OCS-A 0501 MASS USA

VINEYARD WIND

CONSTRUCTION AND OPERATIONS PLAN ADDENDUM

Submitted

December 5, 2024

Updated December 16, 2024

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1.0 INTRODUCTION

Vineyard Wind 1, LLC (Vineyard Wind 1) is submitting this Addendum to its approved Construction and Operations Plan (COP) for certain construction activities resulting from the blade failure at AW-38 that were not specifically described in the COP. More specifically, Vineyard Wind 1 will remove blades from a maximum of 22 wind turbine generators (WTGs) that were installed prior to the July 13, 2024 blade failure.

By way of background, on July 13, 2024, an installed blade at AW-38 failed resulting in blade debris being released to the environment. Emergency notifications and measures, including emergency consultations with state and federal agencies were activated to contain and retrieve the released debris. The Bureau of Safety and Environmental Enforcement (BSEE) exercised its oversight authority, suspending further blade installation and power production until certain conditions were met. A root cause analysis (RCA) of the blade failure has been conducted by the manufacturer and installer (GE Vernova) which concluded that the failure was due to a manufacturing deviation at its Gaspe, Canada plant. The RCA found that there was insufficient bonding at certain locations within the blade, which should have been detected at the manufacturing plant through inspection and quality control procedures. After reprocessing of the manufacturing data from the installed blades, additional blades with insufficient bonding were identified, leading to GE Vernova's decision and BSEE's direction to remove all installed blades manufactured at the Gaspe, Canada plant. This COP Addendum includes removal activities at 22 locations [redacted], and pending further BSEE review, potentially two additional locations where blades from other manufacturing plants were installed.

Blade removal was not an activity specifically addressed in the COP as part of the construction phase of the Project. However, blade removal is simply the reverse of blade installation, which was addressed in COP Volume I, Section 4.4.3 as part of decommissioning phase. Vineyard Wind 1 is submitting this Addendum in accordance with BOEM's November 29, 2024 determination that a COP revision is required. As demonstrated in this COP Addendum all vessels, equipment, and potential impacts associated with the blade removal activities have been addressed in the COP and FEIS.

All other activities associated with the WTGs are fully described in the COP, e.g., tower, nacelle, and blade installation, operations and maintenance, etc. for which a COP revision is not necessary.

2.0 CONFORMANCE WITH APPLICABLE REGULATIONS

Vineyard Wind 1, through its contractor GE Vernova, will remove blades from up to 22 wind turbine generators (WTGs) that were installed prior to July 13, 2024 in compliance with all applicable provisions of 30 CFR §585.626(a) and in a manner that conforms to all applicable laws, regulations, Lease stipulations, and COP approval terms and conditions. Table 2.0-1 lists the relevant regulations and where the corresponding information can be found in this Construction and Operations Plan (COP) Addendum.

Table 2.0-1 COP Addendum Regulatory Crosswalk Table

Regulatory Requirement	Location of Information in COP Addendum
30 CFR §585.626(a)	
(1) Contact information	Section 3.2
(2) Designation of operator, if applicable	Section 3.3
(3) The construction and operation concept	Section 3.0
(4) Commercial lease stipulations and compliance	No lease stipulations apply for these proposed activities.
(5) A location plat	Figure 3.1-1
(6) General structural and project design, fabrication, and installation	Section 4.0
(7) All cables and pipelines, including cables on project easements	No cables or pipelines will be used.
(8) A description of the deployment activities	Section 4.0
(9) A list of solid and liquid wastes generated	Jack-up vessels operate in accordance with MARPOL and USCG regulations governing solid and liquid waste.
(10) A list of chemical products used (if stored volume exceeds Environmental Protection Agency (EPA) reportable quantities	No stored chemical products are associated with the blade removal activities
(11) A description of any vessels, vehicles, and aircraft you will use to support your activities	Section 4.0
(12) A general description of the operating procedures and systems (i) Under normal conditions (ii) In the case of accidents or emergencies, including those that are natural or manmade	(i) Sections 3.0, 4.0. (ii) See COP Appendix I-B
(13) Decommissioning and site clearance procedures	No decommissioning activities are associated with the blade removal activities
(14) A list of all Federal, State, and local authorizations, approvals, or permits that are required to conduct the proposed activities, including commercial operations	No additional permits are required.
(15) Your proposed measures for minimizing, reducing, eliminating, and monitoring environmental impacts	Impacts associated with the blade removal activities are fully analyzed in the COP and more specifically in Section 5.0 herein. The activities are anticipated to result in seafloor disturbance at the up to 22 WTG locations where blades will be removed but where no sensitive habitats or archaeological resources occur. All Vineyard Wind 1 COP approval terms and conditions (e.g., vessel speed restrictions) will be followed to minimize, reduce, and eliminate any potential environmental impacts.
(16) Information you incorporate by reference	This COP Addendum incorporates by reference the analyses in the COP (including the appendices) and is focused

Regulatory Requirement	Location of Information in COP Addendum
	on describing impacts that are specific to the blade removal activities.
(17) A list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with your proposed activities	BSEE and the USCG have been actively engaged on issues associated with the blade failure and blade removal activities.
(18) Reference	No references were included.
(19) Financial assurance	No additional financial assurance is required as it has been provided in overall COP approval
(20) CVA nominations for reports required in 30 CFR part 285, subpart G	The CVA was nominated under the COP and has been engaged on the Project including on issues related to the blade failure incident.
(21) Construction schedule	Section 3.1
(22) Air quality information	Section 5.1. Emissions associated with the blade removal activities are within the estimates provided in the COP and comply with all provisions of Vineyard Wind 1's OCS Air Permit.
(23) Other information	No additional information required.

The removal of the blades described in this COP Addendum is wholly within the scope of potential impacts analyzed in the COP[1], the Final Environmental Impact Statement (FEIS)[2], and the Record of Decision (ROD)[3], as outlined in Table 2.0-2.

