Appendix G: Mitigation and Monitoring

This Final Environmental Impact Statement (EIS) assesses the potential physical, biological, socioeconomic, and cultural impacts that could result from the construction, operations and maintenance (O&M), and conceptual decommissioning of the SouthCoast Wind Project (Project) proposed by SouthCoast Wind Energy LLC (SouthCoast Wind) in its Construction and Operations Plan (COP).

As part of the Project, SouthCoast Wind has committed to implement avoidance, minimization, and mitigation measures (AMMs) to avoid, reduce, mitigate, or monitor impacts on the resources discussed in Chapter 3, *Affected Environment and Environmental Consequences*, of this Final EIS. SouthCoast Wind's AMMs are part of the Proposed Action, and implementation of AMMs is considered in the impact analysis for the Proposed Action and each action alternative. These AMMs are described in Table G-1. The Bureau of Ocean Energy Management (BOEM) considers as part of the Proposed Action only those measures that SouthCoast Wind has committed to in the COP (SouthCoast Wind 2024). Attachment G-1 contains the AMMs proposed by SouthCoast Wind as part of its Request for Incidental Take Regulations application. Attachment G-2 contains the applicant-proposed Draft Post-Construction Avian and Bat Monitoring Framework. Attachment G-3 contains SouthCoast Wind's NARW Monitoring and Mitigation Plan for Pile Driving.

BOEM may select alternatives and require additional mitigation or monitoring measures to further protect and monitor these resources. Additional mitigation and monitoring measures, shown in Table G-2, may result from reviews under several environmental statutes (Clean Air Act, Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, Marine Mammal Protection Act, and National Historic Preservation Action) as discussed in Appendix A, *Required Environmental Permits and Consultations* of this Final EIS. Please note that not all of these mitigation measures are within BOEM's statutory and regulatory authority and some may be required by other governmental entities. Additional measures identified during development of this EIS are listed in Table G-3, and Table G-4 identifies measures that may be required by authorizations and permits issued to the lessee.

If BOEM decides to approve the COP, the Record of Decision (ROD) will state which of the mitigation and monitoring measures identified by BOEM in Table G-2 and Table G-3 have been adopted and, if not, why they were not. Where the impacts of an action alternative are determined through the inclusion of any mitigation and monitoring measures, all of those measures will be incorporated in the ROD if that alternative is selected. The ROD will describe the specific terms and conditions of these measures for which compliance is required (40 Code of Federal Regulations [CFR] 1505.3). SouthCoast Wind would be required to certify compliance with these terms and conditions under 30 CFR 285.633(a). Furthermore, pursuant to 30 CFR 585.634(b), BOEM will periodically review the activities conducted under the approved COP, with the frequency and extent of the review based on the significance of any changes in available information and on onshore or offshore conditions affecting, or affected by, the activities conducted under the COP.

Monitoring may be required to evaluate the effectiveness of mitigation measures or to identify if resources are responding as predicted to impacts from the Proposed Action. This monitoring would typically be developed in coordination among BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) modify how a mitigation measure identified in the COP or ROD is being implemented, (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the COP in accordance with 30 CFR 285.633(a), (3) develop measures for future projects, or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g., a potential cumulative impact assessment tool). Unless specified, the proposed mitigation measures described below would not change the impact ratings on the affected resource, as described in Chapter 3 of the Final EIS, but would further reduce expected impacts or inform the development of additional mitigation measures if required.

G.1 Applicant-Proposed Measures

Table G-1 presents applicant-proposed measures as identified in SouthCoast Wind's COP (SouthCoast Wind 2024). In the last column of the table BOEM has identified the anticipated agency that would enforce each measure or whether the measure is a best practice and not an enforceable measure. Attachment G-1 contains the applicant-proposed mitigation measures proposed by SouthCoast Wind as part of its Request for Incidental Take Regulations application under the Marine Mammal Protection Act, dated September 2022 and a revised application dated March 2024. The National Marine Fisheries Service (NMFS) published a Notice of Receipt of the application in the Federal Register on October 17, 2022. These mitigation measures are subject to change pending NMFS's development of final regulations. Additional lessee authorization and permit conditions are included in Table G-4.

Table G-1. Applicant-proposed measures

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Applicant-Proposed Measures from COP Volume 2, Table 16-1 (SouthCoast Wind 2024)				
Construction	**Seabed or Ground Disturbance** Seabed preparation, offshore component installation, and vessel anchoring/spudding	• SouthCoast Wind will use BMPs to minimize sediment mobilization during offshore component installation • SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations • SouthCoast Wind, where practical and safe, will utilize DP vessels • SouthCoast Wind will utilize HDD for sea-to-shore transition	Site Geology	Best practice - not an enforceable measure
O&M	**Seabed or Ground Disturbance** Routine offshore operation and maintenance	• SouthCoast Wind will utilize scour protection methods to avoid developing scour holes at the base of structures • SouthCoast Wind will bury submarine cables at depths to guard against exposure from seabed mobility	Site Geology	BSEE
Decommissioning	**Seabed or Ground Disturbance** Offshore component decommissioning	• SouthCoast Wind will use BMPs to minimize sediment mobilization during decommissioning	Site Geology	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Scour development	• SouthCoast Wind will utilize scour protection methods to avoid developing scour holes at the base of structures • SouthCoast Wind will bury submarine cables at depths to guard against exposure from seabed mobility	Physical Oceanography and Meteorology	BSEE
Construction, O&M	**Planned Discharges: Air Emissions** Vehicles, onshore and offshore construction	• SouthCoast Wind will ensure that vessels used for construction will use the jurisdictionally required compliant fuel, e.g., ultra-low sulfur diesel or a fuel with less emissions	Air Quality	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
	equipment, drones, helicopters and generators	• SouthCoast Wind will ensure fuels used for construction equipment comply with EPA or equivalent emissions standards • SouthCoast Wind will use low-NOx engines when possible • SouthCoast Wind will engage with EPA on how to satisfy Best Available Control Technology		
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Offshore component installation, routine offshore O&M, vessel anchoring, and decommissioning	• SouthCoast Wind will select and use BMPs including the use of a SWPPP to minimize sediment mobilization during offshore construction of WTGs and OSPs, scour protection placement, and HDD operations • SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations	Water Quality	Best practice – not an enforceable measure
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Onshore component installation and decommissioning	• SouthCoast Wind will follow BMPs, including the use of a SWPPP, during onshore construction activities to control sedimentation and erosion	Water Quality	BSEE, USCG, USACE, EPA, MassDEP and RIDEM
Construction, O&M, Decommissioning	**Planned Discharges** Stormwater runoff, routine releases, and duct bank installation	• SouthCoast Wind will follow USCG requirements at 33 CFR Part 151 and 46 CFR Part 162 regarding bilge and ballast water • SouthCoast Wind will require all Project vessels to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including EPA requirements under the EPA 2013 Vessel General Permit and state and local government requirements	Water Quality	BOEM, BSEE and USCG
Construction, O&M, Decommissioning	**Accidental Events/Natural Hazards** Unplanned releases	• SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's OSRP	Water Quality	BOEM, BSEE, USACE and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind's SWPPP will include a Project-specific SPCC plan to prevent inadvertent releases of oils and other hazardous materials to the environment to the extent practicable • SouthCoast Wind will have an HDD Contingency Plan in place to mitigate, control, and avoid unplanned discharges related to HDD activities		
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Habitat loss/fragmentation **Introduced Sound** Avoidance/ displacement **Presence of Structures** Collision with WTGs, avoidance/displacement and barrier effects, and habitat loss/modification	• SouthCoast Wind will site the proposed Project to avoid locating Project components in or near areas of known important or high bird use (e.g., nesting, foraging and overwintering areas, migratory staging or resting areas) • SouthCoast Wind will incorporate use of HDD at landfall locations to avoid disturbance to shorelines and coastal habitats to the extent practicable • SouthCoast Wind will coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures	Birds	BOEM, USFWS, USACE, MassDEP and RIDEM
Construction, Decommissioning	**Changes in Ambient Lighting** Displacement/attraction and collision with WTGs **Vessel Operations** Collision with vessels and avoidance/ displacement	• SouthCoast Wind will minimize lighting, to the extent practicable, to reduce potential attraction of birds to vessels during construction activities	Birds	BOEM, BSEE
Construction, O&M, Decommissioning	**Planned Discharges** Disturbance or fatality **Accidental Events** Oiling or fatality from accidental spills, and ingestion of marine debris	• SouthCoast Wind will use approved OSRP mitigation measures, as necessary, to prevent birds from going to affected areas including chumming, hazing, and relocating to unaffected areas	Birds	BOEM, BSEE, and USFWS
O&M	**Changes in Ambient Lighting** Displacement/attraction and collision with WTGs	• SouthCoast Wind will develop and implement a Post-Construction Monitoring Plan	Birds	BOEM, BSEE, and USFWS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
O&M	**Changes in Ambient Lighting** Displacement/attraction and collision with WTGs	• SouthCoast Wind will ensure that lighting on WTGs will be executed in accordance with FAA regulations • Lighting on OSPs will be minimized to that required for navigation safety to reduce potential attraction of birds to the extent practicable		BOEM, BSEE
Construction, O&M, Decommissioning	**Ground Disturbance** Habitat loss/fragmentation **Introduced Sound** Behavioral disturbance **Changes in Ambient EMF** Displacement/attract-ion	• SouthCoast Wind will site Project components to avoid locating onshore facilities or landfall sites in or near significant fish and wildlife habitats, including known hibernacula, maternal roosting colonies or other concentration areas as practicable. The proposed onshore substation site and converter stations will be constructed in primarily open, developed areas • Onshore export cables will be buried underground beneath local roadways from landfall to the onshore substation site • SouthCoast Wind will coordinate with MassWildlife, RIDEM, and USFWS to identify appropriate mitigation measures	Bats	BSEE, USFWS, MassDEP and RIDEM
Construction, O&M, Decommissioning	**Changes in Ambient Lighting** Displacement/ attraction	• SouthCoast Wind will ensure that lighting will be minimized to reduce potential attraction of bats to vessels and vehicles during construction activities within the Onshore and Offshore Project Areas to the extent practicable	Bats	Best practice – not an enforceable measure
Construction, O&M, Decommissioning	**Tree Clearing** Roost disturbance from tree trimming or removal	• SouthCoast Wind will consult with BOEM and the USFWS to discuss BMPs available to avoid and minimize potential effects from construction/decommissioning to bats	Bats	BOEM and USFWS
O&M	**Presence of Structures** Collisions with WTGs	• SouthCoast Wind will develop and implement a Post-Construction Monitoring Plan	Bats	BOEM, BSEE, USFWS, MassDEP and RIDEM

