


*Proposed Wireless
Telecommunications Facility*

93 Lake Street
Manchester, Connecticut

Prepared for **Optasite Towers LLC**
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Westborough, MA 01581

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September 2007

Visual Resource Evaluation

Optasite Towers LLC seeks approval from the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need to construct a wireless telecommunications facility ("Facility") on property located at 93 Lake Street ("host property") in the Town of Manchester, Connecticut. This "Visual Resource Evaluation" was conducted to approximate the visibility of the proposed Facility within a two-mile radius of the Site ("Study Area").

Project Introduction

The proposed Facility includes the construction of a 110-foot tall monopole capable of supporting up to four antenna arrays with associated ground equipment to be located within a fenced enclosure at the base of the tower. Based on information provided by the project engineer, Clough Harbour and Associates LLP, the proposed project area is located at approximately 467 feet Above Mean Sea Level (AMSL). Access to the proposed Facility would be provided via a proposed gravel driveway that would extend to the proposed compound area in a northerly direction from Lake Street.

Site Description and Setting

Identified in the Town of Manchester Tax Assessors records as Map 135/Block 3330/Lot 93A, the host property consists of 23.40 acres of land and is currently occupied by a single-family residence and associated garage. The proposed Facility would be situated on a wooded portion of the host property, roughly 550 feet northwest of the existing residential dwelling. A photograph of the proposed project area is included in Attachment A. Attachment A also contains a map that depicts the location of the proposed Facility and the limits of the Study Area. Land use within the general vicinity of the host property is comprised of medium-density residential parcels. Several commercial land uses can be found further to the southeast and southwest of the host property along Route 6/Route 44. Segments of Interstate 384, Route 44 and Route 6 traverse the Study Area. In total, the Study Area contains roughly 125 linear miles of roadways.

The topography in the Study Area is generally characterized by rolling hills that range in ground elevation from approximately 200 feet AMSL to roughly 850 feet AMSL. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species interspersed with stands of mature evergreen species. The tree canopy occupies approximately 4,663 acres of the 8,042-acre study area (58%). During the in-field activities associated with this analysis, an infrared laser range finder was used to accurately determine the average tree canopy height throughout the Study Area. Numerous trees were selected for measurement and the average tree canopy established, in this case 65 feet. In addition, the Study Area features a total of approximately 81 acres of surface water; attributed mainly to Bolton Notch Pond, Case Pond and several nearby reservoirs.

METHODOLOGY

To estimate the visibility associated with the proposed Facility, VHB incorporates a two-fold approach utilizing 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 photographic 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.

Visibility Analysis

Using ESRI's ArcView® Spatial Analyst, a computer modeling tool, the areas from where the proposed 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, existing vegetation and any significant structures/objects that may act to obstruct potential views. Data incorporated in the model includes 7.5 minute digital elevation models (DEMs) and a digital forest layer for the Study Area. The DEMs were produced by the United States Geological Survey (USGS) in 1982 at a 30 meter resolution. The forest layer was derived through on-screen digitizing in ArcView® GIS from 2004 digital orthophotos with a 0.5-foot pixel resolution.

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 provides a reference for comparison once the tree canopy is established and also assists in the evaluation of potential seasonal visibility of the proposed Facility. A conservative tree canopy height of 50 feet is then used to prepare a preliminary viewshed map for use during the Study Area reconnaissance. The average height of the tree canopy is determined in the field using a hand-held infra-red laser range finder. The average tree canopy height is incorporated into the final viewshed map; in this case, 65 feet was identified as the average tree canopy height. The forested areas within the Study Area were then overlaid on the DEM with the measured tree height of 65 feet added and the visibility calculated for the final viewshed map. The forested areas are then 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 Connecticut State Department of Environmental Protection (CTDEP), which depicts various land and water resources such as parks and forests, recreational areas, dedicated open space as well as other categories. This layer is useful in identifying potential visual impacts to any sensitive receptors that may be located within the Study Area. In addition, utilizing the *Connecticut Walk Book (East)* it was determined that segments of the Shenipsit Trail, part of the Connecticut Blue Blaze System, traverse the eastern third of the Study Area. These portions of the trail have been digitized and are depicted on the viewshed map contained in Attachment B of this document. Lastly, based on a review of available data published by the Connecticut Department of Transportation and discussions with staff in Manchester and Bolton, it was determined that there are no state or locally designated scenic roadways contained within the Study Area.

