

SIMULATIONS

010 Long Point Camps
Misty Night



SIMULATION

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Misty Night

Siemens SWT-3.6-107

10 nm

Simulation

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Misty Night

Siemens SWT-3.6-107
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GENERAL INFORMATION

Base Photograph

Photo Name: LPS_0099-UV3

Date: June 3, 2012

Time: 4:39 AM

GPS Coordinates¹: lat 34.898977°, long -76.25513°

Viewpoint Elevation: 11'

Weather

Moon is below horizon

Weather Conditions: Starlit (see notes)

Visibility²: 10 mi

Wave Height: 2 - 4'

Period: Unknown

Camera

Camera Make/Model: Nikon D7000

Sensor Dimensions: 23.6 mm X 15.6 mm

Lens Make/Model: Nikkor DX AF-S 35 mm

Lens Focal Length: 35 mm

35 mm Equivalent Focal Length: 52.5 mm

Horizontal and Vertical Angles of View:

37.3° wide and 25.3° high

Camera Height: 1.5 m (5')

Camera Azimuth³: 118°

Wind Turbine Information

Number: 200

Make and Model: Siemens SWT-3.6-107

Height/Dimensions:

Support Structure/Monopile Ht.: 13 m (43')

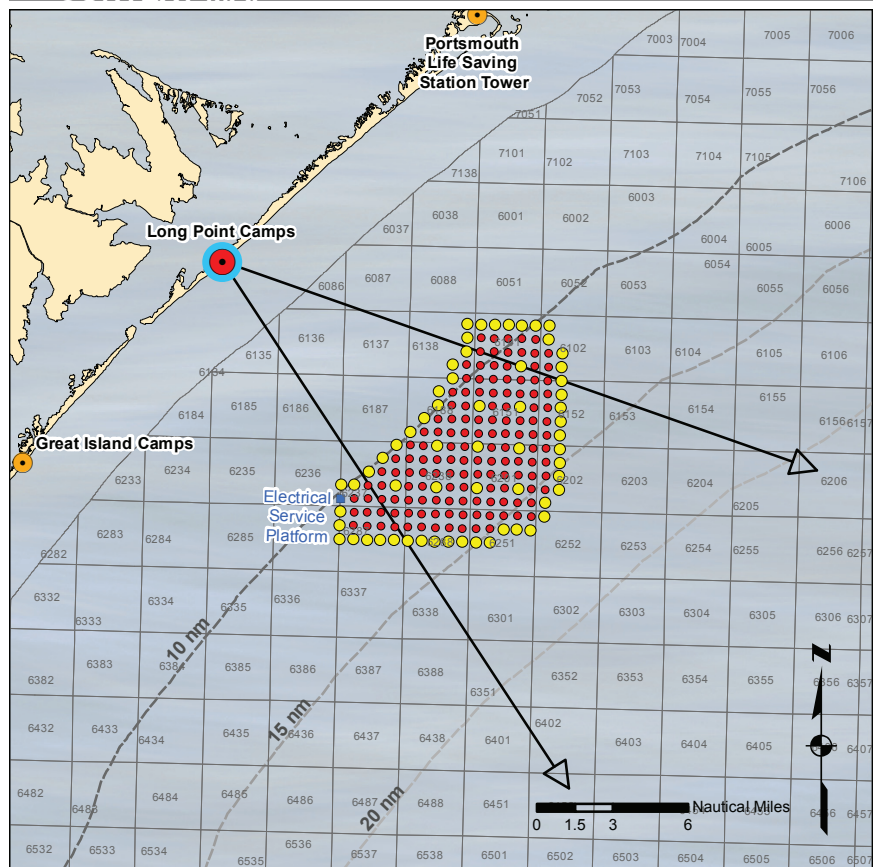
Hub Ht. (above Monopile): 80 m (262')

Rotor Diameter: 107 m (351')

Total Height to Tip of Blade: 147 m (481')

Service Platform: A bldg. 50'H X 100'W X 200' L
elevated 50' above the water

CONTEXT MAP



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- The resulting image represents an impression of how the wind project lighting might appear if it were surrounded by a light mist on an otherwise clear night.
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- The image was taken with a UV filter.
- Refraction Coefficient⁴ (k) = .075

