



MARINE MAMMAL COMMISSION

27 July 2020

Mr. James F. Bennett, Chief
Office of Renewable Energy Programs
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

Dear Mr. Bennett:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the Bureau of Ocean Energy Management's (BOEM) 12 June 2020 notice of availability of the Vineyard Wind Offshore Wind Energy Project draft environmental impact statement (DEIS) prepared for the Vineyard Wind LLC (Vineyard Wind) construction and operations plan (COP) (85 Fed. Reg. 35952). The Commission also reviewed the supplement to the DEIS, and offers the following comments.

Background

Vineyard Wind proposes to construct an 800 megawatt (MW) offshore wind farm approximately 23 km southeast of Martha's Vineyard. The proposed wind farm would consist of up to 100 wind turbine generators (WTGs) and one or more electrical service platforms (ESPs). Two foundation types are proposed for installation of the WTGs and ESPs—monopiles and jacket piles. The monopile foundations would consist of a single steel pipe pile with a maximum diameter of up to 10.3 m. The jacket foundations would include three or four steel jacket piles approximately 3 m in diameter. WTGs would be laid out in a grid-like pattern with a spacing of 1.4 to 1.8 km between turbines.

BOEM has identified six action alternatives and a 'no-action' alternative for Vineyard Wind's proposed construction and operations plan. Five of the six action alternatives are the same as was proposed under the original DEIS¹. The six action alternatives include—

- Alternative A: The proposed action, as described above.
- Alternative B: Cable landfall limited to Covell's Beach instead of New Hampshire Avenue, to reduce impacts on environmental and socioeconomic resources.
- Alternative C: No surface occupancy in the northernmost portion of the proposed wind development area to reduce visual impacts and potential conflicts with existing ocean uses.
- Alternative D (1, 2): Minimum spacing of 1 nautical mile (nm) between WTGs, with Alternative D2 having WTGs arranged in an east-west orientation. This alternative would reduce conflicts with existing ocean uses.

¹ [BOEM 2018-060](#)

- Alternative E: A reduced project size, consisting of no more than 84 WTGs, to reduce impacts on existing ocean uses and environmental resources. The size and capacity of the individual WTGs could be larger than for the other alternatives.
- Alternative F: This additional sixth alternative would establish a vessel transit lane either two or four nautical miles in width in which no WTGs or ESP would be installed. Alternative F would result in an overall larger footprint for the wind development area of up to 61 percent, as compared to the other action alternatives.

The project design envelope has been updated in the supplement for each of the six alternatives to include turbine generators of higher capacity and larger size. The maximum capacity of the project would be the same under each alternative (800 MW).

The Commission has reviewed the action alternatives and does not have any recommendations regarding a preferred alternative, because each of those alternatives would have similar potential impacts on marine mammals. Potential impacts on marine mammals are discussed in Chapter 3.5 of the supplement and include accidental releases of fuel, fluids, hazardous materials, and/or trash and debris; changes in the geomagnetic field caused by power cable electromagnetic fields; elevated turbidity from cable-laying activities; sound emitted during geophysical surveys, cable laying, and construction-associated pile driving; increased vessel traffic and associated disturbance; the presence of wind energy structures in marine mammal habitat. BOEM indicated that it considered impacts from climate change in more depth in the supplement than in the DEIS.

North Atlantic right whales and understanding cumulative impacts

Impacts resulting from the construction or operations of wind energy facilities could pose a potential risk to the North Atlantic right whale population, especially combined with impacts of fishery-related entanglements and vessel strikes. The population of North Atlantic right whales is declining at an alarming rate and faces an increasing risk of extinction. As such, the Commission continues to be very concerned about the status of right whales, particularly in light of recent deaths and low recruitment to the population. The population has fallen from approximately 500 to 400 whales in less than a decade and fewer than 100 reproductive-age females remain (Pace et al. 2017, Pettis et al. 2020). Recent studies have shown that right whale distribution patterns have been in flux over the last decade, with increasing evidence of year-round presence in migratory corridors along the mid-Atlantic and southern New England, including Vineyard Wind's proposed project area (Davis et al. 2017). BOEM's projections for the construction of more than 2,000 wind energy turbines in the right whale migratory corridor in the next 6 – 12 years² could significantly increase disturbance of right whales. Although BOEM has attempted to conduct a thorough cumulative impacts analysis in its supplement to the DEIS, a quantitative assessment of the long-term impacts on right whales and other marine mammals is challenging and currently may not be possible. Regardless, BOEM will need to consider how a changing climate will impact marine mammal populations as well as potential unforeseen consequences of construction and operations of wind energy projects and the unintended consequences of efforts to mitigate adverse impacts to other ocean ecosystem services.

