Finding of Adverse Effect for the Vineyard Wind Project Construction and Operations Plan

April 10, 2019

The Bureau of Ocean Energy Management (BOEM) has made a Finding of Adverse Effect (Finding) for the Vineyard Wind Construction and Operations Plan (COP) on the Gay Head Lighthouse and the Nantucket Island National Historic Landmark, pursuant to 36 CFR 800.5. Because the identification of historic properties is ongoing for both marine and terrestrial archaeological resources portions of the area of potential effects (APE), BOEM will continue consultation with the parties, and, if appropriate, revise this Finding to incorporate any new information received. Resolution of all adverse effects to historic properties will be codified in a Memorandum of Agreement (MOA), pursuant to 36 CFR 800.6(c).

1 Description of the Undertaking

On December 19, 2017, BOEM received a COP from Vineyard Wind, LLC (Vineyard Wind) proposing development of an up to 800 megawatt (MW) offshore wind energy project within Lease OCS-A 0501 offshore Massachusetts. If approved by BOEM, the COP would allow Vineyard Wind to construct and operate wind turbine generators (WTGs), an export cable to shore, and associated facilities for a specified term. BOEM is now conducting its environmental and technical reviews of the COP and has published a Draft Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) for approval of the plan. The Draft EIS and information on the Vineyard Wind project, including the COP are available at https://www.boem.gov/Vineyard-Wind/.

BOEM has determined that approval, approval with modification, or disapproval of the Vineyard Wind COP constitutes an undertaking subject to Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) and its implementing regulations (36 CFR 800), and that the activities proposed under the COP have the potential to affect historic properties.

1.1 Background

In 2014, BOEM prepared an environmental assessment to analyze the environmental impacts associated with issuing commercial wind leases and approving site assessment activities within the Massachusetts Wind Energy Area (WEA). Additionally in 2012, BOEM executed a Programmatic Agreement and concurrently conducted a Section 106 review of its decision to issue commercial leases within the Massachusetts WEA. On January 29, 2015, BOEM held a competitive lease sale for the WEA offshore Massachusetts and Vineyard Wind (formerly Offshore MW) was the winner of lease area OCS-A 0501. Subsequently, Vineyard Wind submitted a Site Assessment Plan for the installation of meteorological buoys, which BOEM reviewed under Section 106, resulting in the October 6, 2017 *Finding of No Historic Properties Affected*. See: https://www.boem.gov/Vinyard-Wind-106-Findings-and-Appendix-A-to-J.

1.2 Undertaking

Vineyard Wind is proposing a project design envelope in their COP, which represents a reasonable range of design parameters that may be utilized in the project. In reviewing the design envelope, BOEM is analyzing the maximum impacting scenario that could occur from any combination of the contemplated parameters. BOEM's analysis and review of the design envelope may result in the approval of a project that is constructed within that range or a subset of design parameters within the proposed range. Additional information on design envelopes is found in the draft guidance document at www.boem.gov/Draft-Design-Envelope-Guidance/. Detailed information about the proposed wind energy facility, including the COP and its appendices, can be found on BOEM's website at: https://www.boem.gov/Commercial-Wind-Leasing-Offshore-Massachusetts/. Confidential appendices to the COP referenced in this document were sent via courier to all consulting parties on October 16, 2018. Both the COP, as well as its public and confidential appendices, are hereby incorporated by reference.

In its COP, Vineyard Wind is proposing the construction, operation, and eventual decommissioning of an 800 MW wind energy project consisting of offshore WTGs (each placed on a foundation support structure), electrical service platforms, an onshore substation, offshore and onshore cabling, and onshore operations & maintenance facilities (Figure 1 of this document, below). Vineyard Wind's COP proposes installing up to 100 WTGs, each with a capacity between 8 and 10 MW (Figure 3.1-1 of the COP). Although Vineyard Wind is seeking approval for 106 turbine locations, and would only install up to 100 turbines, BOEM's preferred alternative is 84 turbines. Foundations would be either all monopoles or mostly monopoles with up to 10 jackets. The proposed facility includes one to two offshore electrical service platforms. The potential export cable landfalls identified by Vineyard Wind include sites near the towns of Yarmouth (New Hampshire Avenue) and Barnstable (Covell's Beach) in the Commonwealth of Massachusetts (Figure 2.2-1 of the COP). On-shore construction and staging would take place at the New Bedford Marine Commerce Terminal facility. At its nearest point, the project area is approximately 14 miles from the southeast corner of Martha's Vineyard and a similar distance from the southwest side of Nantucket (Figure 2.1-1 of the COP). Water depths where the turbines would be located range from approximately 37 to 49 meters (m; approximately 121 to 161 feet [ft]).

1.3 Area of Potential Effect

BOEM defines the APE for approval of the COP to include the following geographic areas:

- The depth and breadth of the seabed potentially impacted by any bottom-disturbing activities, constituting the marine archaeological resources portion of the APE;
- The depth and breadth of terrestrial areas potentially impacted by any ground disturbing activities, constituting the terrestrial archaeological resources portion of the APE;
- The viewshed from which renewable energy structures, whether located offshore or onshore, would be visible, constituting the viewshed portion of the APE; and
- Any temporary or permanent construction or staging areas, both onshore and offshore, which may fall into any of the above portions of the APE.

These are described below in greater detail with respect to the proposed activities.

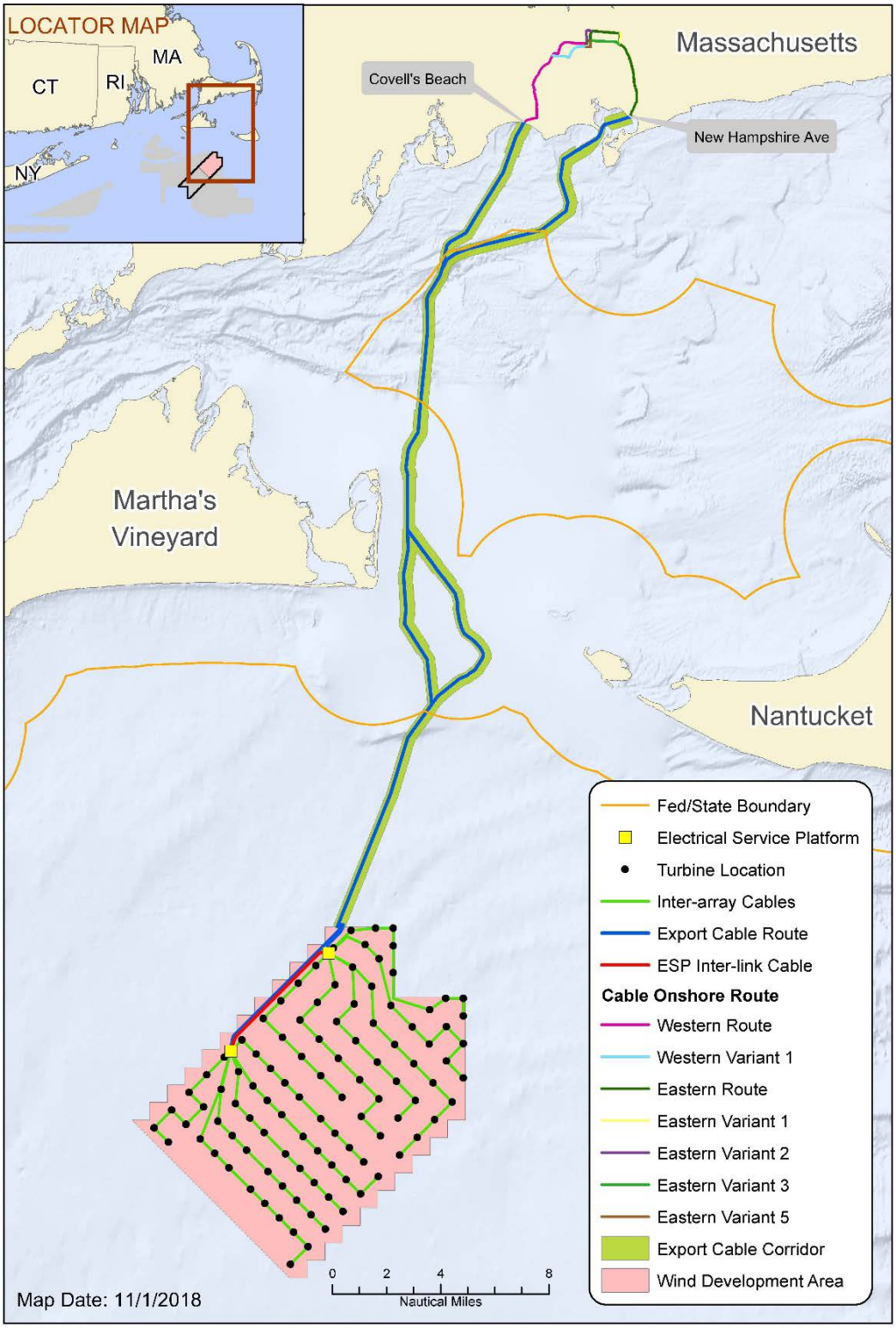

Figure 1. Vineyard Wind Construction and Operations Plan proposed project elements.

1.3.1 Marine Archaeological Resources APE

The depth and breadth of the seabed potentially impacted by any bottom-disturbing activities, constituting the marine archaeological resources portion of the APE, includes a conservative design envelope that can accommodate a number of potential designs, whether monopole or jacketed foundations are used, installed by jack-up vessels. This envelope includes a maximum expected vertical depth of disturbance for each WTG and/or electrical service platform (ESP) monopole structure of approximately 20 to 45 m (66 to 148 ft), with a diameter of approximately 7.5 to 10.3 m (25 to 34 ft). The seabed surface would have a scour protection radius of approximately 22 to 26 m (72 to 85 ft). A jacketed WTG structure would penetrate the seabed approximately 30 to 60 m (98 to 197 ft), have a footprint of approximately 18 to 35 m (59 to 115 ft), and the seabed surface would have a scour protection radius of approximately 20 to 24 m (65 to 79 ft). A jacketed ESP structure would penetrate the seabed approximately 30 to 75 m (98 to 246 ft), have a footprint of approximately 18 to 45 m (59 to 115 ft), and the seabed surface would have a scour protection radius of approximately 20 to 28 m (65 to 92 ft).

During construction of the WTGs and ESP, jack-up vessels may be employed. The horizontal APE is a diameter around the implanted structure that may be disturbed that is projected to be between 180 and 250 m (590 and 820 ft). The vertical depth of disturbance is considered to be less than the monopole and jacketed foundation depth described in the preceding paragraph. Anchoring activities, if required, would be confined within a construction corridor of 500 to 800 m (1,640 to 2,625 ft) centered on inter-array and export cables. The vertical disturbance to the seabed from vessel anchors is expected to be less than 3 m (10 ft). Many deep-water operations are anticipated to make use of dynamically positioned vessels with no anticipated seabed or subsurface impact. The marine archaeological resources APE for activities within the lease area is depicted in Figure 2.

Cabling of the project is expected to utilize two or more methods with different bottom disturbances. The inter-array and export cables will likely be installed by jet plow. The primary vertical impact from the cable installation occurs over a 2-m (6.6-ft) wide swath projected to range between 1.5 and 2.5 m (5 and 8 ft) deep. Minor disturbance may occur from the weight of the device resting on the seafloor over its full width of 5 to 6 m (16 to 20 ft). A dredge/trenching device is expected to be necessary in some sections of the route and may excavate to 4.5 meters (15 feet) in the vertical and cast dredged material in an approximately 60 m (197 ft) wide area of the seabed. In areas with difficult seabed conditions where full cable burial is hard to achieve, articulated concrete mattresses may overlay the cable. The maximum dimensions of the protective mattress covering is expected to be a 9-m (29.5-ft) swath, 4.5 m (15 ft) to each side of the cable. The marine archaeological resources APE for activities within the cable route is depicted in Figure 3.

1.3.2 Terrestrial Archaeological Resources APE

The APE for terrestrial archaeological resources includes areas potentially impacted by any ground disturbing activities. The APE is presented as a conservative design envelope and includes the Landfall sites, underground cable routes, the substation site, and equipment laydown areas. The depth and breadth of potential ground disturbing activities is described below for each location (Figure 4). The Preferred Alternative of the Covell's Beach Landfall Site and Cable Route are depicted in Figure 5; the Noticed Alternative of the New Hampshire Avenue

Landfall Site and Cable Route are depicted in Figure 6. Figure 7 depicts the onshore Substation Site.

1.3.2.1 Landfall Site - Covell's Beach (Preferred Route)

The APE for the Covell's Beach landfall site is specified as follows. At the Covell's Beach landfall site, the horizontal directional drilling (HDD) rig and its supporting equipment will occupy approximately 0.8 acres of the paved staging area in the eastern end of the 2-acre Covell's Beach parking lot. The following Project elements will require excavation into the parking lot:

1. At the upper end of the parking lot, two transitional cable joint bays (one per landfall power cable), each approximately 6 m wide by 18.9 m long (20 ft wide by 62 ft long) by 2 m (6.5 ft) deep.
2. Immediately adjacent to each joint bay, two fiber optic cable vaults (one fiber optic cable per landfall power cable), each approximately 1.8 m (6 ft) long by 1.2 m (4 ft) wide by 1.5 m (5 ft) deep.
3. Approximately 9.1 m (30 ft) from the seaward edge of the parking lot, two HDD entry pits (one per landfall cable duct), each approximately 1.5 m (5 ft) wide by 1.5 m (5 ft) long by 1 m (3.3 ft) deep.
4. From each temporary HDD entry pit, a 46 cm – 76 centimeters (cm) (18 to 30 inches) diameter High-Density Polyethylene (HDPE) pipe with a ground disturbance diameter of 91 cm (36 inches) will be installed via HDD for use in housing the export cables which will intersect with the onshore cable route. HDPE conduits will run beneath the parking lot, beach and intertidal zone, emerging at an exit point approximately 305 m (1,000 ft) offshore. The HDD conduit will be approximately 6.7 m (22 ft) beneath the middle of the beach; and at its deepest point, the conduit will be approximately 9.1 m (30 ft) below the seafloor.
5. Between the HDD entry pit and the joint bay, the two export cables will be installed in open trenches measuring approximately 1.8 m (6 ft) in depth, 1.2 m (4 ft) in width at the bottom and 2.4 m (8 ft) in width at the top.
6. After the export cables leave the two joint bays, they will be housed inside the proposed concrete encased duct bank of 8 ducts in a 4 x 2 array (6 for cables + 2 spares). Overall concrete duct bank width will be 1.5 m (5 ft) and overall duct bank height will be 0.8 m (2.5 ft). The duct bank leaving Covell's Beach will be installed with 0.9 m (3 ft) of cover in an open trench with approximate trench depth of 1.7 m (5.5 ft) and approximate trench width (at the top) of 3 m (10 ft). The duct bank will leave the paved parking area, cross a short segment of unpaved area between Craigville Beach Road and the northwest corner of the parking lot. The duct bank will then follow roadways, and the dimensions will be as described below under the sections discussing the onshore cable routes (preferred and alternative).