1 Available under "Construction and Operations Plan" at https://www.boem.gov/vineyard-wind
2 Available under "Environmental Review" at https://www.boem.gov/vineyard-wind
3 Available at: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Final-Record-of-Decision-Vineyard-Wind-1.pdf

Table 2.0-2 Summary of Impacts of Proposed Change

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
Physical Resources	Air Quality	The jack-up vessels that will be employed for removal of the blades will comply with MARPOL Annex VI and the requirements of Vineyard Wind 1's OCS Air Permit. The COP analyzed air emissions associated with the use of jack-up vessels, including a second vessel, for installation of WTGs, which involves the same activity as blade removal.
Physical Resources	Water Quality	Blade removal activities will not result in additional impacts on onshore water resources but may affect offshore water quality. Any impacts to water quality from blade removal activities would be short term. Volume III, Section 5.2.2.1.5 of the COP describes routine releases from vessels, which would apply to the jack-up vessel used to remove blades. Vineyard Wind 1 will require the jack-up vessel to comply with all regulatory requirements related to the prevention and control of discharges and the prevention and control of accidental spills, as well as the USCG ballast water management requirements at 33 CFR Part 151 and 46 CFR Part 162. The USCG regulations include the same discharge standards as the International Maritime Organization (IMO) Ballast Water Management Convention (BWM) standards, but also include additional requirements beyond the IMO's requirements. Specifically, Section A.8.2 of the FEIS analyzed the impacts to water quality and determined that impacts would be negligible to minor. Because Vineyard Wind 1 is only installing 62 WTGs the small scale of vessel activity associated with removal of blades at up to 22 WTG locations is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval and all relevant mitigation measures in Table D-1 of the FEIS for water quality, including #41.
Biological Resources	Bats	Blade removal activities will not result in any onshore land disturbance that may affect bats but will involve vessel activity. The blade removal activities are consistent with the impacts evaluated in the FEIS and would not change the analysis in the Vineyard Wind 1 FEIS. Specifically, Section A.8.4 of the FEIS analyzed the impacts to bats and determined that impacts would be negligible. As noted in the FEIS (page A-137): "Use of the OCS by migrating tree bats is expected to be very low and limited to spring and fall migration periods." Because Vineyard Wind 1 is only installing 62 WTGs, the small scale of vessel activity associated with removal of blades at up to 22 WTG locations is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval and all relevant mitigation measures in Table D-1 of the FEIS, including #8 and #10.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
Biological Resources	Benthic Habitat, Essential Fish Habitat, Invertebrates, and Finfish	Blade removal activities will result in temporary seafloor disturbance. The activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.2 of the FEIS analyzed the impacts to benthic habitat, EFH, invertebrates, and finfish and determined that impacts would be negligible to moderate and moderately beneficial. Because Vineyard Wind 1 is only installing 62 WTGs, the temporary seafloor disturbance associated with the blade removal activities is well within the scope of the impacts analyzed in the FEIS. Table 5.2-1 below shows the seafloor disturbance for each of the scenarios described in Section 4.0, including the disturbance attributable to the 10 installed hammerheads and 30 WTGs that have yet to be installed. The table shows that the maximum seafloor disturbance is 77,880m^3 (19.2 acres) which is 186,120m^2 (46 acres) less than the seafloor disturbance analyzed in the COP and FEIS.
	Birds	Blade removal activities will not result in any onshore land disturbance that may affect birds but will involve one additional vessel offshore that was already accounted for in the COP. Vessel use associated with the blade removal activities is consistent with the impacts evaluated in the FEIS and would not change the analysis in the Vineyard Wind 1 FEIS. Specifically, Section A.8.3 of the FEIS analyzed the impacts to birds and determined that impacts would be negligible to minor and potentially beneficial. Because Vineyard Wind 1 is only installing 62 WTGs and removing blades at up to 22 WTG locations the impacts are within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval and all relevant mitigation measures in Table D-1 of the FEIS for birds, including #2-9 and #24 and the COP terms and conditions.
Biological Resources	Other Terrestrial and Coastal Habitats and Fauna	Blade removal activities will not result in any onshore or coastal habitat impacts. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Vineyard Wind 1 will adhere to all relevant conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for terrestrial and coastal habitats and fauna will be followed, including #11-15.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
	Marine Mammals	Blade removal activities will involve limited vessel activity, potential short-term effects to offshore water quality, and temporary seafloor disturbance. The activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.4 of the FEIS analyzed the impacts to marine mammals and determined that impacts would be negligible to moderate and minor beneficial. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves up to only 22 positions, the small scale of additional vessel activity, are within the scope of the water quality, and benthic habitat effects impacts analyzed in the FEIS. As described in Section 5.5 herein, Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval and the 2024 Biological Opinion and Incidental Harassment Authorization
Biological Resources	Sea Turtles	Blade removal activities will involve limited vessel activity, that may cause short-term effects to offshore water quality, and temporary seafloor disturbance. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.5 of the FEIS analyzed the impacts to sea turtles and determined that impacts would be negligible to moderate and minor beneficial. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves up to only 22 positions, the small scale of vessel activity, water quality, and benthic habitat impacts are within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval and the 2024 Biological Opinion, as well as Table D-1 of the FEIS for sea turtles will be followed, including #39-41, #46-48, #51, #52, #57-63.
	Wetlands and other Waters of the United States	Blade removal activities will not result in any onshore wetlands impacts but will result in temporary seafloor disturbance to waters within the Lease Area. As described under benthic habitat, essential fish habitat, invertebrates, and finfish, the scope of the seafloor impacts associated with the proposed blade removal activities is with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. See Section 5.2.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
	Commercial Fisheries and For- Hire Recreational Fishing	The addition of one jack-up vessel for blade removal activities will not affect commercial fisheries and for-hire recreational fishing as the COP and FEIS already assume that two jack-up vessels would be used for WTG installation. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.10 of the FEIS analyzed the impacts and determined that impacts would be moderate for commercial fisheries and minor to moderate for recreational fishing. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves only a maximum of 22 positions, the small scale of vessel activity, water quality, and benthic habitat impacts are within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for commercial fisheries and for-hire recreational fishing, including #40 and #73-79.
Socioeconomic and Cultural Resources	Cultural Resources	As discussed in Section 5.3 herein, the area where the jack-up vessels will jack up to remove the blades has been fully surveyed, reviewed, and cleared by the Qualified Marine Archaeologist (QMA). The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.8 of the FEIS analyzed the impacts to cultural resources and determined that impacts would be negligible to major. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions with one additional vessel that is already included in the COP, the sea floor impacts are within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all applicable terms and conditions of the Memorandum of Agreement, including the Offshore Post Review Discoveries Plan should cultural material be observed.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
	Demographics, Employment, and Economics	Blade removal activities will not change the expected benefits to employment and economics and impacts evaluated in the Vineyard Wind 1 FEIS. Specifically, Section 3.6 of the FEIS analyzed the benefits and impacts to demographics, employment, and economics and determined that impacts would be negligible to moderate and negligible to minor beneficial. When considering benefits, the FEIS conservatively evaluated the economic benefits associated with a 14 MW WTG (i.e., the benefits associated with a minimum of 57 WTGs) and the proposed blade removal activities will not alter the Project's ability to meet the minimum expected economic benefits. When considering impacts, the FEIS considered the installation of 84 WTGs as part of Alternative E. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions, the small scale of one additional vessel is well within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for demographics, employment, and economics will be followed, including #64 and #100.
Socioeconomic and Cultural Resources	Environmental Justice	Blade removal activities will not result in any onshore impacts that may affect environmental justice. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.7 of the FEIS analyzed the impacts to environmental justice and determined that impacts would be negligible to major and beneficial. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS analysis, impacts are within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS will be followed, including #64 and #99-101.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
	Land Use and Coastal Infrastructure	Blade removal activities will not result in any onshore impacts but will involve vessel activity. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section A.8.6 of the FEIS analyzed the impacts to land use and determined that impacts would be negligible to minor. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS analysis, the small scale of vessel activity is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS.
	Navigation and Vessel Traffic	Blade removal activities will involve vessel activity that may affect navigation and vessel traffic. The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.11 of the FEIS analyzed the impacts to navigation and determined that impacts would be negligible to moderate. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS analysis, the small scale of vessel activity is within the scope of the impacts analyzed in the FEIS. The number of vessel trips to Canada associated with the blade removal activities is significantly below the trips analyzed in the COP and FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for navigation and vessel activity will be followed, including #40, #82, #83, #85, #88, and #89.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
Socioeconomic and Cultural Resources	Other uses (marine, military use, aviation, offshore energy)	The blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.12 of the FEIS analyzed the impacts to other uses and determined that impacts would be negligible to major. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS, the small scale of vessel activity is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for other uses will be followed, including #25, #26, #65, #40, #75-77, #94, and #95.
	Recreation and Tourism	Blade removal activities are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.9 of the FEIS analyzed the impacts to recreation and tourism and determined that impacts would be negligible to moderate and negligible to minor beneficial. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves only a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS, the small scale of vessel activity is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for recreation and tourism will be followed, including #7 and #66.