A preliminary viewshed map is generated for use during the in-field activity in order to confirm that no significant land use changes have occurred since the 2004 aerial photographs used in this analysis were produced and to verify the results of the model in comparison to the balloon float. Information obtained during the reconnaissance is then incorporated into the final visibility map.

Balloon Float and Study Area Reconnaissance

On June 27, 2007 Vanasse Hangen Brustlin Inc., (VHB) conducted a "balloon float" at the proposed Facility site 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 110 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 verify where the balloon was, and was not, visible above and/or through the tree canopy. During the balloon float, the temperature was approximately 80 degrees Fahrenheit with calm wind conditions and mostly sunny skies.

Photographic Documentation

During the balloon float, VHB personnel drove the public road system in the Study Area to inventory those areas where the balloon was visible. The balloon was photographed from two vantage points to document the actual view towards the proposed Facility, as described below:

1. View from Lake Street adjacent to house #93, looking northwest.
2. View from intersection of Garth Road and Chilstone Lane, looking northeast.

Photographs of the balloon from the view points listed above were taken with a Panasonic Digital Camera DMC-FZ5, which has a lens focal length equivalent to a 35 mm camera with a 38 to 115 mm zoom. "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.¹ The optical zoom lens for the Panasonic DMC-FZ5 was set at a range of 50 mm to 70 mm for the purposes of this Visual Resource Evaluation.

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.

Photographic Simulation

Photographic Simulations were generated for the two locations identified above. The Photographic Simulations represent a scaled depiction of the proposed monopole from these locations. The height of the Facility is determined based on the location of the balloon in the photographs and a proportional monopole image is simulated into the photographs. The simulations are contained in Attachment B.



CONCLUSIONS

Based on this analysis, areas from where the proposed 110-foot monopole would be visible above the tree canopy comprise approximately 34 acres, or less than one half of one percent of the 8,042 acre Study Area. Much of the anticipated year-round visibility depicted on the viewshed map is confined to the host property and its immediate vicinity, including select portions of Lake Street to the south/southeast. Passing views of the balloon were also achieved from a small segment of Garth Road roughly 0.42 mile to the southwest of the proposed Facility. The viewshed map also depicts several smaller areas of visibility located on private properties to the south, southwest and northeast. VHB estimates that approximately 12 residences within the Study Area will have partial year round views of the proposed monopole above the existing tree line. Overall, the topography, existing tree cover and other vegetative screening found within the Study Area would serve to minimize areas where the proposed Facility is expected to be at least partially visible, particularly as one moves further away from the site. No views are anticipated from the Shenipsit Trail. The viewshed map also depicts several additional areas where seasonal (i.e. during "leaf off" conditions) views through the trees are anticipated. These areas comprise approximately 39 additional acres and are generally located within a 0.25-mile radius surrounding the proposed Facility. In total, VHB anticipates that approximately 8 additional residences would achieve seasonal views of the proposed Facility from select portions of their respective properties.