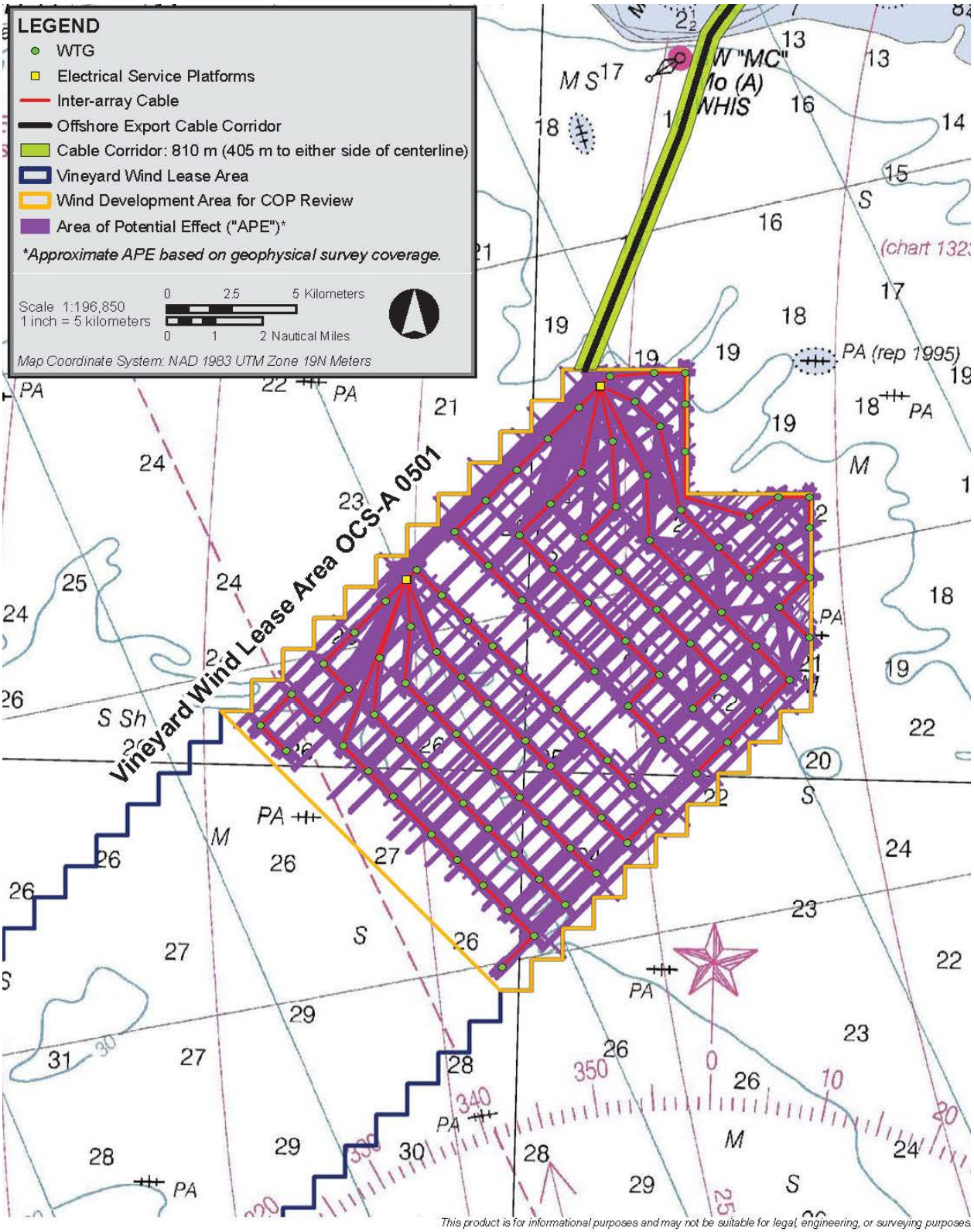

Figure 2. Marine archaeological resources APE for activities within the lease area (Tuttle, Donata, and Scholl 2018).

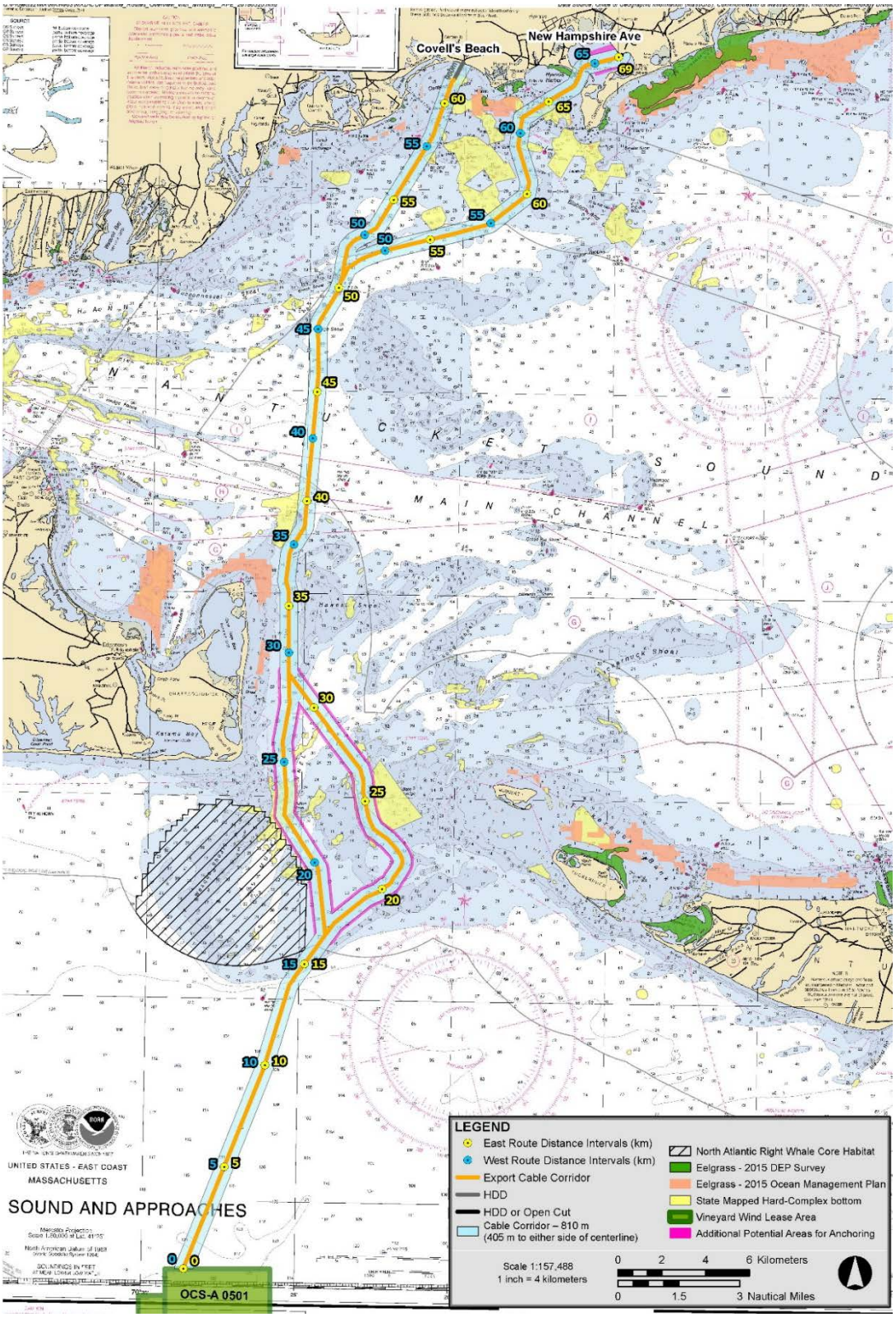

Figure 3. Marine archaeological resources APE for activities within the cable route (Tuttle, Donata, and Scholl 2018).

1.3.2.2 Cable Route - Covell's Beach (Preferred Route)

The APE for the preferred onshore cable route associated with the Covell's Beach Landfall Site is the Town of Barnstable ROW along the proposed onshore cable route. As described further below, the disturbance within the ROW will range from 3.4 m (11 ft) wide and 2.4 m (8 ft) deep for the typical trench width to install the duct bank, or up to 10.9 m (36 ft) wide and 3.7 m (12 ft) deep where splice vaults are necessary. Both the duct bank and the splice vaults may be installed anywhere within the Town of Barnstable ROW; therefore, the entire ROW along the onshore export cable route is considered the APE, though only a portion of the ROW will actually be disturbed.

At either the Preferred Route or Noticed Alternative (described in the following section), the proposed underground cable routes will be installed within HDPE or PVC pipes or sleeves encased in concrete duct banks connecting from the selected Landfall site to the Substation site. The proposed duct banks will be formed using cast-in-place concrete installed in open trenches measuring approximately 2.4 m (8 ft) in depth, 1.8 m (6 ft) in width at the bottom and 3.4 m (11 ft) in width at the top. Existing conditions within paved roadways will dictate the orientation of the duct bank, which will be either: 0.8 m (2.5 ft) wide by 1.5 m (5 ft) deep or 1.5 m (5 ft) wide by 0.8 m (2.5 ft) deep. In locations where splice vaults are necessary, the excavated area will be larger, approximately 11 m (36 ft) wide by 15.2 m (50 ft) long and 3.7 m (12 ft) deep, to accommodate pairs of pre-cast concrete splice vaults, which typically are 2.9 m (9.5 ft) wide by 10.8 m (35.5 ft) long and up to 2.9 m (9.5 ft) deep (outer dimensions). Thus, the maximum extent of disturbance within the APE (the Town of Barnstable ROW along the onshore cable route) is 11 m (36 ft) wide and 3.7 m (12 ft) deep.

The Preferred Route also includes Variant 1 along a utility right-of-way (ROW). This Variant would include the same dimensions for the duct banks or the splice vaults that are described in the preceding paragraph. For the purposes of defining the APE, an area of potential ground disturbance measuring 3.7 m (12 ft) in depth and 11 m (36 ft) in width for the entirety of Variant 1 should be considered the APE.

1.3.2.3 Landfall Site - New Hampshire Avenue (Noticed Alternative Route)

Vineyard Wind is proposing open-trenching at the New Hampshire Avenue Landfall Site, but is maintaining a short HDD as an alternative approach. Both options are described.

At the New Hampshire Avenue Landfall Site, the in-water work area for open trenching would be enclosed with temporary sheet piling and is approximately 9.1 m (30 ft) wide and extending up to 61 m (200 ft) from shore, with a maximum depth of approximately 6.1 m (20 ft) mean sea level. A landfall transition vault would be located approximately 39.6 m (130 ft) from the landward edge of the sea wall; the vault's expected outer dimensions are 10.8 m (35.5 ft) long by 2.8 m (9.5 ft) wide by 2.9 m (9.5 ft) tall. Each landfall cable would be installed in a 46 to 76 cm (18 to 30 inch) HDPE conduit with a ground disturbance diameter of 91 cm (36 inches) that would be trenched in from the in-water work area to the landfall transition vault; the trench dimensions for these two transfer conduits will be about 2.4 m (8 ft) in depth, 1.2 m (4 ft) in width at the bottom and 2.4 m (8 ft) in width at the top. Landward of the transition vault, the dimensions for cable installation will be as described below under the sections discussing the onshore cable routes (preferred and alternative).

If HDD were to be used at the New Hampshire Avenue Landfall Site instead of open trenching, the HDD rig and its supporting equipment will be set up using an up to 0.25-acre staging area near the southernmost end of New Hampshire Avenue. The HDD would extend approximately 91.4 m (300 ft) offshore (total length of approximately 126 m [415 ft] long), with a 46 to 76 cm (18 to 30 inch) HDPE conduit with a ground disturbance diameter of 91 cm (36 inches) and a maximum depth of 4 m (13 ft) below mean sea level. A landfall transition vault (as described in the preceding paragraph) will be installed near the landward end of the HDD. Landward of the transition vault, the dimensions for cable installation will be as described below under the sections discussing the onshore cable routes (preferred and alternative).

1.3.2.4 Cable Route - New Hampshire Avenue (Noticed Alternative Route)

The APE for the alternative onshore cable route associated with the New Hampshire Avenue Landfall Site is the Town of Yarmouth and/or Town of Barnstable right-of-way along the proposed onshore cable route. As described in the previous section for Covell's Beach, the disturbance within the right-of-way will range from 3.4 m (11 ft) wide and 2.4 m (8 ft) deep for the typical trench width to install the duct bank, or up to 10.9 m (36 ft) wide and 3.7 m (12 ft) deep where splice vaults are necessary. Both the duct bank and the splice vaults may be installed anywhere within the Town of Yarmouth and/or Town of Barnstable ROW; therefore, the entire ROW along the onshore export cable route is considered the APE, though only a portion of the ROW will actually be disturbed.

The Noticed Alternative Route also includes portions that are unpaved or do not have a defined roadway ROW; and all or parts of Variants 2, 3, and 5 are either unpaved or do not have a defined roadway ROW. For the purposes of defining the APE for areas without a defined roadway right-of-way, an area of potential ground disturbance measuring 3.7 m (12 ft) in depth and 11 m (36 ft) in width is considered the APE.

1.3.2.5 Substation Site

The APE for the Substation site is 5.9 acres of the total 6.35 acre site with a maximum ground disturbance of 4.6 m (15 ft) below the high peak of existing grade for the entirety of the roughly 5.9-acre area. The same substation site would be used regardless of the Landfall Site and onshore route chosen. Approximately 5.9 acres of the substation site will be cleared and graded; this proposed land clearing is limited only to what is needed to accommodate the substation. To complete finished site grades, and to balance earth cuts and fills, several retaining walls will be required and excavation for and construction of these walls will be required as part of completing the site grading effort.

Construction at the substation site will also require excavation of areas required for major component foundations/footings and full volume containment, excavation of the drainage swales and basins required for site drainage, and excavation of the trench for the portions of the duct bank within the substation site. Ground disturbing activities will vary across the site and are anticipated to be a maximum of 4.6 m (15 ft) below the high peak of existing grade for the entirety of the roughly 5.9-acre area.