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction, O&M	**Ground Disturbance** Habitat loss/fragmentation **Introduced Sound** Behavioral disturbance and displacement **Changes in EMF** Behavioral disturbance	• SouthCoast Wind will site Project components to avoid locating onshore facilities and landfall sites in or near significant fish and wildlife habitats to the greatest extent practicable. The proposed onshore substation site and the converter station site will be constructed in primarily open, developed areas. • SouthCoast Wind will train construction staff on biodiversity management and environmental compliance requirements • SouthCoast Wind will bury the onshore export cables underground beneath local roadways from landfall to the onshore substation site.	Terrestrial Vegetation and Wildlife	BOEM, USFWS, NMFS, MassDEP and RIDEM
Construction, Decommissioning	**Changes in Ambient Lighting** Displacement/attraction	• If tree clearing is required, SouthCoast Wind will conduct habitat assessments and presence/absence surveys and will coordinate with MassWildlife, RIDEM, and USFWS as appropriate • SouthCoast Wind will, to the extent practicable, conduct construction activities outside of periods when highly sensitive species are likely to be present • SouthCoast Wind will implement erosion and sediment control measures in areas adjacent to water resources, such as wetlands, ponds, and other waterbodies, or in areas with significant grades that would make them prone to erosion • SouthCoast Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources	Terrestrial Vegetation and Wildlife	USFWS, MassDEP and RIDEM
Construction	**Changes in Ambient Lighting** Displacement/attraction	• SouthCoast Wind will ensure lighting will be minimized to the extent practicable to reduce potential displacement or attraction of wildlife species to Project sites during construction activities in the Project Area	Terrestrial Vegetation and Wildlife	Best practice – not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction, O&M, Decommissioning	**Operation of Equipment and Heavy Machinery** Collision with equipment and heavy machinery Collision with utility lines or electrocution	• Vehicle speed limits will be enforced at all Project sites to minimize potential for vehicle collisions with wildlife • SouthCoast Wind will conduct presence/absence surveys; surveys for protected plant and wildlife species will be completed as needed to inform the detailed engineering and design of the Project facilities	Terrestrial Vegetation and Wildlife	Best practice – not an enforceable measure
Construction, Decommissioning	**Planned Discharges** Disruption of water flow or alteration of turbidity	• SouthCoast Wind will ensure that standard construction BMPs (including erosion and sediment control measures) will be implemented to avoid dewatering discharge scour and siltation to nearby receiving waters, including wetlands	Terrestrial Vegetation and Wildlife	Best practice – not an enforceable measure
Construction, Decommissioning	**Accidental Events** Release of hazardous materials into environment	• SouthCoast Wind will implement a construction-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials	Terrestrial Vegetation and Wildlife	BOEM, BSEE and USCG
O&M	**Ground Disturbance** Habitat loss/fragmentation **Introduced Sound** Behavioral disturbance and displacement **Changes in Ambient Lighting** Displacement/attract-ion	• SouthCoast Wind will implement a Vegetation Management Plan as approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources	Terrestrial Vegetation and Wildlife	Best practice - not an enforceable measure
O&M	**Accidental Events** Release of hazardous materials into environment	• SouthCoast Wind will implement an operations-phase OSRP to provide procedures for containing, cleaning, and reporting any accidental spills of oil fuel, or other hazardous materials	Terrestrial Vegetation and Wildlife	BOEM,BSEE and USCG
Decommissioning	**Ground Disturbance** Habitat loss/fragmentation **Introduced Sound**	• SouthCoast Wind will implement a Vegetation Management Plan approved by NHESP, RIDEM, and the Massachusetts Department of Agricultural Resources	Terrestrial Vegetation and Wildlife	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
	Behavioral disturbance and displacement **Changes in Ambient Lighting** Displacement/attract-ion	• SouthCoast Wind will implement erosion and sediment control measures in accordance with applicable regulations		
Construction, Decommissioning	**Ground Disturbance** Temporary habitat disturbance	• SouthCoast Wind will implement erosion and sediment control measures in accordance with Massachusetts and Rhode Island regulations and industry BMPs throughout the Onshore Project Area to abate technical and biological erosion	Wetlands and Waterbodies	Best practice - not an enforceable measure
Construction, Decommissioning	**Planned Discharges** Dewatering and stormwater runoff	• If groundwater is encountered, SouthCoast Wind will perform dewatering measures using standard construction BMPs for dewatering, including, but not limited to, use of temporary settling basins, dewatering filter bags, or temporary holding or frac tanks • SouthCoast Wind will direct dewatering wastewaters to well-vegetated uplands away from wetlands or other water resources to allow for infiltration to the soil of the discharged water • SouthCoast Wind will place construction mats to minimize soil disturbance in any wetland areas that cannot be avoided or are required to be temporarily crossed	Wetlands and Waterbodies	Best practice - not an enforceable measure
Construction	**Accidental Events** Release of hazardous materials into environment	• SouthCoast Wind will always require the construction contractor to have spill control and containment kits on site to allow for immediate response and cleanup in the event of an accidental release of fuel, oils, or other hazardous materials • Implementation of BMPs, the SMS, and a SWPPP for construction as well as an emergency response procedure to avoid, control, and address any accidental releases during construction activities	Wetlands and Waterbodies	BOEM, BSEE, USACE and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind and their construction contractor will store petroleum products in upland areas more than 100 feet (30.5 meters) from wetlands and waterbodies • Equipment will not be parked overnight within 100 feet (30.5 meters) of a wetland or waterbody, with an exception being for equipment that cannot be practically moved. Temporary containment will be required for equipment that cannot be practically moved and must be parked overnight within 100 feet (30.5 meters) of a wetland or other water resources • SouthCoast Wind will use a secondary containment system for refueling that needs to occur within 100 feet (30.5 meters) of wetlands to contain any minor amounts of fuel inadvertently dripped or released during refueling • SouthCoast Wind will set up cement cleanout tubs in areas at least 100 feet (30.5 meters) from wetlands or other water resources to contain and hold any residual cement and washout from cement trucks prior to their departure from the site		
O&M	**Planned Discharges** Dewatering and stormwater runoff	• Discharges as a result of dewatering will be managed in accordance with the requirements for applicable EPA, MassDEP, RIDEM, and/or local regulations pertaining to dewatering	Wetlands and Waterbodies	BOEM, EPA, MassDEP AND RIDEM
O&M	**Accidental Events** Release of hazardous materials into environment	• SouthCoast Wind and their construction contractor will store petroleum products in upland areas more than 100 feet (30.5 meters) from wetlands and waterbodies	Wetlands and Waterbodies	BOEM, BSEE and USCG
Decommissioning	**Accidental Events** Release of hazardous materials into environment	• SouthCoast Wind will always require the decommissioning contractor to have spill control and containment kits on site to allow for immediate response and cleanup in the event of an accidental release of fuel, oils, or other hazardous materials	Wetlands and Waterbodies	BOEM, BSEE and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will implement BMPs, an SMS, and an SWPPP as well as an emergency response procedure to avoid, control and address any accidental releases during decommissioning activities as applicable • Equipment will not be parked overnight within 100 feet (30.5 meters) of a wetland or waterbody, with an exception being for equipment that cannot be practically moved • Temporary containment will be required for equipment that cannot be practically moved and must be parked overnight within 100 feet (30.5 meters) of a wetland or other water resources • The use of a secondary containment system for refueling that needs to occur within 100 feet (30.5 meters) of wetlands to contain any minor amounts of fuel inadvertently dripped or released during refueling		
Construction, O&M	**Seabed or Ground Disturbance** **Planned Discharges/ Accidental Events** Project installation and vessel O&M	• SouthCoast Wind will select sites for construction that avoid areas of sensitive seafloor and benthic habitat to the extent practicable • SouthCoast Wind will utilize HDD for nearshore export cable installation • SouthCoast Wind will minimize trench and sidecasting widths for export cable installation and anchor outside of eelgrass beds where possible • To the extent possible, SouthCoast Wind will avoid use of anchored vessels near known eelgrass beds	Coastal Habitats	BOEM, USACE and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction	**Change in Ambient Lighting**	• Any effects of changes to ambient lighting will be limited to proposed landfall locations where eelgrass beds or clusters of macroalgae were identified along the northern portions of the proposed export cable corridors	Coastal Habitats	BOEM and NMFS
Construction	**Actions that May Displace Biological Resources (Eelgrass and Macroalgae)** **Actions that May Cause Direct Injury or Death**	• Offshore export cable installation and the location of the HDD exit pit are planned for outside the mapped eelgrass extents at the cable landing locations	Coastal Habitats	BOEM, USACE, and NMFS
O&M	**Change in Ambient EMF**	• EMF modeling conducted for the proposed Project indicates that HDD installation in nearshore areas will reduce, but not entirely eliminate magnetic fields in the area where eelgrass beds or clusters of macroalgae were identified.	Coastal Habitats	Best practice - not an enforceable measure
Decommissioning	**Seabed or Ground Disturbance**	• The proposed Project's offshore export cables may be left in place to minimize environmental effects, thus resulting in minimal or no sea bottom disturbance	Coastal Habitats	Best practice - not an enforceable measure
Decommissioning	**Change in Ambient Lighting**	• The proposed Project's offshore export cables may be left in place to minimize environmental effects, thus resulting in no change to ambient lighting	Coastal Habitats	Best practice - not an enforceable measure
Decommissioning	**Displacement of Eelgrass and Macroalgae** **Actions that May Cause Direct Injury or Death of Biological Resources**	• The offshore export cables may be left in place to minimize environmental effects, thus resulting in no displacement	Coastal Habitats	Best practice - not an enforceable measure
Construction, Decommissioning	**Introduced Sound into the Environment (In-air or Underwater)** Behavioral disturbance	• SouthCoast Wind will incorporate lower-impact construction methods, where possible	Benthic and Shellfish Resources	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance/ Planned Discharges/ Accidental Events** Harassment/mortality	• SouthCoast Wind will design the scour protection system to reduce and minimize scour and sedimentation to the extent practicable	Benthic and Shellfish Resources	Best practice - not an enforceable measure
Construction, Decommissioning	**Actions that May Displace Biological or Cultural Resources, or Human Uses** Habitat Loss	• SouthCoast Wind will use HDD at landings to avoid disturbance to nearshore productive shellfish beds to the extent practicable • SouthCoast Wind will select lower-impact construction methods, where possible • SouthCoast Wind will select corridor and micro-route cables within selected corridor to avoid complex habitats, where possible • SouthCoast Wind's Project cable burial layout was designed to minimize length of cable needed • SouthCoast Wind will bury cables, where possible, to allow for benthic recolonization after construction is complete	Benthic and Shellfish Resources	BOEM and NMFS
O&M	**Actions that May Displace Biological or Cultural Resources, or Human Uses** Habitat Loss	• Presence of Project foundation areas, scour protection, and cable burial would allow for benthic recolonization	Benthic and Shellfish Resources	Best practice – not an enforceable measure
O&M	**Change in Ambient EMF** Displacement/harassment	• SouthCoast Wind will employ industry standard cable burial and cable shielding methods to reduce potential effects • SouthCoast Wind's Project cable burial layout was designed to minimize length of cable needed to reduce potential effects	Benthic and Shellfish Resources	BSEE
Construction, Decommissioning	**Introduced Sound into the Environment (in-air or underwater)** Behavioral disturbance	• SouthCoast Wind will incorporate soft start methods, to the extent practicable, during initial pile driving activities to allow mobile finfish and invertebrates to migrate away from the area	Finfish and Invertebrates	BOEM, BSEE, USACE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will employ sound-attenuation measures (e.g., bubble curtains, insulated piles) • SouthCoast Wind will limit duration of pile driving activities to reduce sound propagation/sound exposure		
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Harassment/ mortality	• SouthCoast Wind will design the scour protection system to reduce and minimize scour and sedimentation	Finfish and Invertebrates	Best practice – not an enforceable measure
Construction, O&M, Decommissioning	**Habitat Disturbance and Modification** Habitat Loss and artificial reef effect from	• SouthCoast Wind will design the sea-to-shore transition to reduce the dredging footprint and effects on benthic organisms (e.g., cofferdam and/or gravity cell) • SouthCoast Wind will incorporate use of HDD at landing(s) and avoid disturbance to finfish and invertebrate EFH to the extent practicable • SouthCoast Wind will incorporate use of HDD of subsea cables, as appropriate, to minimize spatial and temporal effects on benthic organisms	Finfish and Invertebrates	Best practice - not an enforceable measure
Construction, Decommissioning	**Change in Ambient Lighting/ Planned Discharges/ Accidental Events** Displacement, harassment, and mortality	• SouthCoast Wind will incorporate use of HDD at landings and avoid disturbance to finfish and invertebrate EFH to the extent practicable	Finfish and Invertebrates	Best practice - not an enforceable measure
Construction	**Change in Ambient Lighting/ Planned Discharges/ Accidental Events** Displacement, harassment and mortality	• SouthCoast Wind will install offshore export cables and inter-array cables to target burial depths and use cable shielding materials to minimize effects of EMFs	Finfish and Invertebrates	BSEE
Construction, O&M, Decommissioning	**Introduced Sound into the Environment (in-air or underwater)**	• When technically feasible, SouthCoast Wind will employ a “ramp-up” of the HRG survey equipment at	Marine Mammals	BOEM, BSEE, USACE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
	Behavioral disturbance	the start or re-start of HRG survey activities to minimize sound source effects. • SouthCoast Wind will ensure that active acoustic sound sources will not be activated until the PSO has reported the clearance zone clear of all marine mammals after the appropriate amount of pre-clearance watch time has passed based on the proposed Project's Incidental Take Authorization • SouthCoast Wind will employ sound-attenuation measures (e.g., bubble curtains, insulated piles, etc.) • SouthCoast Wind will limit duration of pile driving activities to reduce sound propagation/sound exposure • SouthCoast Wind will incorporate soft start methods during initial pile driving activities to allow marine mammals to migrate away from the area of effect • SouthCoast Wind will employ shut-down procedure when protected species are detected in their respective shutdown zones in the Project Area • SouthCoast Wind will ensure that Project activities adhere to NMFS-authorized Incidental Take Authorization for the proposed Project • SouthCoast will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan • To reduce impacts on NARW and other marine mammals, SouthCoast Wind does not intend to conduct pile-driving activities from January 1 through April 30 • SouthCoast Wind will not conduct pile driving activities within the Enhanced Mitigation Area from June 1 through October 31		
Construction, O&M, Decommissioning	**Vessel Operations** Serious injury or mortality	• SouthCoast Wind will ensure all vessels maintain a separation distance of 328 feet (100 meters) or greater from any sighted ESA-listed whales or humpback whales (except NARW). Ensure that the following	Marine Mammals	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		avoidance measures are taken if a vessel comes within 328 feet (100 meters) of whale: • If underway, the vessel must reduce speed and shift the engine to neutral and must not engage the engines until the whale has moved beyond 328 feet (100 meters). • If stationary, the vessel must not engage engines until the whale has moved beyond 328 feet (100 meters). • SouthCoast Wind will ensure all vessels maintain a separation distance of 1,640 feet (500 meters) or greater from any sighted NARW or unidentified large marine mammal • If a vessel is stationary, the vessel must not engage engines until the NARW has moved beyond 328 feet (100 meters) • SouthCoast Wind will ensure that all vessels underway do not divert to approach any marine mammals • SouthCoast Wind will ensure that all vessels maintain a separation distance of 164 feet (50 meters) or greater from any sighted small cetacean or seal, except when a small cetacean or seal approaches the vessel • If a small cetacean or seal approaches any vessel underway, the Project vessel underway must avoid excessive speed or abrupt changes in direction to avoid injury to the animal • SouthCoast Wind will require all vessels operating within and transiting to/from the Project Area comply with the vessel strike avoidance measures specified in lease stipulations, including: • Ensure that vessel operators and crews maintain a vigilant watch for marine mammals and slow down or stop their vessel to avoid striking these protected species		

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• Ensure that vessels 65 feet (19.8 meters) in length or greater that operate between November 1 through July 31, operate at speeds of 10 knots (11.5 mph) or less • Vessel operators should monitor NMFS NARW reporting systems all year and whenever a Dynamic Management Area is established within any area vessels operate • Ensure that all vessel operators comply with 10-knot (18.5 kilometers per hour [km/hr]) speed restrictions in any Dynamic Management Area • SouthCoast Wind will ensure that all vessel operators reduce vessel speed to 10 knots or less when mother/ calf pairs, pods, or large assemblages of marine mammals are observed near an underway vessel • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan		
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance** Displacement/ harassment **Habitat Disturbance and Modification** Habitat loss and artificial reef effect	• SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan	Marine Mammals	BOEM, BSEE, and NMFS
Construction, O&M, Decommissioning	**Entanglement** Harassment/mortality **Accidental Events** Ingestion/entanglement	• SouthCoast Wind will adhere to all regulations under the EPA Clean Water Act • SouthCoast Wind will ensure that any structures or devices attached to the seafloor for continuous periods greater than 24 hours use the best available mooring systems (vertical and float lines, swivels, shackles, and anchor designs) for minimizing the risk of entanglement or entrainment of marine mammals while still ensuring the safety and integrity of the structure or device	Marine Mammals	BOEM, BSEE, EPA and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will ensure that all mooring lines and ancillary attachment lines use one or more of the following measures to reduce entanglement risk: shortest practicable line length, rubber sleeves, weak-links chains, cables, or similar equipment types that prevent lines from looping or wrapping around animals, or entrapping protected species • If an entangled live or dead marine protected species is reported, SouthCoast Wind personnel must provide any assistance to authorized stranding response personnel as requested by BOEM or NMFS • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan		
Construction, O&M, Decommissioning	**Planned Discharges/ Accidental Events** Harassment/mortality	• SouthCoast Wind will use approved OSRP mitigation measures to prevent animals from going to affected area including translocation to unaffected areas as necessary • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan • To minimize potential impacts on zooplankton from impingement and entrainment, the northernmost HVDC converter OSP will be located outside of a 10kilometer buffer of the 30-meter isobath from Nantucket Shoals.	Marine Mammals	BOEM, BSEE, and NMFS
Construction, O&M, Decommissioning	**Introduced Sound into the Environment (in-air or underwater)** Behavioral disturbance	• SouthCoast Wind will incorporate soft start methods during initial pile driving activities to allow sea turtles to migrate away from the area of effect • SouthCoast Wind will ensure that active acoustic sound sources will not be activated until the PSO has reported the clearance zone clear of all sea turtles after the appropriate amount of pre-clearance watch time has	Sea Turtles	BOEM, BSEE, USACE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		passed based on the proposed Project's Incidental Take Authorization • SouthCoast Wind will employ sound-attenuation measures (e.g., bubble curtains, insulated piles, etc.) • SouthCoast Wind will limit duration of pile driving activities to reduce sound propagation/sound exposure • SouthCoast Wind will employ shut-down procedure when protected species are detected in their respective shutdown zones in the Project Area • SouthCoast Wind will ensure that Project activities adhere to NMFS-authorized Incidental Take Authorization for the proposed Project • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan		
Construction, O&M, Decommissioning	**Vessel Operations** Serious injury or mortality	• SouthCoast Wind will ensure that all vessels underway do not intentionally approach any sighted sea turtle • SouthCoast Wind will ensure that all vessels maintain a separation distance of 164 feet (50 meters) or greater from any sighted sea turtles • SouthCoast Wind will require all vessels operating within and transiting to/from the Lease Area comply with the vessel strike avoidance measures specified in lease stipulations or NMFS authorization, including: • Ensure that vessel operators and crews maintain a vigilant watch for sea turtles and slow down or stop their vessel to avoid striking these protected species • Employ reporting system to NMFS in the event of a vessel strike • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan	Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction, O&M, Decommissioning	**Habitat Disturbance and Modification** Reduced prey availability/ habitat loss	• SouthCoast Wind will design scour protection system to reduce and minimize scour and sedimentation • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan	Sea Turtles	BOEM, BSEE, and NMFS
Construction, O&M, Decommissioning	**Entanglement** Harassment/mortality or ingestion/entanglement from marine debris	• SouthCoast Wind will adhere to all regulations under the EPA Clean Water Act. SouthCoast Wind will ensure that any structures or devices attached to the seafloor for continuous periods greater than 24 hours use the best available mooring systems (vertical and float lines, swivels, shackles, and anchor designs) for minimizing the risk of entanglement or entrainment of sea turtles, while still ensuring the safety and integrity of the structure or device • SouthCoast Wind will ensure that all mooring lines and ancillary attachment lines will use one or more of the following measures to reduce entanglement risk: shortest practicable line length, rubber sleeves, weak-links chains, cables or similar equipment types that prevent lines from looping or wrapping around animals or entrapping protected species • If an entangled live or dead marine protected species is reported, SouthCoast Wind personnel must provide any assistance to authorized stranding response personnel as requested by BOEM or NMFS • SouthCoast Wind will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan	Sea Turtles	BOEM, BSEE, EPA and NMFS
Construction, O&M, Decommissioning	**Planned Discharges/ Accidental Events** Harassment/mortality	• SouthCoast Wind will use approved OSRP mitigation measures to prevent animals from going to affected area including translocation to unaffected areas	Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast will implement measures as identified in Appendix O, Marine Mammal and Sea Turtle Monitoring and Mitigation Plan		
O&M	**Changes in Ambient EMF** Displacement/harassment	• Employ industry standard cable burial and cable shielding methods to reduce potential effects	Sea Turtles	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Seabed or Ground Disturbance/Sediment Suspension and Deposition** Unanticipated discovery of underwater cultural heritage	• SouthCoast Wind will maintain avoidance buffers around identified [marine archaeological resources], as appropriate • SouthCoast Wind will mark identified [ASLFs] for avoidance, as appropriate • SouthCoast Wind will continue to develop, in consultation with the [tribal nations] and applicable federal and state agencies, an Unanticipated Discovery Plan in the unlikely event unidentified and an unanticipated underwater cultural heritage [marine cultural resources and human remains] is encountered • Under the [UDP] (COP Volume II, Appendix Q.1; SouthCoast Wind 2024), in the event that a potential cultural resource is discovered during construction activities, all bottom-disturbing activities in the area of discovery will cease and every effort will be made to avoid or minimize damage to the potential [marine] cultural resource(s) • Training to identify archaeological resources will be provided by the QMA for resident engineers and contractor field supervisors prior to the implementation of Project and contractor personnel	Cultural – Marine Archaeological Resources	BOEM, BSEE, and USACE
Construction	**Ground Disturbance** Unanticipated discovery of terrestrial archaeological resources from ground disturbance	• SouthCoast Wind will site the onshore Project components in locations that minimize impacts on, or avoid, potential terrestrial archaeological resources, to the extent practicable	Cultural – Terrestrial Archaeological Resources	BOEM, BSEE, and USACE