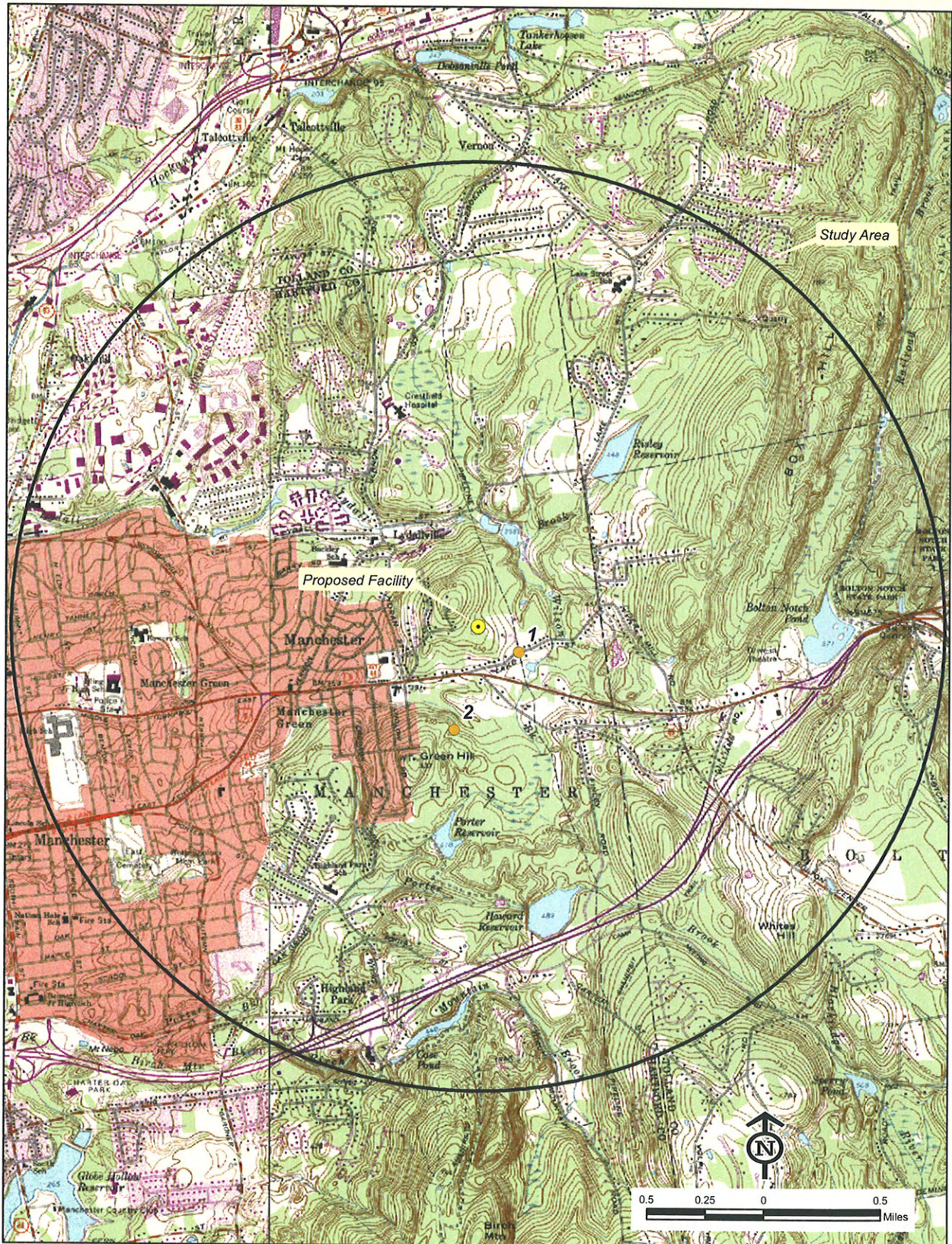
¹ Warren, Bruce. *Photography*, West Publishing Company, Eagan, MN, c. 1993, (page 70).

Attachment A

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

Photolog Documentation

Town of
Manchester
Connecticut



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Photographic Documentation - Proposed Site Area

