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NYSERDA ORECRFP23-1

Purchase of Offshore Wind Renewable Energy Credits

Submitted by Empire Offshore Wind LLC- January 25, 2024

Section 8.5 - Visibility Study

Powering New York. Together

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8. RESPONSIBLE DEVELOPMENT

8.5. Visibility Study

The Submission must include both Confidential and Public versions of a visibility study consistent with the Visual Impact Assessment as part of the COP.

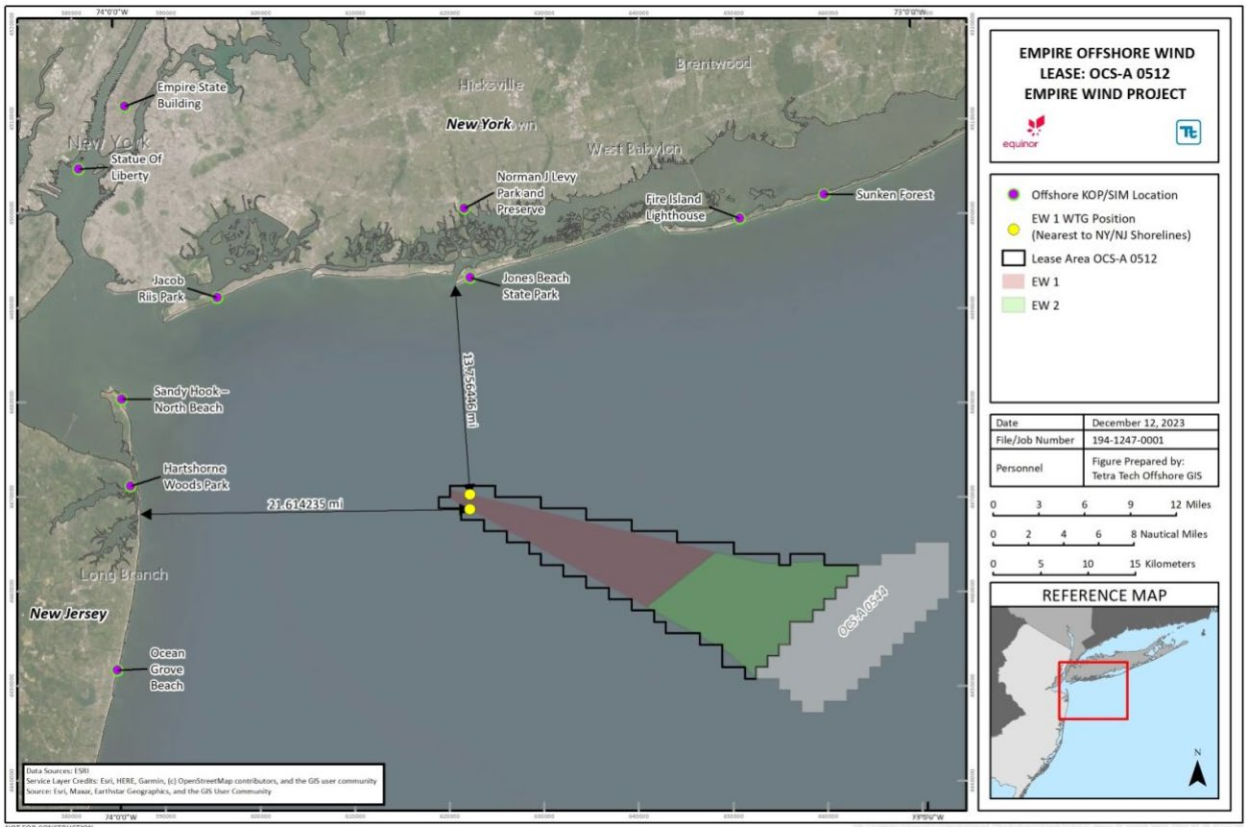
The Visibility Study must present visual simulations of the proposed Offshore Wind Generation Facility. Visibility studies must include a map or maps that depict the nearest coastline, the boundary of the proposed site to be developed and any other reasonable reference points (e.g., coastal cities, historic sites, other wind energy areas). The visibility Study must identify the distance in statute miles between the nearest shoreline point and the nearest Offshore Wind Generation Facility turbines. If the nearest shoreline point is not in New York State, the Proposal should also identify the nearest New York shoreline point and include the nearest New York shoreline point in the viewshed impacts discussion. Simulations must be single frame, photographic images with superimposed simulations of the proposed wind turbine technology configured to represent a commercially-scaled and technically feasible scenario that is consistent with the proposed Project including operating capacity, wind turbine size, and generic spacing and configuration. Viewing instructions must be included on each simulation.

Visual simulations must represent, at a minimum, clear, partly cloudy, and overcast conditions during early morning, mid-afternoon, and late day, as well as one simulation at night with the turbines lit under clear conditions. Visual simulations must be provided from a minimum of two representative vantage points which represent the closest points to shore from any turbine within the Offshore Wind Generation Facility and, if applicable, any sensitive or historic viewpoints, consistent with the Visual Impact Assessment required through the COP. Proposals must address any mitigative viewshed impacts considered for the closest points to shore and if applicable any sensitive or historic viewpoints. The visibility study must also include analysis of the percentage of time during which different visibility conditions are expected to occur based on past meteorological data.

The simulations must be provided in a format suitable to be printed or electronically viewed by the public and/or the Scoring Committee.

Empire Wind recognizes the importance of ensuring that offshore wind is developed in a manner that minimizes the impact on viewsheds and respects significant historical, cultural, and economic resources. As demonstrated by Figure 8.1 below, the Empire Wind Project (“EW1”) is located 13.75 miles from the nearest point to shore.

Figure 8.1: Project Distance to Shore



As noted in Section 6.2.1, the viewshed impact of EW1 has been fully evaluated in accordance with Federal and State agency environmental reviews processes. Among other things, the Project has recently received its Record of Decision ("ROD"), concluded its Section 106 consultation with a Memorandum of Agreement ("MOA") between parties to resolve adverse effects to historic properties, and received its Article VII certificate.

Empire Wind has committed to the following measures to minimize visibility and the potential impact on viewshed resources through the ROD and the Section 106 MOA. This includes:

- Utilizing project-specific turbines with uniform size rotor blades, nacelles, and towers.
- Utilizing turbines of a light color, no lighter than RAL 9010 pure white and no darker than RAL 70355 light gray, as dictated by the United States Coast Guard ("USCG") and Bureau of Ocean Energy Management ("BOEM") requirements to help reduce the potential visibility of the turbines against the horizon during daylight hours.

- Smart aviation lighting systems, such as an Aircraft Detection Lighting System ("ADLS"), further discussed in Section 8.5.3.[1]
- Use of consistent spacing and as far apart as possible in the dominant trawl tow where feasible to decrease visual clutter.

