



# Construction and Operations Plan

Lease Area OCS-A 0534

## Volume III Appendices

December 2022

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Submitted to  
Bureau of Ocean Energy  
Management  
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# **New England Wind Construction and Operations Plan for Lease Area OCS-A 0534**

## **Summary of Historic Properties Visual Impact Assessment**

*Submitted to:*  
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## 1.0 INTRODUCTION

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Park City Wind, LLC (the Proponent) is proposing to develop offshore renewable wind energy facilities in Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0534. This development is known as New England Wind and includes two phases: Phase 1 (which includes Park City Wind) and Phase 2 (which includes Commonwealth Wind). On behalf of the Proponent, Epsilon Associates Inc. (Epsilon) completed a Historic Properties Visual Impact Assessment (HP VIA) for proposed renewable wind energy facilities in BOEM Lease Area OCS-A 0534 along with associated offshore and onshore cabling, onshore substations, and onshore operations and maintenance (O&M) facilities. The results of the Assessment were presented in a detailed technical report entitled *New England Wind Historic Properties Visual Impact Assessment*, which was included as an Appendix to the Construction and Operations Plan (COP) submitted to BOEM and the Massachusetts Historical Commission (MHC). The purpose of the Assessment was to identify historic properties (defined as properties listed or eligible for listing on the National Register of Historic Places [NR]) and to assess potential visual effects from the proposed wind energy facilities. In addition to identifying historic properties and evaluating potential visual effects, the Assessment outlines environmental factors that obscure potential visibility as well as avoidance and mitigation measures.

The HP VIA for New England Wind is intended to assist BOEM, the MHC (in its role as the State Historic Preservation Office), federally recognized tribes and other consulting parties in their review of New England Wind under Section 106 of the National Historic Preservation Act and the National Environmental Policy Act. The Preliminary Area of Potential Effects (PAPE) described has been developed to assist BOEM and MHC in identifying historic resources listed, or eligible for listing, in the National Register of Historic Places (National Register) in order to assess the potential effects of New England Wind on historic properties. The methods and results of the HP VIA are briefly summarized herein.

## 2.0 DESCRIPTION OF NEW ENGLAND WIND

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### 2.1 Project Overview

New England Wind will be developed in two Phases with a maximum of 130 wind turbine generator (WTG) and electrical service platform (ESP) positions within the Southern Wind Development Area (SWDA). The SWDA may be approximately 411–453 square kilometers (km<sup>2</sup>) (101,590– 111,939 acres) in size depending upon the final footprint of Vineyard Wind 1. Within the SWDA, the closest WTG is approximately 34.1 km (21.2 mi) from Martha’s Vineyard and 40.4 km (25.1 mi) from Nantucket. The WTGs and ESP(s) in the SWDA will be oriented in an east-west, north-south grid pattern with one nautical mile (NM) (1.85 km) spacing between positions. Phase 1, which includes as Park City Wind, will be developed immediately southwest of the Vineyard Wind 1 project. Phase 2, which includes Commonwealth Wind, will be immediately southwest of Phase 1 and will occupy the remainder of the SWDA.

Each Phase of New England Wind will be developed and permitted using a Project Design Envelope (the “Envelope”). This allows the Proponent to properly define and bracket the characteristics of each Phase for the purposes of environmental review while maintaining a reasonable degree of flexibility with respect to the selection of key components, such as the WTGs, foundations, offshore cables, and ESP(s). To assess potential impacts and benefits to various resources, a “maximum design scenario,” or the design scenario with the maximum impacts anticipated for that resource, is established considering the Envelope parameters for each Phase that have the potential to cause the greatest effect. For the purposes of assessing the potential visibility of the offshore facilities, the Proponent assessed the maximum potential size of the SWDA with a full buildout of 130 WTG/ESP positions (i.e., a full buildout of both Phases). This approach of assessing the full buildout of both Phases is consistent with the Proponent’s intent to fully develop the entire SWDA. The WTGs utilized for visual simulations are the tallest WTGs currently under consideration for both Phases (357 meters [m] [1,171 feet [ft]]). This height is representative of the height at the peak of the blade tip above Mean Lower Low Water (MLLW) and includes the supporting foundation/transition piece, WTG tower, and nacelle.