² The full life cycle of these projects could be 50 years or more.

BOEM has funded a number of studies to assess the abundance and distribution of right whales, including the Atlantic Marine Assessment Program for Protected Species and passive acoustic monitoring studies. Those studies have contributed greatly to our understanding of right whale movements and how these animals are likely to respond to increasing human activities and changing oceanographic conditions. BOEM has recently proposed additional studies to begin in Fiscal Years 2021 to 2022³, including the parameterization of right whale bioenergetics models, the development of enhanced tagging technologies, the deployment of acoustic and telemetry tags to study diving behavior and habitat use, and a comparative analysis of aerial survey techniques. BOEM's Office of Renewable Energy Programs has proposed a pilot program to conduct aerial surveys, passive acoustic monitoring, and prey sampling in the various wind energy project sites. The Commission commends BOEM for supporting these and other projects to better understand the short- and long-term impacts of wind energy development and other human activities on right whales and other marine mammals.

In light of recent deaths and low recruitment to the population, all potential impacts on right whales are of concern, and adaptive strategies for reducing or preventing long-term, cumulative impacts must be explored. The Commission recommends that BOEM continue to work with Vineyard Wind, other wind energy developers, states, and stakeholder groups⁴ to support collaborative research focused on long-term, area-wide studies to determine the cumulative impacts of wind energy development on marine mammals—especially right whales—and their habitat. In the event that wind energy development is shown to have significant adverse impacts on marine mammal populations, it is unclear from the supplement or other BOEM documents what actions would be necessary to mitigate those impacts. To address those concerns, the Commission recommends that BOEM specify in the final environmental impact statement for Vineyard Wind what actions would be necessary to minimize impacts to right whales and other marine mammals in the event that studies indicate adverse impacts to marine mammal populations as a result of wind energy development.

Mitigation and monitoring to reduce potential impacts from pile-driving

The supplement includes general mitigation measures that would be used by Vineyard Wind to reduce potential impacts on individual marine mammals. Some are stipulated in lease agreements with BOEM, while others would be required through Marine Mammal Protection Act (MMPA) incidental take authorizations to ensure that determinations can be made under section 101(a)(5) of the MMPA regarding negligible impact, small numbers, and least practicable adverse impact. As noted in section 3.5.2.1 of the supplement and other studies (Best and Halpin 2019), one of the primary concerns during construction and operations of Vineyard Wind's proposed wind energy project would be the potential for auditory injury and adverse behavioral responses to sound generated during pile-driving.

Vineyard Wind's proposed pile-driving activities would consist of a maximum of two monopiles or one jacket-type foundation installed per day using an impact hammer; a vibratory hammer also may be used to seat piles prior to impact driving. Pile driving would occur for four to

³ BOEM's Environmental Studies Program [Studies Development Plan for 2021-2022](#).

⁴ E.g., the Regional Wildlife Science Entity, the [Responsible Offshore Science Alliance](#), the [New York State Energy Research and Development Authority](#), and the [Offshore Renewable Joint Industry Program](#).

six hours per day on up to 102 days. Pile driving would not occur between January and early May during the peak season of North Atlantic right whale occurrence in the project area. Vineyard Wind stated in its COP that it would develop mitigation measures to minimize and avoid impacts on marine mammals from pile-driving sound, in accordance with the Best Management Practices identified by BOEM in its *Information Guidelines for a Renewable Energy Construction and Operations Plan*⁵. Vineyard Wind stated, for example, in Table 4.2-2 of its COP, that current best practice sound attenuation methods, such as bubble curtains, will be considered. It also plans to evaluate new and currently available monitoring technologies as part of the permitting process.