There are several documents prepared to analyze visual impacts. First, in support of the Construction and Operation Plan ("COP"), Empire Wind prepared a Visual Impact Assessment ("VIA") (Appendix AA, July 2023) which is summarized in COP Volume 2d: Visual Resources. The scope and approach to the VIA were supported through engagement with BOEM, U.S. National Park Service ("NPS"), the New York State Historic Preservation Office ("NY SHPO"), the New Jersey State Historic Preservation Office ("NJ HPO"), New Jersey Department of Environmental Protection ("NJDEP"), and New York State Department of Environmental Conservation ("NYSDEC"). The VIA was prepared in accordance with BOEM's Guidelines for Information Requirements for a Renewable Energy Construction and Operations Plan (BOEM 2016). The VIA also considered the following New York Policies, Plans, and Programs:

- New York State Coastal Management Program
- New Jersey Coastal Management Program
- Vision 2020: New York City Comprehensive Waterfront Plan (NYC 2011)
- Waterfront Revitalization Program (NYC 2016)
- Long Island South Shore Estuary Reserve Comprehensive Plan 2021
- Nassau County Master Plan (NY)
- Monmouth County Master Plan (NJ)

Using the VIA prepared for the COP, BOEM prepared a Seascape, Landscape, and Visual Impact Assessment ("SLVIA") as part of its National Environmental Policy Act ("NEPA") analysis of the project. The SLVIA is Appendix M of the Final Environmental Impact Statement ("FEIS") and is summarized in Volume 1 Section 3.20. The SLVIA has two separate but linked parts: the seascape, open ocean, and landscape impact assessment ("SLIA") and the VIA. The SLIA analyzes and evaluates resource sensitivity, susceptibility, and magnitude of change in the consideration of impacts on both the physical elements and features that make up a landscape, seascape, or open ocean; and the aesthetic, perceptual, and experiential aspects of the landscape, seascape, or open ocean that make it distinctive. The VIA analyzes and evaluates the impacts on people of adding the proposed development to views from selected viewpoints. The SLVIA evaluates visual

[1] Federal Aviation Administration ("FAA") and USCG lights on the wind turbines will contribute to their visual effect, especially during nighttime or poor visibility conditions. These warning lights are a required safety measure; therefore, they cannot be reduced in number or eliminated. However, lighting-related impacts can be minimized by optimizing wind turbine lighting to the minimum time duration allowable by the FAA and USCG.

impacts under each of the eight project alternatives developed by BOEM in addition to the NEPA-required No Action Alternative.

Both the VIA for the COP and the VIA for the FEIS are used to assess effects to historic resources under the National Historic Preservation Act of 1966. This assessment, known as the Assessment of Visual Affects to Historic Properties ("AVEHAP") can be found in Appendix Z of the COP, and is summarized in Volume 2d. The findings are then carried forth into the FEIS Appendix N: Finding of Adverse Effect which contains the Memorandum of Agreement, signed on November 20, 2023 by BOEM, the Advisory Council on Historic Properties ("ACHP") and the State Historic Preservation Offices ("SHPO") of both New York and New Jersey.

Project activities for all stages of the Project life cycle (construction and installation, Operations and Management ("O&M"), and decommissioning) are assessed against the environmental baseline to identify the potential interactions between the Projects and the seascape, landscape, and viewers. The onshore geographic analysis area includes landfalls, buried onshore export cables, onshore substations, and transmission connections to the electric grid. The SLVIA also provides a cumulative VIA. It is important to note that these analyses consider offshore visual impacts of both EW1 and Empire Wind, Phase 2 projects together while impacts of the onshore substations and O&M building are considered individually. In addition, the VIA was conducted based on the Project Design Envelope, which considers the maximum case scenario of 174 turbines, with a hub height of 525 ft and an upper blade tip height of 951 ft.

All COP documents and FEIS documents can be accessed directly from BOEM's website.

8.5.1. Summary of Visibility Study

This section summarizes the visual impact of the "Proposed Action" or Alternative A, as determined by the SLVIA in the FEIS.

Atmospheric conditions offshore and near the shoreline limit views more than the typically drier-air conditions in inland areas. Visual simulations from representative viewpoints included as Appendix D to the VIA (Appendix AA of the COP) indicate that daytime and nighttime visibility of wind turbine generators ("WTGs") and offshore substation ("OSS") would be noticeable to the casual observer from beach and landward viewpoints.

Typical human perception extends to 124° in the horizontal axis and 55° in the vertical axis. The nearest shoreline viewers would be 14.1 miles (25.9 kilometers) from the Wind Farm Development Area. Earth curvature ("EC"), at this distance, reduces the observable height above the horizon of the nearest WTG by 86.1 feet (26.2 kilometers), from 951 feet (289.9 meters) Mean Lower Low Water ("MLLW") to 864.9 feet (263.6 meters), resulting in occupation of 0.7°, 1.3% of the vertical view. Remaining WTGs would further diminish in perceived size with distance and EC.

Visibility, character-changing effects, scale, prominence, and visual contrasts reduce steadily with distance from the observation point. Visibility, character-changing effects, scale, prominence,

and visual contrasts increase with elevated observer positions in comparison with the wind farm as shown in Figure 8.2 below.

Figure 8.2: Heights of Noticeable[2] WTG Elements and Substations and Visible Distances[3]

Noticeable Element	Height in Feet (meters)	Visible Distance in Miles (km)
Rotor Blade Tip	951 (290) MLLW	0-40.5 (65.2)
Navigation Light	544 (165.8) MLLW	0-31.3 (50.4)
Nacelle	534 (162.8) MLLW	0-31.1 (50.1)
Hub	525 (160) MLLW	0-30.8 (49.6)
Mid-tower Light	263 (78) MLLW	0-22.6 (36.4)
Offshore Substation	200 (61) HAT	0-20.1 (32.3)
Yellow Tower Base Color	68.9 (21) HAT	0-11.4 (18.3)

The strongest daytime contrasts would result from tranquil and flat seas combined with sunlit WTG towers, nacelles, rotating rotors, flickering rotors, and a yellow tower base color against a dark background sky and an undifferentiated foreground. There would be daily variation in WTG color contrast as sun angles change from backlit to front-lit (sunrise to sunset) and the backdrop would vary under different lighting and atmospheric conditions. The weakest daytime contrasts would result from turbulent seas combined with overcast daylight conditions on WTG towers, nacelles, and rotors against an overcast background sky and a foreground modulated by varied landscape elements. The strongest nighttime contrasts would result from dark skies (absent moonlight) combined with navigation lights, activated lighting on the OSS, mid-tower lights, and Project lighting reflections on low clouds and active (non-reflective) surf, and the dark-sky light dome. The weakest nighttime contrasts would result from moonlit, cloudless skies; tranquil (reflective) seas; ADLS activation; and only mid-tower lights.

Viewshed analyses (COP Appendix AA) determined that clear-weather visibility of the WTGs and OSS would occur from 12.5% of the land area within the Proposed Action's zone of visual

[2] Perception of Project elements, from 5 feet (1.5 meters) human eye-level while standing at mean sea level, involves static distance-related sizes, forms, lines, colors, and textures; variable daytime lighting conditions; variable nighttime light conditions; and variable meteorological conditions.

[3] Based on intervening EC and clear-day conditions.
MLLW= Mean Lower Low Water
HAT= Highest Astronomical Tide

influence. The Proposed Action would be visible along portions of Long Island's southern beaches. The majority of landward visibility (155 square miles) would occur within 14.2–28 miles of the Proposed Action over inland bays. Visibility would diminish between 28 and 40 miles, contributing 44 square miles to the zone of visual influence. Elevated viewing conditions, such as would occur at the Fire Island Lighthouse (160 feet [48.5 meters]), Sandy Hook Lighthouse (108 feet [32.9 meters]), and Empire State Building (1,304 feet [397.5 meters]), would increase WTG visibility distances to as much as 42 miles (67.6 kilometers). Due to coastal meteorological conditions, Proposed Action visibility in these areas would be noticeably reduced on approximately 3 days out of 4 to 5 days. ADLS would reduce nighttime impact levels due to substantially limited hours of lighting.