1.3.2.6 Equipment Laydown and Staging Areas – Covell's Beach Landfall Site to Substation (Preferred Route)

Equipment laydown and staging areas will be set up along the proposed routes. As mentioned previously, for the Covell's Beach landfall site, the HDD rig and its supporting elements would be set up using an approximately 0.8 acre staging area in the eastern end of the 2-acre paved Covell's Beach parking lot. Additional staging areas may be necessary along the onshore export cable route. Any additional staging areas will either be paved or, if unpaved, will be previously established, well-known staging areas that are already used to support construction projects. Within these established staging areas, no excavation or vegetation clearing will be required. It is expected that, if additional staging areas are used, they will temporarily store items such as typical roadway construction equipment (excavators, backhoes, dump trucks, etc.), lengths of pipe, framing/support materials, etc. Since any additional unpaved staging areas used will be existing, previously established staging areas that are used for multiple projects, these staging areas would not be considered part of the specific APE for the Vineyard Wind Project.

1.3.2.7 Equipment Laydown and Staging Areas – New Hampshire Avenue Landfall Site to Substation (Noticed Alternative Route)

As mentioned previously, for the New Hampshire Avenue Landfall Site, the HDD rig and its supporting elements will be set up using an up to 0.25-acre staging area near the southernmost end of New Hampshire Avenue. For existing paved areas such as those mentioned for the Landfall Sites, no ground disturbance is expected at equipment laydown and staging areas.

An equipment staging area with dimensions of approximately 0.22 acres (19.5 m [64 ft] wide by 45.7 m [150 ft] long by <0.3 m [1 ft] deep) is also proposed along the inactive extension of Higgins Crowell Road where a MassDOT bike path parking lot is proposed. Two additional staging areas are town-owned parcels within the Eversource ROW that, while partially disturbed from the existing utility line, are unpaved. These areas are approximately 0.6 acres in size (Area 3 is approximately 22.9 m [75 ft] wide by 113 m [370 ft] long and Area 4 is approximately 30 m [100 ft] wide by 84 m [275 ft] long) and may require minimal grading for level storage of materials. For unpaved equipment areas, the depth of potential disturbance is expected to be a maximum of 0.3 to 0.9 m (1 to 3 ft).

1.3.3 Viewshed APE

The viewshed from which renewable energy structures – whether located offshore or onshore – would be visible, constitutes the viewshed portion of the APE. Onshore, the viewshed APE includes a one-quarter mile boundary around the proposed onshore substation site (Figure 8); all other elements will be underground and will not be visible.

Offshore, the viewshed APE includes a boundary of 56.8 km (35.3 mi) around the wind development area, conservatively determined as the distance at which no part of the wind turbines would be visible due to the Earth's curvature and horizon line. This was based on the maximum height of the blade tip of approximately 212 m (696 ft) and a 1.8-m (6-ft) observer height at the shoreline. At 56.8 km (35.3 mi), a target height of 212 m (696 ft) would be below the horizon line. At 1.8 m (6 ft) in height, an observer at the shoreline would perceive the horizon at 4,828 km (3 mi). With the height of 212 m (696 ft), a 56.8 km (35.3 mi) radius would

ensure the entirety of the offshore structures would be below the horizon line. Environmental conditions such as wave height, fog, rain, haze, and other factors were not considered in this calculation, but would serve to further limit visibility. The more visually substantial elements of the assemblies will extend only to 121 m (397 ft); these elements will be entirely below the horizon line at a distance of approximately 44.1 km (27.4 mi) (Epsilon Associates 2018).

The APE is further refined for island coastal areas through GIS analysis, and is shown on Figures 3-3 (a through c), 3-5, and 3-7 (a through c) in the historic resources report. "Within the 56.8 km (35.3 mi) radius from the [wind development area] are numerous islands as well as Cape Cod; however, the first landmasses to be affected (Cuttyhunk Island, Martha's Vineyard, Nomans Land, Nantucket, Muskeget Island, and Tuckernuck Island) serve to provide a visual obstruction and buffer to areas within Buzzards Bay, Vineyard Sound, and Nantucket Sound. A narrow view corridor between Martha's Vineyard and Muskeget Island into Nantucket Sound allows for the potential visibility of the WDA from the Towns of Mashpee, Barnstable, and Yarmouth on Cape Cod at the end of the 56.8 km (35.3 mi) radius. Given the extreme distance and the numerous buildings and structures along the shorelines of Mashpee, Barnstable and Yarmouth, only those areas directly along the shoreline are considered within the proposed APE. Although simulations show that the WTGs will not be visible from these distances, they are nevertheless included to be conservative" (Epsilon Associates 2018) (Figure 9).

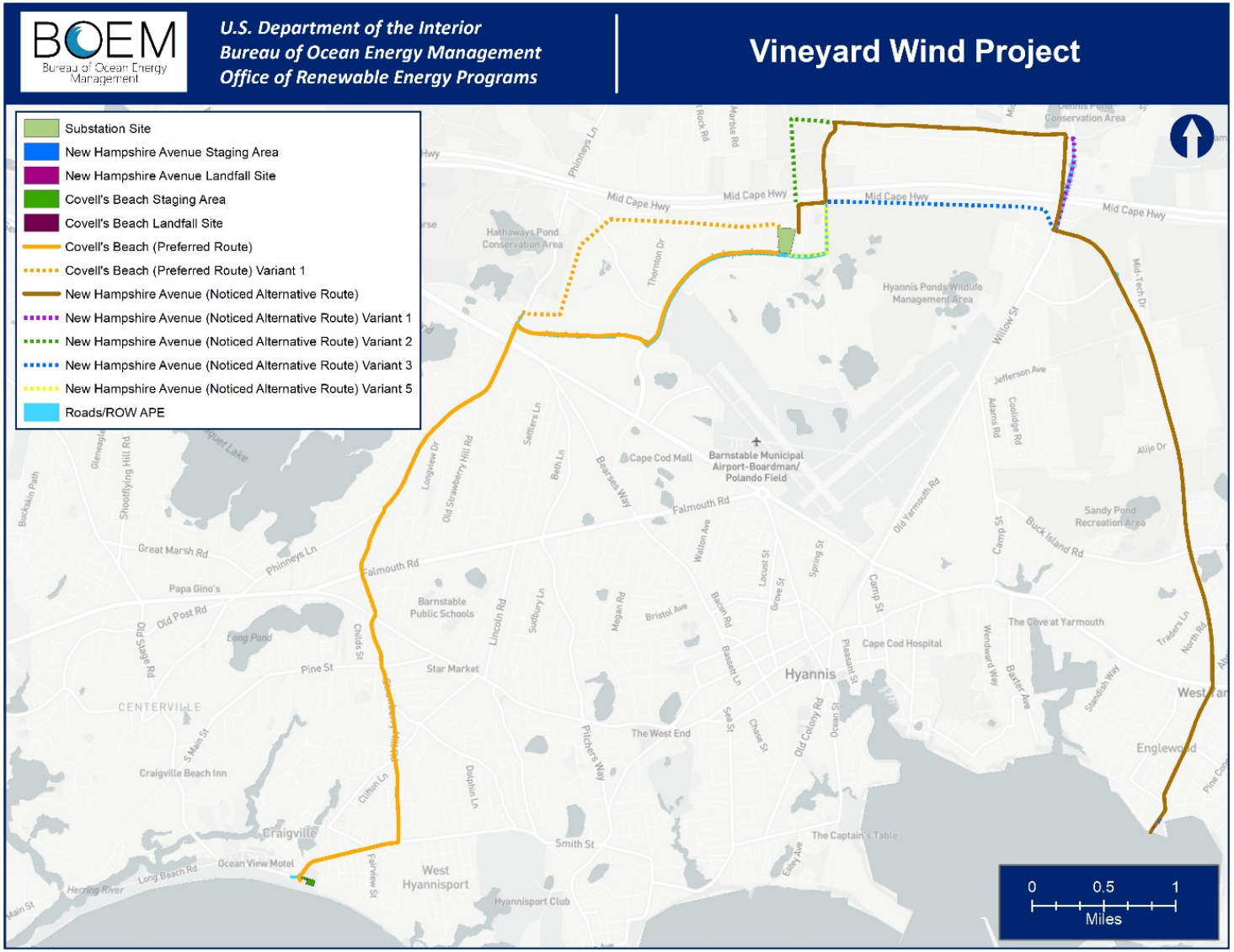

Figure 4. Overview of terrestrial archaeological resources APE.

Figure 5. Terrestrial archaeological resources APE for the Covell's Beach Landfall Site (Preferred).

Figure 6. Terrestrial archaeological resources APE for the New Hampshire Avenue Landfall Site (Noticed Alternative).

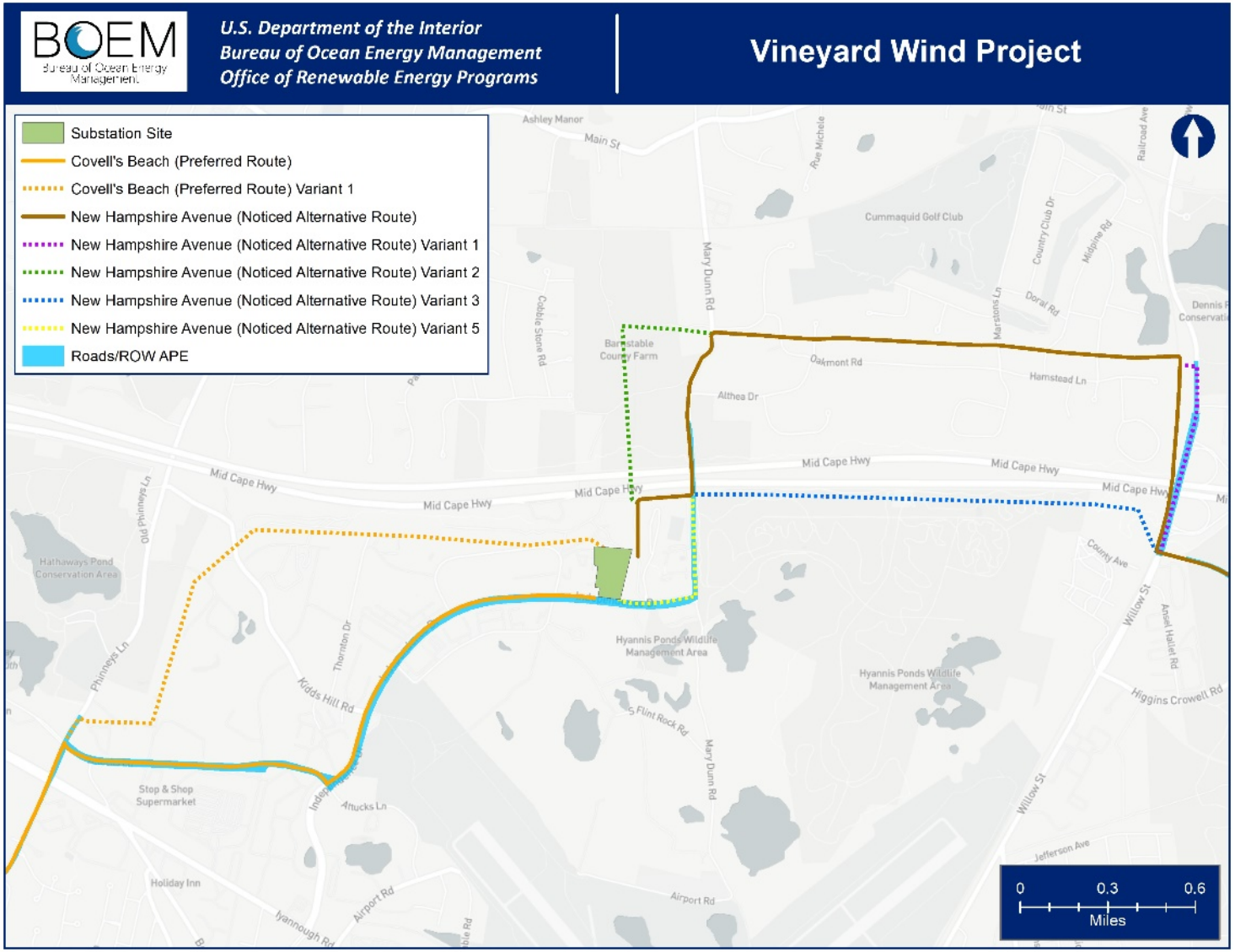

Figure 7. Terrestrial archaeological resources APE for the Substation Site.

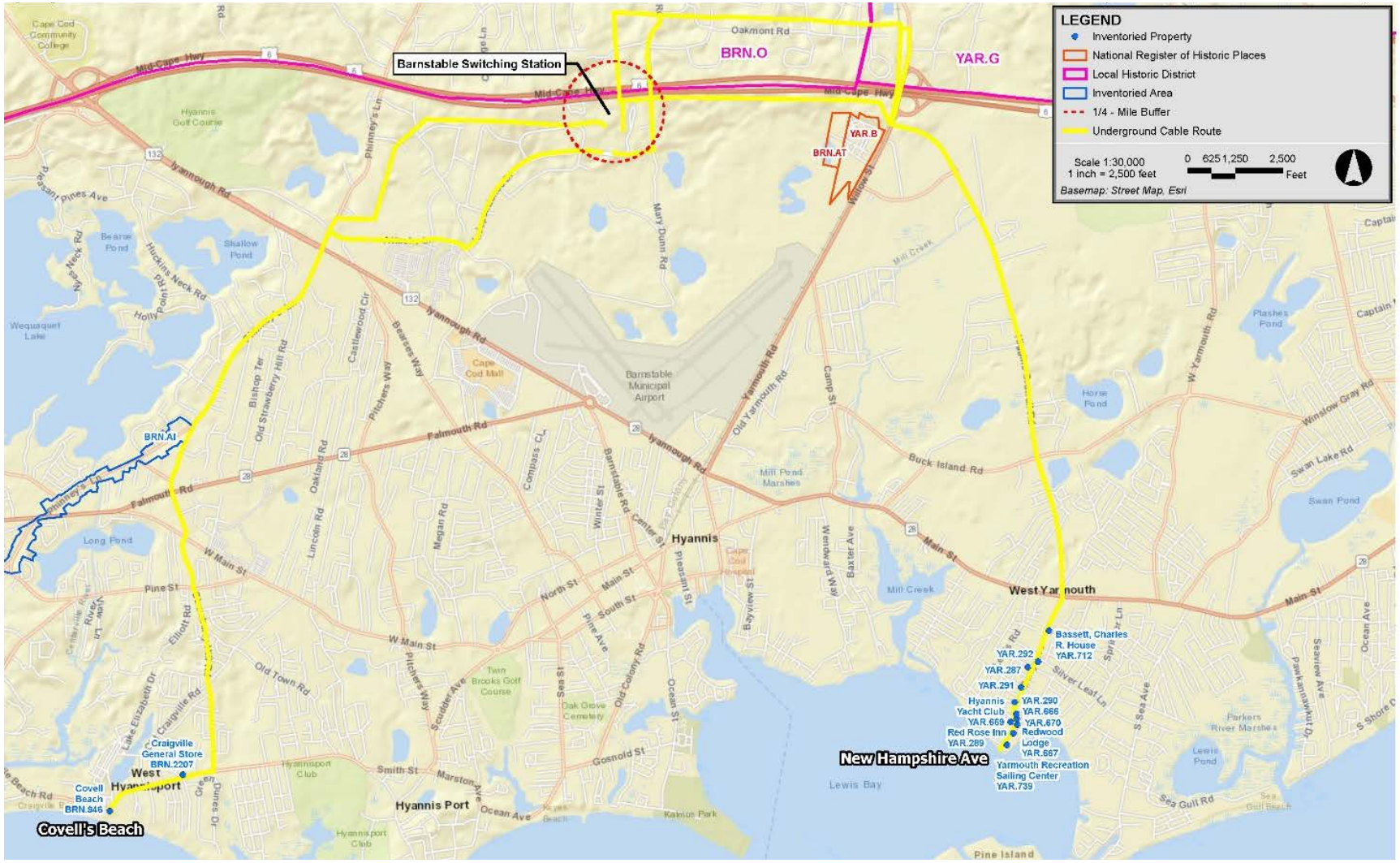

Figure 8. Map depicting the onshore viewshed APE, which includes a one-quarter mile boundary around the proposed onshore substation site.