Resource Category	Resource	Summary of Impacts of Proposed Change and location of analysis in FEIS/ROD & BMPs/mitigation measures
Socioeconomic and Cultural Resources	Visual Resources	Blade removal activities will not result in any impacts to visual resources, are consistent with the impacts evaluated in the Vineyard Wind 1 FEIS and would not change the analysis in the FEIS. Specifically, Section 3.9 of the FEIS analyzed the impacts to visual resources and determined that impacts would be negligible to moderate and negligible to minor beneficial. Specific to vessel lights, the FEIS found that vessel lighting would enable commercial shipping and commercial fishing operations to safely navigate around the vessels and work areas and would be visible from coastal locations, primarily while the vessels are in transit. Vessel lighting is not anticipated to impact the volume of business at visitor-oriented businesses or other businesses. Impacts of vessel lighting would be localized, short-term, intermittent, and possibly adverse. Because Vineyard Wind 1 is only installing 62 WTGs and blade removal involves a maximum of 22 positions involving one additional vessel that is already accounted for in the COP and FEIS, the small scale of vessel activity is within the scope of the impacts analyzed in the FEIS. Vineyard Wind 1 will adhere to all applicable terms and conditions of COP approval, as well as all relevant mitigation measures in Table D-1 of the FEIS for visual resources.

3.0 PROPOSED ACTIVITIES

Removal of installed blades involves the same activities used to install blades. As described in COP Volume 1, Section 4.2.3.7, the WTGs are installed by one or two main installation vessels, which may be a jack-up or a dynamic positioning ("DP") vessel. The tower is first erected followed by the nacelle and finally the blades. This installation procedure has been followed for each of the 22 locations where blades will be removed and will continue to be followed for all remaining positions where WTGs are installed. To date, only one jack-up vessel (the Sea Installer) has been used to install WTGs. However, the Sea Installer has also removed blades from two (2) WTG locations (AT-39, AS-40) under the direction and oversight of BSEE.

Removal of blades at up to 22[4] WTG locations will be conducted by the Sea Installer and/or a second jack-up vessel as described in the scenarios presented in Section 4.0. As the COP contemplated that two jack-up vessels could be used to install WTGs, adding a second jack-up vessel to remove blades is within the parameters of the COP. *See* COP Volume 1; Table 4.2-1; Volume III, Section 2.2.1.1.

3.1 Locations and Schedule

The 22 locations where blades were installed from the Gaspe, Canada plant are shown below and in Figure 3.1-1. Blades at two of these locations have already been removed under BSEE's oversight and therefore are not included in this Addendum. Two additional locations with blades from a different manufacturing plant are under review by BSEE and may potentially be removed (AS-42 and AT-41) and are included within the 22 locations analyzed in this Addendum.

AN-37	AQ-38	AR-41	AU-39
AN-38	AQ-39	AS-39	AU-40
AP-38	AR-38	AS- 41	AV-38
AP-39	AR-39	AT-40	AV-39
AQ-36	AR-40	AU-38	AW-38

With the exception of blade removal on AP-39 and AU-39, which will be removed immediately following the installation of Blade Set 14-A in accordance with BSEE's direction, the remainder of the blades will be removed in 2025.