The Commission is concerned that BOEM's analysis of impacts in the supplement, which is based on modeling discussed in Vineyard Wind's COP, assumes an optimistic and unverified, 12-dB sound reduction in sound levels. The COP indicates that the 12-dB sound reduction would be achieved using various "proven" technologies (identified as Hydro-sound Damper, AdBm "encapsulated bubble sleeves" (i.e., resonators) and/or bubble curtains) deployed both near the pile and farther from the source. The effectiveness of sound attenuation devices varies greatly, depending on pile diameter, water depth, sediment type, hammer energy, and how effectively the sound attenuation equipment is deployed. In addition, some of the sound generated by impact pile driving radiates through the ground and emerges in the water column at some distance from the pile, unattenuated by bubble curtains or other sound attenuation devices that rely on near-source, pile-surrounding barriers (Dahl and Reinhall 2013). Recent guidelines emphasize the importance of deploying both a primary and secondary sound mitigation measure during pile driving (Koschinski and Lüdemann 2020). Studies of the effectiveness of various sound attenuation devices are summarized in Koschinski and Lüdemann (2020) and discussed in more detail in numerous other reports and papers (Weyres-Offshore 2013, Bellman 2014, Elmer and Savery 2014, Reinhall et al. 2015 and 2016, Andersson et al. 2016, Wochner et al. 2016, Dahne et al. 2017, and Verfuss et al. 2019).

The Commission reviewed the National Marine Fisheries Service's (NMFS) proposed incidental harassment authorization (IHA) for Vineyard Wind's construction activities (84 Fed. Reg. 18346) and submitted comments and recommendations in its [3 June 2019 letter](#) to NMFS. In that letter, the Commission recommended that NMFS require Vineyard Wind to conduct and report sound source and sound propagation measurements during all pile-driving activities (impact and vibratory), assess impacts during vibratory pile driving, and reassess and revise the take estimates associated with Level A and B harassment of marine mammals. The Commission noted that NMFS would require Vineyard Wind to achieve at least a 6-dB reduction in sound levels during pile-driving activities from the use of one or more of the sound attenuation devices noted previously. The Commission raised concerns about the assumptions used by NMFS regarding the efficacy of bubble curtains in achieving a 6-dB sound reduction during pile driving. The Commission noted in one of its previous letters to NMFS⁶ that performance testing conducted by the California Department of Transportation (CalTrans 2015) indicated that bubble curtains provide the greatest reduction in sound pressure levels (SPLs) in the near field (within 100 m); however, SPLs at distances of 400–500 m were reduced by only 1 to 2 dB. Based on uncertainties associated with Vineyard Wind's proposed sound attenuation devices, the Commission recommended that NMFS require Vineyard

⁵ Available at <https://www.boem.gov/COP-Guidelines/>.

⁶ See the Commission's [14 May 2019 letter](#) regarding a proposed incidental harassment authorization for construction activities at Chevron's Richmond Refinery Long Wharf in Richmond, California.

Wind to assess the efficacy of its proposed sound attenuation devices during installation of the first monopile and monitor sound levels associated with pile driving at least monthly to ensure that the sound attenuation device continues to provide at least a 6-dB reduction in sound levels.

There are a wide variety of sound attenuation devices available and a limited number of studies have been conducted in U.S. waters to measure sound propagation of the large monopiles proposed for installation by Vineyard Wind and other wind energy developers. Testing to verify sound attenuation effectiveness for these large monopiles will be key. The Commission commends BOEM for its ongoing efforts to measure sound generated by wind energy construction projects through its Real-time Opportunity for Development Environmental Observations (RODEO) program and other environmental studies noted herein. Such studies are providing a better understanding of the effects of wind energy development in U.S. waters, where wind energy development is still in its early stages. They are especially critical for evaluating potential effects on right whales and other low-frequency cetaceans that are sensitive to the sound generated by pile driving (Finneran 2016). The Commission recommends that BOEM continue to work with NMFS to evaluate sound levels associated with pile driving, including measurements with and without sound attenuation devices, to determine the effectiveness of such devices at reducing marine mammal exposure to harmful sound levels.