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PANORAMA



Simulation location within the panorama view (190° X 60°)
from the Long Point Camps site

T. J. Boyle Associates
landscape architects • planning consultants



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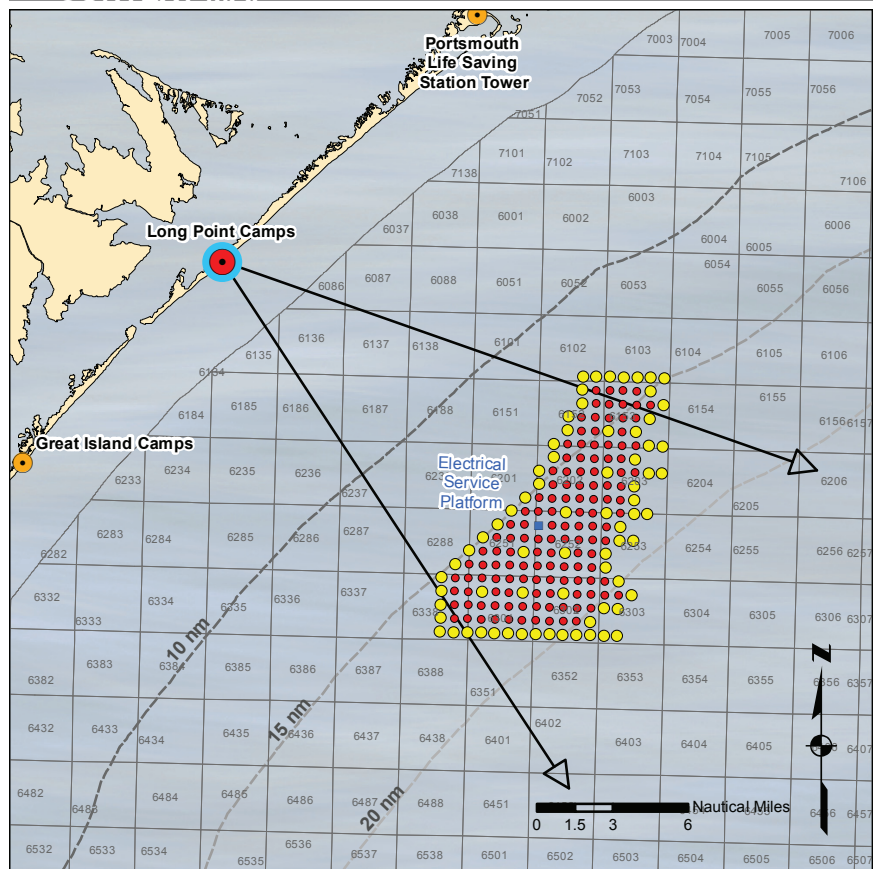
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VISUALIZATION STUDY FOR OFFSHORE NORTH CAROLINA
010 Long Point Camps, Misty Night, Siemens SWT-3.6-107, 15 nm