Meteorological Conditions

Because the Empire Wind Project is located within the Area of Analysis ("AoA") included in the New York State Energy Research and Development Authority's ("NYSERDA") Visual Threshold Study ("VTS"), the NYSERDA VTS was reviewed to identify the typical or average weather conditions and visibility conditions expected to occur within the Empire Wind Project area and the percentage of time during which different visibility conditions were expected to occur. The NYSERDA VTS assessed the visibility of a hypothetical wind farm at various distances (13.2 and 30 miles) from shore under different meteorological conditions within the AoA. The AoA identified in the NYSERDA VTS consisted of the Atlantic shoreline of Long Island and offshore views roughly perpendicular to that shoreline. Weather data was examined in the study to determine how frequently each combination of visibility (*i.e.*, less than 10 miles or greater than 10 miles), background sky conditions (*i.e.*, clear, partly cloudy, or overcast), and time of day (*i.e.*, morning, midday, afternoon) is likely to occur during a typical year. The analysis was based on hourly meteorological surface data collected from the DS3505 data set available from the National Climatic Data Center ("NDCD") for the weather stations at the John F. Kennedy International Airport and the Long Island-MacArthur Airport for a period of six years.

Based on data collected from the weather stations and the results of the analysis, during daytime hours,[4] overcast conditions were most common over the course of a year occurring approximately 60% of the daylight hours. Clear conditions occur in approximately 17% of the daylight hours, followed by partly cloudy conditions which occurred approximately 6% of daylight hours. Under these three types of conditions, it is assumed that visibility would be 10 miles or greater. For the remaining 16% of the daylight hours, for which NYSERDA did not classify, visibility was less than 10 miles.

[4] The NYSERDA VTS did not assess nighttime conditions with the exception of the use of nighttime aviation warning lights.

The most frequent condition is overcast skies during the morning, which occurs 21.8% of daylight hours, followed by overcast skies during midday and afternoon hours, which occurs 21.5% and 17% of daylight hours, respectively. The least frequent weather condition is partly cloudy skies during the midday hours (1.8% of total daylight hours). Figure 8.3 provides a summary of frequency of occurrence of the various time of day/weather scenarios.

Figure 8.3: Frequency of Occurrence of Various Time of Day/Weather Scenarios

Time of Day	Percentage of Daylight Hours		
	Clear	Partly Cloudy	Overcast
Morning	7.6	2.2	21.8
Midday	4.2	1.8	17.0
Afternoon	5.3	1.9	21.5
Total	17.1	5.9	60.3

8.5.2. Visual Simulations

Within a 40-mile visual study area, 17 Key Observation Points ("KOPs") were selected to represent individuals or groups of people who may be affected by changes in views and visual amenity. In addition, four KOPs were selected for viewer analysis of the EW1 Onshore Substation.

Photographic simulations were then created to depict the Project components and their potential changes to the existing landscape. The simulations were used to determine the level of contrast between the existing landscape and the expected landscape after the Project is implemented. Simulations were prepared for 10 of the KOPs to represent daytime views of the WTGs. The simulations that were produced depict actual weather conditions at the time photography was taken during the field visits. Of these 10, two also include panoramic daytime/nighttime, computer generated and time lapse video simulations (Jones Beacon State Park, NY and Ocean Grove Beach, NJ). Attachment AA-3 to COP Appendix AA presents all WTG and OSS visual simulations from the KOPs that were created for this analysis. For convenience, these simulations have been excerpted as Attachment 8.J. Of the 10 KOPs, the two closest points to shore are Short Beach at Jones Beach State Park (14.2 miles) and Norman J. Levy Park and Preserve (18.8 miles).

The Jones Beach simulation was created based on photography captured during clear conditions on December 7, 2018. Photography for the Norman J. Levy Park simulation was captured on November 8, 2018 under partly cloudy conditions. Both of these simulations conclude that all proposed structures would be visible from these two KOPs.

Viewers at beaches along the southern coast of Jones Beach Island will theoretically have views of the nacelle (hub), full rotor blades, and the towers of the representative wind turbines. Although much of the turbine structures will be visible, the perceived scale of the wind turbines will be relatively small, amounting to fractions of an inch for viewers onshore. At Short Beach, located within the western portion of Jones Beach State Park, at a distance of 14.2 mi (22.9 km) from the nearest representative wind turbine within the Project Area 879.2 ft (268 m) of the 951.4 ft (290 m) (mean sea level to tip of blades) wind turbine will extend above the horizon. The photographic simulation from Short Beach at Jones Beach State Park was created so that it is true to scale when viewed at a distance of 24 inches (610 millimeters), provided as Attachment 8.J. Under those conditions, the theoretically visible portion of the closest representative wind turbine would amount to 0.14 inch (3.6 millimeters) when measured on the simulation graphic. From Short Beach, beachgoers will have views looking toward the broad side of the Project Area. Therefore, the wind turbines will appear spread out over a long distance. Given the proximity of the representative wind turbines, the portion of the wind turbines visible, the introduction of vertical elements into a primarily horizontal landscape setting, the motion of the blades, and the spatial dominance within the landscape setting, the Project will attract attention and become a focal point within the view. As such, the representative wind turbines will create strong visual contrast at this location.

Although the Project will introduce several new vertical elements into the viewscape from Norman J. Levy Park, they would appear as thin objects on the horizon. The photographic simulation from Norma J. Levy Park is provided as Attachment 8.J. The strong horizontal line of the horizon is already disrupted by existing development along the Jones Beach Island, including the Jones Beach Tower and the Nikon Theater. The distance of the wind turbines from the viewer will help to reduce their dominance within the landscape setting and the Project will appear as a co-dominant feature with the other elements competing with the viewer's attention. Furthermore, the existence of other features in the built environment within the view lessens the contrast between the character of the existing view and the view with the Project. As such, the Project will introduce moderate visual contrast at this KOP.

The simulations were created using geographic information system ("GIS") software, Autodesk 3D Studio Max®, and rendering and Photoshop software. To create the simulations, the location data captured by the GPS device were transferred to ArcMap, where it was combined with GIS data of the preliminary layouts of Project components and facilities. A map showing the data was exported at true scale and imported into 3D Studio Max®. Using this scaled map as a base, 3D models of the offshore and onshore Project Areas were created to scale. These 3D models of the Project features, previously modeled to scale in 3D Studio Max®, were added in their appropriate locations and elevations. The views from the existing digital photographs were then matched in the 3D model using virtual cameras with the same focal length and field of view as the DSLR camera setting. After date- and time-specific lighting was added to the 3D model, renderings from the virtual cameras were created. These renderings were then blended into the existing

conditions photographs in Adobe Photoshop software. Any necessary modifications to the existing landscape were completed in Photoshop as well. This process of creating a 3D model at true scale and rendering images using the same specifications used by the camera ensures that the spatial relationships of the landscape, Project features, and viewer perspective are accurate and match the existing site photographs. Each simulation was then scaled to be viewed at a specified distance to represent the actual size of the turbines.

In accordance with the solicitation requirements Empire Wind is providing, as Attachment 8.J, visual simulations from at least "two representative vantage points which represent the closest points to shore from any turbine within the Offshore Wind Generation Facility…". These simulations have been provided in a format suitable to be printed or electronically viewed by the public and/or the Scoring Committee. **For proper viewing, all simulations should be printed 11"x17" in full size with no scaling and viewed from an arm's length away (approximately 24 inches). Viewing the attached simulations in a manner that does not follow the directions set out above, such as on a computer screen, will provide an unrealistic and exaggerated view of the visual impact of these projects.**

8.5.3. Mitigation

To address mitigation, Empire Wind will prepare and implement a scenic and visual resource monitoring plan (in coordination with BOEM) that monitors and compares the visual effects of the wind farm during construction and O&M (daytime and nighttime) to the findings in the COP VIA and verifies the accuracy of the visual simulations (photo and video). The monitoring plan will include monitoring and documenting the meteorological influences on actual wind turbine visibility over a duration of time from selected onshore key observation points, as determined by BOEM and the developer. In addition, Empire Wind will include monitoring of the operation of ADLS in the monitoring plan. Empire Wind will monitor the frequency that the ADLS is operative, documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures are to be included in the plan.