Even with effective sound attenuation devices deployed, the sound generated by pile driving is estimated to exceed the threshold for Level A harassment of North Atlantic right whales and other low-frequency cetaceans at significant distances. For Vineyard Wind, assuming a 6-dB sound reduction would be achieved through the use of effective sound attenuation devices, the Level A harassment zone for low-frequency cetaceans is estimated to be 3.2 km for monopile installations and 7.2 km for jacket pile installations⁷. NMFS typically requires monitoring of the Level A and B harassment zones to implement mitigation measures to minimize impacts on marine mammals (such as clearance of an area before pile driving can begin, or shutdown of operations if a marine mammal is detected approaching or entering the zone). The Level A harassment zones expected to result from Vineyard Wind's pile-driving activities are clearly too large for monitoring by visual means alone. Vineyard Wind has proposed to conduct passive acoustic monitoring during spring and fall to supplement visual observations. However, passive acoustic monitoring was not proposed to be conducted from 15 May to 31 October. North Atlantic right whales have been detected year-round by passive acoustic monitoring throughout the species' range (including the Vineyard Wind project site⁸; Davis et al. 2017). The use of passive acoustic monitoring during all proposed pile-driving activities would enhance the detection of right whales at distances that cannot be effectively monitored visually, provided that the animals are vocalizing. Similarly, Vineyard Wind has proposed to continue limited pile driving⁹ during nighttime hours¹⁰. Passive acoustic monitoring is also the most effective way to ensure detection of right whales and other marine mammals during nighttime operations. For these reasons, the Commission recommends that BOEM include, as part of its Best Management Practices, the requirement that passive acoustic monitoring be conducted at *all* times

⁷ If a 12-dB attenuation is achieved, the Level A harassment zones for low-frequency cetaceans would be 1.6 km for monopile installations and 3.8 km for jacket pile installations (84 Fed. Reg. 18365).

⁸ Although detections declined from August through October, right whales were still present during those months.

⁹ But not *initiate* pile driving at night.

¹⁰ Based on concerns for human safety or ensuring the feasibility of installation.

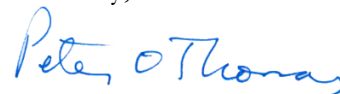
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that pile-driving activities occur to enhance the detection of right whales and other marine mammals and implement appropriate mitigation measures.

To assist in evaluating the effectiveness of mitigation and monitoring measures in reducing impacts on marine mammals, and to improve the usefulness of information being collected by protected species observers (PSOs), the Commission has advocated in various fora for a comprehensive analysis of the data collected by PSOs, including the circumstances under which mitigation measures were implemented. As part of its Fiscal Year 2020 call for proposals, the Commission is funding a study to evaluate the utility of PSO data to address cetacean management and conservation. The study is being led by Dr. Jessica Redfern of the New England Aquarium Corporation. The objectives are to summarize the PSO data available for the Massachusetts and Rhode Island wind energy areas and to compare those data to aerial survey data collected by the New England Aquarium. The study will provide recommendations to inform the development of standardized PSO data collection protocols and enhance the utility of PSO data in scientific analyses that evaluate the effectiveness of management and mitigation efforts for future activities regulated under both the Endangered Species Act and the MMPA for the conservation of protected species. The final report will be available in mid-2021 on the Commission's website (www.mmc.gov).

The Commission hopes these comments will be helpful to BOEM in meeting its responsibilities under the National Environmental Policy Act. Please let me know if you have any questions.

Sincerely,



Peter Thomas, Ph.D.,
Executive Director

Cc: Ms. Jolie Harrison, NMFS, Office of Protected Resources
Ms. Diane Borggaard, NMFS, Greater Atlantic Regional Fisheries Office
Dr. Sean Hayes, NMFS, Northeast Fisheries Science Center

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