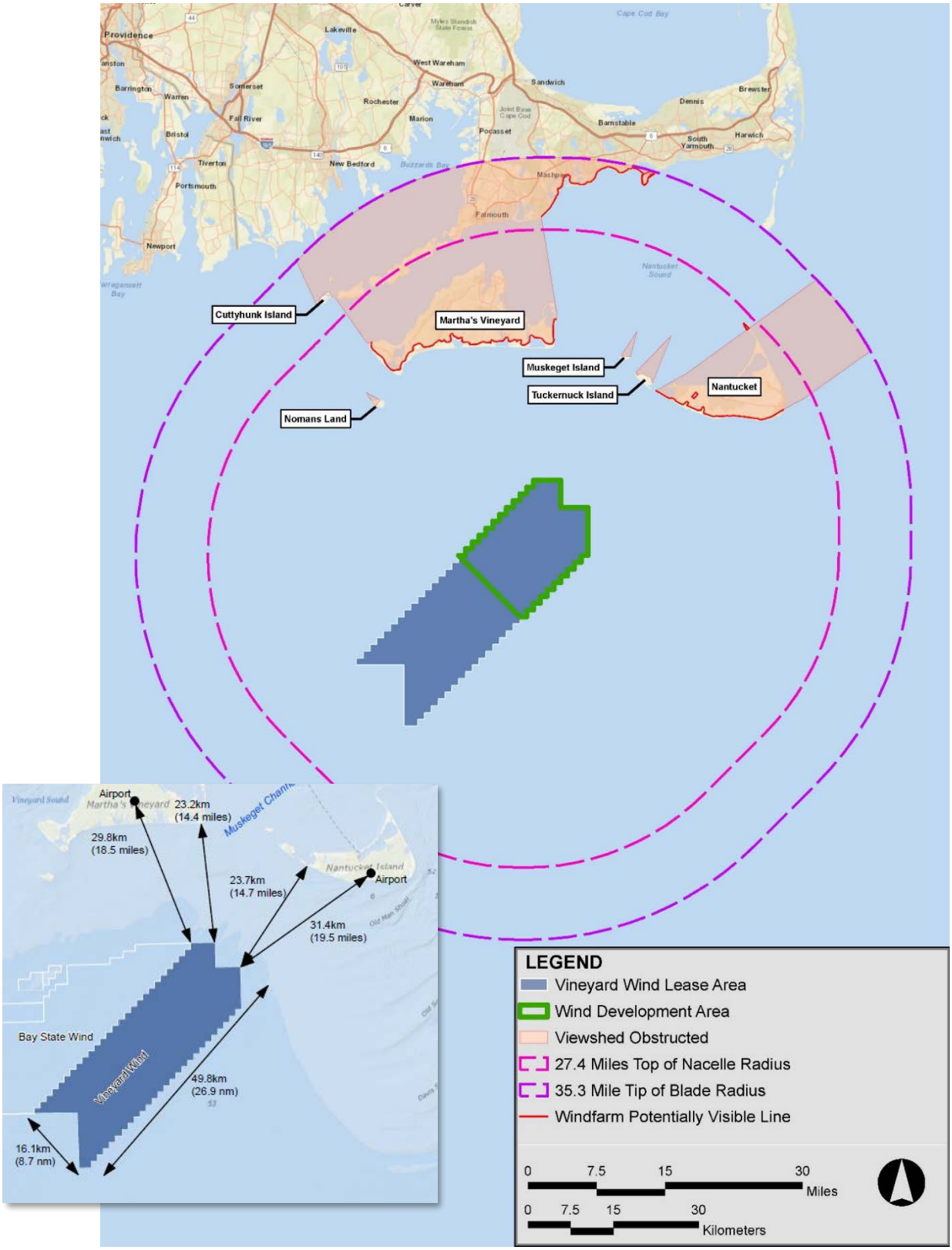

Figure 9. Map depicting the offshore viewshed APE, with inset depicting distance from various landmarks

2 Steps Taken to Identify Historic Properties

2.1 Technical Reports

To support the identification of historic properties within the APE, Vineyard Wind has provided, or is currently preparing, the following survey reports as appendices to the COP:

- A marine archaeological survey report, which will include a survey of all areas of potential seafloor disturbance following BOEM's *Guidelines for Providing Archaeological and Historic Property Information Pursuant to 30 CFR Part 585*. A preliminary reconnaissance report – Confidential Volume II, Appendix II-C of the COP – was shared with consulting parties in October 2018, and is hereby incorporated by reference. The final detailed archaeological survey results were submitted to BOEM in spring 2019; BOEM is currently reviewing the report and data for sufficiency.
- A terrestrial archaeological survey report, which will include a survey of the onshore cable routes, substations, and any other onshore areas that could be impacted by ground-disturbing activities. A preliminary assessment of the route – Confidential Volume III, Appendix III-G of the COP (PAL 2017) – was shared with consulting parties in October 2018, and is hereby incorporated by reference. Subsequently, an intensive archaeological survey was conducted within the location of the proposed substation, a 6.35-acre parcel of land within the Independence Park industrial area in Barnstable (PAL 2018). It is enclosed with transmittal of this Finding, and is hereby incorporated by reference.
- A visual impact assessment (VIA) with visual simulations, and an assessment of visual effects to historic properties for the entire project design envelope was completed, found sufficient by BOEM, and shared with consulting parties in October 2018. Volume III, Appendix III-H.a, comprising the VIA and simulations, and the Visual Effects Assessment Report are hereby incorporated by reference.

While noting that the identification of historic properties is ongoing for both marine and terrestrial archaeological resources, BOEM has reviewed all preliminary reports discussed below and found them to be sufficient to initiate consultation. Moreover, BOEM has found that the assessment of visual effects to historic properties is sufficient to apply the criteria of adverse effects and begin consultations for resolving adverse effects to historic properties for this portion of the APE.

1. The COP includes a preliminary Terrestrial Archaeology Resources Report for the proposed upland export cable routes (PAL 2017). A preferred route and an alternative route, with possible variants, are shown on Figure 1 of the report. The study boundaries extend within a half mile of the centerline of the proposed routes. The preliminary terrestrial report identifies sections of the route as having high, medium, and low overall potential for archaeological historic properties and the project area overall is evaluated as having a medium to high sensitivity for archaeological sites.

2. Subsequent to COP submittal, BOEM received a report documenting an intensive archaeological survey of the proposed substation at the Barnstable Switching Station. Two pre-contact period isolated finds were recorded, neither of which were potentially significant cultural resources. Massachusetts Historical Commission also reviewed the

report and concurred with its conclusions. Surveys for the cable route are ongoing and reports will be submitted to BOEM in winter 2019, after which BOEM will continue consultation with the parties and possibly revise this Finding to incorporate any new information. BOEM will ensure that all sections of the cable route that remain included in the proposed undertaking's APE are surveyed at an intensive level, in accordance with the Massachusetts Historical Commission's standards.

3. The COP includes a preliminary Marine Archaeological Resources Report for the submerged portion of the APE (both on the Outer Continental Shelf and in state waters) (Tuttle, Donata, and Scholl 2018). Archival research was conducted for both the wind development area and the offshore export cable corridor. A portion of the WDA was surveyed (northeast portion) and over 1,243 kilometers (km; 772 miles [mi]) of survey data were examined in 2016. During the 2017 survey season, approximately 175 km (109 mi) of survey data were examined in the offshore export cable route. Data were collected at a reconnaissance level over the lease area and have begun to be collected at a resolution to identify historic properties; reports were submitted to BOEM in spring 2019, and BOEM is reviewing them for sufficiency. Once BOEM finds the reports sufficient, BOEM will transmit these to the parties and continue consultation, possibly revising this Finding or issuing a subsequent Finding to incorporate any new information. BOEM will ensure that all portions of the proposed undertaking's APE are surveyed at an intensive level.

4. The COP also includes a complete and final assessment of visual (indirect) effects to historic properties (historic structures and Traditional Cultural Properties) identified within the viewshed APE of the project, as well as visual simulations prepared to inform those assessments (Epsilon Associates, Inc. 2018). The same visual simulations are also used to form an assessment of impacts to human aesthetic experience, recreation, tourism, etc., under the NEPA, commonly called a Visual Impact Assessment, or VIA. BOEM finds that the APE for potential visual effects analyzed is appropriate for the scale and scope of the proposed undertaking. BOEM further finds that the inventory of historic properties is sufficient to initiate consultation for the undertaking, and represents a good faith effort to identify historic properties within the viewshed APE potentially affected by the undertaking, as defined at 36 CFR 800.4.

2.2 Consultation and Coordination with the Parties and Public

2.2.1 Early Coordination

Since 2009, BOEM has coordinated Outer Continental Shelf renewable energy activities offshore Massachusetts with its Federal, state, local, and tribal government partners through its Intergovernmental Renewable Energy Task Force. Additionally, BOEM has met regularly with federally recognized tribes that may be affected by renewable energy activities in the area since 2011, specifically during planning for the issuance of leases and review of site assessment activities. BOEM also coordinates public information meetings to help keep interested stakeholders updated on major renewable energy milestones. Information pertaining to BOEM's Massachusetts Intergovernmental Renewable Energy Task Force meetings is available here:

https://www.boem.gov/Massachusetts-Renewable-Energy-Task-Force-Meetings/ and information pertaining to BOEM's stakeholder engagement efforts is available: https://www.boem.gov/Renewable-Energy-Program/State-Activities/MA/Public-Information-Meetings.aspx.

2.2.2 NEPA Scoping and Public Hearings

On March 30, 2018, BOEM announced its Notice of Intent (NOI) to prepare an EIS for the Vineyard Wind COP. This purpose of the NOI is to solicit input on issues and potential alternatives for consideration in the Vineyard Wind COP EIS. Throughout the scoping process, Federal agencies, state, tribal, and local governments, and the general public had the opportunity to help BOEM determine significant resources and issues, impact-producing factors, reasonable alternatives, and potential mitigation measures to be analyzed in the EIS, as well as provide additional information. BOEM also used the NEPA commenting process to allow for public involvement in the Section 106 consultation process under the National Historic Preservation Act (54 U.S.C. 300101 et seq.), as permitted by 36 CFR 800.2(d)(3). Through this notice, BOEM announced its intention to inform its Section 106 consultation using the NEPA commenting process, and invited public comment and input regarding the identification of historic properties or potential effects to historic properties from activities associated with approval of the Vineyard Wind COP.

Additionally, BOEM held public scoping meetings, which included specific opportunities for engaging on issues relative to Section 106 for the Vineyard Wind COP at the following places and times:

- New Bedford, Massachusetts, Monday, April 16, 2018;
- Martha's Vineyard, Massachusetts, Tuesday, April 17, 2018;
- Nantucket, Massachusetts, Wednesday, April 18, 2018;
- Hyannis, Massachusetts, Wednesday, April 18, 2018; and
- Kingston, Rhode Island, Thursday, April 19, 2018.

Through this NEPA scoping process, BOEM received comments related to cultural, historic, archaeological, or tribal resources. These are presented in BOEM's EIS Scoping Report, available here: https://www.boem.gov/VW-EIS-Scoping-Report/ and are summarized as follows:

- Potential for visual impacts on Nantucket's economy and historic buildings, places, and districts, especially from Madaket Beach in the west to Sconset Beach in the east.
- Consultation with the Nantucket Historic District and the Nantucket Historical Commission should be performed due to the high cultural and historic sensitivity of the island.
- Coordination with the potentially affected tribes in determining whether any of the proposed lease areas are historically, culturally, or spiritually important.
- BOEM should document coordination pursuant to Executive Order 13175 in the EIS and that BOEM should work with federal agencies involved in the proposed Project to determine the lead agency for consultation for impacts from the proposed Project on land and the ocean.
- Tribes have requested the opportunity to participate when archaeology work is being conducted, as opposed to being invited to discuss results after fieldwork has been

completed. The recommendation is for BOEM work to promote this level of coordination for the proposed Project.
- Strobing or blinking nighttime lighting systems, as are standardly installed on WTGs, are incongruous with Nantucket's lighting regulations and would negatively impact the Island's cultural identity of historic and environmental preservation.

On December 7, 2018, BOEM published a Notice of Availability (NOA) for the Draft EIS for the COP submitted by Vineyard Wind. As part of this process, BOEM held public hearings from February 11-15, 2019 in Rhode Island and Massachusetts at the following places and times:

- Nantucket, Massachusetts, Monday, February 11, 2019;
- Martha's Vineyard, Massachusetts, Tuesday, February 12, 2019;
- Hyannis, Massachusetts, Wednesday, February 13, 2019;
- New Bedford, Massachusetts, Thursday, February 14, 2019; and
- Narragansett, Rhode Island, Friday, February 15, 2019.

The public comment period closed on February 22, 2019. The input received via this process will be used to inform preparation of the Final EIS.

2.2.3 Initiation of Section 106 Consultations

After receipt of the COP submission from Vineyard Wind, BOEM contacted 65 governments and organizations, providing information on the proposed project and inviting them to be a consulting party to the Section 106 review of the COP (Appendix A-1); entities that responded to BOEM's invitation or were subsequently made known to BOEM and added as consulting parties are listed in Appendix A-2. BOEM initiated Section 106 consultation with letters to these entities on June 7, 2018, and held an initial Section 106 consultation meeting by webinar on June 26, 2018. Additionally, BOEM held government-to-government consultation meetings with the Mashantucket Pequot Tribe, the Mohegan Tribe of Connecticut, and the Narragansett Indian Tribe on August 21 and 22, 2018. BOEM held a government-to-government consultation meeting with the Mashpee Wampanoag Tribe on February 14, 2019, and has requested a government-to-government consultation meeting with the Wampanoag Tribe of Gay Head Aquinnah; a staff-level meeting will be held on April 3, 2019. In these letters and consultation meetings, BOEM requested information from consulting parties on historic properties that may be potentially affected by the proposed undertaking. To date, BOEM has been made aware of no additional historic properties that may be affected.