SIMULATION

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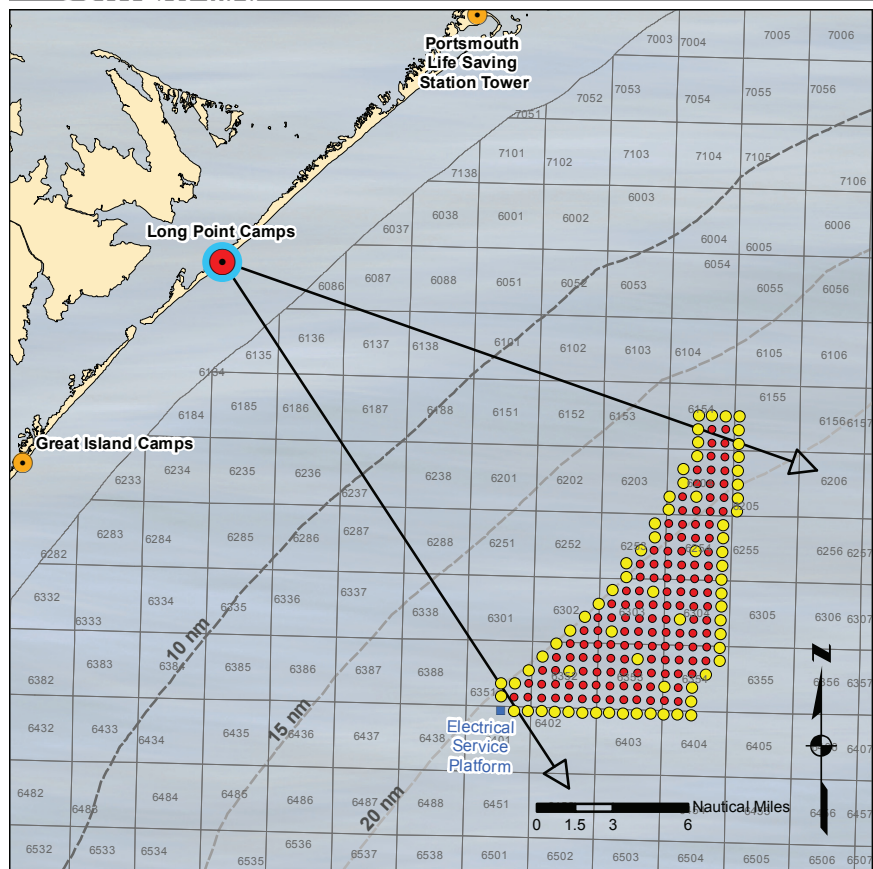
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SIMULATION

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Vestas V164-7.0 MW

10 nm

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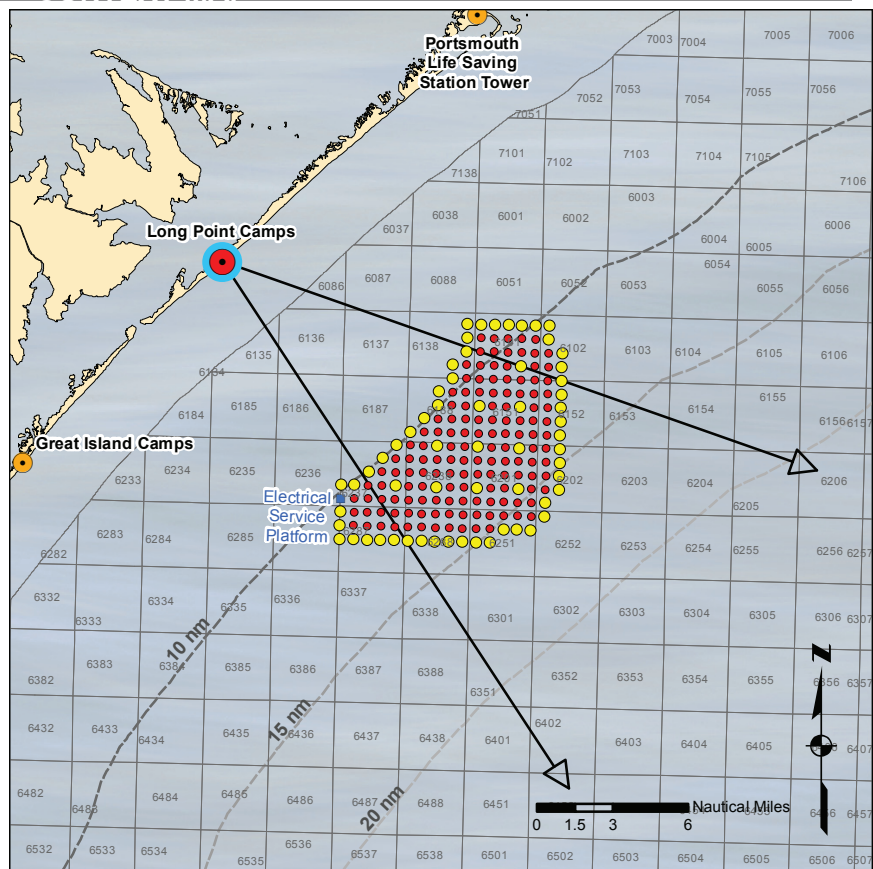
Hub Ht. (above Monopile): 105 m (345')