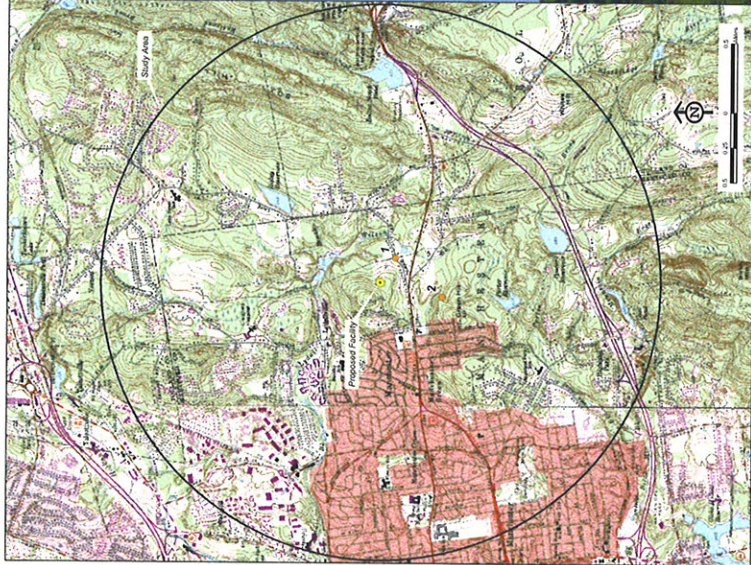
Town of
Manchester
Connecticut



PHOTO TAKEN OF PROPOSED SITE AREA, LOOKING NORTHWEST

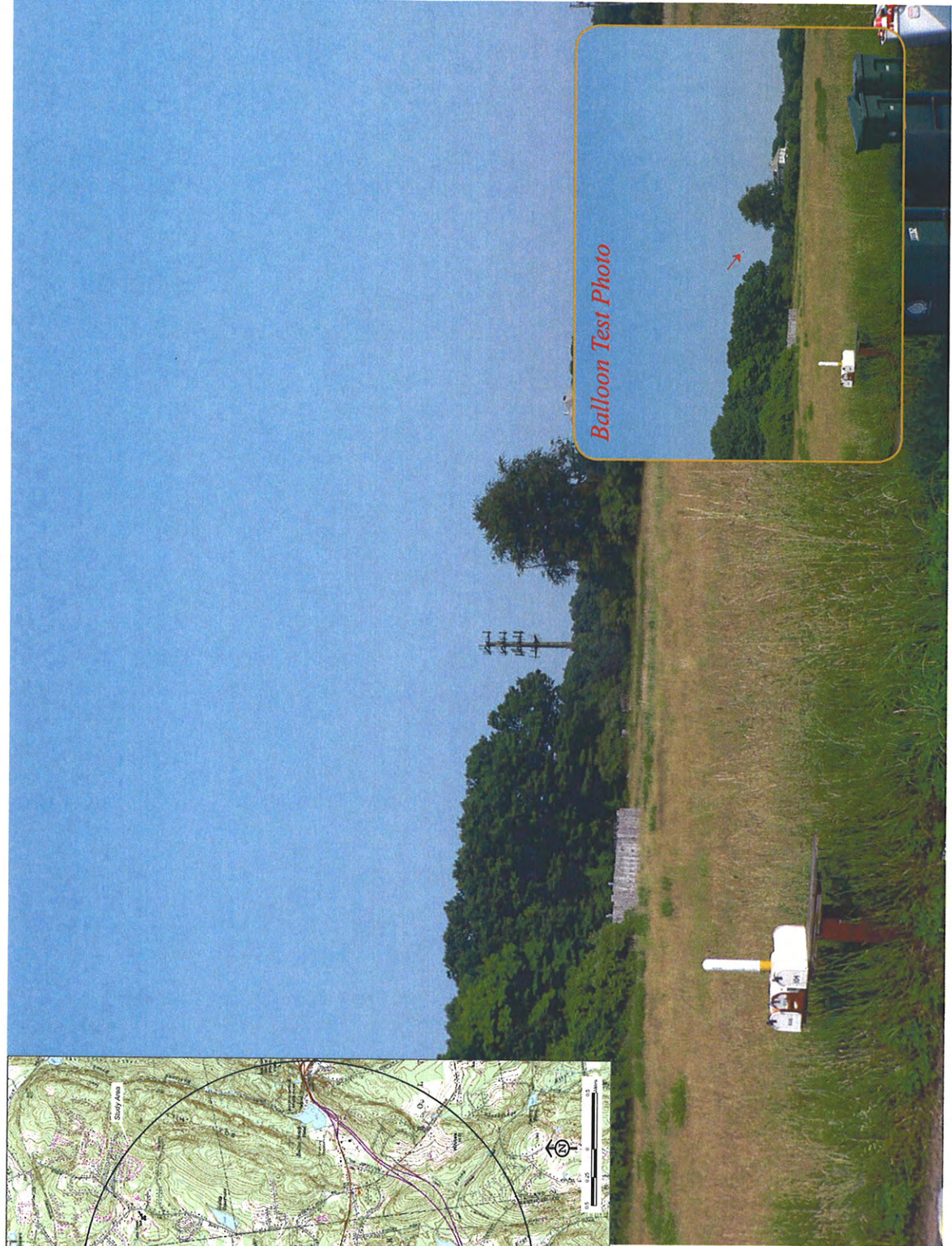
Photographic Documentation and Simulation *View 1*