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will monitor archaeological subsurface testing during construction in areas determined to have a moderate to high potential for undiscovered archaeological resources • SouthCoast Wind will implement an Unanticipated Discovery Plan that will include stop-work and notification procedures to be followed if a cultural resource is encountered during installation • SouthCoast Wind will conduct additional site-specific site evaluation and site mitigation if determined to be warranted due to the identification of archaeological resources that exhibit a potential for listing in the NRHP • SouthCoast Wind will perform fieldwork in accordance with current standards and consultation with the MHC and RIHPHC • SouthCoast Wind will work with a cultural resource consultant (CRC) to determine the need for a site visit by the CRC within 24 hours upon discovery of a potential cultural resource • SouthCoast Wind will conduct necessary archaeological investigations under archaeological permits issued by the MHC and/or RIHPHC • SouthCoast Wind will handle any discoveries of human remains in accordance with the appropriate state requirements and if they appear to be Native American will be guided by the policy statement adopted by the ACHP		
Construction, O&M, Decommissioning	**Accidental Events** Damage to unanticipated archaeological resources from accidental events	• SouthCoast Wind will implement BMPs throughout the proposed Project phases to minimize potential effects, including accidental releases • SouthCoast Wind will develop and implement a SMS and OSRP to avoid, control and address any accidental releases during all proposed Project activities	Cultural – Terrestrial Archaeological Resources	BOEM, BSEE, and USACE

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• A SPCC plan will be developed for the Project, as appropriate		
Construction, O&M, Decommissioning	**Altered Visual Conditions/ Changes to Ambient Lighting** Change in resource setting	• SouthCoast Wind proposes to design the onshore substation to mitigate visual effects to the extent feasible, improving site aesthetics by adhering to landscape codes and edge treatments, and improving substation building architecture to fit local context • SouthCoast Wind will work with the Towns of Falmouth, if Falmouth is the selected POI for Project 2, with Somerset, and with Portsmouth to ensure the lighting scheme complies with Town requirements • SouthCoast Wind will ensure the design of outdoor light fixtures at the onshore substation complies with night sky lighting standards to the extent practicable • SouthCoast Wind will keep lighting at the onshore substation to a minimum; only a few lights will be illuminated for security reasons on dusk-to-dawn sensors and other lights will utilize motion-sensing switches. The majority of lights will be switched on for emergency situations only • SouthCoast Wind will implement ADLS to reduce nighttime visual impacts • SouthCoast Wind will continue to develop Historic Property Treatment Plans to resolve any adverse visual effects on historic properties • SouthCoast Wind will develop and implement a landscape vegetation and screening plan as part of the Historic Property Treatment Plan for the Oak Grove Cemetery in Falmouth, Massachusetts, if Falmouth is the selected POI for Project 2	Cultural – Visual Effects to Historic Properties	BOEM, BSEE, USACE, MassDEP and RIDEM
Construction, O&M, Decommissioning	**Altered Visual Conditions/ Changes to Ambient Lighting**	• SouthCoast Wind proposes to design the substation and converter stations to mitigate visual effects to the extent feasible, including height, location, and color	Visual Resources	BOEM and BSEE

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
	Change in seascape/ landscape	• SouthCoast Wind proposes to design the onshore substation and converter stations to mitigate visual effects to the extent feasible, including improving site aesthetics by adhering to landscape codes and edge treatments, and improving building architecture to fit local context. • SouthCoast Wind will work with the Towns of Falmouth, if Falmouth is the selected POI for Project 2, with Somerset, and with Portsmouth to ensure the lighting scheme complies with town requirements • SouthCoast Wind will design outdoor light fixtures at the onshore substation and converter stations to comply with night sky lighting standards, to the extent practicable • SouthCoast Wind will ensure lighting at the onshore substation and converter stations will be keep to a minimum. Only a few lights will be illuminated for security reasons on dusk-to-dawn sensors and other lights will utilize motion-sensing switches. The majority of lights will be switched on for emergency situations only • SouthCoast Wind will implement an ADLS		
Construction	**Activities that Introduce Sound into the Environment: In-Air Noise** HDD activities; Presence of onshore substation and converter stations	• SouthCoast Wind will minimize the amount of work conducted outside of typical construction hours • SouthCoast Wind will maintain construction equipment and use newer models to the extent practicable to provide the quietest performance • SouthCoast Wind will, when possible, use enclosures on continuously operating equipment such as compressors and generators • SouthCoast Wind will turn off construction equipment when not in use and minimize idling times; and	In-Air Acoustics	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will mitigate the impact of noisy equipment on sensitive locations by using temporary barriers or buffering distances as practicable • SouthCoast Wind will install a temporary noise barrier, if necessary, at edges of the site, where practicable and safe • SouthCoast Wind will use equipment silencers, where required, for drilling rig exhaust, mud cleaner generator exhaust, and mud pump exhaust		
O&M	**Activities that Introduce Sound into the Environment: In-Air Noise** Onshore substation and converter stations	• SouthCoast Wind will install noise barriers at edges of the site, where necessary, to meet regulatory requirements	In-Air Acoustics	Best practice - not an enforceable measure
Construction, Decommissioning	**Introduced Sound into the Environment** Displacement; Harassment; Potential injury; Avoidance	• SouthCoast Wind will utilize noise abatement systems to decrease the sound levels produced by Project activities in the water • SouthCoast Wind will employ soft-start measures allowing for a gradual increase in sound levels before the full pile driving hammer energy is reached	Underwater Acoustics	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Workforce Hiring/ Procurement of Materials, Equipment and Services Including Port Use and Vessel Charters/Presence of Infrastructure/Influx of Non-Local Employees that Could Affect Housing** Increase in employment and economic opportunities	• SouthCoast Wind will maintain a stakeholder engagement plan with outreach and communications mechanisms to share information and gather input from external stakeholders, including potential supply chain partners, educational institutions, and workforce training providers • SouthCoast Wind will execute financial commitments pursuant to the Project's Section 83C proposal, in collaboration with the Massachusetts Clean Energy Center, including: $35 million ports and infrastructure, $10 million local innovation and entrepreneurship, $5 million applied research, $5 million workforce development, $10 million marine science, $7.5 million	Demographics and Employment, and Economics	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		operations and maintenance port upgrades, and $5 million low income strategic electrification • SouthCoast Wind will encourage the hiring of skilled and unskilled labor from the Project region		
Construction, Decommissioning	**Workforce Hiring/ Procurement of Materials, Equipment and Services Including Port Use and Vessel Charters/Presence of Infrastructure/ Influx of Non-Local Employees that Could Affect Housing/Vehicle Traffic/Planned Discharges: Air Emissions** Increase in employment opportunities; Contribution to the economy	• SouthCoast Wind will maintain a stakeholder engagement plan with outreach and communications mechanisms to share information and gather input from external stakeholders, including EJ communities • SouthCoast Wind will execute financial commitments pursuant to the Project's Section 83C proposal, under the terms of an agreement with Massachusetts Clean Energy Center, for initiatives that benefit EJ communities, including: $5 million workforce development; and $5 million low income strategic electrification • SouthCoast Wind will encourage the hiring of the skilled and unskilled labor from the Project region	Environmental Justice Minority and Lower Income Groups and Subsistence Resources	Best practice - not an enforceable measure
Construction, Decommissioning	**Presence of Infrastructure/ Influx of Non-Local Employees that Could Affect Housing/Vehicle Traffic/ Planned Discharges: Air Emissions** Installation, construction, and decommissioning activities	• SouthCoast Wind will develop and implement a Traffic Management Plan to minimize disruptions to the community in the vicinity of construction and installation activities, especially along the underground transmission route. The Traffic Management Plan will be developed in consultation with the municipalities and will be submitted for review and approval by municipal authorities • SouthCoast Wind will develop and implement an onshore construction schedule to minimize effects on recreational uses and tourism-related activities to the extent practicable • SouthCoast Wind will mandate one or more independent construction and environmental monitors to ensure compliance with the Traffic Management Plan and other environmental plans. SouthCoast Wind	Environmental Justice Minority and Lower Income Groups and Subsistence Resources	BOEM, USACE, MassDEP and RIDEM

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		will coordinate with the municipalities to determine the need for such monitoring		
O&M	**Workforce Hiring/ Procurement of Materials, Equipment and Services Including Port Use and Vessel Charters** Increase in employment opportunities	• SouthCoast Wind will execute commitment to make at least 75 percent of O&M local	Environmental Justice Minority and Lower Income Groups and Subsistence Resources	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Construction Areas and Traffic/Saturation of Tourism-related Services/ Influx of Non-Local Employees that Could Affect Housing/Vehicle Traffic/ Planned Discharges: Air Emissions** Accessibility disruption and reduced enjoyment of land-based resources due to vehicle traffic	• SouthCoast Wind will develop and implement a Traffic Management Plan to minimize disruptions to residences and commercial establishments in the vicinity of onshore construction activities; pedestrian and bicycle safety and movement would also be addressed to minimize effects of construction • SouthCoast Wind will develop an onshore construction schedule to minimize effects on recreational uses and tourism related activities to the extent feasible, such as scheduling nearshore construction activities to avoid the height of the summer tourist season and coordinating with stakeholders/visitors' bureaus to schedule outside of major events taking place onshore	Recreation and Tourism	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	Accessibility disruption due to saturation of tourism-related services	• SouthCoast Wind will provide a 1 nm (1.9 km) space between offshore structures (WTGs and OSPs) providing room for anticipated vessels to transit through and safely maneuver within the proposed Offshore Project Area • SouthCoast Wind will implement a comprehensive communication plan and a Fisheries Communication Plan to keep relevant marine stakeholders informed of the Project activities especially during the construction and decommissioning phases. This will include the distribution of notices to inform mariners of Project-	Recreation and Tourism	BOEM, BSEE

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		related activities within the offshore export cable corridors and Lease Area • SouthCoast Wind will utilize PATONs in accordance with IALA Guidance for the marking of man-made offshore structures (IALA, 2013), and USCG approval		
Construction, O&M, Decommissioning	Reduced enjoyment of land-based resources due to noise and air emissions	• SouthCoast Wind will implement BMPs throughout the Project phases to minimize potential effects • SouthCoast Wind will develop an onshore construction schedule to minimize effects on recreational uses and tourism-related activities to the extent feasible	Recreation and Tourism	Best practice - not an enforceable measure
Construction, Decommissioning	**Vessel Activity/Presence of Infrastructure** Vessel traffic and construction	• SouthCoast Wind will adhere to a 1 nm x 1 nm (1.9 km x 1.9 km) grid layout agreed upon with USCG will be the mitigation measure regarding this impact • SouthCoast Wind will direct communications of vessel schedules and locations during construction activities to Fisheries Liaison Officer, Fisheries Representative, local ports, and other networks • SouthCoast Wind will continue to participate in the MA/RI WEA joint developer Marine Affairs Working Group • SouthCoast Wind will implement construction safety zones in consultation with USCG and communicate to local mariners regarding upcoming and ongoing construction activities • SouthCoast Wind will work with fishermen to determine appropriate courses of action for areas that will be temporarily closed during specific construction activities • Where possible, the SouthCoast Wind will avoid sensitive areas and common fishing grounds nearshore and offshore • SouthCoast Wind will work with Port Agencies and Port agents to schedule and communicate activities to	Commercial and Recreational Fishing	BOEM, BSEE, and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		minimize impacts on fishing vessels coming in to not delay their ability to port and deliver their haul		
Construction, Decommissioning	**Actions that May Displace Biological Resources** Vessel activity and presence of infrastructure	• SouthCoast Wind will avoid locating onshore facilities or landfall sites in or near important fish habitats to the extent practicable • SouthCoast Wind will apply construction methods for cable laying activities that align with regulatory guidance • To mitigate impacts of vibration from pile-driving activities, SouthCoast Wind will utilize noise abatement systems around relevant construction activities • Certain construction activities have time-of-year restrictions to avoid, minimize, and mitigate impacts on marine organisms, such as sturgeon and winter flounder, which will also be protective of other demersal groundfish species • SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities • SouthCoast Wind's Boulder Relocation Plan will include a plan to document and communicate the locations of moved or newly uncovered boulders to vessels that fish in the area	Commercial and Recreational Fishing	BOEM, BSEE and NMFS
Construction, Decommissioning	**Gear Interactions** interactions	• SouthCoast Wind is currently working with commercial and recreational fishermen as well as FRs to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction • Temporary safety zone restrictions associated with construction activities will limit direct access to areas with construction activity for the safety of mariners and Project employees, but these areas will be limited spatially and temporally	Commercial and Recreational Fishing	BOEM, NMFS, and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will implement construction safety zones around active construction areas in consultation with USCG • SouthCoast Wind will notify mariners via LNMs of the presence and location of partially installed structures • The SouthCoast Wind FLO proactively contacts fishermen if their gear is entangled by geophysical and geotechnical survey operations and will continue to do so in later phases of the proposed Project, including during construction • SouthCoast Wind will consider the use of fixed mooring buoys at various strategic locations in the Project Area to avoid the need for anchoring		
O&M	**Vessel Activity/Presence of Infrastructure**	• SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners • SouthCoast Wind will implement the 1 nm x 1 nm (1.9 km x 1.9 km) grid layout agreed upon with USCG and the MA/RI WEA developers • SouthCoast Wind will work with Port Agencies and Port agents to schedule and communicate activities to minimize impacts on fishing vessels • SouthCoast Wind will adopt best practice of an east-west orientation in the Lease Area with 1 nm (1.9 km) spacing between WTG/OSP rows. Layout orientation aligns with neighboring lease holders to provide fishermen consistent navigable routes to fishing grounds • SouthCoast Wind, the SouthCoast Wind FLO, and SouthCoast Wind FRs have been in close	Commercial and Recreational Fishing	BOEM, BSEE and USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		communication with industry stakeholders to share information, and to avoid sensitive areas and common fishing grounds inshore and offshore to the extent practicable		
O&M	**Actions that May Displace Biological Resources** Vessel activity and presence of infrastructure	• SouthCoast Wind will install subsea cables to target burial depth and consider use cable shielding materials to minimize potential but unlikely effects of EMF • Cable routing has been designed to minimize cable crossings, cable length, and overlap with known fishing areas, while also maximizing the portion of the cable that can be buried and maintained at target burial depth, in order to mitigate potential impacts on fishing activity	Commercial and Recreational Fishing	BSEE
O&M	**Gear Interactions** Entanglement and snags	• The target cable burial depths that have been established will mitigate the risk of potential impact for anticipated gear types, regardless of penetration depth • Safety zones surrounding each foundation will partially include the scour protection on the seabed within that zone, and it is unlikely that fixed or mobile gear will be set or towed close enough to interact with the scour protection surrounding each foundation, in the interest of vessel safety procedures • SouthCoast Wind will work with fishermen through a gear loss claim application form to determine if reimbursement is warranted in a process similar to the compensation application process already in place for potential gear loss due to geophysical and geotechnical survey activity • SouthCoast Wind has conducted a Cable Burial Risk Assessment to calculate the target cable lowering depth to minimize risks to the offshore export cables from damage, and to mitigate potential conflicts	Commercial and Recreational Fishing	BSEE

