

# *Proposed Wireless Telecommunications Facility*

CTNH808A  
15 Orchard Park Road  
Madison, Connecticut

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Prepared for 

Prepared by **VHB/Vanasse Hangen Brustlin, Inc.**  
54 Tuttle Place  
Middletown, CT 06457

July 2009

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## Visual Resource Evaluation

Omni Point Communications, Inc., dba T-Mobile, seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the construction of a wireless telecommunications facility ("Facility") to be located on property at 15 Orchard Park Road in the Town of Madison, Connecticut (identified herein as the "host property"). This Visual Resource Evaluation was conducted to assess the visibility of the proposed Facility within a two-mile radius ("Study Area"). Attachment A contains a map that depicts the location of the proposed Facility and the limits of the Study Area.

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## Project Introduction

The proposed Facility includes the installation of a 100-foot tall monopole with associated ground equipment to be located at its base. Both the proposed monopole and ground equipment would be situated within a 40-foot by 45-foot fence-enclosed compound. The proposed Facility is located at approximately 16 feet Above Mean Sea Level ("AMSL"). Access to the Facility would be provided via an existing paved driveway currently located on the host property.

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## Site Description and Setting

Identified in the Town of Madison land records as Map 36/ Lot 3, the host property consists of approximately 3.51 acres of land and is currently occupied by a multi-unit self storage facility. The proposed Facility would be located in an open, undeveloped area adjacent to several of the existing storage units. Land use in the immediate vicinity of the host property consists of commercial/light industrial establishments to the east and west; undeveloped woodlands to the north and south; and an existing Amtrak railroad corridor (and associated overhead electrical infrastructure) located further to the north. Segments of US Route 1, Route 79 and Interstate 95 are contained within the Study Area. In total, the Study Area features approximately 102 linear miles of roadways and rail line.

The topography within the Study Area is characterized by gently rolling hills with ground elevations that range from sea level to approximately 165 feet AMSL. The Study Area contains approximately 1,781 acres of surface water, including portions of Long Island Sound which occupies the southern third of the Study Area and the East River which flows north to south through the western half of the Study Area. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 3,840 acres of the 8,042-acre study area (48%). During the in-field activities associated with this analysis, an infrared laser range finder was used to determine the average tree canopy height throughout the Study Area. Numerous trees were selected for measurement and the average tree canopy was determined to be 60 feet.

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## METHODOLOGY

In order to better represent the visibility associated with the Facility, VHB uses a two-fold approach incorporating both a predictive computer model and in-field analysis. The predictive model is employed to assess potential visibility throughout the entire Study Area, including private property and/or otherwise inaccessible areas for field verification. A “balloon float” and Study Area drive-through reconnaissance are also conducted to obtain locational and height representations, back-check the initial computer model results and provide documentation from publicly accessible areas. Results of both activities are analyzed and incorporated into the final viewshed map. A description of the methodologies used in the analysis is provided below.

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### Visibility Analysis

Using ESRI’s ArcView® Spatial Analyst, a computer modeling tool, the areas from where the top of the Facility is expected to be visible are calculated. This is based on information entered into the computer model, including Facility height, its ground elevation, the surrounding topography and existing vegetation. Data incorporated into the predictive model includes a digital elevation model (DEM) and a digital forest layer for the Study Area. The DEM was derived from the Connecticut LiDAR-based digital elevation data. The LiDAR data was produced by the University of Connecticut Center for Land Use Education and Research (CLEAR) in 2007 and has a horizontal resolution of 10 feet. In order to create the forest layer, digital aerial photographs of the Study Area are incorporated into the computer model. The mature trees and woodland areas depicted on the aerial photos are manually traced in ArcView® GIS and then converted into a geographic data layer. The aerial photographs were produced in 2006 and have a pixel resolution of one foot.