From the SWDA, offshore export (undersea) cables will transmit electricity onshore to landfall sites in Barnstable. Underground onshore export cables, located principally in roadway layouts or utility rights-of-ways (ROWs), will connect the landfall sites to new onshore substations in Barnstable. Grid interconnection cables will then connect the onshore substations to the ISO New England (ISO-NE) electric grid at Eversource’s existing 345 kilovolt substation in West Barnstable.

## 3.0 METHODOLOGY

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### 3.1 Defining the Preliminary Area of Potential Effects (PAPE)

The Area of Potential Effects (APE) is defined in 36 CFR § 800.16 as “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.” BOEM’s “Guidelines for Providing Historic Property Information Pursuant to 30 CFR Part 585” (dated May 27, 2020) state that “[t]he scope of these geographic areas should include the following:

1. The depth and breadth of the seabed potentially impacted by any bottom-disturbing activities;
2. The depth and breadth of terrestrial areas potentially impacted by any ground disturbing activities;
3. The viewshed from which renewable energy structures, whether located offshore or onshore, would be visible; and
4. Any temporary or permanent construction or staging areas, both onshore and offshore” (BOEM 2020).

The PAPE for direct visual effects includes “the viewshed from which renewable energy structures, whether located offshore or onshore, would be visible” (BOEM 2020). Using the regulatory definition of APE in 36 CFR § 800.16 and the information from the BOEM Guidelines related to direct visual effects (BOEM 2020), the phrase “would be visible” is interpreted to mean that the APE shall include areas from which New England Wind would, with some certainty, be visible and recognizable under a reasonable range of meteorological conditions.

The PAPE for onshore visual effects to historic priorities is limited to the installations needed for the cable routes and onshore substations. The onshore cables will be underground and within existing utility and road rights-of-way (ROWs). While historic, privately owned properties may be adjacent to existing ROWs, the PAPE is limited to the ROWs and does not extend to adjacent private properties. With the exception of waterway crossings and landfall sites, the onshore cables will be installed underground within duct banks using the open trenching construction method. Areas disturbed by onshore cable installation within ROWs will be restored to pre-construction condition, including any potential disturbances to hardscape or plantings that may occur within the ROWs. Limited visual impact is expected from the proposed substation locations as they are in areas with limited development and have large mature tree growth. A bridge crossing of the Centerville River may be required and if so, will have a limited visual impact to the small size of the proposed utility bridge.

Delineating the offshore PAPE for direct visual effects involved a three-step process:

**Step 1: Identifying the Maximum Theoretical Area of Nacelle Visibility.** The first step in determining the PAPE includes identifying the maximum theoretical distance from which the New England Wind WTG nacelles can be seen. The maximum theoretical distance that the top of the nacelles could potentially be visible is 60.3 km (37.5 mi) from the Phase 1 and Phase 2 WTGs (see Figure 3.1-1).

The maximum theoretical area of nacelle visibility is based upon a mathematical formula that calculates the maximum possible distance from which a 1.8 m (6 ft) tall observer has a theoretical line of sight to a WTG (in clear air conditions) due to the curvature of the earth given the maximum nacelle heights. The top of the nacelle has been chosen for the maximum theoretical visibility assessment over the blade tip height due to the greater possibility of observing the nacelle and support structure over great distances as opposed to the narrow blades. The maximum theoretical area of nacelle visibility includes portions of the following locations: Martha's Vineyard (and adjacent Nomans Land), Nantucket (and its adjacent outlying islands), Nantucket Sound, Cape Cod, and the Elizabeth Islands.