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		between commercial or recreational fishermen and the new structure • To minimize conflicts between fishing gear and the proposed Project's inter-array and offshore export cables, the inter-array cables will be buried at a target depth of 3.2 to 8.2 feet (1.0 to 2.5 meters), and the offshore export cables will be buried at a target depth of 3.2 to 13.1 feet (1.0 to 4.0 meters) • To minimize interference with fishing activities, SouthCoast Wind has sited the export cable corridors to minimize overlap with known areas of high fishing activity • Long-term monitoring of cable burial depth and condition will serve as another mitigation strategy, ensuring appropriate burial depth is maintained during the O&M phase • Where applicable, SouthCoast Wind will record required cable protection on electronic charts to be distributed to fishermen		
Construction, Decommissioning	Change in zoning exception or relief for the installation of the landing location landfall site and onshore substation	• SouthCoast Wind will work with the local authorities and MA EFSB and RI ESFB to facilitate the authorization of the required land use	Zoning and Land Use	Best practice - not an enforceable measure
Construction, Decommissioning	**Construction Areas and Vehicle Traffic** Accessibility disruption of neighboring land uses	• SouthCoast Wind will develop and implement a Traffic Management Plan prior to construction to minimize disruptions to residences and commercial establishments in the vicinity of onshore construction activities; pedestrian and bicycle safety and movement would also be addressed to minimize effects of construction • SouthCoast Wind will develop and implement a Construction Management Plan, including an onshore construction schedule, in consultation with the local	Zoning and Land Use	BOEM, MassDEP and RIDEM

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		authorities and relevant stakeholders to minimize effects on neighboring land uses to the extent feasible • SouthCoast Wind will coordinate with stakeholders to schedule work activities outside of major events taking place onshore • SouthCoast Wind will ensure that onshore construction activities comply with local regulatory authority requirements		
Construction, Decommissioning	Reduced enjoyment of neighboring land uses due to noise, vibration, and fugitive dust	• SouthCoast Wind will implement BMPs throughout the proposed Project phases to minimize potential effects • SouthCoast Wind will develop and implement an onshore construction schedule to minimize effects on neighboring land uses to the extent feasible • SouthCoast Wind will ensure that onshore construction activities comply with local regulatory authority requirements	Zoning and Land Use	Best practice - not an enforceable measure
Construction, Decommissioning	Disruption of use due to accidental releases	• SouthCoast Wind will implement BMPs throughout the proposed Project phases to minimize potential effects • SouthCoast Wind will follow the approved SMS and OSRP to avoid, control, and address any accidental releases during all proposed Project activities	Zoning and Land Use	Best practice - not an enforceable measure
O&M	Reduced enjoyment of neighboring land uses due to noise, vibration, and fugitive dust	• SouthCoast Wind will implement best practices throughout the proposed Project phases to minimize potential effects • SouthCoast Wind will develop and implement an onshore construction schedule to minimize effects on neighboring land uses to the extent feasible • SouthCoast Wind will ensure that onshore construction activities comply with local regulatory authority requirements	Zoning and Land Use	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
O&M	Accessibility disruption of neighboring land uses due to construction areas and vehicle traffic	• If unscheduled repairs are required, SouthCoast Wind will obtain an authorization from the local authorities as required • SouthCoast Wind will coordinate with stakeholders to schedule unscheduled repairs outside of major events taking place onshore, to the extent possible • SouthCoast Wind will ensure that unscheduled repairs comply with local regulatory authority requirements	Zoning and Land Use	Best practice - not an enforceable measure
O&M	Disruption of use due to accidental events	• SouthCoast Wind will implement best practices throughout the proposed Project phases to minimize potential effects • SouthCoast Wind will develop and implement an emergency response procedure to avoid, control and address any accidental releases during all proposed Project activities	Zoning and Land Use	Best practice - not an enforceable measure
Construction	**Actions that may Displace Human Uses/ Activities that may Displace or Impact Fishing and Recreation and Tourism/Accidental Events/ Altered Visual Conditions** Vessel operations and presence of offshore equipment	• SouthCoast Wind will coordinate directly with the USCG in response to distress/Search and Rescue events • SouthCoast Wind will post LNMs on the SouthCoast Wind website • SouthCoast Wind will submit LNMs to the USCG and Fleet Command prior to the commencement of offshore construction activities • SouthCoast Wind will implement construction safety zones in consultation with USCG and communicate to local mariners regarding upcoming and ongoing construction activities. • SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of construction activity, as necessary • SouthCoast Wind will investigate means to update navigation charts with NOAA to improve communications for on-water activities	Navigation and Vessel Traffic	USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will comply with regulatory requirements • SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of construction activity, as necessary		
Construction	**Change in Ambient Lighting** Construction lighting	• SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of construction activity, as necessary	Navigation and Vessel Traffic	Best practice - not an enforceable measure
O&M	**Actions that may Displace Human Uses/ Activities that may Displace or Impact Fishing and Recreation and Tourism/Accidental Events/ Altered Visual Conditions** Vessel operations and presence of structures	• SouthCoast Wind will coordinate directly with the USCG in response to distress/Search and Rescue events • Mariner diligence and offshore standard work safety practices will be established for all Project-related vessels • SouthCoast Wind will adopt best practice of an east-west orientation in the Lease Area with 1 nm (1.9 km) spacing between WTG/OSP rows. Layout orientation aligns with neighboring lease holders to provide fishermen consistent navigable routes to fishing grounds	Navigation and Vessel Traffic	Best practice - not an enforceable measure
O&M	**Actions that may Displace Human Uses/ Activities that may Displace or Impact Fishing and Recreation and Tourism/Accidental Events/ Altered Visual Conditions** Vessel operations and presence of structures	• SouthCoast Wind will include lighting and marking of offshore proposed Project structures according to permit requirements • Marking of structures will be aligned with letter and number marking of all offshore structures within the MA/RI WEA, improving SAR and general navigation • SouthCoast Wind will maintain the Project's distance from the established Traffic Separation Scheme	Navigation and Vessel Traffic	BOEM, BSEE, USCG
O&M	**Changes in Ambient Lighting** Lighting of offshore structures	• SouthCoast Wind will submit requests for PATON permits from the USCG that consider a range of issues related to navigational safety	Navigation and Vessel Traffic	USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Decommissioning	**Accidental Events** Vessel operations	• SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of decommissioning activity, as necessary	Navigation and Vessel Traffic	Best practice - not an enforceable measure
Decommissioning	**Actions that may Displace Human Uses/ Activities that may Displace or Impact Fishing and Recreation and Tourism/Accidental Events/ Altered Visual Conditions** Presence of offshore equipment	• SouthCoast Wind will coordinate directly with the USCG in response to distress/Search and Rescue events • SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of decommissioning activity, as necessary	Navigation and Vessel Traffic	Best practice - not an enforceable measure
Decommissioning	**Changes in Ambient Lighting** Decommissioning equipment lighting	• SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of decommissioning activity, as necessary	Navigation and Vessel Traffic	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Changes in Ambient Lighting** Introduced lighting	• SouthCoast Wind will comply with USCG, BOEM and FAA marking and lighting guidelines • SouthCoast Wind will utilize PATONs approved by USCG and installed in accordance with IALA Guidance (IALA, 2013) for the marking of man-made offshore structures • SouthCoast Wind will ensure marking of structures will be aligned with letter and number marking of all offshore structures within the MA/RI WEA, improving SAR and general navigation • SouthCoast Wind will coordinate with the USCG, Air Force, Navy, NORAD, and other military and national security stakeholders to implement operational curtailment of WTGs during search and rescue operations, or other national security emergencies, near the Lease Area, as necessary • SouthCoast Wind will avoid, minimize, or mitigate effects on navigation by equipping all Project-related	Other Marine Uses	BOEM, BSEE, USCG

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		vessels and relevant infrastructure with the required navigation marking and lighting and day shapes		
Construction, O&M, Decommissioning	**Installation and Maintenance of Infrastructure** Increased marine/vessel traffic and damage to existing cables/pipelines	• SouthCoast Wind will use well established standard techniques for adequately protecting existing and newly installed cables • SouthCoast Wind will develop cable crossing specifics in consultation with the cable owners as proposed Project planning continues • SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of construction/ decommissioning activity, as necessary • SouthCoast Wind will investigate means to update navigation charts with NOAA to improve communications for on-water activities • SouthCoast Wind will establish mariner diligence and offshore standard work safety practices for all Project-related vessels	Other Marine Uses	Best practice - not an enforceable measure
Construction, O&M, Decommissioning	**Presence of Infrastructure** Obstruction to air navigation, and interference with radar systems	• SouthCoast Wind will work with the FAA and the owner/operator of any affected systems to ensure that appropriate mitigation measures are identified and implemented • SouthCoast Wind will use ADLS to reduce visual effects • SouthCoast Wind will coordinate with the DoD Siting Clearinghouse, FAA, and NORAD to determine potential effects on radars and NAVAIDS and identify appropriate mitigation measures • SouthCoast Wind will coordinate with NOAA and the Northeastern Regional Association of Coastal Ocean Observing Systems to determine potential effects on high-frequency radars and identify appropriate mitigation measures, as necessary	Other Marine Uses	Best practice - not an enforceable measure

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
O&M	**Installation and Maintenance of Infrastructure/Presence of Infrastructure** Use conflicts—military	• SouthCoast Wind will provide a 1 nm (1.9 km) space between offshore structures (WTGs and OSPs) providing room for anticipated vessels to transit through and safely maneuver within the proposed Offshore Project Area • SouthCoast Wind will align marking of structures with letter and number marking of all offshore structures within the MA/RI WEA, improving SAR and general navigation • SouthCoast Wind will liaise with the military and national security stakeholders to reduce potential conflicts. • SouthCoast Wind will ensure mariner diligence and offshore standard work safety practices are established for all Project-related vessels	Other Marine Uses	BOEM, BSEE, and USCG
Construction	**Unplanned Events** Allisions and collisions, unplanned releases, and occupational hazards	• SouthCoast Wind will operate under an approved SMS • SouthCoast Wind will utilize on-scene safety vessel(s) and/or personnel to advise mariners of decommissioning activity, as necessary • SouthCoast Wind will investigate means to update navigation charts with NOAA to improve communications for on-water activities • SouthCoast Wind will develop and implement an onshore Traffic Management Plan prior to construction to address vehicular, bicycle, and pedestrian safety • SouthCoast Wind will ensure onshore work would also be planned to be performed primarily off-season when there are fewer people in the area • SouthCoast Wind will operate under an approved OSRP that details prevention and control measures of unplanned releases in the Project Area • SouthCoast Wind will ensure Project Vessels will adhere to USCG regulations surrounding planned and unplanned discharges	Public Health and Safety	BOEM, USCG, MassDEP and RIDEM

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• SouthCoast Wind will prepare and submit an SWPPP for onshore construction activities before start of construction		
O&M	**Unplanned Events** Allisions and collisions, unplanned releases, and occupational hazards	• SouthCoast Wind will maintain the northeast approach Traffic Separation Scheme • Mariner diligence and offshore standard work safety practices will be established for all Project-related vessels • SouthCoast Wind will adopt best practice of an east-west orientation in the Lease Area with 1 nm (1.9 km) spacing between WTG/OSP rows. Layout orientation aligns with neighboring lease holders to provide fishermen consistent navigable routes to fishing grounds • SouthCoast Wind will include lighting and marking of offshore proposed Project structures according to permit requirements • Marking of structures will be aligned with letter and number marking of all offshore structures within the MA/RI WEA, improving SAR and general navigation. • In the event that scheduled or unscheduled repairs are required that would impede onshore traffic flow, an authorization will be obtained from the local authorities as required. • SouthCoast Wind will follow measures prescribed and detailed in the approved SMS and OSRP • SouthCoast Wind will operate under an approved OSRP that details prevention and control measures of unplanned releases in the Project Area • Project Vessels will adhere to USCG regulations surrounding planned and unplanned discharges	Public Health and Safety	BOEM, BSEE, USCG, MassDEP and RIDEM

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Applicant-Proposed Measures from COP Appendix O, SouthCoast Wind Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (SouthCoast Wind 2024)				
PSO and Acoustic PSO (PAM Operator) Training, Experience and Responsibilities				
Construction	**Observer qualifications and training**	• PSOs and Acoustic PSOs (APSO / PAM Operators) will have met NMFS and BOEM training and experience requirements. • PSOs and APSOs will be employed by a third-party observer provider. Briefings between construction supervisors and crews and the PSO/APSO team will be held prior to the start of all pile driving activities, as well as when new personnel join the vessel(s). • At least one PSO on duty at all times will have prior experience working as a PSO. • APSOs responsible for determining if an acoustic detection originated from a NARW will be trained in identification of mysticete vocalizations.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
	Responsibilities and authorities of PSOs	• PSOs will have no other responsibilities while on watch. • Any PSO or APSO on duty will have the authority to delay the start of operations or to call for a shutdown based on their observations or acoustic detection. • A clear line and method of communication between the PSOs/APSOs and pile-driving crew will be established and maintained to ensure mitigation measures are conveyed without delay.		
Visual Monitoring				
Construction	**Number of PSOs**	• A sufficient number of PSOs will be stationed aboard the installation and/or nearby support vessels to meet the following criteria: ○ At least two PSOs on duty during all pre-clearance periods and active pile driving; - At least one PSO on duty during all other daylight periods.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		○ A maximum of four consecutive hours on watch per PSO. ○ A maximum of 12 hours on watch during a 24-hour period.		
	Visual monitoring methods	• Observations will be conducted from the best safe vantage point(s) on the construction or nearby support vessel to ensure visibility of the clearance zones. • When conducting observations during pile driving, PSOs will scan systematically with the unaided eye, high magnification (25x) binoculars, and/or standard handheld (7x) binoculars to search continuously for marine mammals during all observational periods. • When monitoring at night, PSOs will monitor for marine mammals and other protected species using night-vision goggles with thermal clip-ons and a hand-held spotlight. • PSOs will watch for and record all marine mammal sightings regardless of the distance from the observer and/or sound source. • Distances to observed animals will be estimated with range finders, reticule binoculars, or clinometers when possible and based on the best estimate of the PSO when necessary. • PSOs will record watch effort and environmental conditions on a routine basis.		
	Visual monitoring during vessel transit	• PSOs and/or trained vessel crew will observe for marine mammals and sea turtles at all times when vessels are transiting to/from and in the Project Area and port. • PSOs and/or vessel crew will request ship-strike avoidance measures if necessary (see below).		
Acoustic Monitoring				

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Construction	**Number of APSOs**	• At least one APSO during all pre-clearance periods and active pile driving. • A maximum of 4 consecutive hours on watch per APSO. • A maximum of 12 hours of watch time per 24-hour period per APSO.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
	Passive acoustic monitoring methods	• A real-time PAM system will be used to supplement visual monitoring during pre-piling clearance and throughout pile driving. • Use of PAM will allow initiation of pile driving when visual observation of the entire clearance zone is not possible due to poor visibility, including darkness. • A detailed description of the real-time PAM system will be developed during the Marine Mammal Protection Act Incidental Take Authorization process. • The PAM system may not be located on the pile-installation vessel to reduce masking of marine mammals sounds. • The APSOs will immediately communicate all acoustic detections of marine mammals to PSOs performing visual observations including any determination regarding species identification, distance, and bearing of the marine mammal.		