Once the data are entered, a series of constraints are applied to the computer model to achieve an estimate of where the Facility will be visible. Initially, only topography was used as a visual constraint; the tree canopy is omitted to evaluate all areas of potential visibility without any vegetative screening. Although this is an overly conservative prediction, the initial omission of these layers assists in the evaluation of potential seasonal visibility of the proposed Facility. The average height of the tree canopy was determined in the field using a laser range finder. The average tree canopy height is incorporated into the final viewshed map; in this case, 60 feet was identified as the average tree canopy height. The forested areas within the Study Area were then overlaid on the DEM with a height of 60 feet added and the visibility calculated. As a final step, the forested areas are extracted from the areas of visibility, with the assumption that a person standing among the trees will not be able to view the Facility beyond a distance of approximately 500 feet. Depending on the density of the vegetation in these areas, it is assumed that some locations within this range will provide visibility of at least portions of the Facility based on where one is standing.

Also included on the map is a data layer, obtained from the State of Connecticut Department of Environmental Protection ("CTDEP"), which depicts various land and water resources such as parks and forests, recreational facilities, dedicated open space, CTDEP boat launches and other categories. In addition, based on a review of information published by both the State of Connecticut Department of Transportation (ConnDOT) and the Town of Madison, it was determined that there are several locally-designated scenic roadways located within the Study Area including US Route 1, Route 79 and Neck Road. Although the segments of US Route 1 and Route 79 that traverse the Study Area have been designated as scenic by the Town of Madison, these state highways have not been designated as such by ConnDOT. Lastly, the Town of Madison Plan of Conservation and Development identifies a number of scenic areas and vistas, several of which are located within the Study Area. These include the Rockledge Drive vista, Tuxis Pond, Tuxis Island, Cedar Island and East River/Neck River Marshes.

A preliminary viewshed map (using topography only) is used during the in-field activity to assist in determining if significant land use changes have occurred since the aerial photographs used in this analysis were produced and to compare the results of the computer model with observations of the balloon float. Information obtained during the reconnaissance was then incorporated into the final visibility map.

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## Balloon Float and Study Area Reconnaissance

On July 7, 2009 Vanasse Hangen Brustlin Inc., (VHB) conducted a balloon float at the proposed Facility location to further evaluate the potential viewshed within the Study Area. The balloon float consisted of raising and maintaining an approximate four-foot diameter, helium-filled weather balloon at the proposed site location at a height of 100 feet. Once the balloon was secured, VHB staff conducted a drive-by reconnaissance along the roads located within the Study Area with an emphasis on nearby residential areas and other potential sensitive receptors in order to evaluate the results of the preliminary viewshed map and to document where the balloon was, and was not, visible above and/or through the tree canopy. During the balloon float, the temperature was approximately 70 degrees Fahrenheit with calm wind conditions and sunny skies.

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## Photographic Documentation

During the balloon float, VHB personnel drove the public road system within the Study Area to inventory those areas where the balloon was visible. The balloon was photographed from several different vantage points to document the actual view towards the proposed Facility. Several photographs where the balloon was not visible are also included. The locations of the photos are described below:

1. View from US Route 1 west of Stony Lane.
2. View from Stony Lane adjacent to house #26.

3. View from Circle Beach Road adjacent to house #25.
4. View from Green Hill Road adjacent to Daniel Hand High School.
5. View from US Route 1 at Madison Town Center.
6. View from West Wharf Road adjacent to house #57.

Photographs of the balloon from the view points listed above were taken with a Nikon D-80 digital camera body and Nikon 18 to 135 mm zoom lens. For the purposes of this report, the lens was set to 50 mm. "The lens that most closely approximates the view of the unaided human eye is known as the normal focal-length lens. For the 35 mm camera format, which gives a 24x36 mm image, the normal focal length is about 50 mm."<sup>1</sup>

The locations of the photographic points are recorded in the field using a hand-held GPS receiver and are subsequently plotted on the maps contained in the attachments to this document.