On October 16, 2018, BOEM shared with consulting parties the preliminary terrestrial archaeological resources report, the preliminary marine archaeological resources report, the complete visual impact assessment and visual simulations report, and the complete report assessing effect to historic properties within the viewshed APE. BOEM additionally held a Section 106 consultation meeting on November 7, 2018 on the island of Nantucket, Massachusetts, in order to review the results of the visual effects assessment on historic properties. BOEM held a subsequent Section 106 consultation meeting on April 2, 2019 in Hyannis, Massachusetts, in order to discuss resolution of adverse effects to two historic properties. Consultation is ongoing; the next Section 106 consultation meetings will occur by webinar on April 30, 2019 – to continue discussions regarding mitigations for the Nantucket

Historic District National Historic Landmark – and May 8, 2019 – for Tribes to meet with BOEM and other agencies regarding mitigations for paleolandforms that cannot be avoided.

3 Affected Historic Properties

As noted above, the identification of historic properties within the terrestrial and marine archaeological resources portions of the APE are ongoing; the identification of historic properties within the viewshed portion of the APE is complete. The following section documents the two affected historic properties within the viewshed APE – Gay Head Lighthouse on Martha's Vineyard and the Nantucket Island Historic District National Historic Landmark – and the undertaking's effects upon them.

3.1 Gay Head Lighthouse, Martha's Vineyard

Gay Head Lighthouse is located on the southwesternmost portion of the island of Martha's Vineyard marking Devil's Bridget rocks, the shoals of the south shore of the island, and the entrance to Vineyard Sound from Buzzard's Bay on the route to Boston Harbor from the South. It was listed on the National Register of Historic Places in 1987 as part of the Lighthouses of Massachusetts Thematic Resources Area and is significant under Criteria A and C as a historic maritime structure and aid to navigation (DiStefano and Salzman 1981; Unnamed 2015; and Epsilon Associates, Inc. 2018).

Constructed in 1855-1856, the Gay Head Lighthouse was once one of the ten most important lights on the Atlantic Coast and originally contained one of the country's first Fresnel lenses. The brick and sandstone tower meets Criterion A for its association with the island's maritime history as an aid to navigation. The structure also meets Criterion C as an example of a 19th century maritime structure constructed of bricks utilizing the clay from the Gay Head Cliffs. The 1856 lighthouse, a brick tower 45 feet in height, is the only remaining structure at the site; the original brick Keeper's House was replaced by a wooden house in 1906 and was later torn down in 1961. Although the lighthouse was moved from its original location 150 feet east in 2015 and its setting and location are partially compromised, the structure retains integrity of design, material, workmanship, feeling, and association (DiStefano and Salzman 1981; Unnamed 2015; and Epsilon Associates, Inc. 2018).

3.2 Nantucket Historic District National Historic Landmark

Situated approximately 30 miles south of Cape Cod, Massachusetts, the Nantucket Historic District National Historic Landmark comprises the entirety of the islands of Nantucket, Tuckernuck, and Muskeget. Combined, the three islands occupy approximately 28,000 acres, and contain 5,027 contributing resources, nearly half of the total number of resources (contributing and non-contributing) located within the property. In 1955, Nantucket became one of the first two local historic districts in Massachusetts and one of the earliest local historic districts in the nation through special legislation initiated by the town and passed by the Commonwealth of Massachusetts. It was listed on the National Register of Historic Places in 1967, with several more recent updates, notably in 1975 and 2012 (Chase-Harrell and Pfeiffer 2012, Heintzelman 1975, and Epsilon Associates, Inc. 2018).

According to the 2012 Landmark nomination,

> "The 1966 National Historic Landmark nomination for Nantucket focused entirely on its association with the American whaling industry (NHL Criterion 1) and the remarkable survival of the architecture and ambiance of an early whaling port (NHL Criterion 4), and the period of significance ended with the decline of whaling on Nantucket. While whaling built Nantucket, other factors preserved it; tourism replaced whaling as the island's economic mainstay, and historic preservation took early root on the island. With the passage of time, the importance of these factors in preserving the island's character has become apparent, and it is the purpose of this update to establish the national significance of tourism and historic preservation as well as whaling on Nantucket and to extend the period of significance to 1975, when the last element of governmental protection of the island was set in place by the expansion of the National Historic Landmark District to include the entirety of the island. This expansion followed the 1971 expansion of the local historic district to encompass the entire island as well as the outlying islands of Tuckernuck and Muskeget. These updates also recognize Nantucket's Native American and African-American communities and the important roles that they played in the whaling industry and the social history of the island" (Chase-Harrell and Pfeiffer 2012).

The Nantucket Historic District National Historic Landmark is significant under Criterion A for its association with the development of Nantucket and the whaling industry, Criterion C for architectural examples including Georgian, Federal, Greek Revival, Italianate, Shingle and Colonial Revival, and Criterion D for the potential archaeological remains associated with Native American pre- and post-contact use as well as historical archaeology. Despite modern construction and intrusions, it retains integrity of location, design, setting, material, workmanship, feeling and association (Chase-Harrell and Pfeiffer 2012, Heintzelman 1975, and Epsilon Associates, Inc. 2018). Additionally, residents, local government officials, and other consulting parties present at the Section 106 consultation meeting BOEM hosted on the island of Nantucket on November 7, 2018, explained the association of the islands and the ocean, their relative isolation, the extensive preservation of historic elements of the Landmark, and the role of these elements in forming and sustaining the cultural identity of community members. It is their position that the view of an undeveloped ocean is integral to the character, setting, feeling, and association of the resource.

4 Undertaking's Effect on Historic Properties

As mentioned above, residents, local government officials, and other consulting parties present at the Section 106 consultation meeting BOEM hosted on the island of Nantucket on November 7, 2018 have expressed that the view of an undeveloped ocean is integral to the character, setting, feeling, and association of the historic properties affected by the undertaking.

4.1 Gay Head Lighthouse, Martha's Vineyard

The maritime setting of the Gay Head Lighthouse and its viewshed would be altered through the introduction of new elements out of character with the historic setting, feeling, and association,

thereby diminishing its integrity. Existing power lines and other modern elements already within the foreground of portions of the view are not located on the ocean, the association and historic feeling of which is integral to this property's setting; thus, their existence does not serve to remove nor offset the effect on the property resulting from the introduction of new ocean-founded visual elements proposed in the Vineyard Wind COP. Additionally, while existing topography and mature tree growth to the southeast partially obstruct the ocean view, it is estimated that the ocean view from the Gay Head Lighthouse to the south and the west will be obstructed by the new ocean-founded visual elements proposed in the COP up to 76% of the time (Epsilon Associates, Inc. 2018). These elements are temporary in nature in that they will be removed in approximately 30 years, as required in the lease.

4.2 Nantucket Historic District National Historic Landmark

The maritime setting of the resource and its viewshed would be altered through the introduction of new ocean-founded visual elements proposed in the Vineyard Wind COP that are out of character with the historic setting, feeling, and association of the resource, thereby diminishing its integrity. It is estimated that the new ocean-founded visual elements proposed in the COP will be visible in the ocean view from the Nantucket Historic District National Historic Landmark up to 68% of the time (Epsilon Associates, Inc. 2018). These elements are temporary in nature in that they will be removed in approximately 30 years, as required in the lease.

5 Application of the Criteria of Adverse Effect

The Criteria of Adverse Effect under Section 106 [36 CFR 800.5(a)(1)] states that an undertaking has an adverse effect on a historic property:

…when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association…. Adverse Effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative (36 CFR 800.5(a)(1).

According to regulation, Adverse Effects on historic properties include, but are not limited to (36 CFR 800.5(a)(2)):

> (i) Physical destruction of or damage to all or part of the property;
>
> (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines;
>
> (iii) Removal of the property from its historic location;
>
> (iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Based on the information BOEM has available from the completed identification of historic properties within the viewshed APE of the project, and the assessment of effects upon those properties, BOEM has found that the proposed project will have an indirect, adverse visual effect to the Gay Head Lighthouse and Nantucket Historic District National Historic Landmark. The undertaking will affect the character of the properties' setting that contributes to their historic significance; and the undertaking introduces visual elements that are out of character with the historic setting of the properties. Due to the distance and open viewshed, the integrity of the properties would not be so diminished as to disqualify any of them for National Register of Historic Places eligibility. The adverse effects to the viewshed of the above-ground historic properties are considered temporary, since they will only occupy the space for approximately 30 years, but unavoidable for reasons discussed below. This application of the criteria of adverse effect and determination that the effects are indirect is based on pertinent National Register Bulletins, subsequent clarification and guidance by the National Park Service and Advisory Council on Historic Preservation, and other documentation, including professionally prepared viewshed assessments and computer-simulated photographs and video.

5.1 Conditions or Future actions to Avoid, Minimize, or Mitigate Adverse Effects

The proposed undertaking has been redesigned to minimize visual impacts to the extent feasible. However, several recommendations raised by consulting parties to avoid adverse effects are infeasible to implement. Removal or relocation of the majority of turbines nearest to the two adversely affected historic properties is not possible without creating additional impacts to other resources and issues of concern analyzed under the NEPA. Moreover, deferring development of the closest turbines until an unspecified later date is not possible because the project requires a sufficient number of turbines within the lease area to produce enough electricity by a certain timeframe in order to meet the commitments of its power purchase agreement. Vineyard Wind will build the largest turbines possible using currently available technologies, which may further reduce the number of turbines needed, but this may not be a sufficient reduction or setback to entirely avoid adverse effects. To that end, additional minimization and mitigation is warranted.

The following is a summary of the proposed minimization and mitigation measures for adverse visual effects to historic properties that would result from the proposed project. Visibility of the turbine array would be minimized and mitigated by the following measures:

- As a condition of COP approval, BOEM would require Vineyard Wind to paint the WTGs using an off-white / grey color, to reduce contrast with the sea and sky and thus minimize daytime visibility of the ocean-based project elements;
- As a condition of COP approval, BOEM would require Vineyard Wind to install and use an Automatic Detection and Lighting System to reduce nighttime lighting and thus minimize nighttime visibility of the ocean-based project elements;
- As a condition of COP approval, BOEM would require Vineyard Wind to fund three projects that were proposed and will be executed by the Gay Head Lighthouse Advisory Board: (1) *Lighthouse Restoration*, including mortar and repointing of brickwork and removing a patch and restoring the structure in the area where the lighthouse keeper's residence used to connect to the lighthouse; (2) *Interpretive Signage*, which includes construction of free-standing interpretive signage; and (3) *Smartphone App*, which includes installation of a Wi-Fi system and creation of a smartphone application to assist with interpretation for visitors. The consulting parties reached agreement on the adequacy of these mitigation measures for effects to the Gay Head Lighthouse during the April 2, 2019 consultation meeting.
- As a condition of COP approval, BOEM would require Vineyard Wind to fund additional mitigation projects for effects to the Nantucket Historic District National Historic Landmark. By agreement of all the parties at the April 2, 2019 meeting, any and all mitigations proposals are due to BOEM by April 19, 2019. Final decisions on these projects will be made at the April 30 meeting.

The Section 106 consultation process is ongoing for the Vineyard Wind Project, and will culminate in a final MOA spelling out those measures to which the signatories agree and their final costs. Should other adverse effects be identified, to comply with the National Historic Preservation Act, BOEM will continue to consult in good faith with the State Historic Preservation Office (SHPO) and other consulting parties to resolve those effects.

6 Views of the Consulting Parties

While BOEM's Section 106 consultation is ongoing, copies or summaries of views provided by consulting parties and the public to-date are included as Appendix B to this Finding.

7 References

Chase-Harrell, Pauline and Brian Pfeiffer. 2012. Nantucket Historic District National Historic Landmarks Program Nomination Form (Updated).

DiStefano, V. and N. Salzman. 1981. Gay Head Light: Lighthouses of Massachusetts Thematic Group Nomination. Massachusetts Historical Commission.

Epsilon Associates, Inc. 2018. Vineyard Wind Historic Properties Visual Impact Assessment for the Vineyard Wind Offshore Wind Farm Project. Submitted to Vineyard Wind. Further submitted to BOEM in support of the Vineyard Wind Construction and Operations Plan.

Heintzelman, Patricia. 1975. Nantucket Historic District National Historic Landmarks Program Nomination Form (Updated).

Public Archaeology Laboratory (PAL). 2017. Vineyard Wind Upland Cable Routes Barnstable and Yarmouth, Massachusetts Archaeological Due Dilligence Report PN 3374. Submitted to Epsilon Associates, Inc.

Tuttle, Michael C., Christopher Donta, and Nathan Scholl. 2018. Marine Archaeological Services in Support of the Vineyard Wind Construction and Operations Plan OCS-A 0501 Lease Area and Offshore Export Cable Corridor. Prepared for Vineyard Wind, LLC.

Unnamed. 2015. Technical Amendment to Gay Head Light National Register of Historic Places Nomination Form.

Appendix A-1: Entities Invited to be Consulting Parties

The following is a list of governments and organizations that BOEM contacted and invited to be a consulting party to the Section 106 review of the Vineyard Wind Project, between June and October 2018. During the consultations, additional parties were made known to BOEM and were added as they were identified (see Appendix B).

