

Proposed Wireless Telecommunications Facility

CTFF310
23 Stonybrook Road
Stratford, Connecticut

Prepared for 

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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 23 Stonybrook Road, in the Town of Stratford, 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 photograph of the proposed project area. Attachment A also contains a map that depicts the location of the proposed Facility and the limits of the Study Area.

Project Introduction

The proposed Facility includes the installation of a 100-foot tall, white unipole tower where the associated telecommunications antenna panels and coaxial cable would be mounted to the interior of the pole, such that no antennas would be visible. Both the unipole and associated ground equipment would be situated within a 40-foot by 50-foot fence-enclosed compound located at the base of the tower. The proposed Facility is located at approximately 77 feet Above Mean Sea Level ("AMSL"). Access to the Facility would be provided via an existing paved driveway currently located on the host property.

Site Description and Setting

Identified in the Town of Stratford land records as Map 162/Block 69/ Lot 00, the host property consists of approximately 0.73 acres of land and is currently occupied by a two-story commercial building. The proposed Facility would be located on a paved area on the southwest corner of the host property, roughly 110 feet to the south of the existing commercial building. Land use in the immediate vicinity of the host property consists of commercial establishments, medium density residential development and the Stonybrook Park which abuts the host property to the south. Segments of Interstate 95, US Route 1, Route 8, Route 108, Route 110, Route 113 and Route 127 are contained within the Study Area. In total, the Study Area features approximately 253 linear miles of roadways.

The topography within the Study Area is characterized by gently rolling hills with ground elevations that range from approximately sea level to approximately 210 feet AMSL. The Study Area contains approximately 299 acres of surface water, dominated in large measure by portions of the Housatonic River located in the southeast portion of the Study Area. The tree cover within the Study Area consists mainly of mixed deciduous hardwood species. The tree canopy occupies approximately 2,567 acres of the 8,042-acre study area (32%). 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.

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.

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. There are currently no hiking trails located within the Study Area. Lastly, based on both a review of published information and discussions with municipal officials in Stratford, it was determined that there are no designated scenic roadways located within the Study Area.

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.

Balloon Float and Study Area Reconnaissance

On August 15, 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 85 degrees Fahrenheit with calm wind conditions and sunny skies.

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 and was not visible. The balloon was photographed from a number of 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 London Terrace at Broadbridge Avenue.
2. View from Broadbridge Avenue at North Avenue.
3. View from Broadbridge Avenue north of Stonybrook Road.
4. View from Klondike Street adjacent to house #214.
5. View from Barnum Terrace south of Yukon Street.
6. View from End of Barnum Terrace.
7. View from Stonybrook Park.
8. View from Stonybrook Road at Eaton Street.

9. View from Marcroft Street at Chevy Street.
10. View from end of Marcroft Street.
11. View from Viele Street south of Marcroft Street.
12. View from Henry Avenue at Henry Place.
13. View from Canaan Street at Mary Street.
14. View from Broadbridge Avenue at Reitter Street.
15. View from Marcroft Street west of Nichols Avenue.
16. View from Stonybrook Field.

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."¹

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 11 representative locations where the balloon was visible during the in-field activities. The photographic simulations represent a scaled depiction of the proposed Facility (a unipole) 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.

CONCLUSIONS

Based on this analysis, areas from where the proposed 100-foot tall unipole may be visible above the tree canopy comprise approximately 10 acres, or less than one half of one percent of the total area contained within the 8,042-acre Study Area. As depicted on the attached viewshed map, the majority of the potential visibility occurs within the immediate vicinity of the proposed Facility, generally within 0.25-mile. This includes select portions of Stonybrook Road, Broadbridge Avenue, North Avenue, London Terrace, Marcroft Street, Viele Street, Barnum Terrace, Klondike Street, Yukon Street, Eaton Street and the southern third of Stonybrook Park. The viewshed map also depicts several smaller areas of potential year-round visibility located to the southeast and southwest of the proposed Facility. These areas are located on private properties and could therefore not be evaluated by VHB staff during the balloon float. In total, VHB estimates that at least partial year-round views of the proposed facility may be achieved from portions of approximately 51 residential properties

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

within the Study Area. This includes six residences located along Stonybrook Road directly across from the host property; eight residences located along Broadbridge Avenue; two residences located along North Avenue near the intersection of Broadbridge Avenue; two residences located along London Terrace just east of Broadbridge Avenue, eight residences along Marcroft Street located between the western terminus of the roadway and Chevy Street; four residences located along Viele Street; nine residences located along Barnum Terrace; four residences located along Klondike Street; six residences located along Yukon Street; and two residences located along Eaton Street just north of Stonybrook Road. As evidenced by the August 15, 2009 balloon float and associated photographic simulations, potential views from these areas would typically be limited to the upper portion of the proposed unipole. Moreover, the design of the proposed Facility, where the associated antenna panels and cables are affixed to the interior of the unipole, serves to minimize potential visual impacts by presenting a reduced visual profile in comparison to traditional telecommunications towers that often feature multiple antennas mounted to external platforms. Overall, potential year-round visibility would be limited to the locations described above by the relatively low height of the proposed Facility (100 feet) and the intervening topography contained within the Study Area. Vegetative screening in the form of mature street trees and landscaping would also minimize the extent of year-round visibility.