8.5.4. Sensitive/Historic Viewpoints

Several KOPs and simulations produced also represent historic properties including New York State Park properties and National Park Service Properties. These simulations can be found in Attachment AA-3 of Appendix AA of the COP, and provided as Attachment 8.J, hereto. Impacts to historic properties are assessed under Section 106 of the National Historic Preservation Act of 1966. The culmination of this process resulted in an MOA between parties to resolve adverse effects to historic properties. After five consulting party meetings and comment periods, this MOA was signed on November 20, 2023 by BOEM, the ACHP and the SHPO of both New York and New Jersey. The MOA addresses mitigation measures for visual adverse effects to 20 historic properties (13 properties in New York and seven properties in New Jersey).

8.6. Visibility Study GIS Shapefiles

Provide supporting GIS shape files that depict the nearest coastline, the boundary of the proposed site to be developed and any other reasonable reference points (e.g., coastal cities, historic sites, other wind energy areas).

Provided as Attachment 8.K.

Section 8.5

Visibility Study

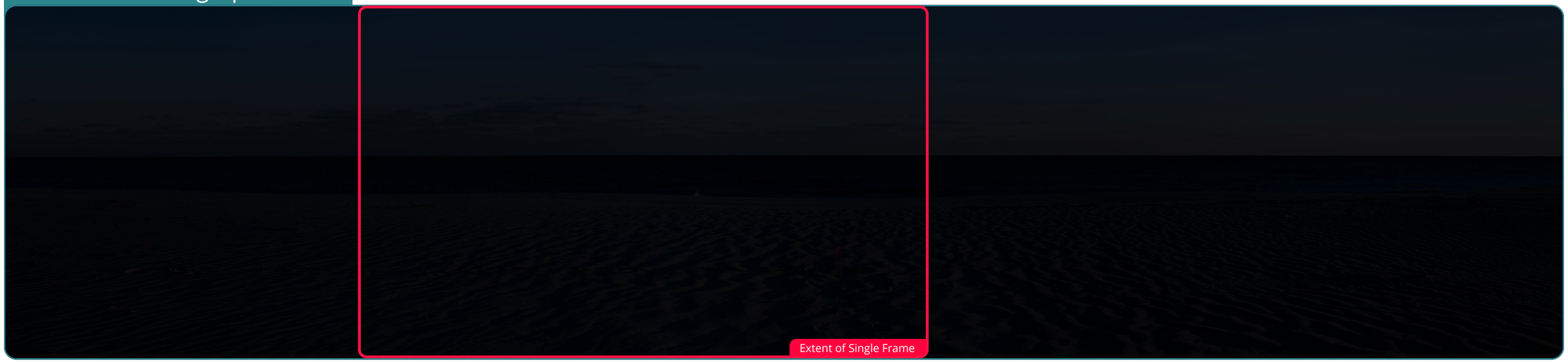
Attachment 8.H

Visual Simulations

equinor

Empire Wind

Panoramic Photograph

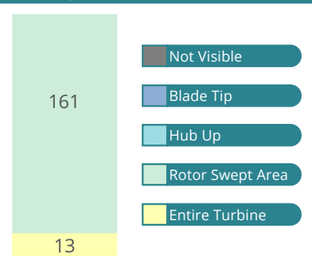


Vicinity Map

Photograph Information

Viewpoint Location:	Short Beach
Date of Photograph:	December 7, 2018
Time of Photograph:	Night (simulated)
Weather Condition:	Clear
Latitude:	40.580436° N
Longitude:	-73.55644° W
Viewing Direction:	Southeast
Ground Elevation + Tripod Height:	16 feet

Turbine Visibility



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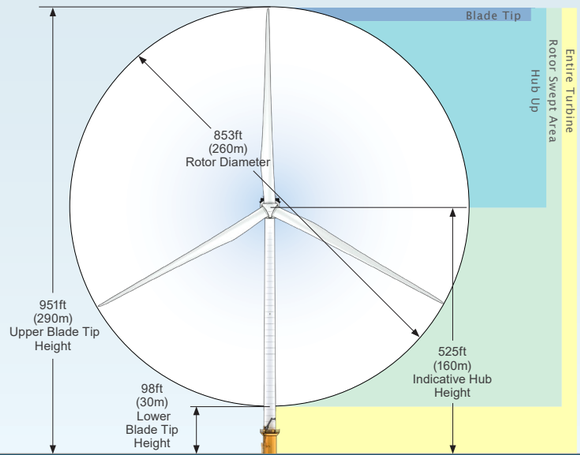
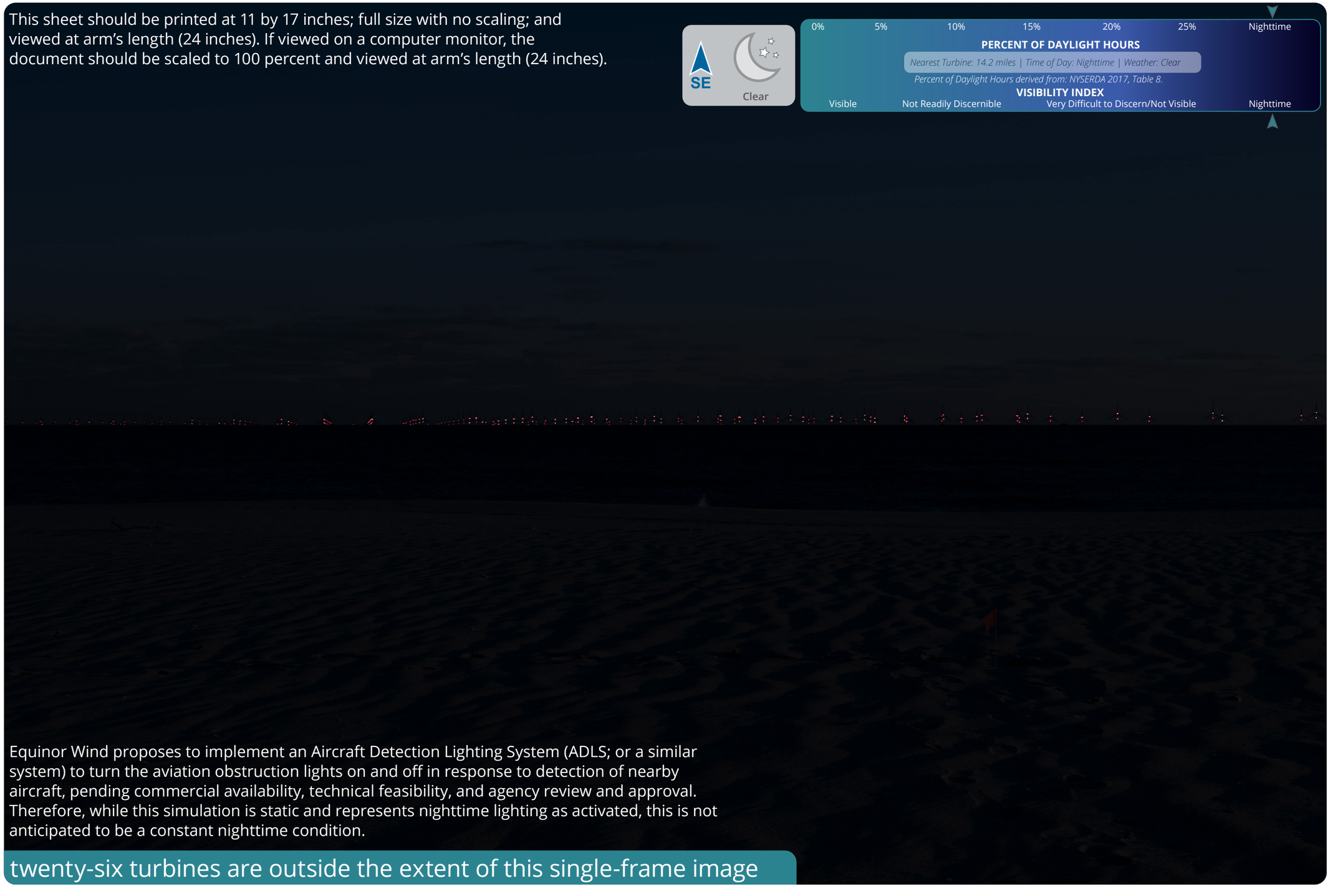


