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Supplemental Visual Assessment

ORANGE NORTH
831 DERBY MILFORD ROAD
ORANGE, CONNECTICUT

Prepared for:

Verizon Wireless
99 East River Drive
East Hartford CT 06108

Prepared by:

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Killingworth, CT 06419

SEPTEMBER 2014

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Supplemental Visual Assessment

To: Ms. Alexandria Carter
Verizon Wireless

Date: September 8, 2014

Re: Orange North
831 Derby-Milford Road
Orange, Connecticut

From: Michael Libertine

At the request of Cellco Partnership (d/b/a "Verizon Wireless"), All-Points Technology Corporation, P.C. ("APT") prepared this Supplemental Visual Assessment in association with Connecticut Siting Council ("Council") Docket 448. At the August 12, 2014 public hearing, the Council asked Verizon Wireless to investigate the possibility of moving the proposed location of the telecommunications facility ("Facility") on the referenced property.

An "Alternate Facility Site" has been proposed approximately 90 feet to the south (tower to tower distance) of the "Original Facility Site." The Alternate Facility Location was selected primarily because it would separate the compound from the nearest wetland area an additional 118± feet. This shift in location would not require additional tree removal or earthwork requirements. At the Alternate Facility Location, Verizon Wireless could also maintain an antenna center line height of 100 feet above existing grade, comparable to the Original facility Location.

To evaluate the potential visibility of Alternate Facility Site and compare it with that of the Original Facility Site, APT conducted balloon floats on August 26, 2014 and again on August 29, 2014. The August 26th balloon float activities were completed to assess what, if any, differences in the character of views might occur as a result of shifting the Facility location. The August 29th activities were conducted to accommodate a request by counsel of the Interveners who indicated that select neighbors on Rainbow Trail would allow APT access to their properties and homes to photo document the event.

On Tuesday, August 26, 2014 APT tethered red weather balloons (approximately four feet in diameter) at string heights of 100 feet at each of the two locations. Once the balloons were secured, APT personnel drove the surrounding area and visually surveyed conditions from within the vicinity. APT also took photographs from select near-view locations originally presented in the May 2014 Visibility Analysis report (CT Siting Council Application of Cellco Partnership, Tab 9). Weather conditions were favorable, with calm winds (less than 5 mph) and mostly sunny skies.

On Friday, August 29, 2014, APT repeated the event, using red weather balloons at 100 feet string lengths. Based on previous balloon floats and reconnaissance of the area, including Rainbow Trail, APT elected to add balloons at heights of 150 feet above grade to provide a visual "marker" of the

approximate locations of the sites from places where the 100-foot high red balloons were not visible. Weather conditions were similar to earlier in the week, with sunny skies sand very calm winds (less than 3 mph).

APT personnel met the Interveners' counsel on Rainbow Trail at approximately 9 a.m. Upon explaining the rationale for placements of the two higher balloons (at 150 feet) APT was informed of the interveners' displeasure with the use of white balloons. APT subsequently changed out the white balloons with black balloons. Returning to Rainbow Trail at approximately 9:30, APT was denied access to property at 907 Rainbow Trail but was granted permission onto property at 908 Rainbow Trail. Photographs were obtained from the rooftop balcony of this residence.

The following table identifies the locations, view orientation, and distances from where each photo was taken relative to the Proposed Facility and Alternate facility locations[1]. A Photolog Map, photographs of the balloon floats and photo-simulations (from locations where the red balloons were visible) are presented in the attachments to this report.