	Sound source verification	• A detailed plan for Sound Source Verification will be developed during the Marine Mammal Protection Act Incidental Take Authorization process.
		• Components of the plan will likely include:
		  ○ Measurements of the largest of each pile type (monopiles and/or jacket piles) to be installed with and without noise attenuating systems to quantify the effectiveness of the system(s).
		  ○ Measurements will be taken at distances designed to verify modeled distances to Level A and Level B		

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		thresholds and/or other mitigation action distances. ○ Measurement results will be used to modify, if necessary, distances to Level A and Level B thresholds and estimate effects in a post-construction monitoring report.		
Clearance Zones				
Construction	**Clearance zones for protected species**	• Because of the low probability of a long-term exposure event and for practical implementation reasons, it is anticipated that the Clearance Zones will be similar to those listed below, with the final distances to be determined during the MMPA ITA application process: • North Atlantic Right Whale: 1 km; - Mysticete whales (low-frequency cetaceans): 0.5 km; - Harbor porpoise (high-frequency cetaceans): 0.12 km; - All other marine mammals (mid-frequency cetaceans and pinnipeds): 0.05 km; and - Sea Turtles: 0.05 km.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
Pre-start Clearance				
Construction	**Pre-start clearance**	• Prior to the beginning of each pile driving event, PSOs and APSOs will monitor for marine mammals and sea turtles for a minimum of 30 minutes and continue at all times during pile driving. • If a marine mammal is detected within or approaching the shutdown zone (via visual observation or PAM) during the preclearance period, pile driving will not begin until the animal(s) is confirmed to have exited the relevant shutdown zone, or until an additional time period has elapsed with no further sighting of the animal. • Additional time period will be 15 minutes for odontocetes and pinnipeds and 30 minutes for mysticetes and sea turtles.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Soft-Start				
Construction	**Soft-start**	• Soft-start procedures will be followed, to the extent practicable, at the beginning of each pile driving event or any time pile driving has stopped for longer than 30 minutes. • If a marine mammal is detected within or about to enter the shutdown zone during the soft-start procedure, pile driving will be delayed and measures will be followed as stated in Section 7.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
Shutdowns				
Construction	**Shutdowns**	• PSOs or APSOs will request a shutdown of pile driving if a marine mammal or sea turtle is detected within or about to enter the applicable shutdown zone for that species (see Section 4). • If a shutdown is not feasible at that time in the installation process because of a risk to human or vessel safety or the risk of jeopardizing the installation process, a reduction in the hammer energy of the greatest extent possible will be considered and implemented. • Following shutdown, pile driving will restart using the same procedure described above during pre-start clearance.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
Potential Additional Measure to Protect North Atlantic Right Whale				
Construction	**NARW protection measures**	• By concentrating construction activities when NARW are less likely to be present in the region (May 1 through December 31), including the Lease Area, the amount of activity to occur when more NARW are likely to be present can be reduced, thereby reducing the total potential impacts on NARW.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• To accomplish this, SouthCoast Wind will propose additional monitoring and mitigation measures to support the start (or continuation) of pile driving at night or in poor visibility conditions during the period when NARW are less likely to be present. • Specific monitoring tools and plans will be developed as a part of the MMPA ITA process, but may include the use of advanced infrared systems, real-time PAM, autonomous underwater vehicles, autonomous aerial vehicles, or other advanced technologies.		
Vessel Strike Avoidance				
Construction	**General measures**	• A minimum of one PSO or trained vessel crew will be present on all vessels when transiting. • Observers will maintain a vigilant watch for all marine mammals and slow down or stop vessels to avoid striking protected species. • Monitoring the NMFS NARW reporting systems from November 1 through May 30 and whenever a DMA is established in the operational area.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS
	Separation distances	• Maintaining >500-meter distance from any sighted NARW or an unidentified large marine mammal. • Maintaining >100-meter from all ESA-listed whales or humpback whales. • Maintaining >50 meters from all other marine mammals, with the exception of delphinids and pinnipeds that approach the vessel, in which case the vessel operator must avoid excessive speed or abrupt changes in direction		
	Actions given observed marine mammal	• If underway, vessels will steer a course away from any NARW at 10 kts or less until the 500-meter minimum separation distance has been established.		

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		• If a NARW comes within 100 meters, then the vessel will reduce speed and shift the engines into neutral, if safe to do so. The vessel will not engage engines until the NARW has moved beyond 100 meters, in which case, any vessel will steer a course away from the animal at 10 knots or less until the 500-meter minimum separation distance has been established. • If the vessel is stationary, the vessel will not engage engines until the NARW has moved beyond 100 meters, in which case any vessel will steer a course away from the animal at 10 knots or less until the 500-meter minimum separation distance has been established. • Report sightings of all dead or injured marine mammals or sea turtles within 24 hours.		
	Speed reduction	• Reducing speed of all vessels, except CTVs, to ≤10 knots between November 1 through May 30. • From November 1 through May 30, CTVs may travel at over 10 knots. However, if a NARW is detected via visual observation within or approaching the transit route, all CTVs will travel at 10 knots or less for the remainder of that day. • Operating vessels, except CTVs, will travel at speeds ≤10 knots in any DMA. • Reducing vessel speeds to ≤10 knots when mother/calf pairs, pods, or large assemblages of marine mammals are observed. • Complying with speed restrictions (≤10 knots) in NARW management areas including SMAs and active DMAs, except as noted previously for CTVs.		
Reporting Dead or Injured Marine Mammals				
Construction, O&M, Decommissioning	**Actions given a marine mammal is**	• The activity(ies) resulting in the injury/death will be stopped immediately.	Marine Mammals and Sea Turtles	BOEM, BSEE, and NMFS

Project Phase	Impact Producing Factors Potential Effect or Category	Description	Resource Area Mitigated	Anticipated Enforcing Agency
	taken in a prohibited manner by construction activities	• The incident will be reported to the NMFS Office of Protected Resources and the NMFS New England Stranding Network Coordinator. • The report will include all available information required by the IHA or the NMFS stranding report form. • SouthCoast Wind will not resume the activity which resulted in the injury until NMFS is able to review the circumstances of the prohibited take and authorize resumption of the activity(ies).		
	Actions given an unknown and recent observed dead or injured marine mammal	• SouthCoast Wind will immediately report the incident to the NMFS Office of Protected Resources and the NMFS New England Stranding Network Coordinator. • The report will include the same information identified for a take by construction activity. • Activities will continue while NMFS reviews the circumstances of the incident and works with SouthCoast Wind to determine whether modifications to the activities are appropriate.		
	Actions given observation of a dead or injured marine mammal not associated with or related to construction activities	• SouthCoast Wind will report the incident to the NMFS Office of Protected Resources and the NMFS New England Stranding Network Coordinator, within 24 hours of the discovery. • SouthCoast Wind will include any documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network including photographs and video footage if available. • Construction activity may continue.		

ACHP = Advisory Council on Historic Preservation; ADLS = Aircraft Detection Lighting System; APSO = acoustic protected species observer; ASLF = ancient submerged landform feature; BMP = best management practice; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; BUAR = Board of Underwater Archaeological Resources; CFR = code of federal regulation; COP = Construction and Operations Plan; CRC = cultural resource consultant; CTV = crew transfer vessel; DMA = dynamic management area; DP = dynamic positioning; EFH = essential fish habitat; EJ = environmental justice; EMF = electromagnetic fields; EPA = Environmental Protection Agency; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FLO = fisheries liaison officer; FR = fisheries representative; HDD = horizontal directional drilling; HRG = high-resolution geophysical; HVDC = high-voltage direct current; IALA = International Association of Marine Aids to Navigation and Lighthouse

Authorities; IHA = Incidental Harassment Authorization; ITA = Incidental Take Authorization; km = kilometer; km/hr = kilometer per hour; LNM = local notice to mariners; MA = Massachusetts; MA EFSB = Massachusetts Energy Facilities Siting Board; MassDEP = Massachusetts Department of Environmental Protection; MHC = Massachusetts Historical Commission; mph = mile per hour; NARW = North Atlantic right whale; NAVAIDS = navigational aids; NHESP = Natural Heritage & Endangered Species Program; nm = nautical mile; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NORAD = North American Aerospace Defense Command; NOx = nitrogen oxides; NRHP = National Register of Historic Places; O&M = operations and maintenance; OSRP = oil spill response plan; OSP = offshore substation platform; PAM = passive acoustic monitoring; PATON = private aid to navigation; PSO = protected species observer; QMA = qualified marine archaeologist; RI = Rhode Island; RI EFSB = Rhode Island Energy Facility Siting Board; RIDEM = Rhode Island Department of Environmental Management; RIHPHC = Rhode Island Historical Preservation & Heritage Commission; SAR = search and rescue; SHPO = state historic preservation officer; SMS = safety management system; SPCC = spill prevention, control, and countermeasure; SWPPP = stormwater pollution prevention plan; THPO = Tribal Historic Preservation Officer; UDP = Unanticipated Discovery Plan; USCG = United States Coast Guard; USFWS = United States Fish and Wildlife Service; WEA = wind energy area; WTG = wind turbine generator

G.2 Agency-Proposed Mitigation Measures

Table G-2 identifies agency-proposed mitigation measures that have been proposed to mitigate and/or monitor potential impacts from the Project. The paragraphs below provide additional information regarding the mitigation measures.

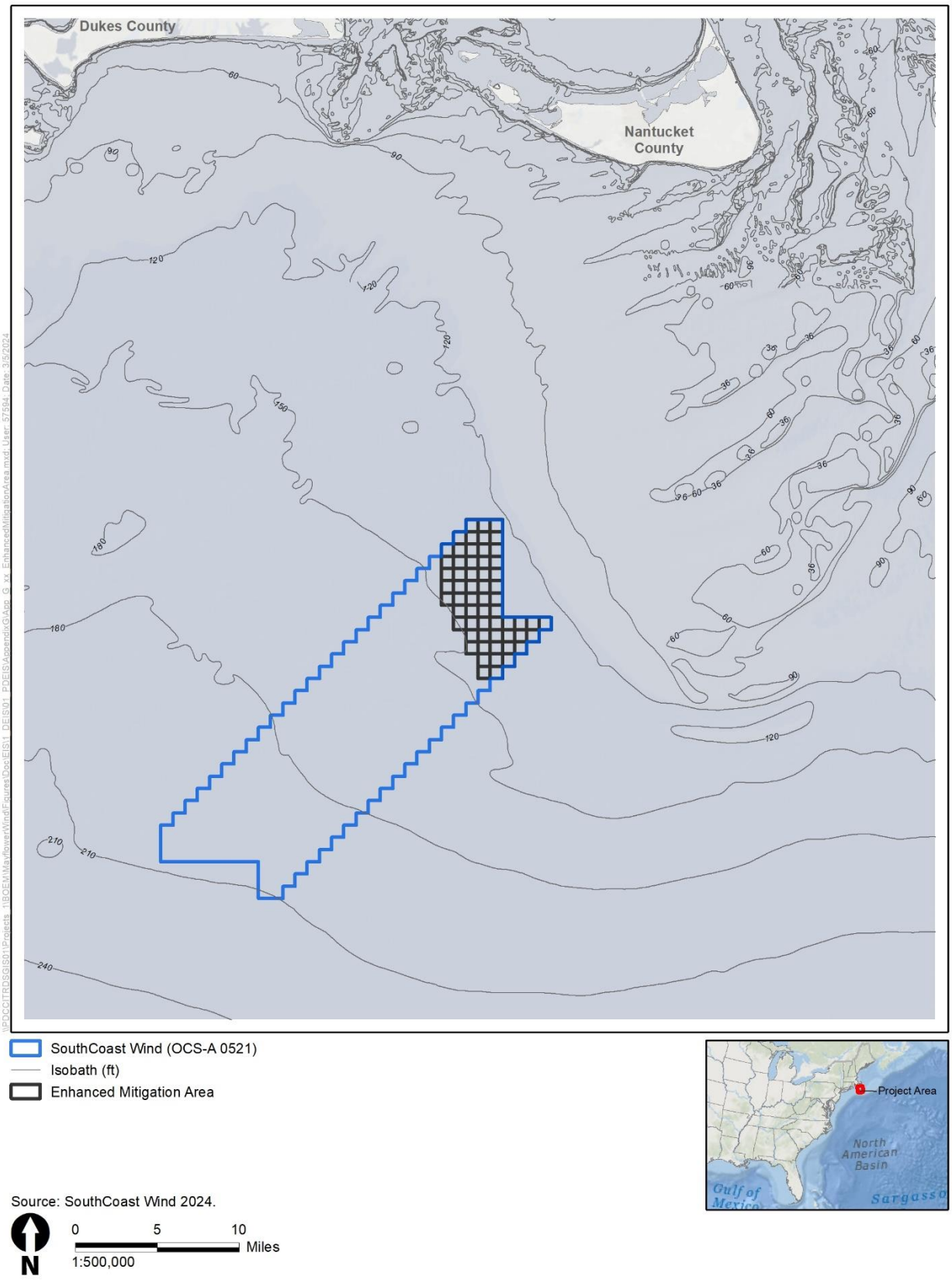

Figure G-1. SouthCoast Wind enhanced mitigation area

Table G-2. Mitigation and monitoring measures resulting from consultations

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
NHPA Section 106 Mitigation Measures from the Memorandum of Agreement					
CUL-1	Pre-C, C, O&M, D	Compliance with Section 106 Memorandum of Agreement	The Lessee will comply with stipulations of the *Memorandum of Agreement Among the Bureau of Ocean Energy Management, Mashantucket (Western) Pequot Tribal Nation, Mashpee Wampanoag Tribe, Wampanoag Tribe Of Gay Head (Aquinnah), The State Historic Preservation Officers of Massachusetts and Rhode Island, Southcoast Wind Energy LLC, and The Advisory Council on Historic Preservation Regarding the SouthCoast Wind Project* (hereafter referred to as the MOA) as developed by BOEM through NHPA Section 106 consultations with federally recognized Tribes, Massachusetts and Rhode Island SHPOs, ACHP, and consulting parties to resolve adverse effects on historic properties. As defined in the Section 106 regulations, consulting parties include those who are property owners of or have demonstrated interest in the historic properties BOEM has determined would be adversely affected by the Project.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Massachusetts Board of Underwater Archaeological Resources, Rhode Island Historical Preservation & Heritage Commission
CUL-2	C	Avoidance of Adverse Effects on Historic Properties in Marine Area of Potential Effect	Per MOA Stipulation I.A.1, the Lessee will comply with protective buffers recommended by the Qualified Marine Archaeologist (QMA) for 31 identified marine archaeological resources and seven ASLFs to avoid adverse effects on these historic properties in the marine APE.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Massachusetts Board of Underwater Archaeological Resources, Rhode Island Historical Preservation & Heritage Commission
CUL-3	C	Funding and Implementation of Historic Properties Treatment Plan for Historic Properties in the Marine Area of Potential Effects	Per MOA Stipulation III.C.1 and the associated HPTP (MOA, Attachment 8), the Lessee will implement the measures described in the HPTP and fund these measures per the agreed-upon amounts in *Mitigation Funding Amounts* (MOA, Attachment 5) to resolve adverse effects on historic properties in the marine APE.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Massachusetts Board of Underwater Archaeological Resources, Rhode Island Historical Preservation & Heritage Commission
CUL-4	Pre-C, C, O&M, D	Marine Archaeology Post-Review Discovery Plan	Per MOA Stipulation XI, if historic properties are discovered that may be historically significant or unanticipated effects on historic properties are found, or in the event of a post-review discovery of a historic property or unanticipated effects on a historic property prior to or during construction, installation, O&M, or decommissioning of the Project, the Lessee will implement the actions described in the post-review discovery plan (PRDP) for marine archaeology (MOA, Attachment 13).	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Board of Underwater Archaeological Resources, Rhode Island Historical Preservation & Heritage Commission
CUL-5	C	Archaeological Monitoring in the Terrestrial Area of Potential Effects	Per MOA Stipulation I.A.2, the Lessee will implement a construction monitoring program consistent with the monitoring plan for terrestrial archaeology (MOA, Attachments 3 and 4).	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Rhode Island Historical Preservation & Heritage Commission
CUL-6	C	Funding and Implementation of Historic Properties Treatment Plans for Historic Properties in the Terrestrial Area of Potential Effects	Per MOA Stipulation III.D.1 and the associated HPTP (MOA, Attachment 7), the Lessee will implement the measures described in the HPTP and fund these measures per the agreed-upon amounts in *Mitigation Funding Amounts* (MOA, Attachment 5) to resolve adverse effects on historic properties in the terrestrial APE.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Rhode Island Historical Preservation & Heritage Commission