3.2 Contact Information

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[redacted]

[4] [redacted]

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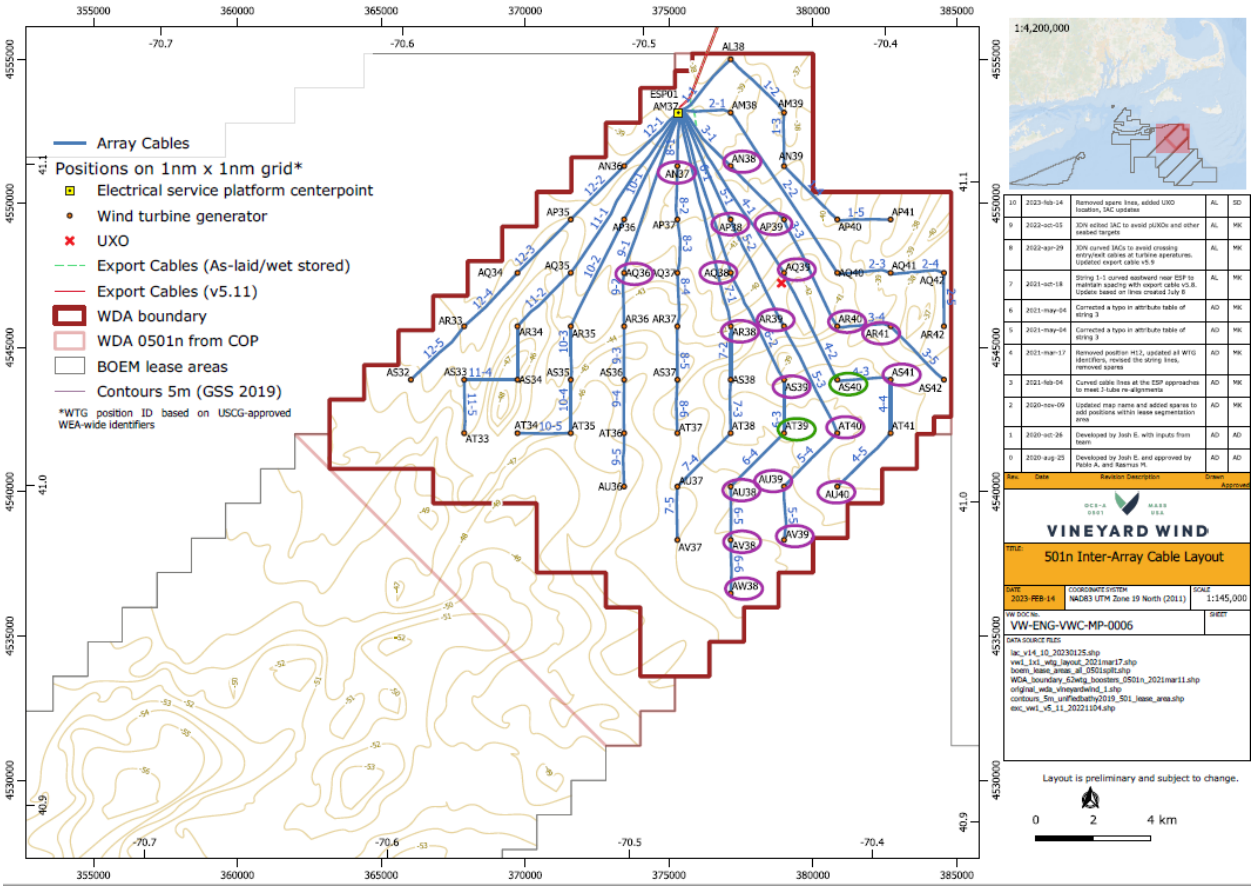
3.3 Designated Operator

The operator of the Project is Vineyard Wind 1, LLC.

Figure 3.1-1 WTG Locations Where Blades Will Be Removed



4.0 VESSEL AND EQUIPMENT

Removal activities may be conducted by the jack-up vessel currently on site (the Sea Installer) and/or a second jack-up vessel. Like the Sea Installer, the second jack-up will be designed to remove and install WTGs, i.e., towers, nacelles, and blades.

The second jack-up vessel will likely have the capacity to install five (5) complete WTGs with five (5) sets of blades (3 blades in a set) before it returns to port in Canada. As identified in the COP, the ports of Sheet Harbor, St. John, or Halifax or ports in the same vicinity will likely be used. The [redacted] pictured below, or a vessel of similar size and capacity would be used.

[redacted]

Blade removal activities may be conducted with the Sea Installer and/or a second jack-up vessel under the scenarios presented below, with the worst-case scenario being that the Sea Installer removes blades from all 22 positions. While the trips to Canada and jack-ups at each location are the same under all of the Sea Installer scenarios, Option 1C would be the most inefficient option and cause significant delays for completion of the Project.

1. **Sea Installer Removes all Blades** (worst-case scenario)

   Option 1A: Sea Installer removes blade set from one location and sails to Canada to offload. It then sails back to the Wind Development Area (WDA) where it installs a set of blades under the current installation procedures (barge from New Bedford brings blades to WDA). After installation, Sea Installer removes another set of blades and then sails back to Canada. Process is repeated until all 22 sets of blades are removed. **Total round trips to Canada – 22; Number of Jack-ups at each location- 2**

   Option 1B: Sea Installer removes a blade set from one location and sails to Canada to offload. It loads a new blade set in Canada and sails back to the WDA and installs the blades. Sea Installer moves to the next location to remove blades and repeats the process until all 22 sets of blades are removed. **Total round trips to Canada – 22; Number of Jack-ups at each location- 2**

   Option 1C: Sea Installer removes a blade set and travels to Canada to offload before returning to site and removing the next blade set. This pattern is repeated until all blades are removed and after which time, installation can resume. **Total round trips to Canada – 22; Number of Jack-ups at each location- 2.**

2. **Second Jack-up Vessel Removes Blades**

   Option 2A: Second jack-up vessel [redacted] loads 4 bade sets from Canada and sails to the WDA. It removes the blade set from the first location and replaces it with new blades. It then moves to the next location and repeats the process until 5 blade sets of blades are removed. It then sails to Canada to offload the 5 sets of blades and reload 4 sets of new blades. The process is repeated until 22 sets pf blades are removed.
   Total round trips to Canada – 5; Number of Jack-ups at 17 locations – 1; 2 at 5 locations.