The viewshed map also depicts several additional areas where seasonal (i.e. during “leaf off” conditions) views are anticipated. These areas comprise approximately 37 additional acres and are limited to the immediate vicinity of the host property. The areas of seasonal visibility depicted on the viewshed map are generally located within close proximity to those locations where year-round visibility is anticipated and includes select portions of the roadways identified in the previous paragraph of this report. During times of the year when leaves are off the trees, additional portions of the unipole may be visible through the deciduous trees from these locations.

Attachment A

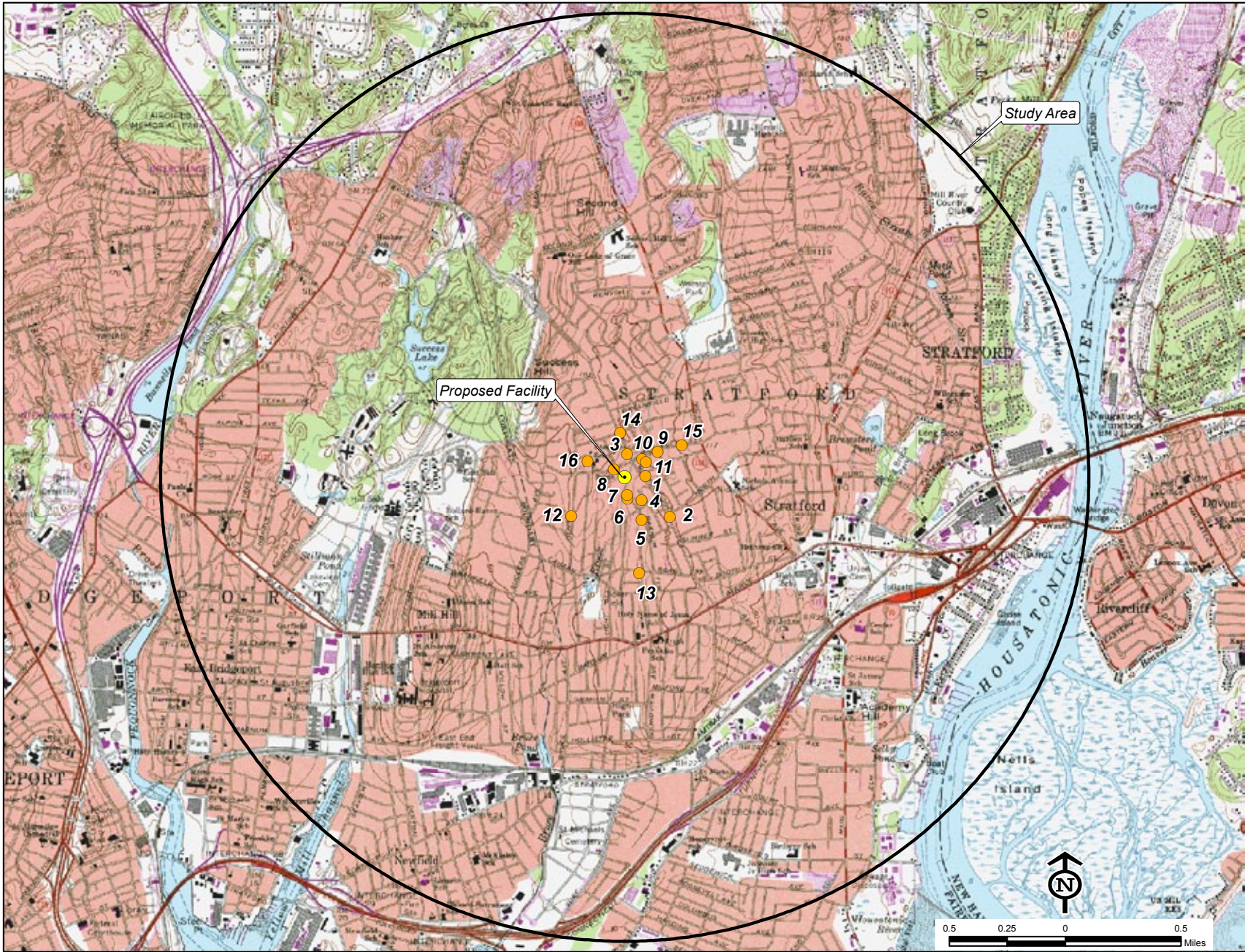
Project Area Photograph, Photolog Documentation Map, Balloon Float Photographs, and Photographic Simulations