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
CUL-7	Pre-C, C, O&M, D	Terrestrial Archaeology Post-Review Discovery Plan	Per MOA Stipulation XI, if historic properties are discovered that may be historically significant or unanticipated effects on historic properties are found, or in the event of a post-review discovery of a historic property or unanticipated effects on a historic property prior to or during construction, installation, O&M, or decommissioning of the Project, the Lessee will implement the actions described in the PRDP for terrestrial archaeology (MOA, Attachment 14).	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Rhode Island Historical Preservation & Heritage Commission
CUL-8	C, O&M	Minimization of Adverse Effects on Historic Properties in the Visual Area of Potential Effects	Per MOA Stipulation II.A, the Lessee will implement measures for minimizing adverse effects on historic properties in the visual APE to decrease visual clutter, reduce visual contrast, and reduce light intrusion.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Rhode Island Historical Preservation & Heritage Commission
CUL-9	C	Funding and Implementation of Historic Properties Treatment Plans for Historic Properties in the Visual Area of Potential Effects	Per MOA Stipulation III.C.1 and the associated HPTPs (MOA, Attachments 8–11), the Lessee will implement the measures described in these HPTPs and fund these measures per the agreed-upon amounts in *Mitigation Funding Amounts* (MOA, Attachment 5) to resolve adverse effects on historic properties in the visual APE.	Cultural	BOEM, BSEE, Massachusetts Historical Commission, Rhode Island Historical Preservation & Heritage Commission
Measures included in BOEM's NMFS BA that are Part of the Proposed Action for ESA Consultation (October 2024)					
BA-1	C	LOA Requirements	The measures required by the final MMPA LOA for Incidental Take Regulations would be incorporated into COP approval.	Marine Mammals	BOEM and BSEE
BA-2	C, O&M, D	Geophysical Surveys and ESA Species	SouthCoast Wind must comply with all the Project Design Criteria and Best Management Practices for Protected Species from the documents "Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection" and "Offshore Wind Site Assessment and Site Characterization Activities Programmatic Consultation" that implement the integrated requirements for threatened and endangered species in the June 29, 2021, programmatic consultation under the ESA (revised November 22, 2021), as well as the June 29, 2021, NMFS Letter of Concurrence (LoC).	Marine Mammals, Sea Turtles, ESA-Listed Species	BOEM and BSEE
BA-4	C, O&M, D	Protected Species Detection and Vessel Strike Avoidance: Vessel Crew and Visual Observer Training Requirements	The Lessee must provide Project-specific training to all vessel crew members, Visual Observers, and Trained Lookouts on the identification of sea turtles and marine mammals, vessel strike avoidance and reporting protocols, and the associated regulations for avoiding vessel collisions with protected species. Reference materials for identifying sea turtles and marine mammals must be available aboard all Project vessels. Confirmation of the training and understanding of the requirements must be documented on a training course log sheet, and the Lessee must provide the log sheets to DOI upon request. The Lessee must communicate to all crew members its expectation for them to report sightings of sea turtles and marine mammals to the designated vessel contacts. The Lessee must communicate the process for reporting sea turtles and marine mammals (including live, entangled, and dead individuals) to the designated vessel contact and all crew members. The Lessee must post the reporting instructions including communication channels in highly visible locations aboard all Project vessels.	Marine Mammals, Sea Turtles	BOEM
BA-5	C, O&M, D	Protected Species Detection and Vessel Strike Avoidance: Vessel Observer Requirements	The Lessee must ensure that vessel operators and crew members maintain a vigilant watch for marine mammals and sea turtles, and reduce vessel speed, alter the vessel's course, or stop the vessel as necessary to avoid striking marine mammals or sea turtles. All vessels transiting to and from the SouthCoast Wind farm must have a trained lookout for NARWs on duty at all times, during which the trained lookout must monitor a vessel strike avoidance zone around the vessel. The trained lookout must maintain a vigilant watch at all times a vessel is underway, and when technically feasible, be capable of monitoring the 500-meter Vessel Strike Avoidance Zone for ESA-listed species and to maintain minimum separation distances. Alternative monitoring technology (e.g., night vision, thermal cameras) must be available to maintain a vigilant watch at night and in any other low visibility conditions. If a vessel is carrying a trained lookout for the purposes of maintaining watch for NARWs, a trained lookout for sea turtles is not required, provided that the trained lookout maintains watch for marine mammals and sea turtles. If the trained lookout is a vessel crew member, the lookout obligations, as noted above, must be that person's designated role and primary responsibility while the vessel is transiting. Vessel personnel must be provided an Atlantic reference guide to help identify marine mammals and sea turtles that may be encountered. Vessel personnel must also be provided material regarding NARW Seasonal Management Areas (SMAs), Dynamic Management Areas (DMAs), and Slow Zones, sightings information, and reporting. All observations must be recorded per reporting requirements.	Marine Mammals, Sea Turtles	BOEM

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			Outside of active watch duty, members of the monitoring team must check NMFS Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs in the SouthCoast Wind farm. The trained lookout must check https://seaturtlesightings.org before each trip and report any detections of sea turtles in the vicinity of the planned transit to all vessel operators or captains and lookouts on duty that day. For all vessels operating north of the Virginia/North Carolina border, between June 1 and November 30, the Lessee must have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. For all vessels operating south of the Virginia/North Carolina border, year-round, the Lessee must have a trained lookout posted on all vessel transits during all phases of the Project to observe for sea turtles. The trained lookout will communicate any sightings in real time to the captain to implement required avoidance measures.		
BA-6	Pre-C, C, O&M, D	Protected Species Detection and Vessel Strike Avoidance: Communication of Threatened and Endangered Species Sightings	The Lessee must ensure that whenever multiple Project vessels are operating, any visual detections of ESA-listed species (marine mammals and sea turtles) are communicated in near real time to a third-party Protected Species Observer (PSO), vessel captains, or both associated with other Project vessels.	Marine Mammals, Sea Turtles	BOEM
BA-7	C, O&M, D	Protected Species Detection and Vessel Strike Avoidance: Vessel Speed Requirements	Vessel captain and crew must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any listed species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised upon the sighting of a single individual. Vessels underway must not divert their course to approach any protected species. During construction, vessels of all sizes will operate port to port at 10 knots or less between November 1 and April 30 and while operating in the Lease Area, along the export cable route, or transit area to and from ports. Regardless of vessel size, vessel operators must reduce vessel speed to 10 knots (11.5 mph) or less while operating in any Seasonal Management Area (SMA) or visually detected Slow Zones. This requirement does not apply when necessary for the safety of the vessel or crew. Any such events must be reported (see reporting requirements). Otherwise, these speed limits do not apply in areas of Narragansett Bay or Long Island Sound where the presence of NARWs is not expected. The Lessee may only request a waiver from any visually triggered Slow Zone/DMA vessel speed reduction requirements during operations and maintenance, by submitting a vessel strike risk reduction plan that details revised measures and an analysis demonstrating that the measure(s) will provide a level of risk reduction at least equivalent to the vessel speed reduction measure(s) proposed for replacement. The plan included with the request must be provided to NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division and BOEM at least 90 days prior to the date scheduled for the activities for the waiver is requested. The plan must not be implemented unless NMFS and BOEM reach consensus on the appropriateness of the plan. BOEM encourages increased vigilance through voluntary implementation of best management practices to minimize vessel interactions with NARWs, and by voluntarily reducing speeds to 10 knots or less when operating within an acoustically triggered slow zone, and when feasible, avoid Slow Zones.	Marine Mammals, Sea Turtles	BOEM
BA-8	C, O&M, D	Vessel Strike Avoidance of Large Cetaceans	All vessel operators must check for information regarding mandatory or voluntary ship strike avoidance and daily information regarding NARW sighting locations. These media may include, but are not limited to: NOAA weather radio, U.S. Coast Guard NAVTEX and Channel 16 broadcasts, Notices to Mariners, the Whale Alert app, or WhaleMap website. Information about active SMAs and Slow Zones can be accessed at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales If an ESA-listed whale or large unidentified whale is identified within 1,640 feet (500 meters) of the forward path of any vessel (90 degrees port to 90 degrees starboard), the vessel operator must immediately implement strike avoidance measures and steer a course away from the whale at 10 knots (18.5 kilometers per hour) or less until the vessel reaches a 1,640-feet (500 meter) separation distance from the whale. Trained lookouts, visual observers, vessel crew, or PSOs must notify the vessel captain of any whale observed or detected within 1,640 feet (500 meters) of the survey vessel. Upon notification, the vessel captain must immediately implement vessel strike avoidance procedures to maintain a separation distance of 1,640 feet (500 meters) or reduce vessel speed to allow the animal to travel away from the vessel. If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator must assume that it is a NARW and execute the required vessel strike avoidance measures to avoid the animal. If an ESA-listed large whale is sighted within 656 feet (200 meters) of the forward path of a vessel, the vessel operator must initiate a full stop by reducing speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 1,640 feet (500 meters). If stationary, the vessel must not engage engines until the ESA-listed large whale has moved beyond 1,640 feet (500 meters).	Marine Mammals	BOEM, NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
BA-9	C, O&M, D	Vessel Strike Avoidance of Small Cetaceans and Seals	If pinnipeds or small delphinids of the genera Delphinus, Lagenorhynchus, Stenella, or Tursiops are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel speed reduction, course alteration, and shutdown are not required. For small cetaceans and seals, all vessels must maintain a minimum separation distance of 164 feet (50 meters) to the maximum extent practicable, except when those animals voluntarily approach the vessel. When marine mammals are sighted while a vessel is underway, the vessel operator must endeavor to avoid violating the 164-foot (50-meter) separation distance by attempting to remain parallel to the animal's course and avoiding excessive speed or abrupt changes in vessel direction until the animal has left the area, except when taking such measures would threaten the safety of the vessel or crew. If marine mammals are sighted within the 164-foot separation distance, the vessel operator must reduce vessel speed and shift the engine to neutral, not engaging the engines until animals are beyond 164 feet (50 meters) from the vessel.	Marine Mammals	BOEM
BA-10	C, O&M, D	Vessel Strike Avoidance of Sea Turtles	The Lessee must slow down to 4 knots if a sea turtle is sighted within 328 feet (100 meters) of the operating vessel's forward path. The vessel operator must then proceed away from the turtle at a speed of 4 knots or less until there is a separation distance of at least 328 feet (100 meters) at which time the vessel may resume normal operations. If a sea turtle is sighted within 164 feet (50 meters) of the forward path of the operating vessel, the vessel operator must shift to neutral when safe to do so and then proceed away from the individual at a speed of 4 knots or less until there is a separation distance of at least 328 feet (100 meters), at which time normal vessel operations may be resumed. Between June 1 and November 30, all vessels must avoid transiting through areas of visible jellyfish aggregations or floating vegetation (e.g., *Sargassum* lines or mats). In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas. All vessel crew members must be briefed on the identification of sea turtles and on regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of sea turtles. The expectation and process for reporting of sea turtles (including live, entangled, and dead individuals) must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to report.	Sea Turtles	BOEM
BA-11	Pre-C, C, O&M, D	Reporting of All NARW Sightings	The Lessee must immediately report all NARWs observed at any time by PSOs or vessel personnel on any Project vessels, during any Project- related activity, or during vessel transit. Reports must be sent to: BOEM (at renewable_reporting@boem.gov) and BSEE (at protectedspecies@bsee.gov); the NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); the Coast Guard (via Channel 16); and WhaleAlert (through the WhaleAlert app at http://www.whalealert.org/). The report must include the time, location, and number of animals.	Marine Mammals	BOEM
BA-12	Pre-C, C, O&M, D	Detected or Impacted Protected Species Reporting	The Lessee is responsible for reporting dead or injured protected species, regardless of whether they were observed during operations or due to Project activities. The Lessee must report any potential take, strikes, dead, or injured protected species caused by Project vessels or sighting of an injured or dead marine mammal or sea turtle, regardless of the cause, to the NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (at nmfs.gar.incidental-take@noaa.gov), NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at protectedspecies@bsee.gov). Reporting must be as soon as practicable but no later than 24 hours from the time the incident took place (Detected or Impacted Protected Species Report). Staff responding to the hotline call will provide any instructions for the handling or disposing of any injured or dead protected species by individuals authorized to collect, possess, and transport sea turtles. Reports must include at a minimum: (1) survey name and applicable information (e.g., vessel name, station number); (2) GPS coordinates describing the location of the interaction (in decimal degrees); (3) gear type involved (e.g., bottom trawl, gillnet, longline); (4) soak time, gear configuration and any other pertinent gear information; (5) time and date of the interaction; and (6) identification of the animal to the species level. Additionally, the e-mail would transmit a copy of the NMFS Take Report Form and a link to or acknowledgement that a clear photograph or video of the animal was taken (multiple photographs are suggested, including at least one photograph of the head scutes). If reporting within 24 hours is not possible due to distance from shore or lack of ability to communicate via phone, fax, or email, reports would be submitted as soon as possible; late reports would be submitted with an explanation for the delay. At the end of each survey season, a report would be sent to NMFS that compiles all information on any observations and interactions with ESA-listed species. This report would also contain information on all survey activities that took place during the season including location of gear set, duration of soak/trawl, and total effort. The report on survey activities would be comprehensive of all activities, regardless of whether ESA-listed species were observed.	Marine Mammals, Sea Turtles, ESA-Listed Species	BOEM
BA-13	Pre-C, C, O&M, D	Detected or Impacted Dead Non-ESA-Listed Fish	Any occurrence of at least 10 dead non-ESA-listed fish within established shutdown or monitoring zones must also be reported to BOEM (at renewable_reporting@boem.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting.	ESA-Listed Species	BOEM