Town of
Manchester
Connecticut



93 Lake Street
Manchester, CT
CT999-0074

Monopole installation
with 4 carriers



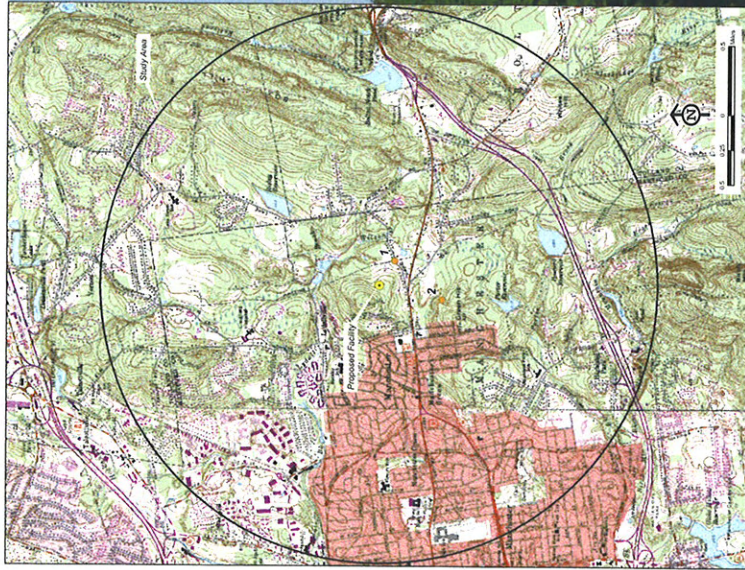
Balloon Test Photo

PHOTO TAKEN FROM LAKE STREET ADJACENT TO HOUSE #93 (HOST PROPERTY), LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.17 MILE +/-