   Option 2B: Second jack-up vessel arrives at WDA without new blades and removes 5 sets of blades. It then sails to Canada to unload the 5 sets of blades and load 5 new sets of blades. It sails back to the WDA and installs the five sets of blades. Process repeats until 22 sets of blades are removed. **Total round trips to Canada – 5; Number of Jack-ups at each location - 2**

3. **Sea Installer and Second Jack-up Vessel Remove Blades**

   Option 3A: Second jack-up vessel follows the same sequence as Option 2B for 17 sets of blades. The Sea Installer supports the replacement campaign following Option 1A for 5 sets of blades (removes a blade set and sails to Canada to offload; returns to WDA to install new blades under current installation procedures). **Total trips to Canada – 9 (5 for Sea Installer; 4 for Second jack-up vessel); Number of Jack-ups at each location - 2**

Option 3B: Second jack-up vessel follows the same sequence as Option 2B for 17 sets of blades. The Sea Installer supports the replacement campaign following Option 1B for 5 sets of blades (remove a set of blades, sail to Canada to offload and load new blades; return to WDA).
Total trips to Canada – 9 (5 for Sea Installer; 4 for Second jack-up vessel); Number of Jack-ups at each location - 2

The operational coordination between the two installation vessels and responsibilities will remain flexible to capitalize on operational efficiencies. Allocation of the 22 blade sets to be removed versus installed from either vessel may be adjusted to reduce the overall project timeline.

The second jack-up vessel will have a maximum transit speed of 11 -12 knots, as indicated in the COP, but it will adhere to the 10 knot speed requirements set forth in the COP Terms and Conditions. The vessel is likely to be a newly built vessel with its engines categorized as Tier 3, but regardless will meet all requirements of Vineyard Wind 1's OCS Air Permit.

Removal of the blades uses the same equipment and procedures as the installation of the blades, just in reverse order. The crane on the jack-up vessel will lift a blade yoke installation tool that will be attached to the blade to secure it until the blade is unbolted from the nacelle. Once unbolted, the crane will lower the blade to the blade racks aboard the jack-up vessel. The figure [redacted] above shows the blade yoke being attached to a blade.

5.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Multiple site investigations have been performed within Lease Area OCS-A 0501, as outlined in the COP, to acquire data for characterization of the Lease Area, as required to meet requirements outlined by the state and federal agencies responsible for overseeing offshore development. *See* COP Volume II and associated Appendices. The results of these surveys were used to assess whether environmental impacts are anticipated from removal of blades at 22 locations. The sections below address in more detail the potential environmental impacts of the blade removal scenarios described in Section 4.0, all of which have already been accounted for in the COP, as the COP contemplated that two jack-up vessels would be used for WTG installation activities, significantly more seafloor disturbance would occur, and significantly more vessel trips to Canada would be required.

5.1 Air Quality

COP Volume III, Section 5.1 discusses impacts on air quality from the Project's multiple emission sources. The total emissions estimated assumed multiple vessels operating within the Lease area, including multiple jack-up vessels and vessel trips. The estimate of the Project's potential air emissions assumed that 106 WTG positions, four light-weight ESPs, and the maximum length of inter-array, inter-link, and export cables would be installed for the 800 MW Project, which represented the maximum design scenario. It also assumed the most aggressive construction schedule under consideration for the 800 MW Project; i.e., that half of the WTGs, three quarters of the inter-array cables, and all of the scour protection, offshore export and inter-link cables, electrical service platforms, and foundations could be constructed

in one year. Further, the emissions estimate also accounted for delays caused by inclement weather and possible time of year restrictions. This very conservative emissions estimate is less than 0.32% of the total emissions from commercial marine vessel activities in U.S. waters for the pollutants NOx, PM_{10}, $PM_{2.5}$, SO_2, and VOC. As the Project is installing only 62 WTGs, the air emission estimates in the COP significantly overestimate actual expected emissions.

The COP also assumed that foreign-flagged vessels would comply with MARPOL Annex VI (International Convention for the Prevention of Pollution from Ships), which, among other things, establishes limits on nitrogen oxide (NOx) emissions and requires the use of low sulfur fuel. In addition, Vineyard Wind 1's OCS Air Permit establishes engine requirements for jack-up vessels when operating as an OCS source.

Emissions from any of the scenarios identified in Section 4.0, will be within the COP assumptions and the vessels will operate in full compliance with MARPOL Annex VI and Vineyard Wind's OCS Air Permit. Under the worst-case scenario described in Section 4.0, a maximum of 22 trips to Canada to offload the removed blades is well within the trips assumed in the COP. *See* Section 5.5 below.

5.2 Sea Floor Disturbance

The seafloor impacts of the jack-up vessel have already been assessed in the COP. COP Volume III, Section 6.5.2.1, describes that temporary impacts to the seafloor would be expected in the vicinity of the proposed WTGs and ESP resulting from the placement of jack-up vessels that will be used for the installation of each WTG and ESP. The impacts from jack-up vessels associated with WTGs are quantified in COP Table 6.5-5 with the total impacts estimated to be 264,000m^2 (65 acres). As shown in Table 6.5-5, the COP assumed that each jack-up vessel would have four legs and would jack up four times at each WTG. The COP also assumed that two jack-up vessels would install WTGs at 100 locations.

As the project has only 62 WTG locations and because the first jack-up vessel jacks-up only once at a WTG location (where the COP and FEIS assumed the installation vessel would jack-up four times at each WTG location), the sea floor impacts associated with removing blades at up to 22 locations under all of the scenarios described in Section 4.0 is well below the total seafloor impacts accounted for in the COP and FEIS.

Table 5.2-1 below shows the seafloor disturbance for each of the scenarios described in Section 4.0, taking into consideration jack-up activities that have already occurred, as well as the disturbance attributable to the 30 WTGs that have not yet been installed. The table shows that the maximum seafloor disturbance is 77,880m^3 (19.2 acres) which is 186,120 (46 acres) less than the seafloor disturbance analyzed in the COP and FEIS.

Table 5.2-1 Seafloor Disturbance of Blade Removal Activities

Jack-up Vessel	No. of Legs	Area Impacted by each Leg (m^3)	No of Positions	No of Jack-Ups *	Total Seafloor Disturbance (m^2)	Total Seafloor Disturbance (acres)
COP	4	165	100	4	**264,000**	**65.2**
Scenario 1A					**77,880**	**19.2**
Blade Removal	4	165	22	3	43,560	10.7
Hammerheads**	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9
Scenario 1B					**77,880**	**19.2**
Blade Removal	4	165	22	3	43,560	10.7
New Hammerheads	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9
Scenario 1C					**77,880**	**19.2**
Blade Removal	4	165	22	3	43,560	10.7
Hammerheads	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9
Scenario 2A					**66,660**	**16.4**
Blade Removal	4	165	17	2	22,440	5.5
Blade Removal	4	165	5	3	9,900	2.4
Hammerheads	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9