Representative Wind Turbine

Viewpoint Visibility	
Closest Visible Turbine	14.2 miles
Farthest Visible Turbine	31.8 miles
Structures Potentially Visible	174 of 174 total

*Fewer turbines may be visible in the simulation due to screening from topography or vegetation

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).



Equinor Wind proposes to implement an Aircraft Detection Lighting System (ADLS; or a similar system) to turn the aviation obstruction lights on and off in response to detection of nearby aircraft, pending commercial availability, technical feasibility, and agency review and approval. Therefore, while this simulation is static and represents nighttime lighting as activated, this is not anticipated to be a constant nighttime condition.

twenty-six turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2)

Short Beach at Jones Beach State Park

equinor

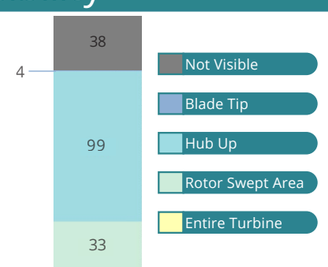
Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Ocean Grove Beach
Date of Photograph:	September 10, 2019
Time of Photograph:	9:40 PM (EDT)
Weather Condition:	Clear
Latitude:	40.211768° N
Longitude:	-74.002643° W
Viewing Direction:	Northeast
Ground Elevation + Tripod Height:	15 feet

Turbine Visibility



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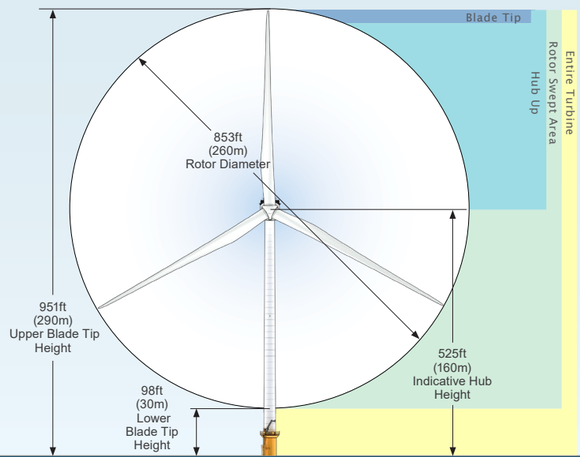

Representative Wind Turbine

Viewpoint Visibility	
Closest Visible Turbine	25.4 miles
Farthest Visible Turbine	48.5 miles
Structures Potentially Visible	136 of 174 total

*Fewer turbines may be visible in the simulation due to screening from topography or vegetation

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Equinor Wind proposes to implement an Aircraft Detection Lighting System (ADLS; or a similar system) to turn the aviation obstruction lights on and off in response to detection of nearby aircraft, pending commercial availability, technical feasibility, and agency review and approval. Therefore, while this simulation is static and represents nighttime lighting as activated, this is not anticipated to be a constant nighttime condition.

zero turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2)

Ocean Grove Beach

equinor

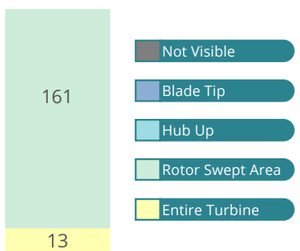
Panoramic Photograph

Vicinity Map

Photograph Information

Viewpoint Location:	Short Beach
Date of Photograph:	December 7, 2018
Time of Photograph:	3:30 PM (EDT)
Weather Condition:	Clear
Latitude:	40.580436° N
Longitude:	-73.55644° W
Viewing Direction:	Southeast
Ground Elevation + Tripod Height:	16 feet

Turbine Visibility



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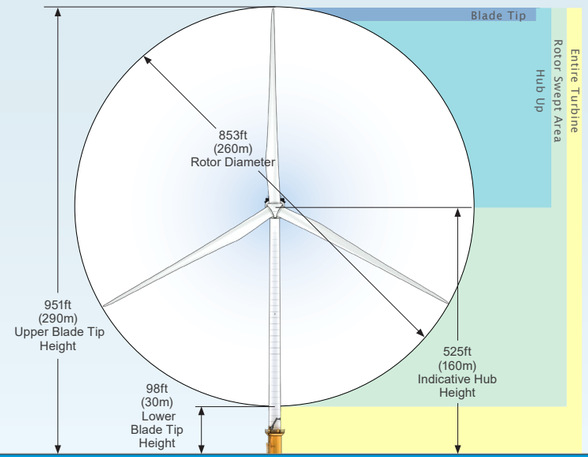


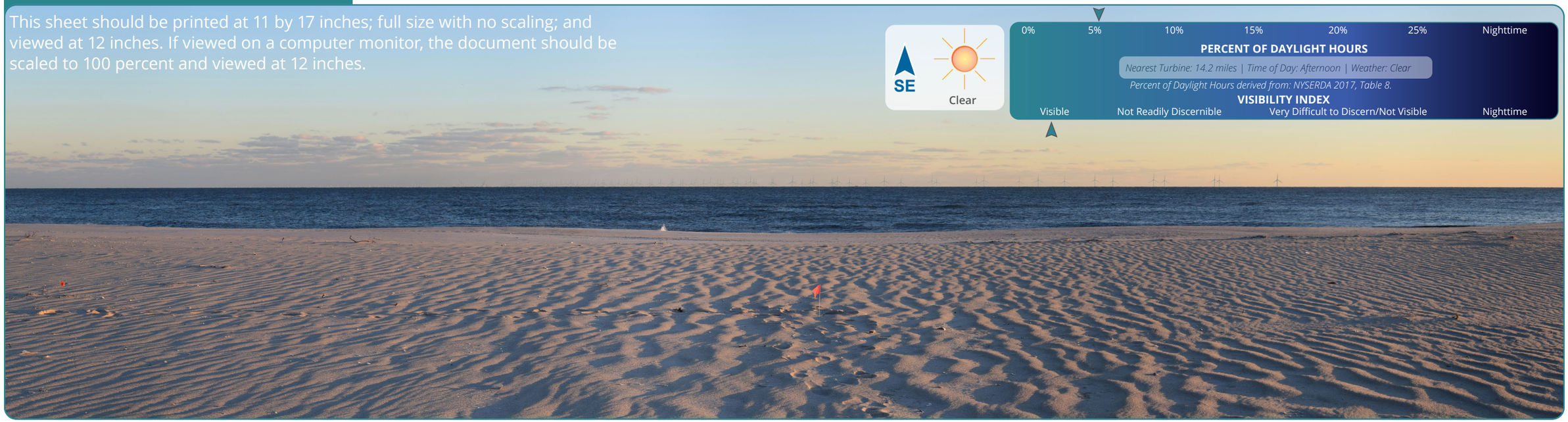
Representative Wind Turbine

Viewpoint Visibility	
Closest Visible Turbine	14.2 miles
Farthest Visible Turbine	31.8 miles
Structures Potentially Visible	174 of 174 total

*Fewer turbines may be visible in the simulation due to screening from topography or vegetation

Panoramic Simulation

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at 12 inches. If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at 12 inches.