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
BA-14	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Time-of-Year Restriction	The Lessee must not conduct any foundation pile-driving activities between December 1 and April 30. Pile driving must not occur in December unless unanticipated delays due to weather or technical problems arise that necessitate extending pile driving through December, and the pile driving is allowed by BOEM in accordance with the following procedures. The Lessee must notify BOEM in writing by September 1 that the Lessee believes that circumstances necessitate pile driving in December. The Lessee must submit to BOEM (at renewable_reporting@boem.gov) for written concurrence an enhanced survey plan for December 1 through December 31 to minimize the risk of exposure of NARWs to pile-driving noise, including noise from daily pre-construction geophysical surveys. BOEM will review the enhanced survey plan and provide comments, if any, on the plan within 30 calendar days of its submittal. The Lessee must resolve all comments on the enhanced survey plan to BOEM's satisfaction and receive BOEM's written concurrence before any pile driving occurs. However, the Lessee may conclusively presume BOEM's concurrence with the enhanced survey plan if BOEM provides no comments on the plan within 90 calendar days of its submittal. The Lessee must also follow the time-of-year enhanced mitigation measures specified in the applicable Biological Opinion. The Lessee must confirm adherence to time-of-year restrictions on pile driving in the pile-driving reports submitted with the FIR.	Marine Mammals, ESA-Listed Species	BOEM
BA-15	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Weather, Time, and Visibility Restrictions	The Lessee must not conduct pile driving operations at any time when lighting or weather conditions (e.g., darkness, rain, fog, sea state) prevent visual monitoring of the full extent of the clearance and shutdown zones. In order to conduct nighttime pile driving, SouthCoast Wind would submit a Nighttime Pile Driving Plan (NPDP) as part of the Alternative Monitoring Plan (AMP) to BOEM and NMFS for approval. The NPDP will describe the methods, technologies, monitoring zones, and mitigation requirements for any nighttime pile driving activities. In the absence of an approved NPDP, all pile driving would be initiated during daytime and nighttime pile driving could only occur if unforeseen circumstances prevent the completion of pile driving during daylight hours and was deemed necessary to continue piling during the night to protect asset integrity or safety. The AMP, including the NPDP if nighttime pile driving is planned, must be submitted by the Lessee to BOEM and NMFS for review and approval 180 calendar days, but no later than 120 days, prior to the planned start of pile-driving. The full AMP may include deploying additional observers, alternative monitoring technologies such as night vision, thermal, and infrared technologies, and use of PAM and must demonstrate the ability and effectiveness to maintain clearance all pre-clearance and shutdown zones during daytime as outlined below in Part 1 and nighttime as outlined below in Part 2 to BOEM's and NMFS's satisfaction. The AMP must include two stand-alone components as described below: 1. Part 1 – Daytime when lighting or weather (e.g., fog, rain, sea state) conditions prevent visual monitoring of the full extent of the clearance and shutdown zones. Daytime being defined as one hour after civil sunrise to 1.5 hours before civil sunset. 2. Part 2 – Nighttime inclusive of weather conditions (e.g., fog, rain, sea state). Nighttime being defined as 1.5 hours before civil sunset to one hour after civil sunrise. The AMP should include, but is not limited to the following information: 1. Identification of night vision devices (e.g., mounted thermal/IR camera systems, hand-held or wearable NVDs, IR spotlights), if proposed for use to detect protected marine mammal and sea turtle species. 2. The AMP must demonstrate (through empirical evidence) the capability of the proposed monitoring methodology to detect marine mammals and sea turtles within the full extent of the established clearance and shutdown zones (i.e., species can be detected at the same distances and with similar confidence) with the same effectiveness as daytime visual monitoring (i.e., same detection probability). Only devices and methods demonstrated as being capable of detecting marine mammals and sea turtles to the maximum extent of the clearance and shutdown zones will be acceptable. 3. Evidence and discussion of the efficacy (range and accuracy) of each device proposed for low visibility monitoring must include an assessment of the results of field studies (e.g., Thayer Mahan demonstration), as well as supporting documentation regarding the efficacy of all proposed alternative monitoring methods (e.g., best scientific data available). 4. Procedures and timeframes for notifying NMFS and BOEM of SouthCoast Wind's intent to pursue nighttime pile driving. 5. Reporting procedures, contacts and timeframes. BOEM may request additional information, when appropriate, to assess the efficacy of the AMP.	Marine Mammals, ESA-Listed Species	BOEM
BA-16	Pre-C, C, O&M, D	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: PSO Requirements	. The Lessee must use PSOs provided by a third party. PSOs must have no Project- related tasks other than to observe, collect and report data, and communicate with and instruct relevant vessel crew regarding the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards). PSOs or any PAM operators serving as PSOs must have completed a commercial PSO training program for the Atlantic with an overall examination score of 80 percent or greater. The Lessee must provide training certificates for individual PSOs to BOEM upon request. And PSOs and PAM operators must be approved by NMFS before the start of a survey. Application requirements to become a NMFS-approved PSO for construction activities can be found online or for geological and geophysical surveys by sending an inquiry to nmfs.psoreview@noaa.gov. Specific PSO Requirements include:	Marine Mammals, Sea Turtles, ESA-Listed Species	BOEM, NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			1. At least one PSO must be on duty at all times as the lead PSO or as the PSO monitoring coordinator during pile driving. Total PSO coverage must be adequate to ensure effective monitoring to reliably detect whales and sea turtles in the identified clearance and shutdown zones and execute any pile driving delays or shutdown requirements. 2. At least one lead PSO must be present on each vessel. PSOs on transit vessels must be approved by NMFS but need not be authorized as a lead PSO. Lead PSOs must have prior approval from NMFS as an unconditionally approved PSO. 3. All PSOs on duty must be clearly listed and the lead PSO identified on daily data logs for each shift. 4. A sufficient number of PSOs, consistent with the Biological Opinion and as prescribed in the final Incidental Take Authorization (ITA), must be deployed to record data in real time and effectively monitor the required clearance, shutdown, or monitoring zone for the Project. 5. The duties of these PSOs include visual surveys in all directions around a pile; PAM; and continuous monitoring of sighted NARWs. 6. Where applicable, the number of PSOs deployed must meet the NARW enhanced seasonal monitoring requirements. A PSO must not be on watch for more than 4 consecutive hours and must be granted a break of no fewer than 2 hours after a 4-hour watch.		
BA-17	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Monitoring Plan Requirements	The Lessee must submit a Pile-Driving Monitoring (PDM) Plan for review to BOEM (at renewable_reporting@boem.gov), BSEE (at OSWsubmittals@bsee.gov), and NMFS 180 calendar days, but no later than 120 days, before beginning the first pile-driving activities for the Project. DOI will review the PDM Plan and provide any comments on the plan within 90 calendar days of its submittal. The Lessee must resolve all comments on the PDM Plan to DOI's satisfaction before implementing the plan. If DOI provides no comments on the PDM Plan within 90 calendar days of its submittal, then the Lessee may conclusively presume DOI's concurrence with the plan. The PDM Plan must: 1. Contain information on the visual and PAM components of the monitoring describing all equipment, procedures, and protocols; 2. The PAM system must demonstrate a near-real-time capability of detection to the full extent of the 160 dB distance from the pile-driving location; 3. The PAM plan must include a detection confidence that a vocalization originated from within the clearance and shutdown zones to determine that a possible NARW has been detected. Any PAM detection of a NARW within the clearance/shutdown zone surrounding a pile must be treated the same as a visual observation and trigger any required delays in pile installation. 4. Ensure that the full extent of the harassment distances from piles are monitored for marine mammals and sea turtles to document all potential take; 5. Include number of PSOs or Native American monitors, or both, that will be used, the platforms or vessels upon which they will be deployed, and contact information for the PSO providers; 6. Include measures for enhanced monitoring capabilities in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. Include an Alternative Monitoring Plan that provides for enhanced monitoring capabilities in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. The Alternative Monitoring Plan must also include measures for deploying additional observers, using night vision goggles, or using PAM with the goal of ensuring the ability to maintain all clearance and shutdown zones in the event of unexpected poor visibility conditions. Describe a communication plan detailing the chain of command, mode of communication, and decision authority must be described. PSOs as determined by NMFS and BOEM must be used to monitor the area of the clearance and shutdown zones. Seasonal and species-specific clearance and shutdown zones must also be described in the PDM Plan including time-of-year requirements for NARWs. A copy of the approved PDM Plan must be in the possession of the lessee representative, the PSOs, impact-hammer operators, and any other relevant designees operating under the authority of the approved COP and carrying out the requirements on site.	Marine Mammals, Sea Turtles	BOEM, NMFS
BA-18	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Soft Start for Pile Driving	The Lessee must implement soft start techniques for all impact pile-driving, both at the beginning of a monopile installation and at any time following the cessation of impact pile-driving of 30 minutes or longer. The soft start procedure must include a minimum of 20 minutes of 4-6 strikes/minute at 10-20 percent of the maximum hammer energy.	ESA-Listed Species	BOEM
BA-19	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Sound	The Lessee must ensure that the distance to the Level A harassment and Level B harassment thresholds, sea turtle injury and harassment thresholds, and Atlantic sturgeon injury and harassment thresholds are no larger than those modelled assuming 10 dB re 1 µPa noise attenuation is met by conducting field verification during pile-driving. The Lessee must submit a Sound Field Verification Plan (SFVP) for review and comment to the USACE, BOEM (at renewable_reporting@boem.gov), and NMFS (at nmfs.gar.incidental-take@noaa.gov) 180 calendar days, but no later than 120 days, before beginning the first pile-driving activities for the Project. DOI will review the SFVP and provide any comments on the plan within 30 calendar days of its submittal. The Lessee must resolve all comments on the SFVP to DOI's satisfaction before implementing the plan. The Lessee may conclusively presume DOI's concurrence with the SFVP if DOI	Sea Turtles, ESA-Listed Species	BOEM, NMFS, USACE

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		Field Verification Plan	provides no comments on the plan within 90 calendar days of its submittal. The Lessee must execute the SFVP and report the associated findings to BOEM for 3 monopile foundations, or as specified under the corresponding LOA for this action. The Lessee must conduct additional field measurements if it installs piles with a diameter greater than the initial piles, if it uses a greater hammer size or energy, or if it measures any additional foundations to support any request to decrease the distances specified for the clearance and shutdown zones. The Lessee must implement the SFVP requirements for verification of noise attenuation for at least 3 foundations for BOEM, in consultation with NMFS, to consider reducing zone distances. The Lessee must ensure that locations identified in the SFVP for each pile type are representative of other piles of that type to be installed and that the results are representative for predicting actual installation noise propagation for subsequent piles. The SFVP must describe how the effectiveness of the sound attenuation methodology will be evaluated. The SFVP must be sufficient to document impacts in Level B harassment zones for marine mammals and injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon.		
BA-20	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Adaptive Refinement of Clearance Zones, Shutdown Zones, and Monitoring Protocols	The Lessee must reduce any unanticipated impacts on marine mammals and sea turtles by adjusting pile-driving monitoring protocols for clearance and shutdown zones, taking into account weekly monitoring results (see BA-28). Any proposed changes to monitoring protocols must be concurred with by DOI and NMFS before those protocols are implemented. Any reduction in the size of the clearance and shutdown zones for each foundation type must be based on at least 3 measurements submitted to BOEM and NMFS for review. For each 4,921 feet (1,500 meters) that a clearance or shutdown zone is increased based on the results from SFVP, the Lessee must deploy additional platforms and must deploy additional observers on those platforms. Should the shutdown zone for sei, fin, humpback, and sperm whales be decreased the full extent of the Level B harassment distance must be monitored using PAM and visual observations. Decreases in the distance of the clearance or shutdown zones for NARW and sea turtles are not permitted.	Marine Mammals, Sea Turtles	BOEM, NMFS
BA-21	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Clearance Zones (No-go Zones) for Sea Turtles	The Lessee must minimize the exposure of ESA-listed sea turtles to noise that may result in injury or behavioral disturbance during pile-driving operations by tasking the PSOs to establish a clearance and shutdown zone for sea turtles during all pile-driving activities that is no less than 1,640 feet (500 meters) between 60 minutes before pile-driving activities, during pile driving and 30 minutes post-completion of pile-driving activity. Adherence to the 1,640-foot (500-meter) clearance and shutdown zones must be confirmed in the PSO reports	Sea Turtles	BOEM, NMFS
BA-22	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Impact Pile-Driving Clearance Zones (No-go Zones) for Marine Mammals	The Lessee must use visual monitoring by at least two PSOs and PAM during impact pile-driving activities following the standard protocols and data collection requirements. The Lessee must ensure that at least two PSOs are on duty on the impact pile driving platform and at least two PSO are on duty on a dedicated PSO vessel and establish the following clearance zones for NARWs to be used between 60 minutes before pile-driving activities and 30 minutes post-completion of pile-driving activity: • The Lessee must establish a clearance zone of 1.37 miles (2.2 kilometers) for large whales other than NARW using visual monitoring for impact pile driving. • The Lessee must also establish a PAM clearance zone of 3.1 miles (5 kilometers) and a PAM shutdown zone of 1.23 miles (2 kilometers) for NARWs. • Impact pile driving activity must be delayed when a NARW is visually observed by PSOs at any distance from the pile. Impact pile driving for all foundations must be delayed upon a confirmed PAM detection of a NARW, if the detection is confirmed to have been located within the 5 km clearance zone. • No pile driving may begin unless all clearance zones have been free of NARW for 30 minutes immediately before pile driving. The Lessee must deploy a real-time PAM system designed and verified to maintain a PAM clearance zone of 3.1 miles (5 km) and a shutdown zone of 1.23 miles (2 km) for all monopile foundations. • Real-time PAM must begin at least 60 minutes before pile driving to monitor a 3.1 mile (5 km) clearance zone. • The real-time PAM system must be configured to ensure that the PAM operator is able to review acoustic detections within approximately 15 minutes of the original detection in order to verify whether a NARW has been detected. • Impact pile driving must be suspended upon a confirmed PAM NARW vocalization within the PAM shutdown Zone detected and identified as a NARW. The detection will be treated as a NARW detection for mitigation purposes	Marine Mammals	BOEM
BA-23	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity:	The Lessee must use visual monitoring by at least two PSOs during vibratory pile-driving activities. The Lessee must ensure that PSOs are on a dedicated PSO vessel and establish clearance zones for NARWs to be used between 30 minutes before pile-driving activities and 30 minutes post-completion of pile-driving activity. For all ESA-listed Mysticete whales and sperm whales, a clearance zone of 4,921 feet (1,500 meters) is to be established. For sea turtles, a clearance zone of 1,640 feet (500 meters) is to be established.	Marine Mammals, ESA-Listed Species	BOEM