**Step 2: Determining the Zone of Visual Influence Using GIS Viewshed Calculation.** The second step in determining the PAPE includes identifying the Zone of Visual Influence (ZVI), which is the geographic area within the maximum theoretical area of nacelle visibility where New England Wind's WTGs could potentially be visible taking into account intervening topography, vegetation, and built structures. The ZVI within the 60.3 km (37.5 mi) radii (i.e., within the maximum theoretical area of nacelle visibility) was generated using a Geographic Information System (GIS) viewshed calculation utilizing Light Detection and Ranging (LiDAR) data.

**Step 3: Refining the ZVI to Include Areas Where New England Wind Would be Visible (PAPE).** Utilizing photo simulations and field observations, the ZVI was further refined to those areas where New England Wind would be visible. For example, a view of the WTGs is theoretically possible from Cape Cod and the western portion of the Elizabeth Islands (where Martha's Vineyard does not fully obscure potential views of the WTGs), including eastern Naushon Island, Pasque Island, Nashawena Island and Cuttyhunk Island (all at distances greater than 48.3 km [30 mi] to the nearest WTG). However, because atmospheric haze reduces visibility, maximum theoretical viewing distances typically exceed what is experienced in reality.

### **3.2 Historic Property Survey and Identification Methods**

The term "historic property" is defined in 36 CFR § 800.16 as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. The MHC's *Historic Properties Survey Manual* and the National Park Service's *How to Apply the National Register Criteria for Evaluation* publications guided the development of a methodology for the assessment of historic properties within the PAPE. Properties were identified and assessed by professionals that satisfy the Secretary of the Interior's (SOI) Professional Qualification Standards. Local records were consulted, where applicable, and these and other records were used to create the target list. Historic maps, aerial photography, municipal records, the State and National Registers, and the

MHC's Inventory of Historic and Archaeological Assets of the Commonwealth (the "Inventory") were consulted to inform the list of potential historic properties evaluated within the PAPE. Information-gathering and assessment methods included desktop analysis and examination of aerial photography to eliminate properties with dates of construction less than 50 years of age.

Field surveys of the PAPE were conducted to identify any previously undocumented historic properties and to assess properties for potential visibility of the SWDA and National Register eligibility. Windshield and walking surveys were conducted by SOI-qualified architectural historians on publicly-accessible roads and areas within the PAPE to review listed, eligible, and potentially eligible National Register properties. Areas identified as recently developed neighborhoods (less than 50-years old) by desktop analysis were excluded, and the field survey focused on remaining areas as they had the potential to contain unknown historic properties. This survey for visual effects largely focused on the islands of Martha's Vineyard and Nantucket as well as the area around the onshore substation sites.