1. Advisory Council on Historic Preservation
2. Alliance to Protect Nantucket Sound
3. Barnstable County Board of Commissioners, Massachusetts
4. Cape Cod Commission
5. Charlestown Historical Society
6. City of Cranston, Rhode Island
7. City of East Providence, Rhode Island
8. City of New Bedford, Massachusetts
9. City of Pawtucket, Rhode Island
10. City of Providence, Rhode Island
11. City of Warwick, Rhode Island
12. County of Edgartown, Massachusetts
13. Dukes County Commission, Edgartown, Massachusetts
14. Maria Mitchell Association (Dark Skies Initiative)
15. Martha's Vineyard Commission
16. Martha's Vineyard Museum
17. Mashantucket Pequot Tribal Nation
18. Mashpee Wampanoag Tribe
19. Massachusetts Historical Commission
20. Massachusetts Historical Society
21. Mohegan Tribe of Indians of Connecticut
22. Museum of African American History, Boston
23. Museum of African American History, Nantucket
24. Nantucket Conservation Foundation
25. Nantucket Historic District Commission
26. Nantucket Historical Association
27. Nantucket Historical Commission
28. Nantucket Planning and Economic Development Commission
29. Nantucket Planning Board
30. Nantucket Preservation Trust
31. Narragansett Indian Tribe
32. National Park Service
33. Preservation Massachusetts
34. Rhode Island Historical Preservation & Heritage Commission
35. Rhode Island Historical Society
36. Shinnecock Indian Nation
37. South County Historical Center, Kingston, Rhode Island
38. Town of and County of Nantucket, Massachusetts
39. Town of Aquinnah, Massachusetts
40. Town of Barrington, Rhode Island
41. Town of Bristol, Rhode Island
42. Town of Charlestown, Rhode Island
43. Town of Chilmark, Massachusetts
44. Town of Dartmouth, Massachusetts
45. Town of East Greenwich, Rhode Island
46. Town of Gosnold, Cuttyhunk Island, Massachusetts
47. Town of Jamestown, Rhode Island
48. Town of Little Compton, Rhode Island
49. Town of Middletown, Rhode Island
50. Town of Narragansett, Rhode Island
51. Town of Oak Bluffs, Massachusetts
52. Town of Portsmouth, Rhode Island
53. Town of Shoreham, Block Island, Rhode Island
54. Town of South Kingston, Rhode Island
55. Town of South Kinston, Wakefield, Rhode Island
56. Town of Tisbury, Vineyard Haven, Massachusetts
57. Town of Tiverton, Rhode Island
58. Town of Warren, Rhode Island
59. Town of West Tisbury, Massachusetts
60. Town of Westerly, Rhode Island
61. Town of Westport, Massachusetts
62. US Army Corps of Engineers
63. Vineyard Power Cooperative
64. Vineyard Wind
65. Wampanoag Tribe of Gay Head (Aquinnah)

Appendix A-2: Consulting Parties to the Vineyard Wind Project

The following is a list of consulting parties to the Section 106 review of the Vineyard Wind Project, as of January 28, 2019.

Advisory Council on Historic Preservation
Alliance to Protect Nantucket Sound
Cape Cod Commission
Gay Head Lighthouse Advisory Board
Nantucket Historic District Commission
Maria Mitchell Association (Dark Skies Initiative)
Mashantuckett Pequot Tribal Nation
Mashpee Wampanoag Tribe
Massachusetts Commission on Indian Affairs
Massachusetts Historical Commission
Mohegan Tribe of Indians of Connecticut
Nantucket Conservation Foundation
Nantucket Historical Commission
Nantucket Preservation Trust
Narragansett Indian Tribe
National Park Service
Preservation Massachusetts
Rhode Island Historical Preservation & Heritage Commission
Shinnecock Indian Nation
Town and County of Nantucket
Nantucket (NPEDC) Planning Commission
US Army Corps of Engineers
Vineyard Power Cooperative
Vineyard Wind
Wampanoag Tribe of Gay Head Aquinnah

Appendix B: Views of the Consulting Parties

December 19, 2017

Rachel Pachter
Vice President, Permitting Affairs
Vineyard Wind, LLC
700 Pleasant Street, Suite 510
New Bedford, MA 02740

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

RE: Vineyard Wind Offshore Wind Energy Project, Massachusetts, BOEM Lease Area OCS-A 0501. MHC # RC.62940

Dear Ms. Pachter:

Staff of the Massachusetts Historical Commission (MHC), office of the Massachusetts State Historic Preservation Officer, have reviewed the Project Notification Form (PNF), submitted by the PAL, Inc., for the Upland Cabling aspect of the project referenced above in Barnstable and Yarmouth.

The MHC will continue to review the project pursuant to the Programmatic Agreement with the Bureau of Ocean Energy Management (BOEM) for Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). The MHC looks forward to consultation with the involved federal and state agencies. A copy of the Environmental Notification Form (ENF) should be submitted to the MHC for review and comment when it is filed with the MEPA office.

The MHC looks forward to reviewing additional project information, including scaled existing and proposed conditions project plans, sized no larger than 11" by 17" for the preferred project alternative to assist BOEM in determining what effect, if any, the proposed project may have on significant historic and archaeological resources. Project information should also be submitted by project planners concurrently to the Massachusetts Board of Underwater Archaeological Resources (MBUAR). Project plans should show all proposed terrestrial and marine project impact areas, including materials staging and equipment storage areas, intertidal horizontal directional drilling entrance and/or exit pits, cable routes, turbine foundation and associated vessel anchorage locations within state and/or federal waters.

The State Archaeologist's permit (950 CMR 70) has been issued to the PAL to conduct the terrestrial archaeological reconnaissance survey for the Upland Cabling aspect of the project. The marine archaeological reconnaissance survey for the Export Cable aspect of the project is being conducted by Gray & Pape, Inc., in consultation with the MHC and MBUAR. The draft technical archaeological reports for the terrestrial upland cabling and marine export cable aspects of the project should be submitted to the MHC for review and comment.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws Chapter 9, Sections 26-27C (950 CMR 70-71) and MEPA (301 CMR 11). If you have any questions concerning this review, please contact Jonathan K. Patton, at this office.

Sincerely,

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: Richard Warner, BOEM
Barbara Newman, USACOE-New England District
Kate Atwood, USACOE-New England District
Bettina Washington, Tribal Historic Preservation Officer, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
Victor Mastone, MBUAR
Deborah C. Cox, PAL, Attn: Duncan Ritchie
Mike Tuttle, Gray & Pape, Inc.

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The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

November 21, 2018

Brandi Carrier
Deputy Federal Preservation Officer
Environmental Branch for Renewable Energy
Bureau of Ocean Energy Management,
Department of the Interior
760 Paseo Camarillo, Suite 102 (CM-102)
Camarillo, CA 93010

RE: Vineyard Wind Offshore Wind Energy Project, Massachusetts, BOEM Lease Area OCS-A 0501. MHC #RC.62490. EEA #15787.

Dear Ms. Carrier:

Staff of the Massachusetts Historical Commission (MHC), office of the Massachusetts State Historic Preservation Officer, have participated in a BOEM webinar on November 7, 2018 for the project referenced above. The MHC looks forward to receiving a copy of the webinar and meeting minutes from the November 7, 2018 presentation for review and comment. The MHC has also received a copy of the draft Construction and Operations Plan (COP) for the project on October 5, 2018. The MHC continues to coordinate the state and federal historic preservation reviews for the project. The project proponent should continue to submit Massachusetts Environmental Policy Act Environmental Impact Reports to the MHC for review and comment as they are developed.

Documents submitted by BOEM and reviewed by MHC include the Vineyard Wind Historic Properties Visual Impact Assessment prepared by Epsilon Associates, Inc., COP Appendix III-H.a, Vineyard Wind Project Visual Impact Assessment, COP Appendix III-G, Preliminary Terrestrial Archaeology Resource Report and Permit Application, and the archaeological report, *Marine Archaeological Services in Support of the Vineyard Wind Offshore Wind Energy Project Construction and Operations Plan OCS-A 0501 Lease Area and Export Cable Corridors Offshore Massachusetts*, prepared by Gray & Pape, Inc.

Information conveyed during the webinar indicates that BOEM intends to make a finding of adverse effect for the project for adverse visual effects to multiple historic properties within the project viewshed, including the Nantucket Historic District and the Gay Head Lighthouse. The MHC looks forward to reviewing BOEM's findings and determinations for the project's visual effects. The MHC recommends that BOEM continue to consult with the Nantucket Historic District Commission, Town of Aquinnah, Martha's Vineyard Museum and National Park Service regarding effects to these National Historic Landmarks. Please also continue to consult with the Tribal Historic Preservation Officers of the Wampanoag Tribe of Gay Head (Aquinnah) and Mashpee Wampanoag Tribe regarding effects to Nantucket Sound and other Traditional Cultural Properties.

Identification efforts for archaeological resources have not yet been completed. Information conveyed during the webinar indicates that two historical period shipwrecks have been identified within the project area of potential effect. The marine archaeological report indicates that one shipwreck has been identified (report Figure 5-11; pg. 62), although the wreck size, location and opinion of potential significance is not included in the report text or Side Scan Sonar Contact Tables (report Appendix D).

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According to the marine archaeological report (pp. 70-71), two vibracore locations (VC-40, 41) contain intact peat layers characteristic of intact terrestrial deposits with radiocarbon dates corresponding to the Archaic Period (approximately 8,000 to 3,000 years ago). As the preferred project alternative is refined, project planners and archaeological consultants should continue to coordinate archaeological terrestrial and marine survey efforts. Previous relevant archaeological research, including information in the MHC's files such as recorded archaeological site records and cultural resource management survey reports within the middle Cape and Nantucket Sound related to the Nantucket Sound Traditional Cultural Property, should be incorporated into the draft marine archaeological report in order to provide preliminary opinions of significance. The results of the final BOEM Best Practices for Developing Protocols for Reconstructing Submerged Paleocultural Landscapes and Identifying Ancient Native American Archaeological Sites in Submerged Environments which is in preparation by the University of Rhode Island should also be reviewed and referenced.

Coordination of survey methodologies should ensure that any identified archaeological resources, including intact paleosols that may contain significant ancient Native American archaeological resources, are consistently evaluated and interpreted in appropriate historical contexts within the cultural history of Massachusetts. Draft marine archaeological survey reports should be submitted to the MHC for review and comment as they are developed. Avoidance of shipwrecks and intact paleosols is recommended where feasible. If avoidance is not feasible, then site examination methodologies, such as systematic vibracoring, may be required to define the horizontal and vertical extent of archaeological resources, site contents, and significance.

I have issued a State Archaeologist's permit (950 CMR 70) to the PAL, Inc., to conduct intensive (locational) archaeological survey and a program of archaeological monitoring for the upland cable aspect of the project in Barnstable and Yarmouth. The MHC looks forward to reviewing the draft archaeological report(s) for the upland cable aspect of the project, and to consult regarding alternatives that would avoid or mitigate adverse effects to significant archaeological resources. A written Post-Review Discoveries protocol should also be developed and implemented for the project consistent with the Massachusetts Unmarked Burial Law (Massachusetts General Laws, Chapter 38, Section 6; Chapter 9, Section 26A and 27C; and, Chapter 7, Section 38A; all as amended). Implementation of the protocol will facilitate any future consultation that may be required to avoid, minimize or mitigate adverse effects to any significant archaeological resources, including unmarked human burials, identified during project construction.

These comments are offered to assist in compliance with Sections 106 of the National Historic Preservation Act of 1966 (36 CFR 800) as amended. If you need information or have any questions concerning these comments, please contact Jonathan K. Patton of my staff.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc: see attached

xc: Richard Warner, BOEM
Rachel Pachter, Vineyard Wind
Barbara Newman, USACOE-NED, Regulatory
Kate Atwood, USACOE-NED
Marc Paiva, USACOE-NED
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
Ramona Peters, Mashpee Wampanoag Tribe
Bonnie Halda, NPS-National Historic Landmarks Program-Philadelphia
Reid Nelson, Advisory Council on Historic Preservation
Secretary Secretary Matthew A. Beaton, Executive Office of Energy & Environmental Affairs
Attn: Purvi Patel, MEPA Unit
Bruce K. Carlisle, Director, Massachusetts Coastal Zone Management
Victor T. Mastone, Massachusetts Board of Underwater Archaeological Resources
Lauren Sinatra, Town of Nantucket
Stephen Welch, Nantucket Historic District Commission
Peter Temple, Aquinnah Planning Board
Phil Wallis, Martha's Vineyard Museum
Deborah C. Cox, PAL, Attn: Duncan Ritchie
Mike Tuttle, Gray & Pape, Inc.

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

January 15, 2019

Secretary Matthew A. Beaton
Executive Office of Energy & Environmental Affairs
Attn: Purvi Patel, MEPA Unit
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Vineyard Wind Offshore Wind Energy Project, Massachusetts, BOEM Lease Area OCS-A 0501. MHC #RC.62490. **EEA #15787.**

Dear Secretary Beaton:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the Final Environmental Impact Report (FEIR) prepared and submitted by Epsilon Associates, Inc., for the project referenced above. The MHC received and reviewed the archaeological report, *Intensive Archaeological Survey Proposed Substation Vineyard Wind Upland Cabling Project, Barnstable, Massachusetts*, prepared and submitted by the PAL for a portion of the Upland Cable portion of the overall project. The FEIR indicates that the Covell's Beach Route in Barnstable has been selected as the preferred project cable landfall route. The FEIR includes a response to MHC comments on the SDEIR on page 6-47.

The Bureau of Ocean Energy Management (BOEM) is reviewing the Construction and Operations Plan (COP) for the project. The MHC expects to participate in further consultation under Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) with BOEM to assist in determining project effects to significant historic and archaeological resources. The MHC has also received a copy of the federal National Environmental Policy Act Draft Environmental Impact Statement for the project.

Results of the archaeological survey conducted for the substation aspect of the project identified the Vineyard Wind Findspot 1 and 2 ancient Native American archaeological sites, consisting of a quartz Small Stemmed-style projectile point and a single piece of quartz by-product of stone tool maintenance and/or manufacture. No additional artifacts, features or soil deposits were identified during substantial close-interval archaeological testing. In the MHC's staff opinion, additional archaeological investigation within the substation aspect of the project is unlikely to contribute additional significant archaeological data. Because the information content of the findspots are limited, it is the opinion of MHC staff that the Vineyard Wind Findspots 1 and 2 do not meet the Criteria of Evaluation (36 CFR 60) for listing in the National Register of Historic Places due to a lack of research potential.

The MHC looks forward to reviewing the complete marine archaeological survey results, and the results of archaeological monitoring for the archaeologically sensitive portions of the upland cable route from Covell's Beach in Barnstable. A written Post-Review Discoveries protocol should also be developed and implemented for the project consistent with the Massachusetts Unmarked Burial Law (Massachusetts General Laws, Chapter 38, Section 6; Chapter 9, Section 26A and 27C; and, Chapter 7, Section 38A; all as amended). The draft protocol should be submitted to the MHC for review and comment. Implementation of the protocol will facilitate any future consultation that may be required to avoid, minimize or mitigate adverse effects to any significant archaeological resources, including unmarked human burials, identified during project construction.

220 Morrissey Boulevard, Boston, Massachusetts 02125
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www.sec.state.ma.us/mhc

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), M.G.L Chapter 9, Sections 26-27C (950 CMR 70-71) and MEPA (301 CMR 11). If you have any questions or require additional information, please contact Jonathan K. Patton at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc:

Richard Warner, BOEM
Barbara Newman, USACOE-New England District
Kate Atwood, USACOE-New England District
Bettina Washington, Wampanoag Tribe of Gay Head (Aquinnah)
David Weeden, Mashpee Wampanoag Tribe
Victor Mastone, MBUAR
Rachel Pachter, Vineyard Wind, LLC
Brian Lever, Epsilon Associates, Inc.
Deborah C. Cox, PAL, Attn: Duncan Ritchie
Mike Tuttle, Gray & Pape, Inc.