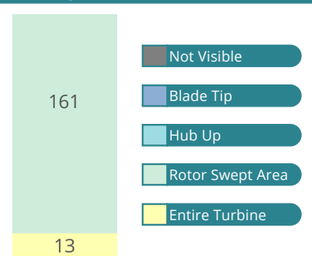
Panoramic Photograph

Vicinity Map

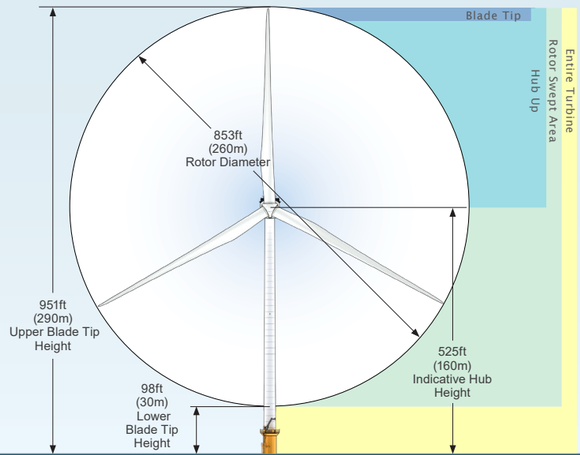
Photograph Information

Viewpoint Location:	Short Beach
Date of Photograph:	December 7, 2018
Time of Photograph:	Night (simulated)
Weather Condition:	Clear
Latitude:	40.580436° N
Longitude:	-73.55644° W
Viewing Direction:	Southeast
Ground Elevation + Tripod Height:	16 feet

Turbine Visibility



Turbine Data



Representative Wind Turbine

Viewpoint Visibility	
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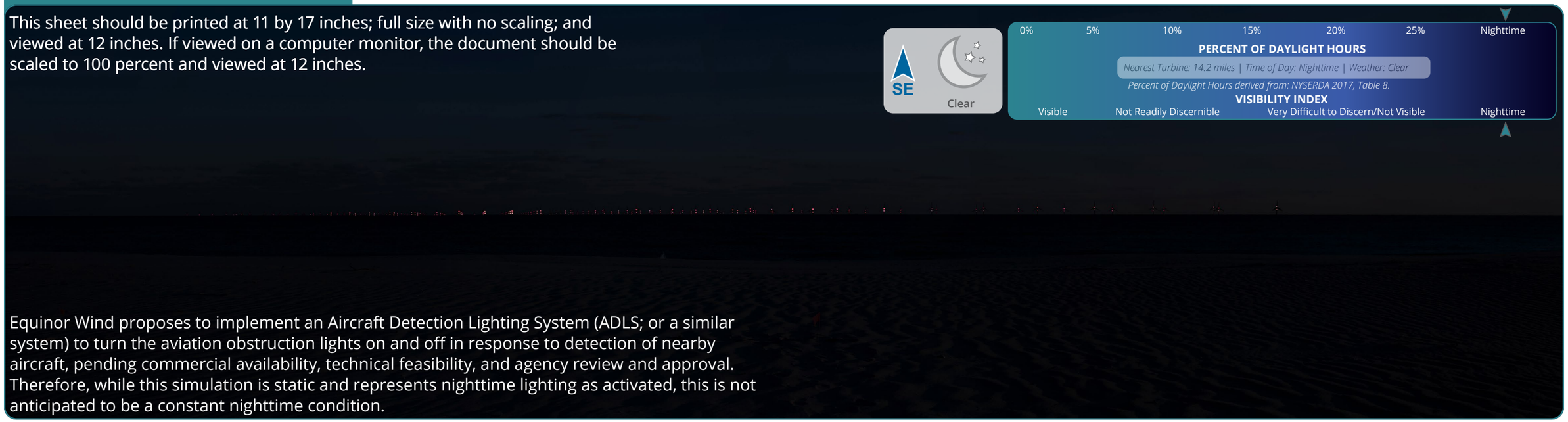
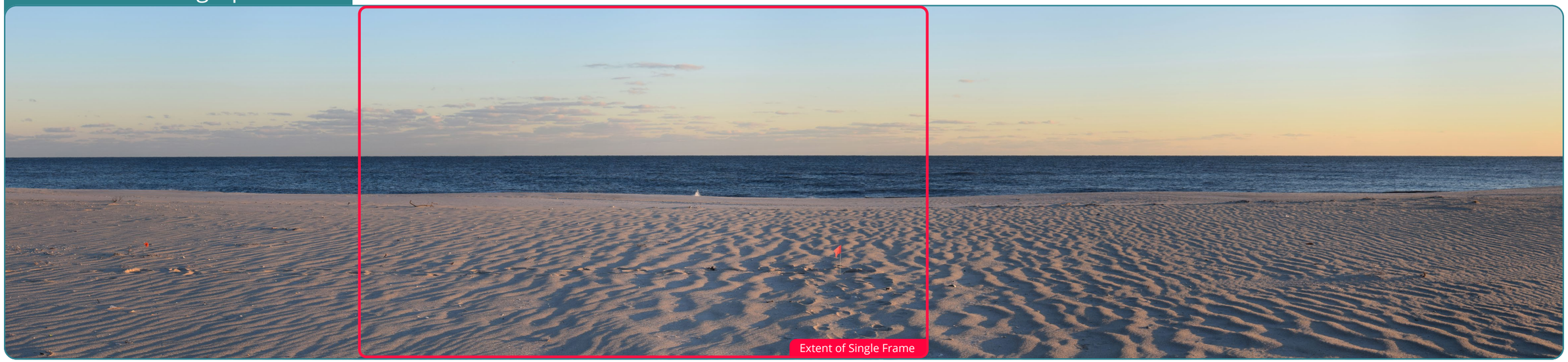
Panoramic Simulation

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at 12 inches. If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at 12 inches.



Equinor Wind proposes to implement an Aircraft Detection Lighting System (ADLS; or a similar system) to turn the aviation obstruction lights on and off in response to detection of nearby aircraft, pending commercial availability, technical feasibility, and agency review and approval. Therefore, while this simulation is static and represents nighttime lighting as activated, this is not anticipated to be a constant nighttime condition.