View	Location	Orientation	Distance to Original Site	Distance to Alternate Site
1	Derby Milford Road	Northeast	±0.09 Mile	±0.08 Mile
2	Glenbrook Road	Northwest	±0.19 Mile	±0.18 Mile
3	Subject Parcel	West	±0.11 Mile	±0.11 Mile
4	Garden Road	Southwest	±0.31 Mile	±0.32 Mile
5	Rainbow Trail	South	±0.28 Mile	±0.30 Mile
6	908 Rainbow Trail	Southeast	±0.22 Mile	±0.23 Mile
6A	908 Rainbow Trail	Northwest	N/A	N/A
7	907 Rainbow Trail	Southeast	±0.20 Mile	±0.21 Mile
8	Rainbow Trail Cul-de-Sac	Southeast	±0.22 Mile	±0.23 Mile

At each photo location, the geographic coordinates of the camera's position were logged using global positioning system ("GPS") technology. Photographs were taken with a Canon EOS 6D digital camera body and Canon EF 24 to 105 millimeter ("mm") zoom lens, with lens set to 50 mm. A 50 mm focal length has a narrower field of view than the human eye but the relation of sizes between objects is represented similar to what the human eye might perceive.

> *"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.*[2]*"*

[1] Note: 6 additional photographs are included at the end of attachments documenting measurements of the string heights.

[2] Warren, Bruce. Photography, West Publishing Company, Eagan, MN, c. 1993, (page 70).

Photographic simulations were generated to portray scaled renderings of the proposed Facility from four (4) representative locations where the proposed Facility would be visible. Using field data, site plan information and 3-dimension (3D) modeling software, spatially referenced models of the site area and Facility were generated and merged. The geographic coordinates obtained in the field for the photograph locations were incorporated into the model to produce virtual camera positions within the spatial 3D model. Photo simulations were then created using a combination of renderings generated in the 3D model and photo-rendering software programs. For presentation purposes in this report, the photographs were produced in an approximate 7-inch by 10.5-inch format.

The results of the Supplemental Visual Assessment reveal that views from distances beyond the immediate vicinity of the two locations would not differ substantially. Similarly, near-views from locations generally to the south and east are not dramatically different, as upper portions of the Facility would be visible above the trees (see photos 2 and 3 as examples). A subtle difference could occur from some locations to the south where the Alternate Facility Site would rise a bit higher above the tree canopy. The characteristics of nearby views from Derby Milford Road to the west however would be altered (see photo 1). A shift to the south pushes the Facility into a slightly more prominent and elevated position relative to the adjacent road, creating a direct line of sight into the general compound area. The Original Facility Site takes advantage of a northeasterly sloping grade that, combined with the tree cover would obstruct most if not all of the compound from Derby Milford Road.

With respect to views from Rainbow Trail, the red balloons could not be seen from any ground locations. Photo 5 provides documentation of the single ground location where the black balloons (flown at 50 feet above the proposed height of the Facility) were visible above the trees. The black balloons were also visible above the trees from the balcony atop the roof of the residence at 908 Rainbow Trail (see photo 6). The red balloon associated with the Alternate Facility Site location could also be seen through the trees from west side of the balcony (where photo 6 was taken). The red balloon associated with the Original Facility Site could not be seen from the balcony. Photos 7 and 8 were also taken from locations at the west end of Rainbow Trail, where none of the balloons could be seen[3].

Given the close proximity of the two locations evaluated (less than 100 horizontal feet separation) no substantive differences in visibility were identified. A Facility at either location would not be visible above the trees from Rainbow Trail, with the exception of rooftop levels of a few homes. This finding is consistent with previous investigations of the Original Facility Site and supports Verizon Wireless's position that centrally locating a relatively short tower on the 34.6-acre subject parcel in an area with natural vegetative screening to serve as a buffer will significantly reduce the visual impact on surrounding neighbors.

[3] Photo 7 was taken from approximately the same position as photo 6 in the May 2014 Visibility Analysis report, adjacent to 907 Rainbow Trail.