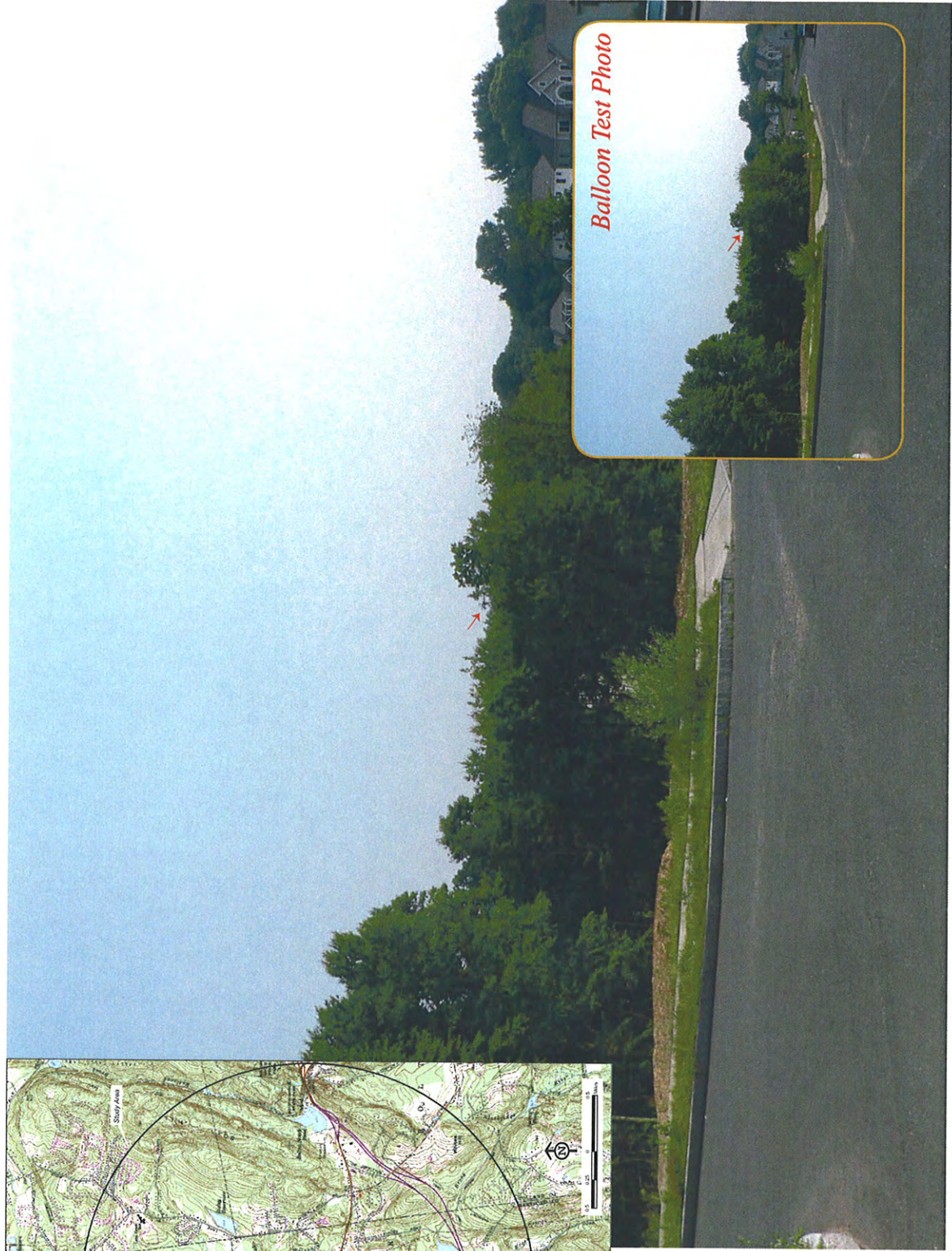
Photographic Documentation and Simulation View 2

Town of
Manchester
Connecticut



93 Lake Street
Manchester, CT
CT999-0074

Monopole installation
with 4 carriers



Balloon Test Photo

PHOTO TAKEN FROM INTERSECTION OF GARTH ROAD AND CHILSTONE LANE, LOOKING NORTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO THE PROPOSED SITE IS 0.42 MILE +/-