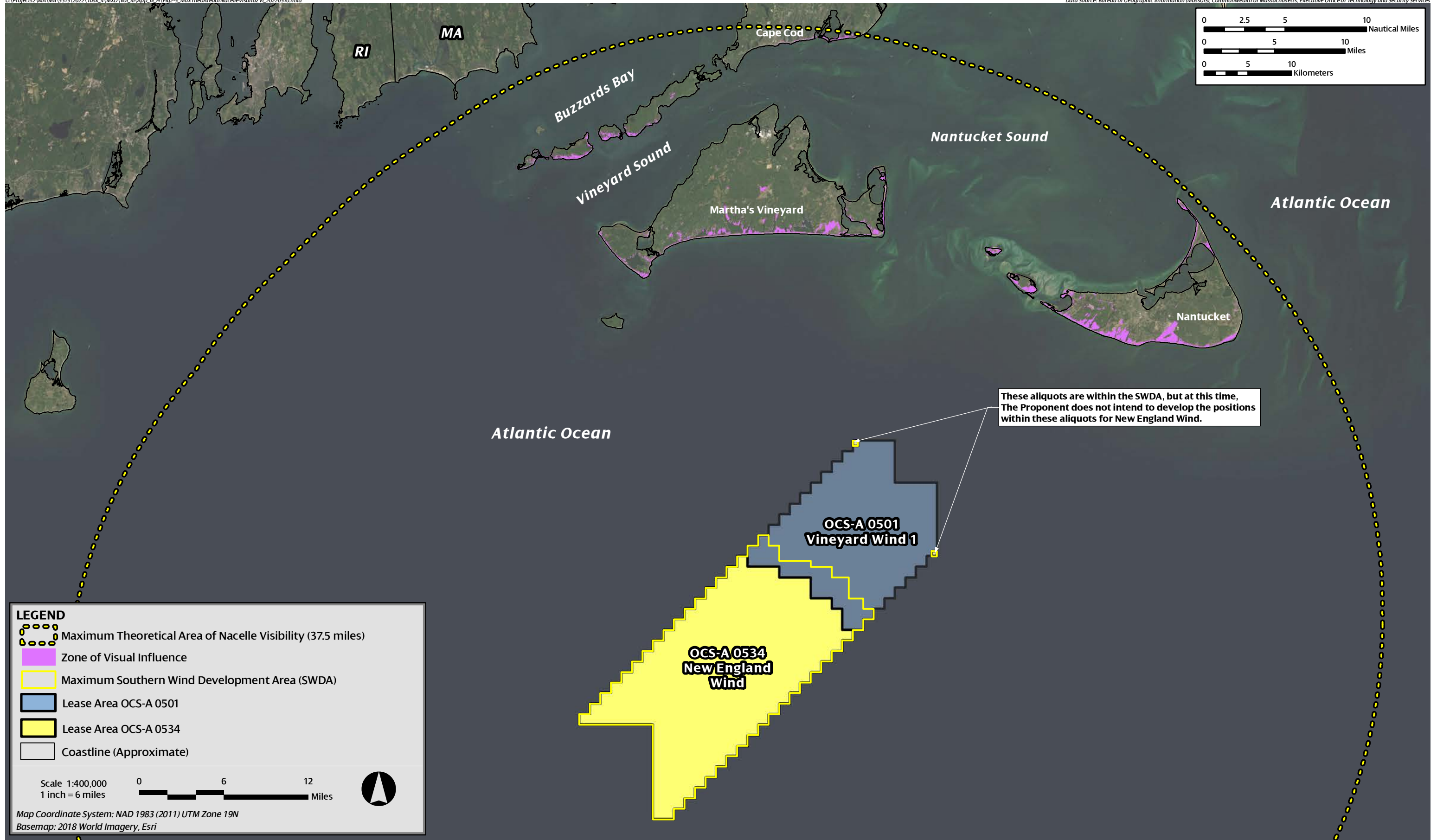
### **3.3 Environmental and Project Scope Visual Mitigating Factors**

Due to the curvature of the earth's surface, objects viewed on the horizon are not seen in their entirety because they begin to fall below the visible horizon. Given the distance between New England Wind's WTGs and the closest coastal vantage point (34.1 km [21.2 mi]), there are no land-based vantage points from which a WTG or ESP can be viewed in its entirety. Exclusive of the effect of earth's curvature and meteorological visibility, viewing a WTG at a distance of 34.1 km (21.2 mi) is roughly equivalent to viewing a pencil at a distance of about 34.4 m (113 ft). Similarly, viewing a WTG blade with a maximum width of 9 m (26 ft) at that distance is roughly equivalent to the width of a drinking straw viewed at 27.7 m (91 ft). Visibility is also dependent on numerous meteorological factors, including the atmosphere itself, haze, fog, various forms and intensities of precipitation, and even more obscure events such as smoke or dust storms. Offshore, visibility is also reduced by wind and wave-induced sea spray and salts.