Rotor Diameter: 164 m (538')

Total Height to Tip of Blade: 200 m (656')

Service Platform: A bldg. 50'H X 100'W X 200' L
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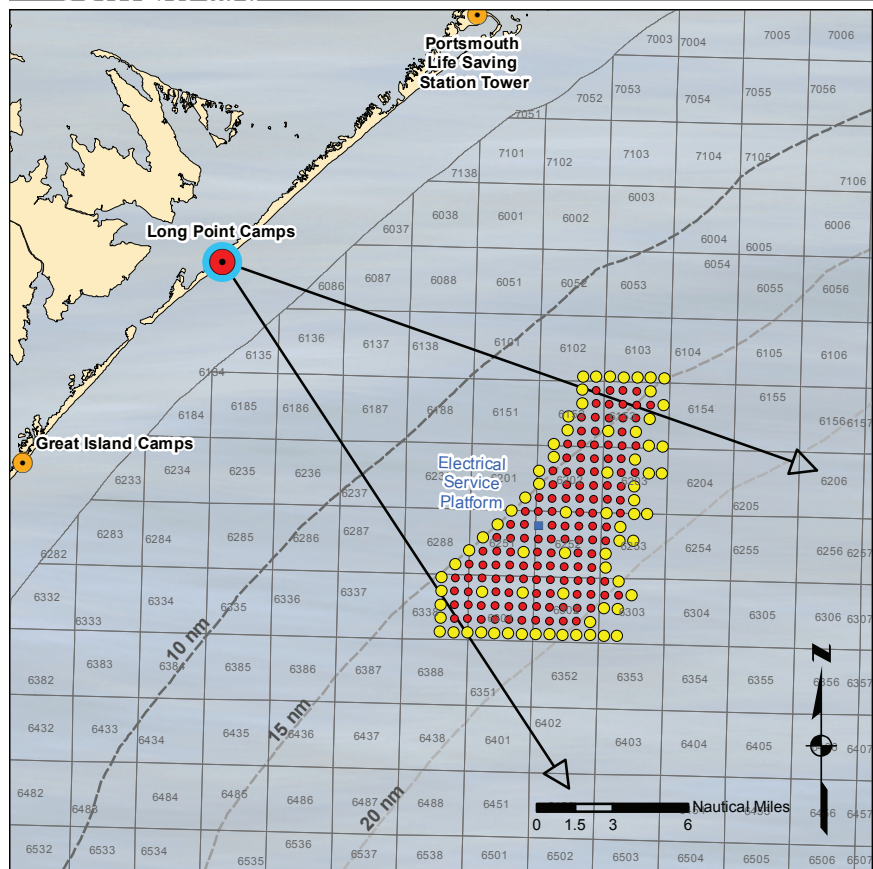
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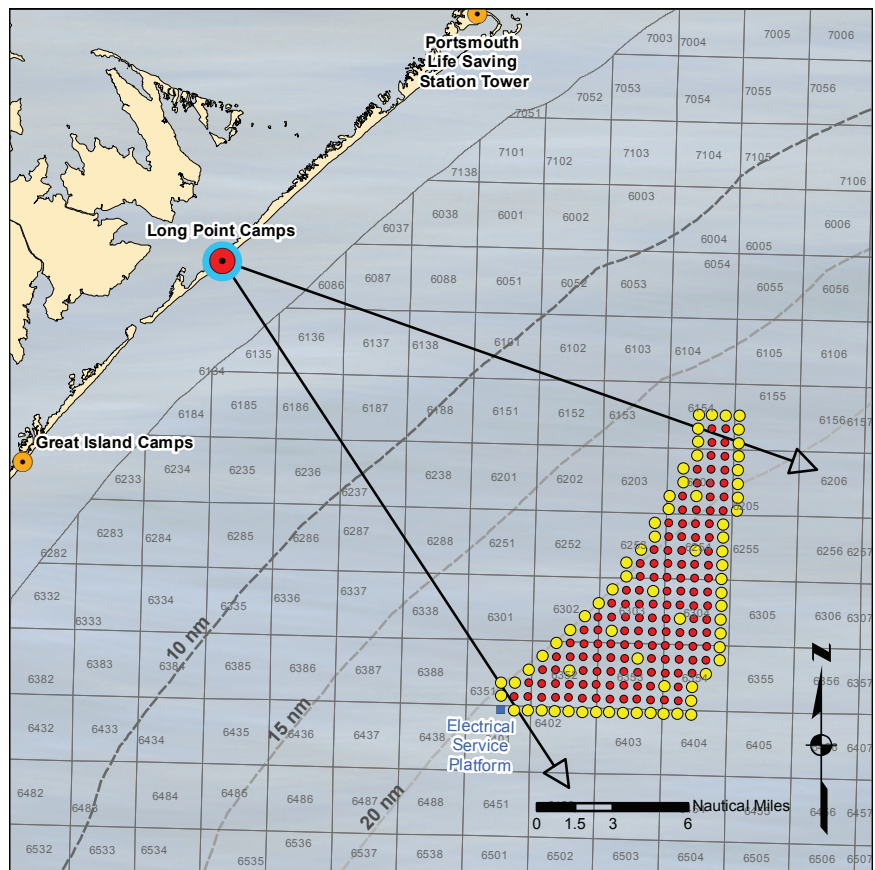
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INFORMATION PAGE FOOTNOTES