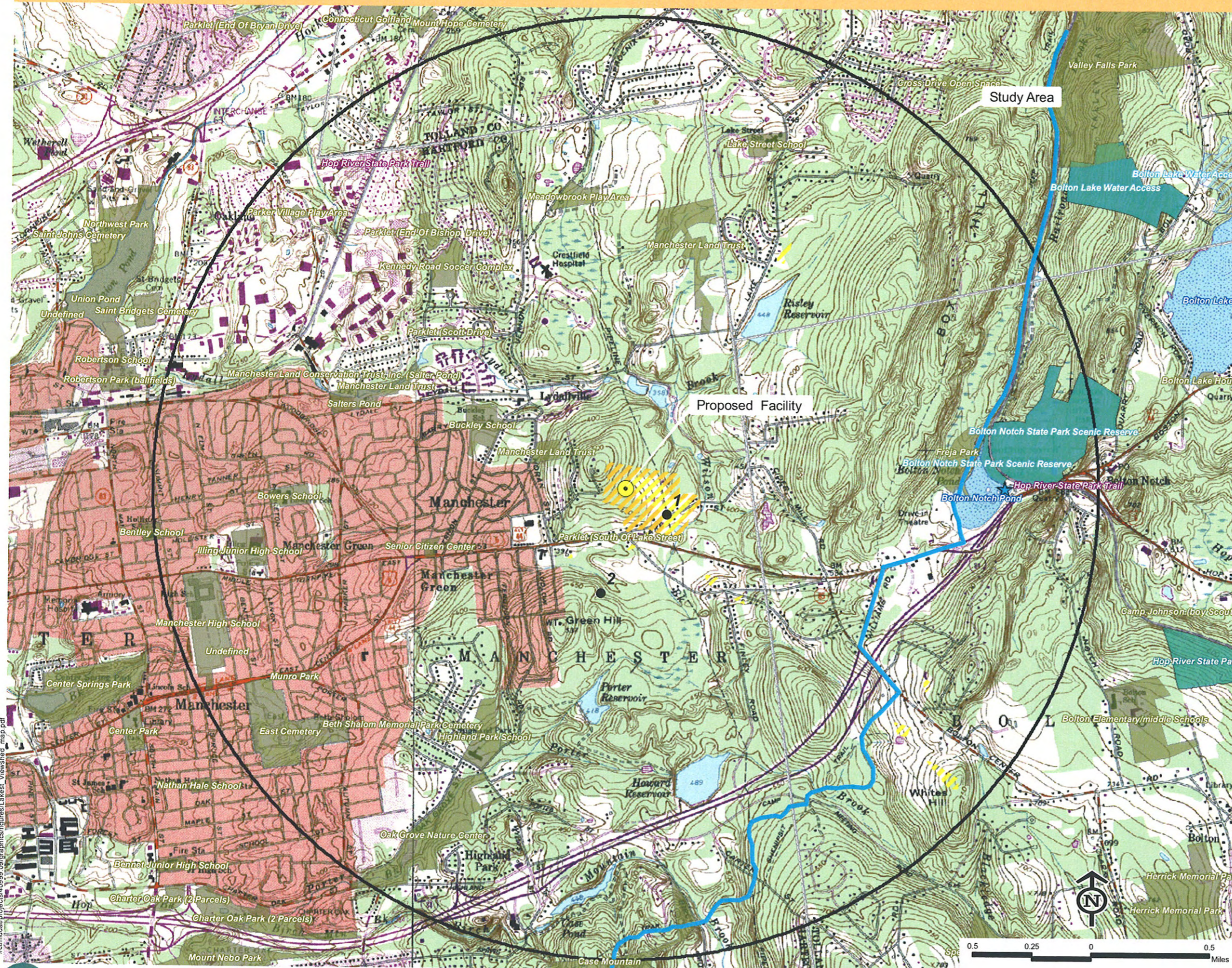
Attachment B

Viewshed Map

Viewshed Map

Topography and Forest Cover as Constraints

Town of
Manchester
Connecticut



Proposed Optasite Telecommunications Facility 93 Lake Street Manchester, Connecticut

NOTE:

- Viewshed analysis conducted using ESRI's Spatial Analyst.
- Proposed Facility height is 110 feet.
- Existing tree canopy height estimated at 65 feet.

DATA SOURCES:

- National Elevation Dataset (NED) with a resolution of one arc-second (approximately 30 meters) produced by the USGS, 1925 - 1999
- Forest areas derived from 2005 digital orthophotos with 2-meter pixel resolution; digitized by VHB, 2007
- Base map comprised of Manchester (1992) and Rockville (1984) USGS Quadrangle Maps
- Protected properties data layer provided CTDEP; May, 2007
- Scenic Roads layer derived from available State and Local listings.

Map Compiled August, 2007

Legend

- Proposed Monopole Location (Includes select areas of visibility approximately 500 feet around facility)
- Balloon visible above trees
- Year-Round Visibility (Approximately 34 Acres)
- Anticipated Seasonal Visibility (Approximately 39 Acres)
- Protected Properties (Municipal)
 - Cemetery
 - Preservation
 - Conservation
 - Existing Preserved Open Space
 - Recreation
 - General Recreation
 - School
 - Uncategorized
- Protected Properties (CT DEP)
 - State Forest
 - State Park
 - DEP Owned Waterbody
 - State Park Scenic Reserve
 - Historic Preserve
 - Natural Area Preserve
 - Fish Hatchery
 - Flood Control
 - Other
 - State Park Trail
 - Water Access
 - Wildlife Area
 - Wildlife Sanctuary
- DEP Boat Launches
- Scenic Road (State and Local)
- Shenipsit Trail (CT Blue Blaze)
- Town Line
- Protected Properties (Federal)