ATTACHMENTS

PHOTO LOG

Legend

● Photo Location — Original Facility Site Layout — Alternate Facility Site Layout ▭ Host Property

150 75 0 150 Feet

N W E S

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
1	**DERBY MILFORD ROAD**	**NORTHEAST**	**+/- 0.09 MILE**	**+/- 0.08 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
1	**DERBY MILFORD ROAD**	**NORTHEAST**	**+/- 0.09 MILE**

ORIGINAL MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
1	**DERBY MILFORD ROAD**	**NORTHEAST**	**+/- 0.09 MILE**

ORIGINAL MONOPINE

ALL-POINTS TECHNOLOGY CORPORATION

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
1	**DERBY MILFORD ROAD**	**NORTHEAST**	**+/- 0.08 MILE**

ALTERNATE MONOPOLE

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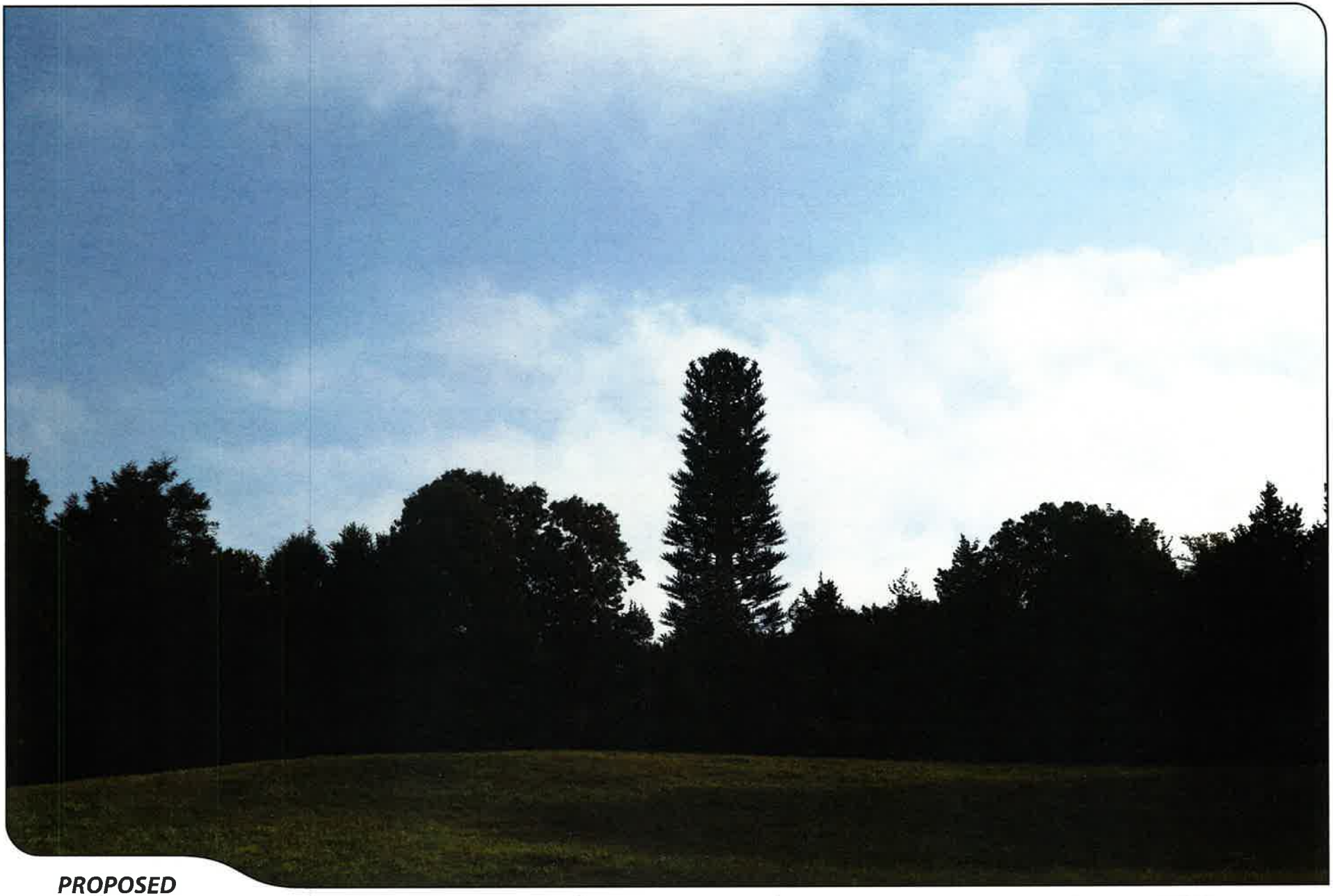