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## Photographic Simulation

Photographic simulations were generated for two representative locations where the balloon was visible during the in-field activities. The photographic simulations represent a scaled depiction of the proposed Facility (a monopole) from these locations. The height of the Facility is determined based on the location of the balloon in the photograph and a proportional monopole image is simulated into the photographs. The simulations are contained in Attachment A.

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## CONCLUSIONS

Based on this analysis, areas from where the proposed 100-foot tall monopole may be visible comprise approximately 712 acres within the 8,042-acre Study Area. As depicted on the attached viewshed map, the majority of the potential visibility occurs over the Cedar Island/East River/Neck River tidal marshes located approximately 0.75 mile to two miles southwest of the proposed Facility and/or over open water on Long Island Sound located roughly one to two miles to the south. Year-round visibility over Long Island Sound and the Cedar Island/East River/Neck River tidal marshes accounts for approximately 630 acres and 60 acres, respectively, of the 712-acre total (97%). The viewshed map also depicts small areas of year-round visibility along select portions of US Route 1 and Stony Lane located approximately 0.36 mile and 0.31 mile to the southeast of the proposed Facility, respectively. As evidenced in View 1 and View 2, potential visibility from these areas would be intermittent and would not be in the direct line of sight of motorists, cyclists or pedestrians traveling along these roadways. Other areas of potential year-round visibility are located within the immediate vicinity of the proposed monopole. No visibility is expected to occur from the Rockledge Drive vista, Tuxis Pond or Tuxis Island, the remaining Town of Madison scenic resources located within the Study Area.

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<sup>1</sup> Warren, Bruce. *Photography*, West Publishing Company, Eagan, MN, c. 1993, (page 70).

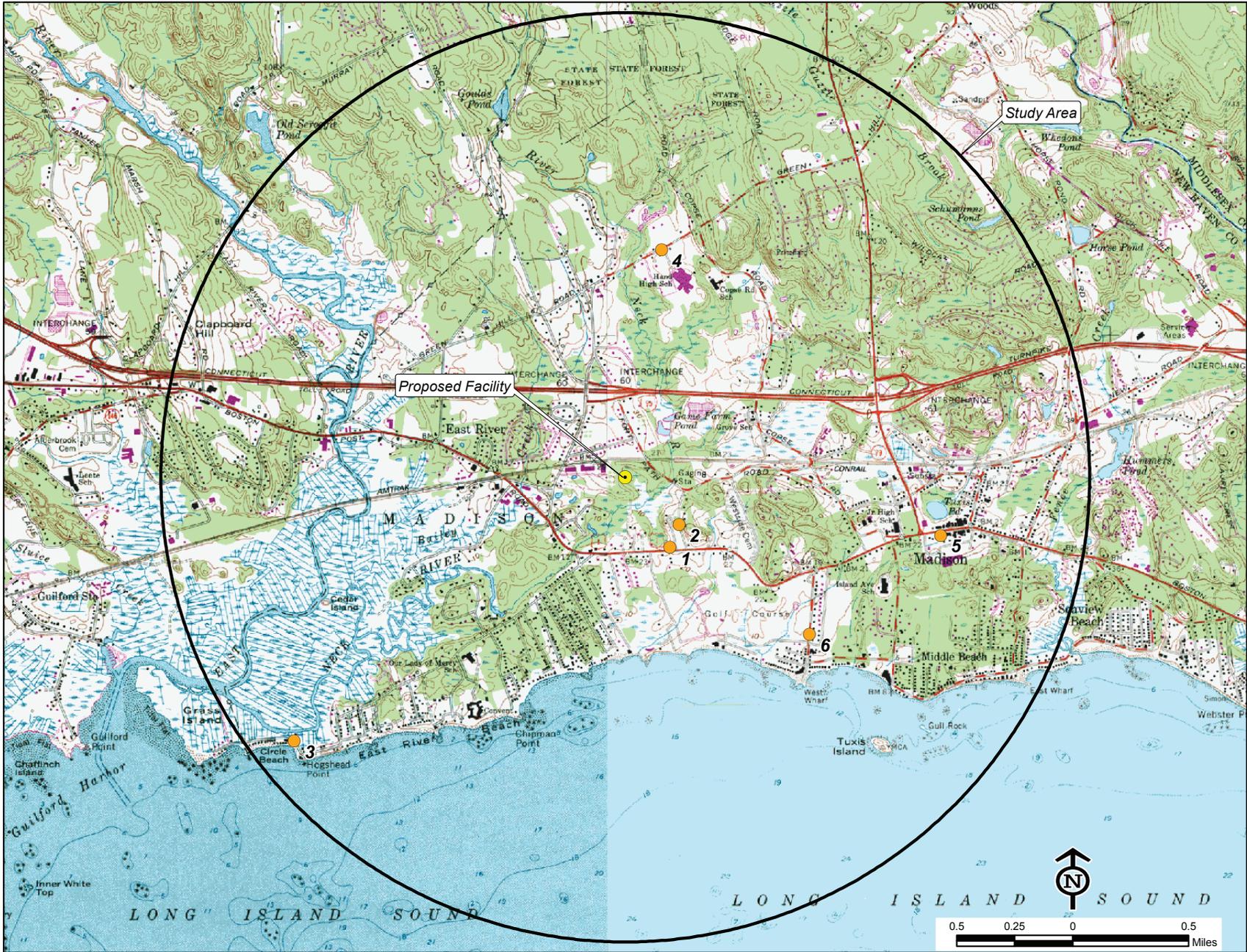
Overall, year-round visibility would be confined to the areas depicted on the attached viewshed map by a combination of the mature vegetation located within the general vicinity of the proposed Facility and the intervening topography found within the Study Area. The relatively low height of the proposed Facility, 100 feet above ground level, and its placement at a somewhat lower ground elevation in comparison to the surrounding areas to the north and west would also contribute to the anticipated absence of extensive views associated with the installation of the proposed monopole. In total, VHB estimates that at least partial views of the proposed Facility may be achieved from select portions of approximately four residential properties located within the Study Area. This includes one residence located along US Route 1 and three residences located along Stony Lane