Jack-up Vessel	No. of Legs	Area Impacted by each Leg (m^3)	No of Positions	No of Jack-Ups *	Total Seafloor Disturbance (m^2)	Total Seafloor Disturbance (acres)
Scenario 2B					**77,880**	**19.2**
Blade Removal	4	165	22	3	43,560	10.7
Hammerheads	4	165	8	2	10,560	2.6
Hammerheads with blades removed		165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9
Scenario 3A					**77,880**	**19.2**
Blade Removal	4	165	17	3	33,660	8.3
Blade Removal	4	165	5	3	9,900	2.4
Hammerheads**	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9
Scenario 3B					**77,880**	**19.2**
Blade Removal	4	165	17	3	33,660	8.3
Blade Removal	4	165	5	3	9,900	2.4
Hammerheads**	4	165	8	2	10,560	2.6
Hammerheads with blades removed	4	165	2	3	3,960	0.9
Yet to be installed WTGs	4	165	30	1	19,800	4.9

*With the exception of "yet to be installed WTGs" the number of jack-ups Includes jack-ups that have already occurred.

**Hammerheads are the towers and nacelles without blades.

In addition, FEIS Section 3.2 and Table 3.2-2 (below) quantified the maximum area of impact predicted from installation, vessels, and dredging. The total area of alteration within the WDA due to foundation and scour protection installation, jack-up vessel use, inter-array and inter-link cable installation, and potential cable protection installation was estimated to be 393 acres (1.6 km2), which is 0.5 percent of the entire WDA. Table 3.3-2 shows the maximum area of disturbance attributable to WTG installation jack-up vessels is 65 acres, but also includes installation of inter -link cables which was not included in the final Project design. As such, an additional 7 acres of seafloor disturbance was considered in the FEIS that was not realized. Further, the inter-array cable estimate was based on 100 WTGs and therefore overestimates the impacts associated with the Project's 62 WTGs.

FEIS Table 3.2-2: Maximum Areas of Impact Predicted from Installation, Vessels, and Dredging

Bottom Disturbance Due to Installation, Jack-up Vessels, and Dredging	Maximum Area of Disturbance	
	Acres	km^2
Export Cables	117	0.47
Inter-link Cable	7	0.03
Inter-array Cables	204	0.83
Dredging [a]	69	0.28
Jack-up Vessels (WTG Installation)	65	0.26
Jack-up Vessels (ESP Installation)	0.3	0.001
Anchoring	4.4	0.017
Total in the WDA (Cables and Jack-up)	277	1.12
Total in the OECC (Cables and Dredging)	186	0.75

Surficial habitats within the Lease Area were initially identified and mapped using geophysical side scan sonar data. These data were then confirmed using grab samples, vibracores, and underwater video to attain further information on the specific organisms inhabiting the benthic communities. The Lease Area is comprised entirely (100%) of unconsolidated sediment substrate with predominantly sand and silt-sized material. Given site water depths and location on the continental shelf, this is a fairly stable benthic environment and is relatively flat and void of relief.

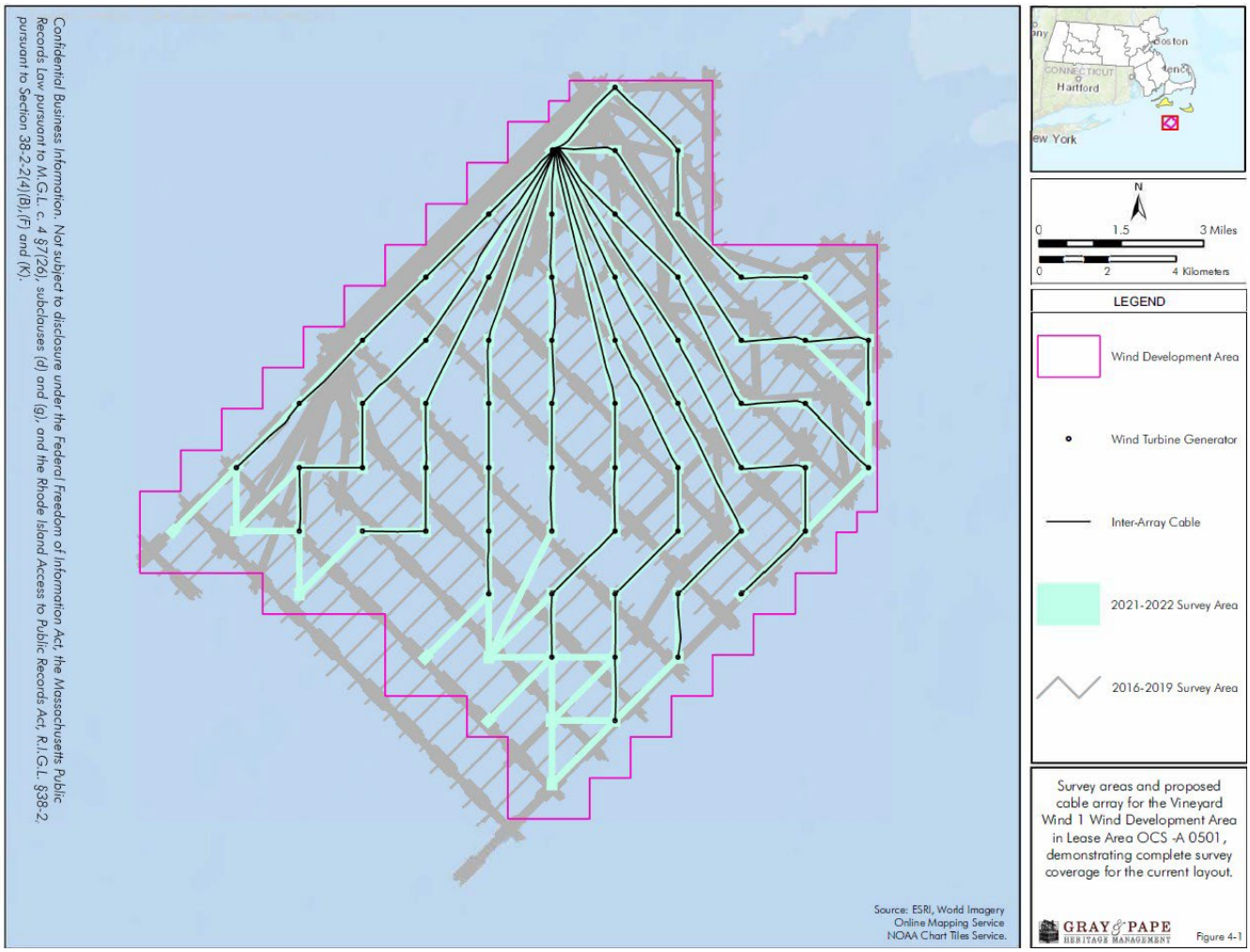
The primary direct impact from the blade removal activities is to benthic epifauna and infauna in the direct path of the jack-up barge pads. Soft bottom habitat and benthic fauna, such as the polychaete worms, Oligochaete worms, amphipods, sand dollars, and sea scallops observed in surveys discussed in the COP (Volume III, Section 6.5), in the direct path of the jack-up barge pads will be crushed and organisms killed. Indirect mortality may occur as disturbed sediments resettle onto nearby areas and smother organisms. These impacts are localized and temporary. In summary, any anticipated impacts resulting from the blade removal activities are significantly less than the impacts already analyzed in the COP and FEIS.