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
1	DERBY MILFORD ROAD	NORTHEAST	+/- 0.08 MILE

ALTERNATE MONOPINE

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
2	**GLENBROOK ROAD**	**NORTHWEST**	**+/- 0.19 MILE**	**+/- 0.18 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
2	**GLENBROOK ROAD**	**NORTHWEST**	**+/- 0.19 MILE**

ORIGINAL MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
2	GLENBROOK ROAD	NORTHWEST	+/- 0.19 MILE

ORIGINAL MONOPINE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
2	**GLENBROOK ROAD**	**NORTHWEST**	**+/- 0.18 MILE**

ALTERNATE MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
2	**GLENBROOK ROAD**	**NORTHWEST**	**+/- 0.18 MILE**

ALTERNATE MONOPINE

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
3	**SUBJECT PARCEL**	**WEST**	**+/- 0.11 MILE**	**+/- 0.11 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
3	**SUBJECT PARCEL**	**WEST**	**+/- 0.11 MILE**

ORIGINAL MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
3	**SUBJECT PARCEL**	**WEST**	**+/- 0.11 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
3	**SUBJECT PARCEL**	**WEST**	**+/- 0.11 MILE**

ALTERNATE MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
3	**SUBJECT PARCEL**	**WEST**	**+/- 0.11 MILE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
4	**GARDEN ROAD**	**SOUTHWEST**	**+/- 0.31 MILE**	**+/- 0.32 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
4	**GARDEN ROAD**	**SOUTHWEST**	**+/- 0.31 MILE**

ORIGINAL MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
4	**GARDEN ROAD**	**SOUTHWEST**	**+/- 0.31 MILE**

ORIGINAL MONOPINE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
4	**GARDEN ROAD**	**SOUTHWEST**	**+/- 0.32 MILE**

ALTERNATE MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
4	**GARDEN ROAD**	**SOUTHWEST**	**+/- 0.32 MILE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
5	**RAINBOW TRAIL**	**SOUTH**	**+/- 0.28 MILE**	**+/- 0.30 MILE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
6	**908 RAINBOW TRAIL - ROOFTOP**	**SOUTHEAST**	**+/- 0.22 MILE**	**+/- 0.23 MILE**

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
6	908 RAINBOW TRAIL - ROOFTOP	SOUTHEAST	+/- 0.23 MILE

ALTERNATE MONOPOLE

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PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE
6	908 RAINBOW TRAIL - ROOFTOP	SOUTHEAST	+/- 0.23 MILE

ALTERNATE MONOPINE

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EXISTING

PHOTO	LOCATION
6A	**908 RAINBOW TRAIL**

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
7	**ADJACENT TO #7 RAINBOW TRAIL**	**SOUTHEAST**	**+/- 0.20 MILE**	**+/- 0.21 MILE**

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EXISTING

PHOTO	LOCATION	ORIENTATION	ORIGINAL SITE DISTANCE	ALTERNATE SITE DISTANCE
8	**RAINBOW TRAIL CUL-DE-SAC**	**SOUTHEAST**	**+/- 0.22 MILE**	**+/- 0.23 MILE**