The viewshed map also depicts several additional areas where seasonal (i.e. during "leaf off" conditions) views are anticipated. These areas comprise approximately 59 additional acres and are limited to the general vicinity of the host property (within 0.35-mile or less). VHB estimates that seasonal views of the proposed monopole may be achieved from portions of approximately nine additional residential properties. These properties are located along US Route 1, Stony Lane and Johnson Lane.

## Attachment A

# Project Area Photograph, Photolog Documentation Map, Balloon Float Photographs, and Photographic Simulations

# PHOTOLOG MAP



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VIEW 1



PHOTO TAKEN FROM US ROUTE 1 WEST OF STONY LANE, LOOKING NORTHWEST  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.36 MILE +/-

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VIEW 1



PHOTO TAKEN FROM US ROUTE 1 WEST OF STONY LANE, LOOKING NORTHWEST  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.36 MILE +/-

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VIEW 2



PHOTO TAKEN FROM STONY LANE ADJACENT TO HOUSE #26, LOOKING NORTHWEST  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.31 MILE +/-

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VIEW 2



PHOTO TAKEN FROM STONY LANE ADJACENT TO HOUSE #26, LOOKING NORTHWEST  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.31 MILE +/-

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VIEW 3



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PHOTO TAKEN FROM CIRCLE BEACH ROAD ADJACENT TO HOUSE #25, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.83 MILES +/-

VIEW 4



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PHOTO TAKEN FROM GREEN HILL ROAD ADJACENT TO DANIEL HAND HIGH SCHOOL, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.00 MILE +/-

VIEW 5



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PHOTO TAKEN FROM US ROUTE 1 AT MADISON TOWN CENTER, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.40 MILES +/-

VIEW 6



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**PHOTO TAKEN FROM WEST WHARF ROAD ADJACENT TO HOUSE #57, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE  
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 1.04 MILES +/-**

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# Attachment B

## Viewshed Map