5.3 Cultural Resources

This COP Addendum does not expand the Project beyond the Project Design Envelope included in the COP, which included the use of two jack-up vessels for WTG installation activities. Nor do the blade removal activities occur outside the defined Area of Potential Effect (APE) analyzed in the Section 106 process and memorialized in the Memorandum of Agreement.

Field investigations included HRG surveys utilizing magnetometer, side scan sonar, shallow and medium penetration sub-bottom profilers, and multibeam echosounder. Field investigations also included geotechnical explorations such as bottom grabs, Cone Penetration Tests (CPT), bores, and/or vibracores. The geophysical data for Vineyard Wind 1 can be found in COP Volume II-A and Volume II-B, and the marine archaeological resources assessment can be found in COP Volume II-C and the Supplemental Marine Archaeological Resources Assessment Report (MARA) submitted in December 2022.

The APE discussed in the MARA for the WDA is shown below. Specifically, MARA Section 1.2 discussed that "during construction of the WTGs and ESP, jack-up vessels may be employed. The horizontal APE is the diameter around the implanted structure that may be disturbed, which is projected to be between 180 and 250 m (59 and 820 ft). The vertical depth of disturbance is less than the monopile and jacketed foundation depth, see above."



The area where blade removal activities will occur has been fully surveyed, reviewed, and cleared by the Qualified Marine Archaeologist (QMA). The QMA cleared the areas following archival and documentary research and field investigations described above and in the MARA. Thus, no effects to archaeological resources that have not already been considered in the COP and FEIS will occur from the blade removal activities at 22 locations. Indeed, the area has already been disturbed by the installation of the WTGs where blades will be removed and the COP and FEIS assumed that the area would be disturbed three additional times by a jack-up barge. Moreover, the area has been determined ALARP for UXOs and other hazards.

Vineyard Wind 1 will follow all applicable terms and conditions of the Memorandum of Agreement, including the Offshore Post Review Discoveries Plan should cultural material be observed.

5.4 Water Quality

Volume III, Section 5.2.2.1.5 of the COP describes routine releases from vessels, which would apply to the second jack-up vessel used to remove blades. Some liquid wastes are allowed to be discharged to marine waters in the WDA. These discharges include domestic water, uncontaminated bilge water, treated deck drainage and sumps, uncontaminated ballast water, and uncontaminated fresh or seawater from vessel air conditioning. As defined, these discharges will not pose a water quality impact. Other waste generation such as sewage, solid waste or chemicals, solvents, oils and, greases from equipment, vessels or facilities will be stored and properly disposed of on land or incinerated offshore and will not generate an impact.

As it currently does, Vineyard Wind 1 will require the jack-up vessels to comply with regulatory requirements related to the prevention and control of discharges and the prevention and control of accidental spills, as well as the USCG ballast water management requirements at 33 CFR Part 151 and 46 CFR Part 162. The USCG regulations include the same discharge standards as the International Maritime Organization (IMO) Ballast Water Management Convention (BWM) standards, but also include additional requirements beyond the IMO's requirements.

Section A.8.2 of the FEIS analyzed the impacts to water quality and determined that impacts would be negligible to minor. Because Vineyard Wind 1 is only installing 62 WTGs and the small scale of vessel activity associated with removal of blades at 22 WTG locations is within the scope of the impacts analyzed in the FEIS.

5.5 Vessel Trips

COP Volume II, Section 7.8.1.2 analyzed commercial vessel traffic in the Project region and the incremental impact of the Project vessels. The COP, as well as BOEM's Biological Assessment (BA) estimated that there could be up to five (5) daily trips and up to 50 trips per month to Canada during construction. *See also* 2024 Biological Opinion, Section 7.2.1. During decommissioning, BA section 5.1.1.2 estimated that 240 vessel trips may originate from Canada. To date, there have been far less than 50 total trips to Canada, most of them associated with foundation installation. As shown in the table below, under the worst-case scenario described in section 4.0, the 22 vessel trips the Sea Installer could make over an approximate 7 month (a maximum of 3 trips per month) is a small fraction of the estimated vessel trips analyzed in the COP and by BOEM.

Table 5.5-1 COP Estimate of Daily and Monthly Trips

Origin or Destination	Est. Max. Daily Trips	Est. Max Trips/Month
New Bedford (MA)	46	1,100
Brayton Point (MA)	4	100
Montaup (RI)	4	100
Providence (RI)	4	100
Quonset (RI)	4	100
Canada (either Sheet Harbor, St. John, or Halifax)	5	50
Europe (ports unknown)	NA	5

Source: COP Addendum Table 3.7-1; Table 5.1-6 in Vineyard Wind 1 BA

Table 5.5-2 Maximum Vessel Trips to Canada Under Each Scenario Described in Section 4.0

Canada Round Trips	Maximum Daily	Maximum Monthly
COP Estimate	5	50
Scenario 1A	1	3
Scenario 1B	1	3
Scenario 1C	1	3
Scenario 2A	2	2
Scenario 2B	2	2
Scenario 3A	2	5
Scenario 3B	2	5

For the expected vessel trips to Canada, Vineyard Wind will follow all applicable mitigation measures described in the COP, the COP approval terms and conditions, the Biological Opinion and Incidental Harassment Authorization.