TOWN AND COUNTY OF NANTUCKET

16 Broad Street
Nantucket, Massachusetts 02554

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April 30, 2018

Bureau of Ocean Energy Management
Office of Renewable Energy Programs
45600 Woodland Road (VAM-OREP)
Sterling, Virginia 20166

INITIAL WRITTEN COMMENTS FROM THE TOWN OF NANTUCKET
RE: Public Scoping for the Draft Environmental Impact Statement for the Vineyard Wind Offshore Wind Energy Project

To Whom It May Concern:

The Town of Nantucket appreciates the opportunity to provide comments on the Vineyard Wind Offshore Wind Energy Project to the Bureau of Ocean Energy Management. As an island community, most vulnerable to the effects of climate change and rising sea levels, the Town of Nantucket supports viable, renewable energy projects—assessed to be competitive and reasonable, which support long-term price stability with the least economic impacts for local ratepayers.

In reviewing the Vineyard Wind Construction and Operations Plan, we have identified three topics of concern that could potentially impact our local community, economy, and environment, for which we offer the following comments:

1. **Nighttime Lighting System**
   In order to preserve and protect Nantucket's nighttime environment and our heritage of dark skies, we strongly urge the use of FAA-approved "Aircraft Detection Light Systems" (ADLS), as the most environmentally-responsible lighting option.

   In 2005, Nantucket adopted a lighting bylaw specifically "to preserve the rural nature of the countryside, enhance nighttime enjoyment of property, to protect property values by controlling light trespass, and to enhance the enjoyment of the night sky."

   Strobing or blinking nighttime lighting systems, as are standardly installed on wind turbine generators (WTGs), are incongruous with Nantucket's lighting regulations

and will negatively impact the Island's cultural identity of historic and environmental preservation.

In selecting nighttime lighting systems for the wind turbine generators, it is imperative to balance the need for safety with the importance of protecting the Island's dark sky qualities, which significantly contribute to Nantucket's unique historical character and astronomical heritage.

The ADLS is designed to mitigate the impact of nighttime lights by deploying a radar-based system around a wind farm, turning lights on only when low-flying aircraft are detected. This smart activation feature allows aviation lights to remain off for an average 98% of the time, which makes this type of system the safest, most effective, and appropriate nighttime lighting solution for the Vineyard Wind project.

2. Daytime Visual Impacts

Nantucket's economy is seasonal in nature and tourism driven. Not only are visitors attracted to the Island's preservation of historic buildings, places, and districts, but also to its world-class, public beaches.

We are therefore sensitive to any potential visual impacts to the ocean horizon and sunset views, especially from the Island's southern coastline: from Madaket Beach in the west to Sconset Beach in the east.

To minimize the daytime visual impacts of the multiple wind turbine generators, which may result in negative local impacts to the character of the Island, we urge the following considerations:

a. Reduce the development footprint by moving the first rows of turbines further from Nantucket's shore. In referencing the map of the "Wind Development Area for COP Review," we strongly advocate for the developer to relocate the closest thirteen WTGS from the first three rows, to the rear of the development area (see enclosed map markings). This design modification of essentially "pushing back" the closest, most visible WTGs from Nantucket, would minimize the local visual impact, without reducing the power output potential of the lease area.

b. Defer development of the closest WTGs to allow technological advancements that could lessen the visual impacts. Based on public feedback of the visual simulations, we understand that that the most negative reactions to the WTG visuals are primarily associated with the *number* of turbines visible from the coastline, and not necessarily the size of the turbines. With the prospect of larger turbines (10-12MW) being available to developers in the near future, a lesser number of turbines will soon be required in order to achieve the same power output. **We therefore strongly urge Vineyard Wind to defer the development of the lease area closest to Nantucket to allow for the future construction of fewer visible turbines.**

3. **Engagement of Nantucket Historical Review Boards in the Massachusetts Historical Commission Project Review**

   At over 30,000 acres, the Nantucket Historic District, which encompasses the entire island of Nantucket as well as the islands of Tuckernuck and Muskeget, is the largest conventional "National Historic Landmark District" by area in the contiguous United States. The Island's historic distinction is recognized in the National Register of Historic Places, the Massachusetts State Register of Historic Places, and the Inventory of Historic and Archaeological Assets of the Commonwealth.

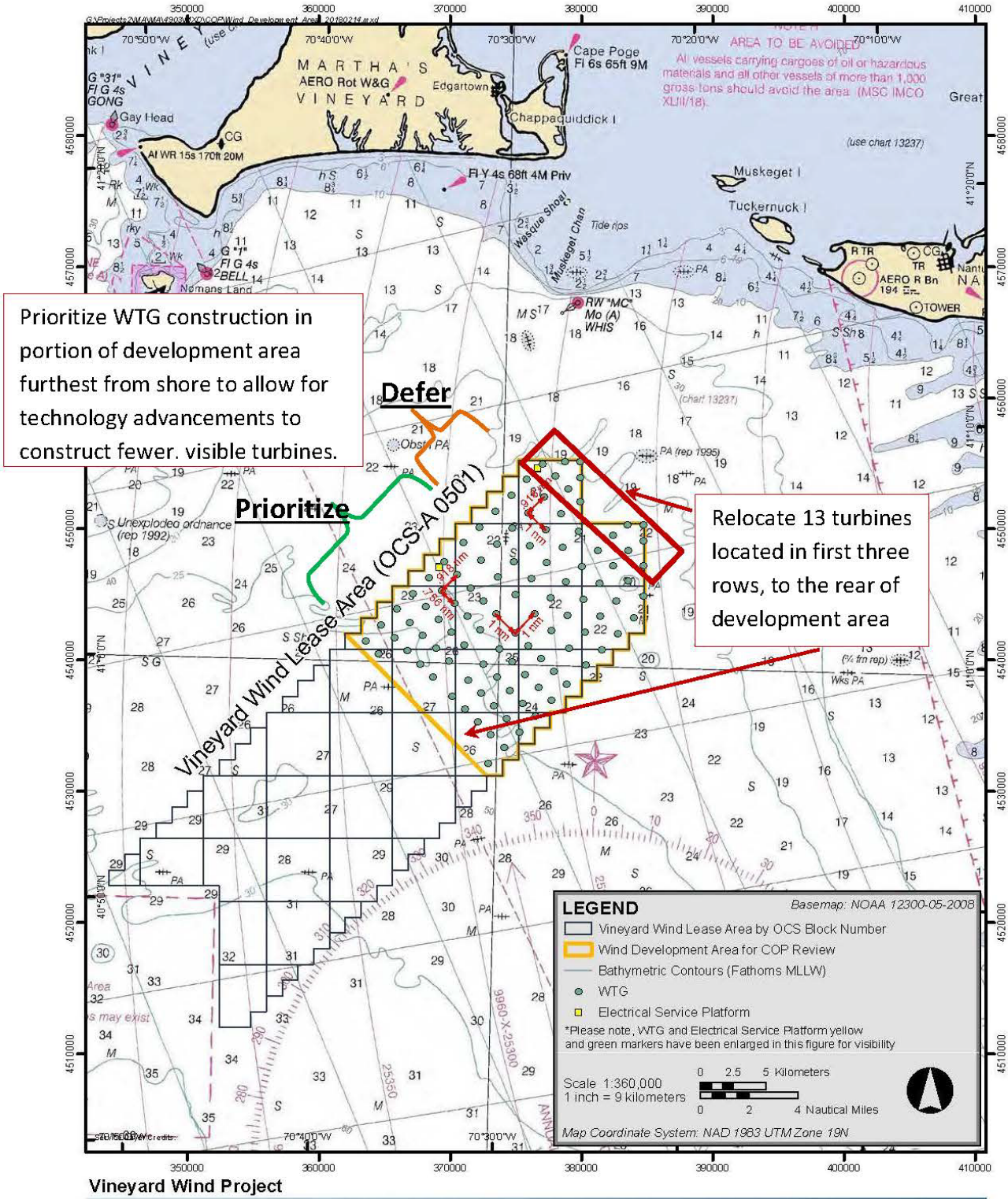
   Since 1955, the Nantucket Historic District Commission (HDC) has played a central role in the "preservation and protection of the Island's historic buildings, places and districts of historic interest through the development of an appropriate setting for these buildings, places and districts and through the benefits resulting to the economy of Nantucket in developing and maintaining its vacation-travel industry through the promotion of these historic associations."

   Due to the high cultural and historic sensitivity of the Island, and its proximity to the development site and cable routes, we strongly urge that Nantucket's historical and cultural review boards and stakeholders, such as the Nantucket HDC and the Nantucket Historical Commission, be consulted and engaged in any historic or archaeological review process of the Project.

We appreciate the opportunity to weigh in on this matter and look forward to engaging in productive efforts and discussions with Vineyard Wind, BOEM, and other stakeholders to help advance clean, affordable, resilient energy projects in the Commonwealth, which align with Nantucket's best interests.

Sincerely,

Jason Bridges, Chair
Nantucket Select Board



Vineyard Wind Project

VINEYARD WIND

Figure 3.1-2b

Wind Development Area for COP Review

Town and County of Nantucket
Select Board • County Commissioners

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Nantucket, Massachusetts 02554

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C. Elizabeth Gibson
Town & County Manager

February 22, 2019

Program Manager
Office of Renewable Energy
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

Dear Program Manager:

The Town of Nantucket appreciates the opportunity to provide comments to the Bureau of Ocean Energy Management (BOEM) in response to the Draft Environmental Impact Statement (DEIS) for Vineyard Wind's proposed Construction and Operations Plan (Lease Number OOCS-A-0501). These written comments supplement the oral comments presented by the Town of Nantucket's Energy Coordinator at the February 11, 2019 Public Hearing held in Nantucket.

The Town of Nantucket supports the responsible development of cost-effective offshore wind as an opportunity to help the Commonwealth meet its Greenhouse Gas (GHG) emission reduction mandate, address the retirement of aging power plants, provide economic development opportunities for Massachusetts businesses, and job creation for Massachusetts residents.

The Town of Nantucket acknowledges the important benefits that the Vineyard Wind project (the Project) may specifically provide, such as:

- Improved reliability of the regional power system,
- Electricity cost savings, and
- Reduced air emissions from fossil fuel fired plants

The following comments should only be construed as constructive, aimed at assisting BOEM with this important analysis. The Town appreciates the significance of getting this first project right, as it will serve as an important precedent for future projects. At this stage of development, it is vital that historic and ecological impacts are clearly recognized and mitigated to the fullest extent.

Notwithstanding the general support that the Town of Nantucket has for cleaner energy alternatives, we have identified, in close consultation with numerous local stakeholder groups, several areas of concern, which may adversely impact Nantucket's natural environment,

maritime economy, and rich cultural heritage. These concern, based on input from the community and reached in agreement with key local stakeholders, are as follows:

Requiring Higher Standards for Nighttime Lighting Systems
In order to preserve and protect Nantucket's nighttime environment and heritage of Dark Skies, we strongly urge for BOEM to formally require the utilization of FAA-approved "Aircraft Detection Light Systems" (ADLS), the most environmentally-responsible and locally appropriate lighting option available, as part of the COP approval.

In selecting nighttime lighting systems for the wind turbine generators (WTGs), it is imperative to balance the need for safety with the importance of protecting the Island's Dark Sky qualities, which significantly contribute to Nantucket's unique historical character and astronomical heritage. Strobing or blinking nighttime lighting systems, as are standardly installed on WTGs, are incongruous with Nantucket's lighting regulations and will negatively impact the Island's cultural identity of historic and environmental preservation.

Aircraft Detection Light Systems should become the new standard for all offshore wind developments, especially those sited within the viewsheds of historic landmarks.

Addressing the visual impacts on Nantucket, a National Historic Landmark
The Nantucket Historic District was designated a National Historic Landmark (NHL) by the Federal Department of the Interior on November 13, 1966, and it remains one of only 2,600 places in the nation with that distinction.[1] We are deeply concerned with the maintenance of the Island's character in this regard.

We disagree with the DEIS conclusion that the project's visual effects on Nantucket would be "minor," or adequately mitigated by paint color or ADLS lighting alone. The size and scale of the project within the viewshed of the Island (as illustrated by the photos in Appendix III-H-a of the COP) will negatively affect Nantucket's designation as a National Historic Landmark.

As was concluded in the "Findings of Adverse Effect" of the Cape Wind project on the Nantucket Historic District:

> "The interruption of the natural horizon line by the WTGs and related structures will alter the historic Nantucket Sound setting of the Nantucket Historic District NHL, a historic early settlement, maritime and premier whaling village, and summer resort. These changes constitute an alteration of the historic character, setting, and viewsheds that make Nantucket nationally significant and eligible for conclusion in the National Register and a NHL.[2]"

We note that the NHL for the Nantucket Historic Landmark District encompasses the entire island of Nantucket, as well as the islands of Tuckernuck and Muskeget, and the definition of a

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[1] National Historic Landmarks Program-nps.gov
[2]Cape Wind DEIS, Appendix 5.10-F, p. 42

National Historic Landmark "is a building, district, object, site or structure that is officially recognized by the United States government for its outstanding historical significance."[3]

To minimize the visual impacts of WTGs, the Town of Nantucket supports a reduction of the project's development footprint (Alternative E), in part by removing or relocating the northern-most rows of turbines, closest to Nantucket's shore (Alternative C).

The removal of *at least* the six closest WTGs from Nantucket would "reduce indirect (i.e., visual) impacts on the historic properties on Martha's Vineyard, the Nantucket Historic District, and Nantucket Sound, from which the proposed Project would be visible (see Section 3.4.3.3)."[4]

This design modification of essentially "pushing back" the closest, most visible WTGs from Nantucket, would minimize the adverse visual impacts upon the Nantucket Historic District, without reducing the power output potential of the lease area.[5]

Because of the large size and height of the Project's preferred 9.5MW MHI Vestas WTGs, the visual impact of the structures on the Nantucket viewshed is a significant environmental impact requiring careful assessment, minimization, and mitigation, above and beyond the limited scope of the Section 106 Review.

Failure to Assess the Project's Specific Impacts on the Unique History and History-Related Tourism of Nantucket

Tourism is the lifeblood of Nantucket's economy, with economic activity related to tourism accounting for over 70% of the Island economy.[6] Notwithstanding the European experience with windfarms, there are no relevant precedents in the U.S., and certainly none with the historical preservation and significance of Nantucket.

Nantucket's unique appeal is firmly rooted in its historic character and pristine environmental characteristics. The size and scale of the Project within the viewshed of the Island is a source of concern for the preservation of the Island's cultural character. The DEIS does not adequately address the impacts on Nantucket-specific tourism related to its historical significance, remote sense of place, natural preservation, or pristine setting of island beaches.