Panoramic Photograph

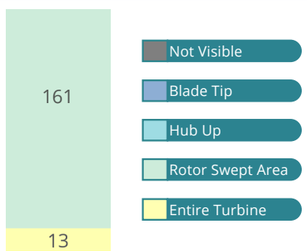


Vicinity Maps

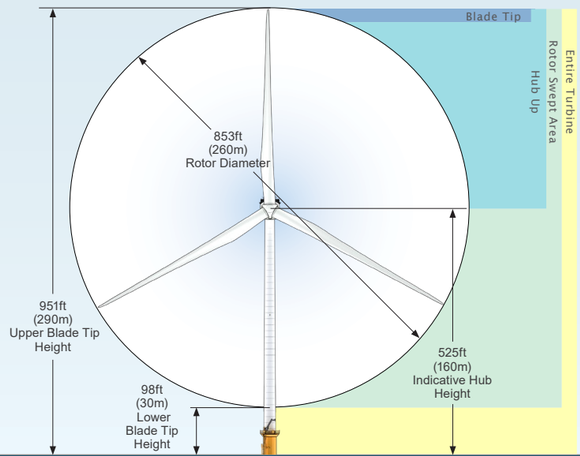
Photograph Information

Viewpoint Location:	Short Beach
Date of Photograph:	December 7, 2018
Time of Photograph:	3:30 PM (EDT)
Weather Condition:	Clear
Latitude:	40.580436° N
Longitude:	-73.55644° W
Viewing Direction:	Southeast
Ground Elevation + Tripod Height:	16 feet

Turbine Visibility



Turbine Data

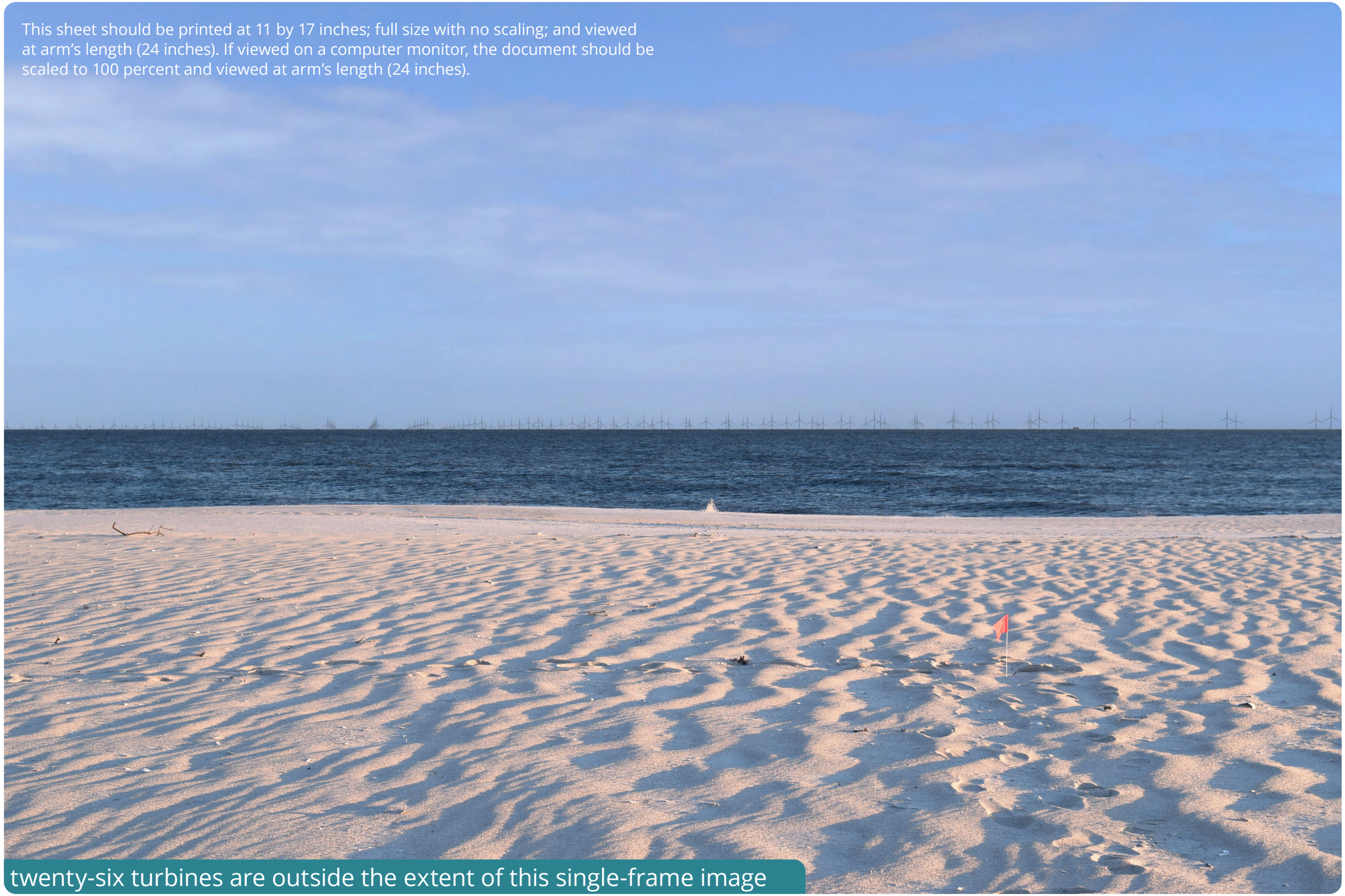


Representative Wind Turbine

Viewpoint Visibility	
Closest Visible Turbine	14.2 miles
Farthest Visible Turbine	31.8 miles
Structures Potentially Visible	174 of 174 total

*Fewer turbines may be visible in the simulation due to screening from topography or vegetation

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).



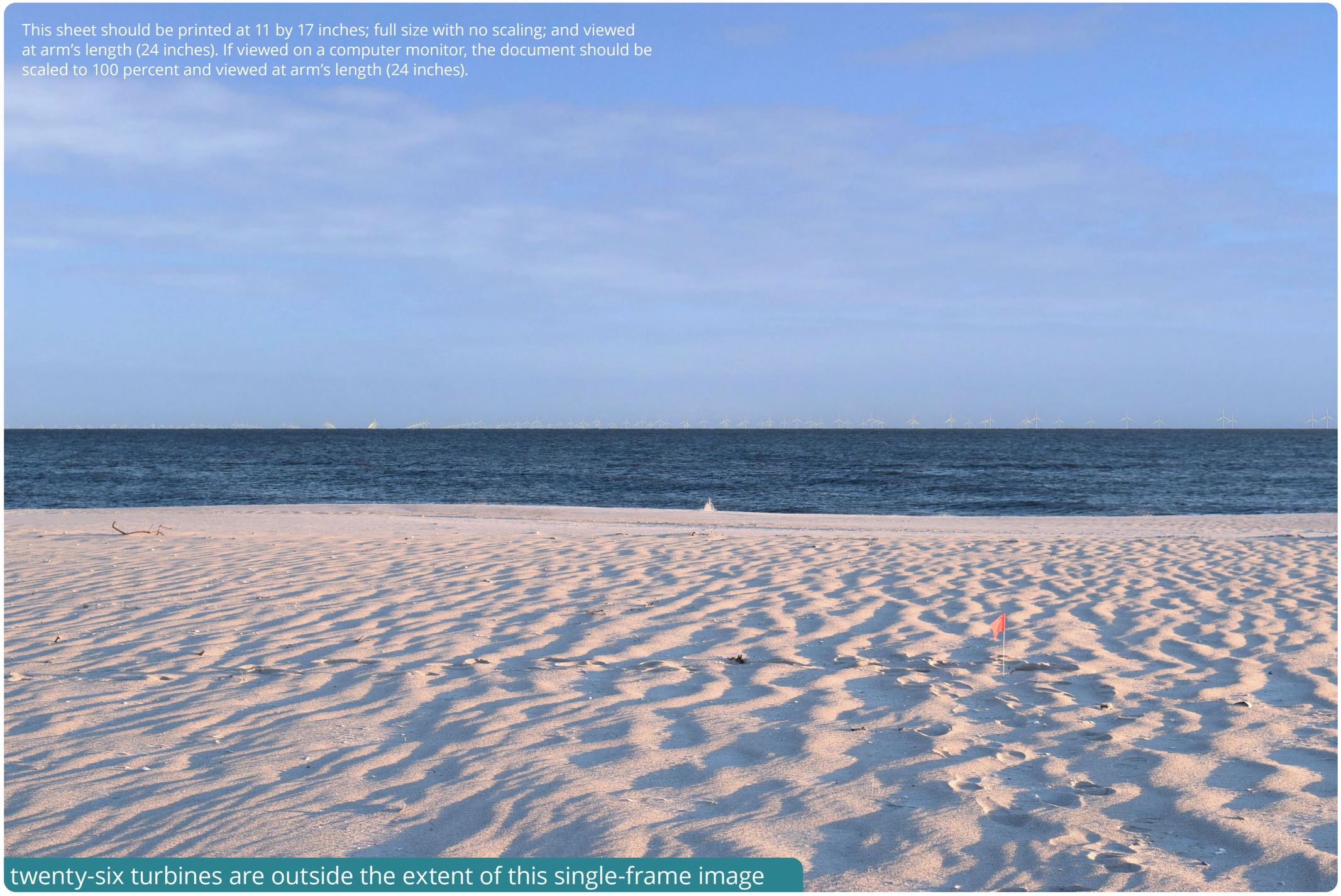
twenty-six turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) | Short Beach at Jones Beach State Park

Computer Generated Back-Lit Conditions

equinor

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).