5.6 Protected Species

Vineyard Wind 1 will follow all applicable measures in the COP approval terms and conditions to minimize impacts to protected species such as marine mammals and sea turtles, including vessel speed restrictions and vessel strike avoidance measures. Vineyard Wind 1 will also ensure that the vessel operator, employees, and contractor engaged in the blade removal activities complete marine trash and debris awareness training.

The maximum speed of the second jack-up vessel is expected to be 11-12 knots but will adhere to the 10-knot speed restriction and vessel strike avoidance measures when transiting to Canada. The vessel will follow the transit routes identified in the Biological Opinion, which for convenience is shown below.

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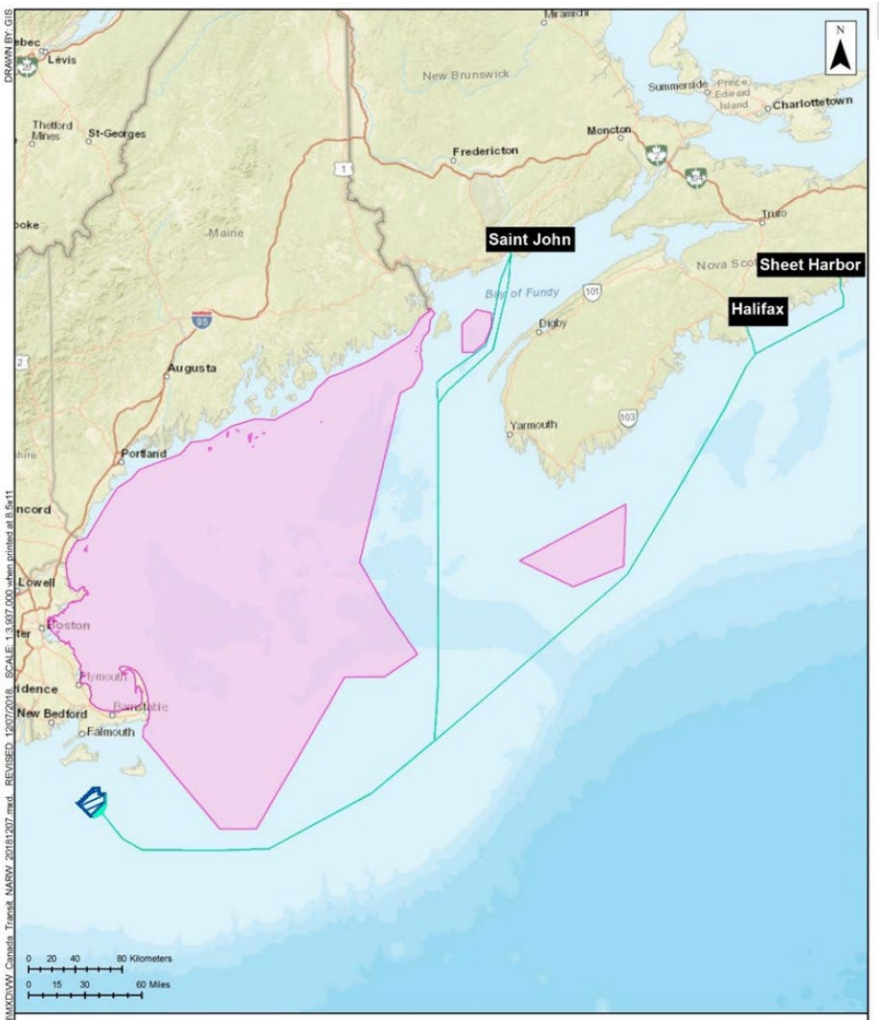

Vineyard Wind 1 will adhere to its terms and conditions of COP approval, the Biological Opinion, and the Incidental Harassment Authorization for the blade removal activities, which are consistent with the following PDCs:

- PDC 1. Avoid Live Bottom Features (there are no live bottom features in the Lease Area)
- PDC 2. Avoid Spawning and Development Habitat of Sturgeon (the work is not within freshwater reaches of rivers where Atlantic or shortnose sturgeon spawning occurs)
- PDC 3. Marine Debris Awareness and Elimination (Vineyard Wind 1 will follow Section 5.1.3 of the Conditions of COP Approval)
- PCD 4. Minimize Interactions with Protected Species during Geophysical Survey Operations (no geophysical surveys are associated with the blade removal activities).

- PDC 5. Minimize Vessel Interactions with Protected Species (Vineyard Wind 1 will follow all requirements related to vessels listed in Section 5 of the Conditions of COP Approval, as those have been updated by the 2024 Biological Opinion and 2024 Incidental Take Authorization)

- PDC 6. Minimize Risk During Buoy Deployment, Operations, and Retrieval (note no buoy deployment, operations, and retrieval are associated with the blade removal activities)

- PDC 7. Protected Species Observers (In accordance with the Terms and Conditions, trained observers will be employed on the jack-up vessels).

- PDC 8. Reporting Requirements (Vineyard Wind 1 will follow all reporting requirements related to protected species listed in Section 5 of the Conditions of COP Approval)

6.0 ADDITIONAL MITIGATION MEASURES TO BE EMPLOYED FOR BLADE INSTALLATION

Installation of WTGs and blades was fully addressed in the COP and in more detail in the FDR and FIR. There is no need to amend the COP to account for the installation activities. However, from lessons learned from the blade failure incident, Vineyard Wind 1 intends to employ additional mitigation measures associated with blade installation and power production. None of these measures result in environmental impacts and are indeed intended to prevent and/or minimize future blade failures. The measures include:

- Prior to installing blades on WTGs, the manufacturing records will be examined to ensure the structural integrity of each blade received, including verifying that each blade meets the 25-year International Electrical Commission (IEC) certification requirements for blade manufacturing.

- For each WTG with a back-up generator installed, the generator and associated fuel tanks will be secured in accordance with established protocols. Where generators are installed to provide back-up power to the grid, confirmation that the WTG can automatically or by remote intervention transition from grid power to the generator.

- Every WTG location will have two functional redundant power sources to ensure the structural integrity of the WTG including (1) connection to the electrical grid and (2) a secondary source of power such as generator or yaw back-up system which would deliver power to the WTG for a minimum of 48 hours.

- Prior to commencing power production, a visual inspection of each installed WTG blade will be conducted.

- Each WTG blade will have a fully functional monitoring system capable of detecting and immediately notifying the Operator of potential blade anomalies while WTGs are producing power.