Furthermore, the DEIS fails to evaluate the viewshed impact on the quality of life for the residents of Nantucket. As evidenced by Figure 3.4.4-1[7], the Project will be visible from all vantage points on the southern coast of Nantucket, and neighboring islands such as Tuckernuck. Many local residents, such as those who live in Madaket, just 14.7 miles from the closest proposed WTGs, treasure the unobstructed ocean views, a resource that has remained unspoiled by industrial elements for thousands of years.[8]

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[3] National Historic Landmarks Program-nps.gov
[4] DEIS, p 3-143
[5] DEIS, p 2-14
[6] Monitoring the Nantucket Economy: An Update to the 1993 Nantucket Economic Base Study, June, 2002, Sponsored by the Nantucket Planning and Economic Development Commission and the Nantucket Island Chamber of Commerce, p 7 & 8
[7] DEIS, p 3-154
[8] Madaket Residents Association DEIS Comments, 22 February 2019.

As recognized in the DEIS, under the National Environmental Policy Act, care must be taken to avoid adverse impacts, and in particular "Irreversible commitments occur when the primary or secondary impacts from the use of a resource either destroy the resource or preclude it from other uses."[9] BOEM must carefully consider the impacts on Nantucket's unique character which we contend is a "resource" both to the Island's economy and under NEPA's definition.

These potential adverse effects must be further analyzed and quantified.

Inadequate Visual Simulations

The current simulations are incomplete and inadequate to show the actual impact of the WTGs, which is necessary to fairly assess adverse impacts and to determine appropriate minimization and mitigation measures. The DEIS does not include photosimulations showing the aesthetic impacts of the Project. Instead, these are contained in a separate document located on BOEM's Vineyard Wind webpage, in a format and quality impossible to accurately judge or interpret.[10] For certain vantage points, such as the Madaket Beach and Surfside Beach locations, the simulations were taken from the most advantageous beach-level elevations rather than on the bluffs or more elevated popular public-viewing locations along Nantucket's south shore, such as Sanford Farm. As a result, the visual simulations provide a "best case" representation of the Project's visual impact upon the Island's southern horizon, a key contributing element of Nantucket's nationally-significant maritime history.

Photosimulations during sunset—a well-known tourist and resident asset—remain missing. The video simulations simply do not capture the extraordinary experience of a Madaket Sunset. Additional simulations representing each season, with strict adherence to best practice guidelines and methodology, as identified by BOEM's Compendium Report for the New York Call Area, are necessary.

We also seek updated visual simulations that reflect any change in final WTG placement or layout, such as the scenarios presented in Alternative D.[11]

Export Cable in Nantucket Coastal Jurisdiction

One of the options included in the DEIS is an export cable route through Nantucket's coastal water jurisdiction ("Eastern Muskeget" route). The final report should identify, demonstrate, and enumerate what specific mitigation measures and benefits would accrue to Nantucket if this option is exercised, especially if this option is determined to disrupt fisheries and local commercial fishing activities. At this time, we recognize the numerous comments and recommendations provided by the Massachusetts Division of Marine Fisheries in their February 5, 2019 letter to the Nantucket Conservation Commission (Appendix A), which warrant further analysis and consideration. As stated in their letter, the Division of Marine Fisheries recognizes that the export cable route area is significant to many marine fisheries species and therefore requirements aimed at monitoring and restoration must be imposed.

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[9] DEIS, p. ES-5.

[10] https://www.boem.gov/Vineyard-Wind-Nantucket-Visuals/

[11] DEIS, p 2-11

Impacts to Commercial and Recreational Fishing Activities
Nantucket has a robust fishing industry which is threatened by the overall project and in particular the export cable route through Nantucket's coastal waters. The design of the wind farm conflicts with commercial fishing methods creating a safety hazard to both commercial fishermen and recreational boaters. Additionally, as stated above, there is potential damage to commercial fisheries, including those for squid, river herring, shad, sea herring, striped bass, lobster, Jonah crab, horseshoe crab, and conch, which have not been addressed in the DEIS.

Vessel Traffic
The DEIS indicates a planned maintenance schedule requiring 392 vessel trips in a typical year. This incremental vessel traffic, over 30 years, can have a material impact on Nantucket and its surrounding waters well beyond the 2-3-year proposed installation period. Vessel routes should be established in advance to minimize these impacts.

Need for Consistent Best Practices and Minimum Guidelines
Lastly, we are concerned over the lack of minimum guidelines and best practice standards established to date for US offshore wind projects, *especially* as relates to adverse visual impacts upon National Historic Landmarks. **This project, and how it is evaluated and permitted, will set the precedent for all future projects off our southern shore and along the entire Atlantic Coast.** We are concerned with this project serving as a "learning exercise" for all other offshore wind projects to follow and placing Nantucket in the unfortunate role of a guinea pig.

It is therefore essential that there be consistency in the criteria applied to this project and subsequent future sites. Due to the high cultural and historic sensitivity of the Island, and its close proximity to the development site and cable routes, we insist that best practice criteria be applied, however and wherever possible. These minimum standards would include:

- Clear guidelines for Visual Impact Assessments and Visual Simulations, such as:
    - Standards and methodology, as identified in the "Renewable Energy Viewshed Analysis and Visualization Simulation for the New York Outer Continental Shelf Call Area: **Compendium Report**"[12]
    - Panoramic Photomontages, such as Trueview Simulations
    - Single Frame simulations per season and during specific times of local concern (i.e. sunset), from nondeceptive angles or perspectives (i.e. beach level vs. bluff). The public should be able to easily compare the visual simulations from different developers "apples to apples" for projects within the same viewshed.
    - Use of 3D software that permits the viewer to create custom views, such as submitted in the 400-page visual simulation assessment within the DEIS for Deep Water Wind's Block Island Wind Farm.[13]
- Requiring the least impactful nighttime lighting, such as Aircraft Detection Lighting Systems, as part of the COP Approval Process.
- Requiring all windfarms in a specific region to use the same paint color, determined to be most effective in minimizing the visual impacts, per specific atmospheric/geographical conditions of the lease sites.

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[12] https://www.boem.gov/Compendium-Report-Final/
[13] http://dwwind.com/wp-content/uploads/2014/08/Appx-S1-Visual-Impact-Assessment.pdf

- Establishing minimum set-back standards from land, with specific considerations for historic landmarks and areas with tourism-driven economies. The distance from Nantucket's shores is 14.7miles, which is arbitrary as a measure, and admittedly less than the "break even" point for social acceptability as analyzed by the University of Delaware.[14] We propose that 17.65 miles, or half of the 35.3-mile visual buffer (limit of WTG visibility) be considered as a more appropriate and reasonable initial benchmark for a minimum setback. The proposed 14.7 miles is too close a distance to a National Historic Landmark and sets a dangerous and irresponsible precedent for the industry.
- For communities with historical significance, BOEM should help ensure that local stakeholders receive fair and direct access to any state and federal agencies or resources, which may provide critical regulatory guidance on how best to avoid, minimize, and mitigate the local impacts of offshore windfarms. This support would be provided independent of the Section 106 process, and would, for example, identify and encourage dialogue between communities with their State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP), connections the Town has been unsuccessful in establishing to date.
- Requiring appropriate project mitigation measures to offset the impacts to communities, such as community benefit agreements, offshore wind mitigation trust funds, or other economic development arrangements, as are standard in the offshore wind industry. This is a critical juncture in the development of the U.S. offshore wind industry, and we believe the citizens and businesses of Nantucket are open minded, if not supportive, of a successful industry. For this to be the case, there must be a meaningful sharing of the benefits from this development. At present, unlike arrangements with Barnstable, Martha's Vineyard, and the Rhode Island Fishing Advisory Board, there are no proposed tangible benefits in terms of electric rates, grants or other mitigation measures to balance the impacts borne upon Nantucket.

The Town of Nantucket is supportive of the responsible development of wind energy as an alternative to traditional sources and means to achieve the State's clean energy goals, improve air quality and human health, reduce the need for additional fossil fuel power plants, and mitigate climate change.

We believe, however, that there are sufficient unknowns about the potentially permanent consequences of the Project to warrant a most cautious approach to permitting the largest such facility in the world, especially regarding viewshed impacts upon nationally historic properties.

We once again thank BOEM for this opportunity to comment.

Sincerely,

Jason Bridges, Chair
Nantucket Select Board

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[14] DEIS, p 3-153

APPENDIX A:

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, Massachusetts 02114
(617)626-1520
fax (617)626-1509

David E. Pierce, Ph.D.
Director

Charles D. Baker
Governor
Karyn E. Polito
Lieutenant Governor
Matthew A. Beaton
Secretary
Ronald Amidon
Commissioner
Mary-Lee King
Deputy Commissioner

February 5, 2019

Nantucket Conservation Commission
Town Building Annex – 1st Floor
37 Washington Street
Nantucket, MA 02554

Dear Commissioners:

The Division of Marine Fisheries (MA DMF) has reviewed the Notice of Intent (NOI) by Vineyard Wind LLC for the Vineyard Wind Connector project for the portions of the offshore transmission that are in Nantucket waters, as part of a broader offshore wind project. Vineyard Wind identified a western and eastern option for the laying of two (2) offshore export cables situated within Muskeget Channel between Martha's Vineyard and Nantucket. This letter is to comment on the 3.1 mile portion of the "eastern" Offshore Export Cable Corridor (OECC) that travels through Nantucket's municipal waters. The two cables traversing Nantucket waters will most likely be jet-plowed approximately 330 feet apart and buried between 5 – 8 feet under the substrate. If cable protection is needed (approximately 10' across), a layer of rock, concrete mattresses, grout/sand bags, or half-shell pipes will be laid over the exposed cables. If the dredging of sand waves is necessary, jetting or trailer suction hopper dredging will be used. Construction methodologies have not been finalized. In our recommendations we attempt to identify the methodologies that minimize impact. If other methodologies are selected, additional conditions to avoid or minimize impacts may be necessary.

The project site lies adjacent to mapped shellfish habitat for surf clam (*Spisula solidissima*). Subtidal waters bordering the project site have habitat characteristics suitable for this species. Land containing shellfish is deemed significant to the interest of the Wetlands Protection Act (310 CMR 10.34) and the protection of marine fisheries.

This portion of the project is located in Muskeget Channel, one of 3 major channels of Nantucket Sound. This channel is utilized by many marine fisheries species, more notably squid, river herring, shad, sea herring, striped bass, lobster, Jonah crab, horseshoe crab, and conch. Muskeget Channel is known to be a major thoroughfare for many migratory fish and marine mammals, including endangered turtles (Leeney et al. 2010). In this high current area, there are many challenges with sampling for these animals, so there is little known about where and when they use the channel (Leeney et al. 2010). Unique benthic and hydrographic features in the channel may be used by marine resources for specific life history behaviors.

MA DMF offers the following comments for your consideration:

- MA DMF has requested in previous communications that all cable laying within Nantucket waters should avoid the spring season (April-June) due to high concentrations of fishing activities and natural resource events (spawning and egg laying). A meeting with Vineyard Wind on 1/31/2019 laid out a sequencing of cable-laying that results in fall cable laying in the northern part of the offshore export cable, alleviating our primary time of year concerns. However, the Muskeget Channel portion is planned to be laid in the spring (April-June) of 2021. Specific actions on the part of Vineyard Wind may be necessary to mitigate conflicts with vessels and fishing activities in Nantucket waters. There are ongoing conversations regarding both compensatory mitigation for fishermen as well as communication protocols during cable laying.
- Turbidity, particularly in the event of dredging, can impact both benthic and pelagic marine fisheries resources. High turbidity levels could affect migrations through Muskeget Channel and sedimentation could smother benthic organisms. We recommend methods be used that minimize turbidity (for example, controlled flow excavation) and habitat alteration.
- Closures around the cable laying vessel are expected per USCG regulations. It is conceivable that a cable laid on the seafloor is protected via a closure until it is buried. This could have adverse impacts on fishing access and depending on the specific time of year and the length of the closure these impacts could be severe. We strongly recommend simultaneous lay and burial to ensure minimal closure of the cable laying area to other activities.
- Some sections of the cable will pass over hard bottom, which may serve as lobster settlement habitat. We recommend the proponent monitor the presence of young of the year lobster in these areas before and after construction to assess impact.
- Once the cable is energized, a potential impact to marine fisheries resources is the electromagnetic field (EMF) emitted by the cable. Some marine fisheries resources are sensitive to these fields (e.g., flounders, see McCann, 2012). The planned burial of the cable to ~1.5-2.5 m will minimize the impact of EMF. We recommend burial of at least 1.5 m and monitoring cable burial continuously via temperature monitoring or other in-situ method. If continuous monitoring cannot be done, then geophysical surveys should occur at least annually (which is more frequently than is currently described in the Construction Operations Plan) and always after major storm events such as hurricanes and nor'easters.
- Some sections of the cable may need to be armored for long-term protection. We recommend using natural materials that mimic the surrounding seafloor. Mitigation for habitat conversion may be needed.
- A mechanism to compensate fishermen for lost gear during construction and operation has not been established but has been discussed.
- The Benthic Habitat Monitoring Plan submitted as part of this NOI is inadequate both in terms of sample sizes and collection methods to assess any potential changes to seafloor infauna or bathymetry following cable installation. Only 10 sites from five habitat types are proposed for assessment. It is unclear if any of these sites are in Nantucket waters.
- The Benthic Habitat Monitoring Plan is insufficient to assess project impacts to important food for wildlife (e.g. shallow submerged lands with high densities of polychaetes, mollusks, or macrophytic algae), distribution of sediment grain size, and changes in natural relief and elevation caused by cable laying. The samples taken to assess these impacts need to be taken at a relevant scale and with quantitative methods. As we have stated in other letters, the Benthic Habitat Monitoring Plan needs to be fully revised with guidance from the agencies. Some specific recommendations that we have made include:

- The benthic stations where infauna are being sampled should also be sampled for grain size.
- Sediment profile imaging (SPI) images should be taken pre- and post-construction.
- The entire cable pathway should be re-imaged with multibeam post-construction; those data should be incorporated in a post-construction impact analysis.
- Video surveys should use high resolution video and be georeferenced.
- The timeline of sampling, including the season, should be clarified.
- The benthic monitoring plan needs additional detail with respect to how change will actually be measured and may need additional sampling stations for a quantitative assessment.
- The plan should state the hypotheses being tested.
- The plan identifies reports as the primary product; we recommend all data be made available in regional database management systems and directly to requesting agencies.

Questions regarding this review may be directed to Eileen Feeney in our New Bedford office at (508) 742-9721.

Sincerely,

Eileen M. Feeney

Eileen M. Feeney
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