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PROPOSED PROJECT AREA

PHOTOLOG MAP



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VIEW 1



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PHOTO TAKEN FROM LONDON TERRACE AT BROADBRIDGE AVENUE, LOOKING WEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.08 MILE +/-

VIEW 1



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PHOTO TAKEN FROM LONDON TERRACE AT BROADBRIDGE AVENUE, LOOKING WEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.08 MILE +/-

VIEW 2



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PHOTO TAKEN FROM BROADBRIDGE AVENUE AT NORTH AVENUE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.25 MILE +/-

VIEW 2



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PHOTO TAKEN FROM BROADBRIDGE AVENUE AT NORTH AVENUE, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.25 MILE +/-

VIEW 3



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PHOTO TAKEN FROM BROADBRIDGE AVENUE NORTH OF STONYBROOK ROAD, LOOKING SOUTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

VIEW 3



PHOTO TAKEN FROM BROADBRIDGE AVENUE NORTH OF STONYBROOK ROAD, LOOKING SOUTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

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VIEW 4



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PHOTO TAKEN FROM KLONDIKE STREET ADJACENT TO HOUSE# 214, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.13 MILE +/-

VIEW 4



PHOTO TAKEN FROM KLONDIKE STREET ADJACENT TO HOUSE# 214, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.13 MILE +/-

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VIEW 5



ctimiddat\40505.05\graphics\FIGURES\40505.05_Photos\im

PHOTO TAKEN FROM BARNUM TERRACE SOUTH OF YUKON STREET, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.20 MILE +/-

VIEW 5



ct:\mddat\40505_05\graphics\FIGURES\40505_05_Photosim

PHOTO TAKEN FROM BARNUM TERRACE SOUTH OF YUKON STREET, LOOKING NORTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.20 MILE +/-

VIEW 6



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PHOTO TAKEN FROM END OF BARNUM TERRACE, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

VIEW 6



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PHOTO TAKEN FROM END OF BARNUM TERRACE, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.10 MILE +/-

VIEW 7



PHOTO TAKEN FROM STONYBROOK PARK, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.07 MILE +/-

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VIEW 7



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PHOTO TAKEN FROM STONYBROOK PARK, LOOKING NORTH
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.07 MILE +/-

VIEW 8



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PHOTO TAKEN FROM STONYBROOK ROAD AT EATON STREET, LOOKING SOUTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.06 MILE +/-

VIEW 8



PHOTO TAKEN FROM STONYBROOK ROAD AT EATON STREET, LOOKING SOUTHEAST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.06 MILE +/-

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VIEW 9



ctm10dat\40505_05\graphics\FIGURES\40505_05_Photosim

PHOTO TAKEN FROM MARCROFT STREET AT CHEVY STREET, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

VIEW 9



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PHOTO TAKEN FROM MARCROFT STREET AT CHEVY STREET, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.17 MILE +/-

VIEW 10



ctm\ddat\40505.05\graphics\FIGURES\40505.05_Photosim

PHOTO TAKEN FROM END OF MARCROFT STREET, LOOKING SOUTHWEST

DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.11 MILE +/-

VIEW 10



PHOTO TAKEN FROM END OF MARCROFT STREET, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.11 MILE +/-

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VIEW 11



ctm\ddat\40505.05\graphics\FIGURES\40505.05_Photosim

PHOTO TAKEN FROM VIELE STREET SOUTH OF MARCROFT STREET, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.11 MILE +/-

VIEW 11



PHOTO TAKEN FROM VIELE STREET SOUTH OF MARCROFT STREET, LOOKING SOUTHWEST
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.11 MILE +/-

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VIEW 12



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PHOTO TAKEN FROM HENRY AVENUE AT HENRY PLACE, LOOKING NORTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.28 MILE +/-

VIEW 13



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PHOTO TAKEN FROM CANAAN STREET AT MARY STREET, LOOKING NORTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.40 MILE +/-

VIEW 14



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PHOTO TAKEN FROM BROADBRIDGE AVENUE AT REITTER STREET, LOOKING SOUTH - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.20 MILE +/-

VIEW 15



ct:\mddat\40505.05\graphics\FIGURES\40505.05_Photosim

PHOTO TAKEN FROM MACROFT STREET WEST OF NICHOLS AVENUE, LOOKING SOUTHWEST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.29 MILE +/-

VIEW 16



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PHOTO TAKEN FROM STONYBROOK FIELD, LOOKING SOUTHEAST - BALLOON IS NOT VISIBLE
DISTANCE FROM THE PHOTOGRAPH LOCATION TO SITE IS 0.19 MILE +/-

Attachment B

Viewshed Map