The Proponent is avoiding and minimizing visual impacts to the maximum extent practicable. The WTGs for each phase will have uniform design, height, and rotor diameter and will be aligned and spaced consistently with other offshore wind facilities, thereby reducing potential for visual clutter. Additionally, the WTGs will be no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey in color in accordance with BOEM and FAA guidance; the Proponent anticipates painting the WTGs off-white/light grey to reduce contrast with the sea and sky and thus minimize daytime visibility of the WTGs. Lighting will also be kept to the minimum necessary to comply with navigation safety requirements and safe operating conditions. Required marine navigation lights mounted near the top of each WTG/ESP foundation (or on the corners of each ESP) are expected to be visible only to distances of approximately 9.3 km (5 NM). As the closest coastal vantage point is at least 34.1 km (21.2 mi) from the nearest WTG, marine navigation lights will not be visible from shore.



Subject to BOEM approval, the Proponent also expects to use an Aircraft Detection Lighting System (ADLS) that automatically turns on, and off, aviation obstruction lights in response to the detection of aircraft for the WTGs. Based on historical use of the airspace, it is estimated that the aviation obstruction lights on both the nacelle and tower (if needed) will be activated for less than one hour per year (less than 0.1% of the nighttime hours) (see Appendix III-K). The effect of nighttime lighting from the aviation obstruction lights is acknowledged as part of the overall visibility and visual effect of the SWDA; however, the effect of nighttime lighting is substantially minimized through the use of ADLS. As stated previously, meteorological conditions will serve to obscure or block view of the SWDA providing additional minimization of the effect of nighttime lighting.



## 4.0 CONCLUSION AND AFFECTS ASSESSMENT

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### 4.1 Direct Physical Effects

Direct physical effects are defined as construction-related impacts or areas of potential disturbance associated with New England Wind. Onshore, these areas include proposed onshore cable routes, the potential Centerville River utility bridge, and new onshore substations in Barnstable including the demolition of the Knights Inn Motel. No adverse effects to historic properties are anticipated as a result of onshore direct physical effects.

### 4.2 Direct Visual Effects

For all historic properties, it is not typically the viewshed of the property that is being affected, but rather the viewshed from the property, which, in many cases, is not as significant. For those properties with potential changes to their viewsheds, a variety of mitigating circumstances are present. For example, for the Edgartown Village Historic Districts (EDG.A and EDG.B), intervening tree growth and structures mitigate the view toward the SWDA, which is only possible when viewing down Katama Bay through the existing harbor. Therefore, while there may be visibility of the SWDA, visibility itself does not constitute an adverse effect finding.

The following summarizes the assessment of effects for the geographical areas within the PAPE:

- ◆ **Martha's Vineyard:** It is conservatively determined New England Wind may have an adverse visual effect on two Traditional Cultural Properties (TCPs), Edwin Vanderhoop Homestead (Aquinnah Cultural Center), Gay Head-Aquinnah Shops Area and the Gay Head Lighthouse. The maritime settings of these resources, and their viewsheds, would be adversely affected through the introduction of new elements. While historic other properties may now have a potential view toward the SWDA, in many cases, the view is a modern condition and is not tied to the historic setting of the property.
- ◆ **Nantucket Island, Muskeget Island, Esther Island, and Tuckernuck Island:** These islands are collectively designated as part of the same National Historic Landmark District. National Historic Landmarks require a higher standard of consideration under the National Historic Preservation Act's Section 110(f), which mandates that federal agencies establish preservation programs and collaborate on historic preservation projects. Even with limited visibility of the SWDA due to distance and weather conditions, it is conservatively determined that New England Wind will have an adverse visual effect to these islands.
- ◆ **Nantucket Sound:** Nantucket Sound has been determined eligible for listing on the National Register as a TCP. While significant viewsheds will not be altered, it is conservatively determined that an adverse visual effect on Nantucket Sound may occur in a limited section of Nantucket Sound.

The Proponent is developing Historic Property Treatment Plans for the adverse visual effects on historic properties.

## 5.0 REFERENCES

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[BOEM] Bureau of Ocean Energy Management. 2020. Guidelines for Providing Historic Property Information Pursuant to 30 CFR Part 585.

<https://www.boem.gov/sites/default/files/documents/about-boem/Archaeology%20and%20Historic%20Property%20Guidelines.pdf>