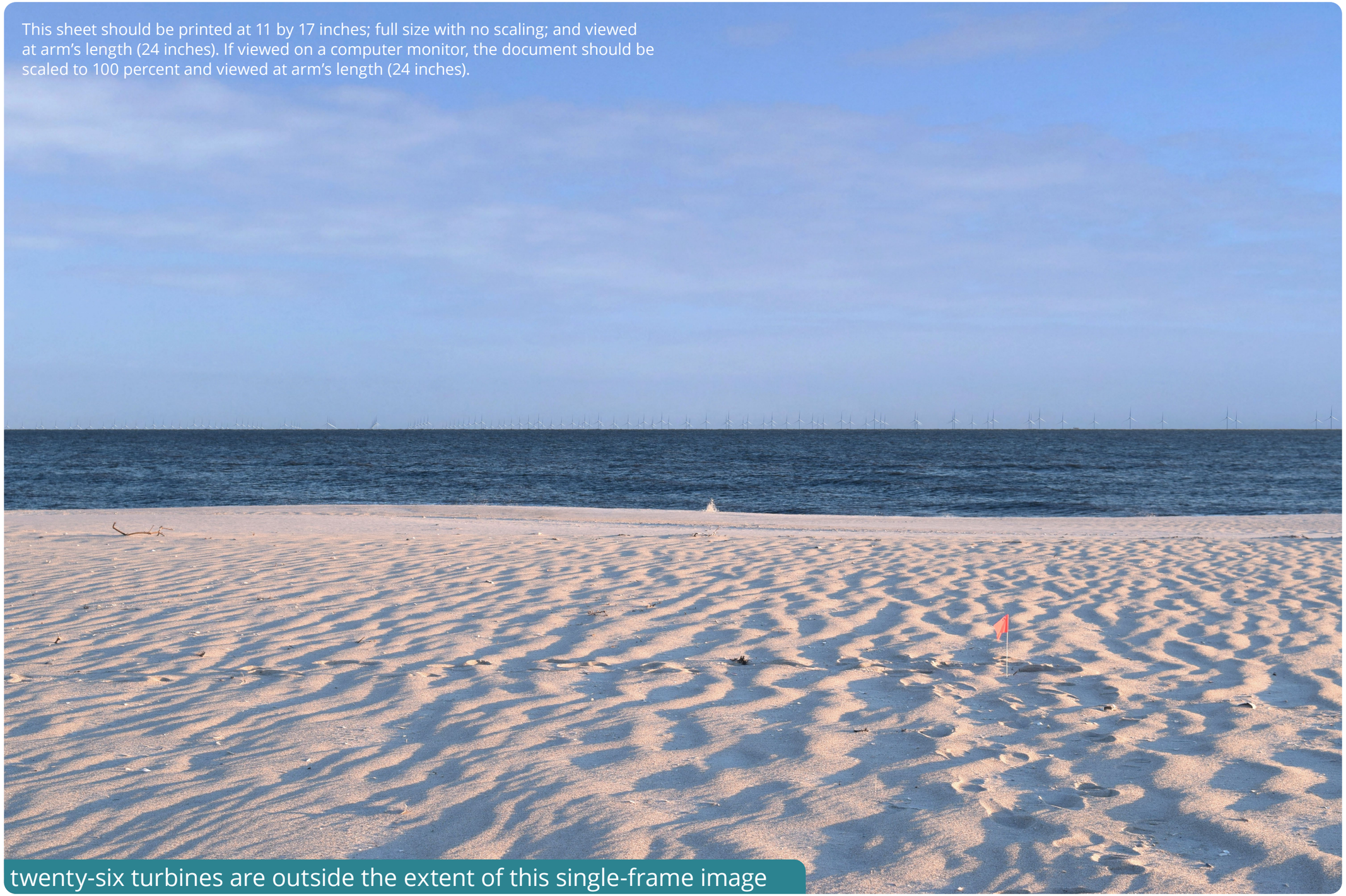
twenty-six turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) | Short Beach at Jones Beach State Park

Computer Generated Front-Lit Conditions

equinor

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).



twenty-six turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2) | Short Beach at Jones Beach State Park

Computer Generated Side-Lit Conditions

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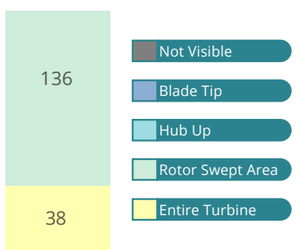
Panoramic Photograph

Vicinity Map

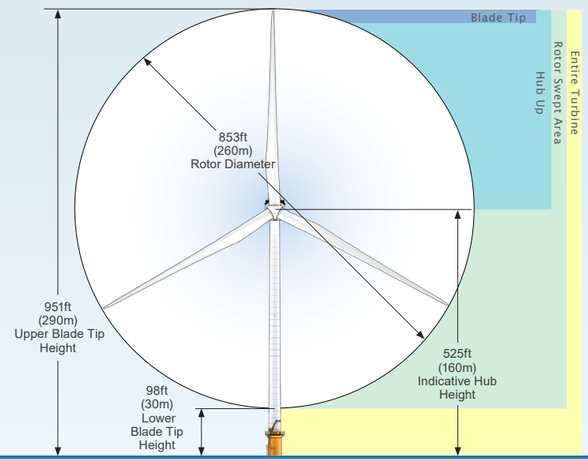
Photograph Information

Viewpoint Location:	Norman J. Levy Park
Date of Photograph:	November 8, 2018
Time of Photograph:	2:35 PM (EDT)
Weather Condition:	Partly Cloudy
Latitude:	40.646587° N
Longitude:	-73.562871° W
Viewing Direction:	Southeast
Ground Elevation + Tripod Height:	105 feet

Turbine Visibility



Turbine Data



Representative Wind Turbine

Viewpoint Visibility	
Closest Visible Turbine	18.8 miles
Farthest Visible Turbine	35.8 miles
Structures Potentially Visible	174 of 174 total

*Fewer turbines may be visible in the simulation due to screening from topography or vegetation

This sheet should be printed at 11 by 17 inches; full size with no scaling; and viewed at arm's length (24 inches). If viewed on a computer monitor, the document should be scaled to 100 percent and viewed at arm's length (24 inches).

nine turbines are outside the extent of this single-frame image

Empire Offshore Wind: Empire Wind Project (EW 1 and EW 2)

Norman J. Levy Park and Preserve

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Section 8.5

Visibility Study

Attachment 8.I

Visibility Study GIS Shapefiles

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Empire Wind