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PHOTOGRAPHS DOCUMENTING STRING MEASUREMENTS

SETUP PHOTOS

ORIGINAL SITE
MEASURING OUT STRING LENGTH

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SETUP PHOTOS

ORIGINAL SITE
50' MEASUREMENT FROM TOP OF STRING TETHERED TO 150' INDICATES 100' HEIGHT AGL

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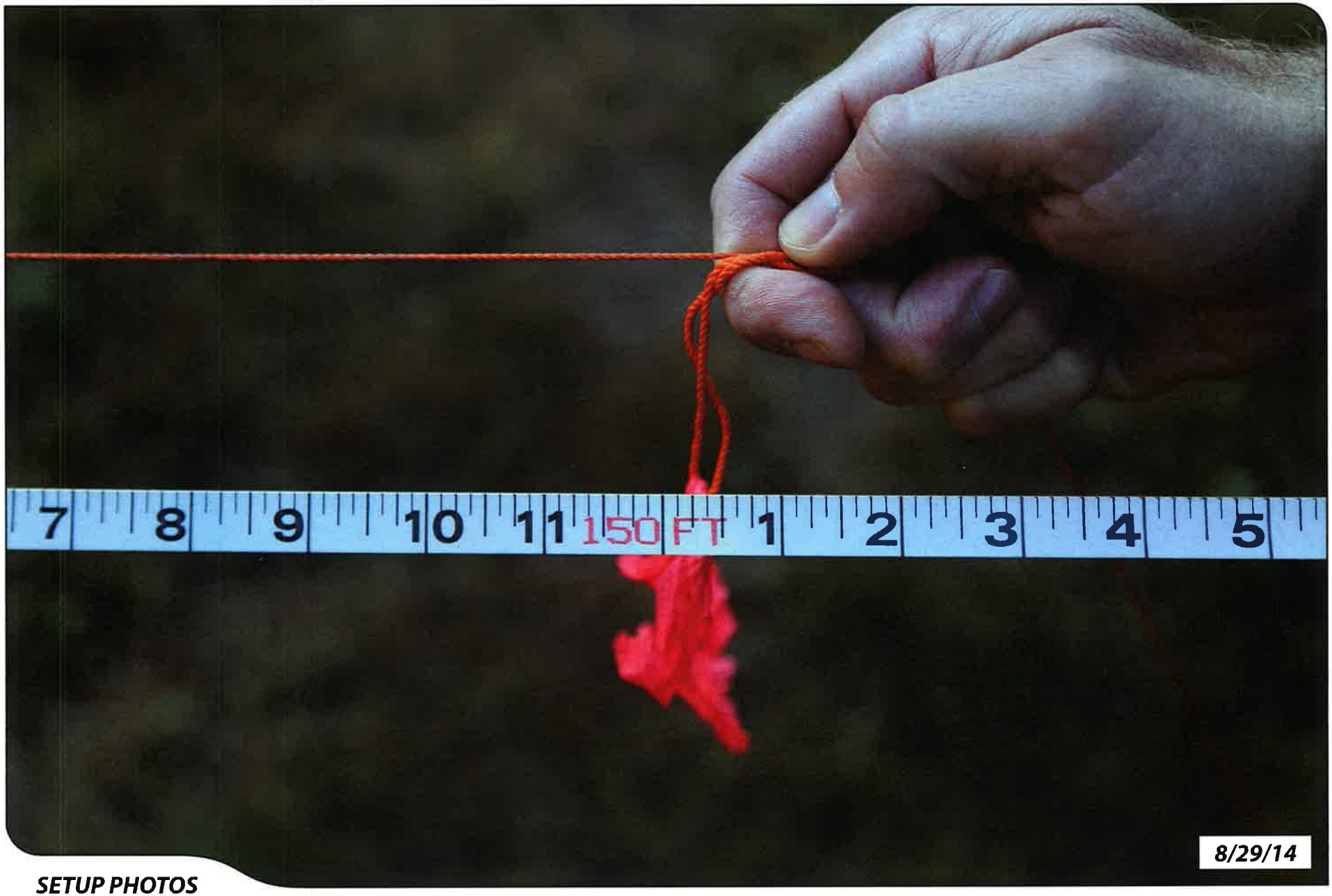

SETUP PHOTOS

ORIGINAL SITE
150' MEASUREMENT WHERE STRING IS TIED OF TO STAKE AT GROUND LEVEL

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SETUP PHOTOS

ALTERNATE SITE
MEASURING OUT STRING LENGTH

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SETUP PHOTOS

ALTERNATE SITE
50' MEASUREMENT FROM TOP OF STRING TETHERED TO 150' INDICATES 100' HEIGHT AGL

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SETUP PHOTOS

ALTERNATE SITE
150' MEASUREMENT WHERE STRING IS TIED OF TO STAKE AT GROUND LEVEL

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