¹GPS Coordinates

Location coordinates as used in WindPRO to register the wireframe diagram to the photograph. Due to slight errors and lens distortion, these values may differ at the fourth significant digit as obtained from a handheld GPS device at the time the photographs were taken and as shown on the Project Location Map.

²Visibility

Visibility is obtained from the closest airport weather station (see chart at right). The chart shows which weather station was used for each site. Visibility is measured up to ten statute miles.

³Camera Azimuth

Camera azimuth was obtained using a magnetic compass at the time of photography. However magnetic anomalies in the study area make some of these measurements unreliable. The camera azimuth reported here is for true north and reflects the bearing used to register the wind turbines to the photograph in WindPRO.

⁴Refraction Coefficient

The correction for refraction comes from Technical Appendix F Earth Curvature and Refraction of Light, in the report *Visual Representation of Windfarms Good Practice Guidance*, prepared for Scottish Natural Heritage (h+m 2006). The coefficient of refraction k is commonly defined as the ratio between the radius of the earth and the radius of the light in the line of sight between an object and the observer (Hirt 2010). The value reported here is half this value, but it is multiplied by two in the Technical Appendix's equation.

ABBREVIATIONS

nm	nautical miles
mi	statute miles
mm	millimeters
m	meters
sec.	seconds
'	feet
"	inches
°	degrees
lat	latitude
long	longitude

REFERENCES

h+m and envision. 2006. Visual Representation of Windfarms Good Practice Guidance. Scottish Natural Heritage.

Hirt C., Guillaume S., Wisbar A., Bürki B. and Sternberg, H. 2010. Monitoring of the refraction coefficient of the lower atmosphere using a controlled set-up of simultaneous reciprocal vertical angle measurements. Journal of Geophysical Research, 115, D21102, doi:10.1029/2010JD014067

Closest Airport Weather Station to Sites

Site	Weather Station Location NC
001 Corolla Lighthouse	Kill Devil Hills
002 Beach at Duck	Kill Devil Hills
003 Kitty Hawk	Kill Devil Hills
004 Coquina Beach	Kill Devil Hills
005 Bodie Island Lighthouse	Hatteras
006 Cape Hatteras Lighthouse	Hatteras
007 Lighthouse Beach	Hatteras
008 Ocracoke Beach	Hatteras
009 Portsmouth Life Saving Station Tower	Hatteras
010 Long Point Camps	Hatteras
011 Great Island Camps	Beaufort
012 Cape Lookout Lighthouse	Beaufort
013 Cape Point	Beaufort
014 Atlantic Beach	Beaufort
015 Bald Head Island	Southport
016 Oak Island	Southport
017 Holden Beach	Southport
018 Sunset Beach	Southport