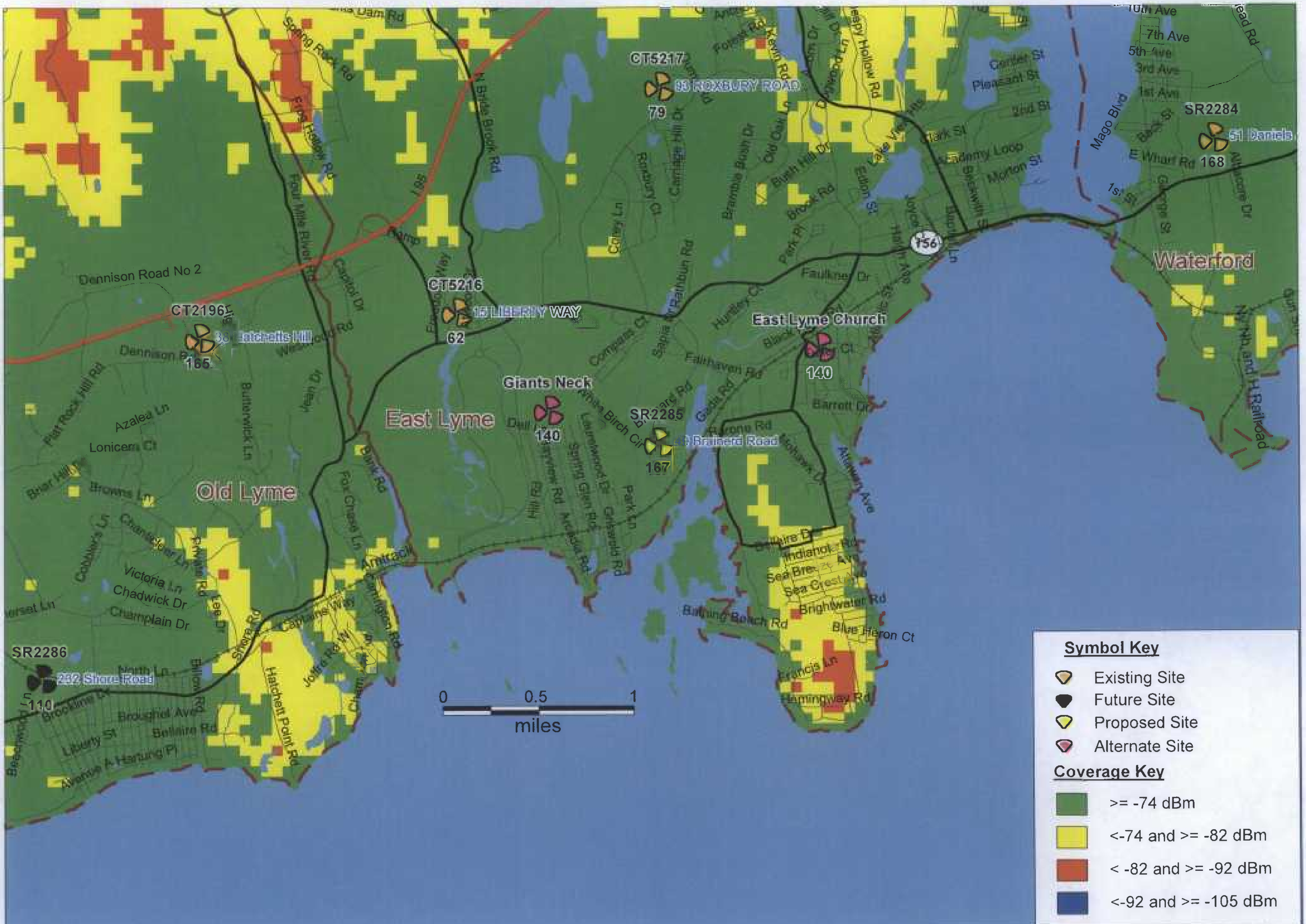

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