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		Vibratory Pile-Driving Clearance Zones (No-go Zones) for ESA-listed Species and Marine Mammals	Vibratory pile driving may begin only after PSOs have confirmed all clearance zones are clear of marine mammals. Vibratory pile driving must be suspended if a marine mammal is visually observed by PSOs within the shutdown zone. At all times of the year, any unidentified whale sighted by a PSO within 6,562 feet (2,000 meters) of the pile must be treated as if it were a NARW and trigger any required pre-construction delay or shutdowns during pile installation. Vibratory pile driving may begin only if all clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, or snow) for at least 30 minutes as determined by the lead PSO. If conditions such as darkness, rain, fog, or snow prevent the visual detection of marine mammals in the clearance zones, construction activities must not begin until the full extent of all clearance zones are fully visible as determined by the lead PSO.		
BA-24	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Noise Mitigation for Impact Pile Driving	The Lessee must apply noise reduction technologies during all impact pile driving to minimize marine species noise exposure. The range measured to the Level B harassment threshold when noise mitigation devices are in use must be consistent with or less than the range modeled assuming 10 dB attenuation, determined via sound field verification of the modeled isopleth distances (e.g., Level B harassment distances). If a bubble curtain is used, the following requirements apply: Bubble curtains must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column. The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100 percent seafloor contact. No parts of the ring or other objects may prevent full seafloor contact of the lowest bubble ring. The Lessee must train personnel in the proper balancing of air flow to the bubblers. The Lessee must submit an inspection and performance report to DOI within 72 hours following the performance test. Any modifications to attenuation devices to meet the performance standards must occur before impact driving occurs and maintenance or modifications completed must be included in the report. The Lessee must ensure PSOs follow all pile driving reporting instructions and requirements.	ESA-Listed Species	BOEM and USACE
BA-25	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Noise Reporting and Clearance or Shutdown Zone Adjustment	The Lessee must measure pile-driving noise in the field for at least three monopile foundations and submit initial results to NMFS, USACE, and BOEM (at renewable_reporting@boem.gov) as soon as they are available. BOEM will discuss the results as soon as feasible. The Lessee may request modification of the clearance and shutdown zones based on these results but must meet or exceed minimum distances for threatened and endangered species specified in the Biological Opinion (e.g., 3,280 feet [1,000 meters] for large whales and 1,640 feet [500 meters] for sea turtles). If the field measurements indicate that the isopleths for noise exposure are larger than those considered in the approved COP, the Lessee must coordinate with BOEM, BSEE, NMFS, and USACE to implement additional sound attenuation measures or larger clearance or shutdown zones before driving any additional piles. NMFS does not anticipate considering any reductions in the clearance or shutdown zones for NARWs.	ESA-Listed Species	BOEM, BSEE, NMFS, and USACE
BA-26	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Pile-Driving Work Within a Slow Zone	If a visually triggered NARW Slow Zone overlaps with the NARW Shutdown Zone, the PAM system detection must extend to the largest practicable detection zone. PSOs must treat any PAM detection of NARWs in the clearance and shutdown zones the same as a visual detection and call for the required delays or shutdowns in pile installation.	Marine Mammals	BOEM
BA-27	C	Wind Turbine Foundations Pile Driving/Impact Hammer Activity: Submittal of Raw Field Data Collected for Marine Mammals and Sea Turtles in the Pile-Driving Shutdown Zone	Within 24 hours of detection, the Lessee must report to BOEM (at renewable_reporting@boem.gov) and BSEE (at protectedspecies@bsee.gov) the sighting of any marine mammal or sea turtle in the shutdown zone that results in a shutdown or a power-down. In addition, PSOs must submit the raw data collected in the field and daily report forms including the date, time, species, pile identification number, GPS coordinates, time and distance of the animal when sighted, time the shutdown or power-down occurred, behavior of the animal, direction of travel, time the animal left the shutdown zone, time the pile driver was restarted or powered back up, and any photographs.	Marine Mammals, Sea Turtles, ESA-Listed Species	BOEM
BA-28	C	Wind Turbine Foundations Pile Driving/Impact	The Lessee must submit weekly PSO and PAM monitoring reports to DOI and NMFS during pile-driving. Weekly reports must document the daily start and stop times of all pile-driving, the daily start and stop times of associated observation periods by the PSOs, details on the deployment of PSOs, and all detections of marine mammals and sea turtles. The weekly reports must be submitted to BOEM (at renewable_reporting@boem.gov), BSEE (at OSWsubmittals@bsee.gov) and	ESA-Listed Species	BOEM, BSEE, NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
		Hammer Activity: Weekly and Final Pile-Driving Reports	NMFS Greater Atlantic Regional Fisheries Office, Protected Resources Division (at nmfs.gar.incidental- take@noaa.gov) every Wednesday during construction for the previous week (Sunday through Saturday) of monitoring of pile-driving activity. Weekly monitoring reports must include: Summaries of pile-driving activities and piles installed including, start and stop times, pile locations, and PSO coverage; Vessel operations (including port departures, number of vessels, type of vessel(s), and route); All protected species sightings; Vessel strike-avoidance measures taken; and any equipment shutdowns or takes that may have occurred. Weekly reports can consist of raw data. Required data and reports provided to DOI may be archived, analyzed, published, and disseminated by BOEM. PSO data must be reported weekly (Sunday through Saturday) from the start of visual and/or PAM efforts during pile-driving activities, and every week thereafter until the final reporting period upon conclusion of pile-driving activity. Any editing, review, and quality assurance checks must be completed only by the PSO provider prior to submission to NMFS and DOI. The Lessee must submit to DOI at renewable_reporting@boem.gov and OSWsubmittals@bsee.gov a final summary report of PSO monitoring 90 days following the completion of pile driving.		
BA-29	Pre-C, C, O&M, D	Marine Debris Awareness and Elimination: Marine Debris Awareness Training	The Lessee must ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the approved COP complete marine trash and debris awareness training annually. The training consists of two parts: (1) viewing a marine trash and debris training video or slide show (described below); and (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at https://www.bsee.gov/debris or by contacting BSEE. The training videos, slides, and related material may be downloaded directly from the website. Operators engaged in marine survey activities must continue to develop and use a marine trash and debris awareness training and certification process that reasonably assures that their employees and contractors are in fact trained. a. The training process would include the following elements: b. Viewing of either a video or slide show by the personnel specified above; c. An explanation from management personnel that emphasizes their commitment to the requirements; d. Attendance measures (initial and annual); and e. Recordkeeping and the availability of records for inspection by DOI. By January 31 of each year, the Lessee would submit to DOI an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. The Lessee would send the reports via email to BOEM (at renewable_reporting@boem.gov) and to BSEE (at OSWsubmittals@bsee.gov).	ESA-Listed Species	BOEM, BSEE
BA-30	Pre-C, C, O&M, D	Marine Debris Awareness and Elimination: Marine Debris Reporting	The Lessee must report to DOI (using the email address listed on DOI's most recent incident reporting guidance) all lost or discarded marine trash and debris. This report must be made monthly and submitted no later than the fifth day of the following month. The Lessee is not required to submit a report for those months in which no marine trash and debris was lost or discarded. In addition, the Lessee must submit a report within 48 hours of the incident (48-hour Report) if the marine trash or debris could: (a) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, with particular attention to marine trash or debris that could entangle or be ingested by marine protected species; or (b) significantly interfere with OCS uses (e.g., because the marine trash or debris is likely to snag or damage fishing equipment or presents a hazard to navigation). The information in the 48-hour report must be the same as that listed for the monthly report, but only for the incident that triggered the 48-hour Report. The Lessee must report to DOI via email to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWsubmittals@bsee.gov) if the object is recovered and, as applicable, describe any substantial variance from the activities described in the Recovery Plan that were required during the recovery efforts. The Lessee must include and address information on unrecovered marine trash and debris in the description of the site clearance activities provided in the decommissioning application required under 30 C.F.R. § 585.906. Materials, equipment, tools, containers, and other items used in OCS activities which are of such shape or properly secured to prevent loss overboard. All markings must clearly identify the owner and must be durable enough to resist the effects of the environmental conditions to which they may be exposed.	ESA-Listed Species	BOEM, BSEE
BA-31	O&M, D	Marine Debris: Periodic Underwater Surveys, Reporting of Monofilament and Other Fishing Gear Around WTG Foundations	The Lessee must monitor indirect impacts associated with charter and recreational fishing gear lost from expected increases in fishing around WTG foundations by surveying at least 10 different WTGs in the SouthCoast Wind Lease Area annually. Survey design and effort may be modified based upon previous survey results with review and concurrence by DOI. The Lessee must conduct surveys by remotely operated vehicles, divers, or other means to determine the frequency and locations of marine debris. The Lessee must report the results of the surveys to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWsubmittals@bsee.gov) in an annual report, submitted by April 30 for the preceding calendar year. Reports must be submitted in Word format. Photographic and videographic materials will be provided on a drive in a lossless format such as TIFF or Motion JPEG 2000. Reports must include daily survey reports that include the survey date, contact information of the operator, location, and pile identification number, photographic and/or video documentation of the survey and debris encountered, any animals sighted, and the disposition of any located debris (i.e., removed or left in place). Required data and reports may be archived, analyzed, published, and disseminated by BOEM. BMPs will be coordinated with NOAA's marine debris program.	ESA-Listed Species	BOEM, BSEE

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
BA-32	C	Establishment of Shutdown Zones for Vibratory Pile Driving	Ensure that vibratory pile-driving operations are carried out in a way that minimizes the exposure of listed sea turtles to noise that may result in injury or behavioral disturbance, PSOs will establish a 1,640-foot (500-meter) shutdown zone for all pile-driving activities. Adherence to the 1,640-foot (500-meter) shutdown zones must be reflected in the PSO reports. Any visual detection of sea turtles the 500-meter shutdown zones must trigger the required shutdown in pile installation. Upon a visual detection of a sea turtles entering or within the shutdown zone during pile-driving, SouthCoast Wind must shut down the pile-driving hammer (unless activities must proceed for human safety or for concerns of structural failure) from when the PSO observes, until: 1) The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance area; or 2) 30 minutes have elapsed without re-detection of the sea turtle(s) by the lead PSO Additionally, if shutdown is called for but SouthCoast Wind determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility, reduced hammer energy must be implemented, when the lead engineer determines it is technically feasible to do so.	Sea Turtles	BOEM
BA-33	C, O&M, D	Sea turtle disentanglement	Vessels deploying fixed gear (e.g., pots/traps) must have adequate disentanglement equipment onboard, such as a (i.e., knife and boathook) onboard. Any disentanglement must occur consistent with the Northeast Atlantic Coast STDN Disentanglement Guidelines at https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501 and the procedures described in "Careful Release Protocols for Sea Turtle Release with Minimal Injury" (NOAA Technical Memorandum 580; https://repository.library.noaa.gov/view/noaa/3773).	Sea Turtles, ESA-Listed Species	BOEM, BSEE, NMFS
BA-34	C, O&M, D	Sea turtle/Atlantic sturgeon identification and data collection	Any sea turtles or Atlantic sturgeon caught or retrieved in any fisheries survey gear must first be identified to species or species group. Each ESA-listed species caught or retrieved must then be documented using appropriate equipment and data collection forms. Biological data collection, sample collection, and tagging activities must be conducted as outlined below. Live, uninjured animals must be returned to the water as quickly as possible after completing the required handling and documentation. a. The Sturgeon and Sea Turtle Take Standard Operating Procedures must be followed (https://media.fisheries.noaa.gov/2021-11/Sturgeon%20%26%20Sea%20Turtle%20Take%20SOPs_external_11032021.pdf). b. Survey vessels must have a passive integrated transponder (PIT) tag reader onboard capable of reading 134.2 kHz and 125 kHz encrypted tags (e.g., Biomark GPR Plus Handheld PIT Tag Reader). This reader must be used to scan any captured sea turtles and sturgeon for tags, and any tags found must be recorded on the take reporting form (see below). c. Genetic samples must be taken from all captured Atlantic sturgeon (alive or dead) to allow for identification of the DPS of origin of captured individuals and tracking of the amount of incidental take. This must be done in accordance with the Procedures for Obtaining Sturgeon Fin Clips (https://media.fisheries.noaa.gov/dam-migration/sturgeon_genetics_sampling_revised_june_2019.pdf). i. Fin clips must be sent to a NMFS-approved laboratory capable of performing genetic analysis and assignment to DPS of origin. SouthCoast Wind must cover all reasonable costs of the genetic analysis. Arrangements for shipping and analysis must be made before samples are submitted and confirmed in writing to NMFS within 60 days of the receipt of the Project BiOp with ITS. Results of genetic analyses, including assigned DPS of origin must be submitted to NMFS within 6 months of the sample collection. ii. Subsamples of all fin clips and accompanying metadata forms must be held and submitted to a tissue repository (e.g., the Atlantic Coast Sturgeon Tissue Research Repository) on a quarterly basis. The Sturgeon Genetic Sample Submission Form is available for download at: https://media.fisheries.noaa.gov/2021-02/Sturgeon%20Genetic%20Sample%20Submission%20sheet%20for%20S7_v1.1_Form%20to%20Use.xlsx?nullhttps://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic. d. All captured sea turtles and Atlantic sturgeon must be documented with required measurements and photographs. The animal's condition and any marks or injuries must be described. This information must be entered as part of the record for each incidental take. Particularly, a NMFS Take Report Form must be filled out for each individual sturgeon and sea turtle (download at: https://media.fisheries.noaa.gov/2021-07/Take%20Report%20Form%2007162021.pdf?null) and submitted to NMFS as described in the take notification measure below.	Sea Turtles, ESA-Listed Species	BOEM, BSEE, NMFS
BA-35	C, O&M, D	Sea turtle/Atlantic sturgeon handling and resuscitation guidelines	Any sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys must be handled and resuscitated (if unresponsive) according to established protocols provided at-sea conditions are safe for those handling and resuscitating the animal(s) to do so. Specifically: a. Priority must be given to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used. Handling times for these species must be minimized, and if possible, kept to 15 minutes or less to limit the amount of stress placed on the animals. b. All survey vessels must have onboard copies of the sea turtle handling and resuscitation requirements (found at 50 CFR 223.206(d)(1)) before begging any on-water activity (download at: https://media.fisheries.noaa.gov/dam-migration/sea_turtle_handling_and_resuscitation_measures.pdf). These handling and resuscitation procedures must be carried out any time a sea turtle is incidentally captured and brought onboard the vessel during survey activities. c. If any sea turtles that appear injured, sick, or distressed, are caught and retrieved in fisheries survey gear, survey staff must immediately contact the Greater Atlantic Region Marine Animal Hotline at 866-755-6622 for further instructions and guidance on handling the animal, and potential coordination of transfer to a	Sea Turtles, ESA-Listed Species	BOEM, BSEE, NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			rehabilitation facility. If survey staff are unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), the USCG must be contacted via VHF marine radio on Channel 16. If required, hard-shelled sea turtles (i.e., non-leatherbacks) may be held on board for up to 24 hours and managed in accordance with handling instructions provided by the Hotline before transfer to a rehabilitation facility. d. Survey staff must attempt resuscitate any Atlantic sturgeon that are unresponsive or comatose by providing a running source of water over the gills as described in the Sturgeon Resuscitation Guidelines (https://media.fisheries.noaa.gov/dam-migration/sturgeon_resuscitation_card_06122020_508.pdf). e. If appropriate cold storage facilities are available on the survey vessel, any dead sea turtle or Atlantic sturgeon must be retained on board the survey vessel for transfer to an appropriately permitted partner or facility on shore unless NMFS indicates that storage is unnecessary, or storage is not safe. f. Any live sea turtles or Atlantic sturgeon caught and retrieved in gear used in any fisheries survey must ultimately be released according to established protocols including safety considerations.		
BA-36	C, O&M, D	Lost Survey Gear	If any survey gear is lost, all reasonable efforts that do not compromise human safety would be undertaken to recover the gear. All lost gear would be reported to NMFS (nmfs.gar.incidental-take@noaa.gov) and BSEE (OSWsubmittals@bsee.gov) within 24 hours of the documented time of missing or lost gear. This report would include information on any markings on the gear and any efforts undertaken or planned to recover the gear	ESA-Listed Species	NMFS, BSEE
Conservation Measures and Reasonable and Prudent Measures and Terms and Conditions from the USFWS Biological Opinion Issued September 1, 2023					
Conservation Measures					
1	Project design, O&M	Turbine configuration and maintenance	a. The WTG design provides a wind turbine air gap (minimum blade tip elevation to the sea surface) to minimize collision risk to marine birds (e.g., roseate terns) that may fly close to the ocean surface. b. To minimize attracting birds to operating turbines, SouthCoast Wind must install bird perching-deterrent devices where such devices can be safely deployed on WTGs and ESPs. The location of bird-deterrent devices proposed by SouthCoast Wind must be based on best management practices applicable to the appropriate operation and safe installation of the devices. SouthCoast Wind must submit for BOEM and Service approval a plan to deter perching on offshore infrastructure by listed species. The plan must include the type(s) and locations of bird perching-deterrent devices, include a maintenance plan for the life of the project, allow for modifications and updates as new information and technology become available, and track the efficacy of the deterrents. The plan will be based on best available science regarding the effectiveness of perching deterrent devices on minimizing collision risk.	Birds	BOEM, BSEE, and USFWS
2	O&M	Offshore Lighting	To aid safe navigation, SouthCoast Wind must comply with all Federal Aviation Administration (FAA), USCG, and BOEM lighting, marking, and signage requirements. a. SouthCoast Wind will use lighting technology that minimizes impacts on avian species to the extent practicable. b. SouthCoast Wind will implement an ADLS on WTGs and ESPs. SouthCoast Wind must use an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind facility to reduce visual impacts at night. SouthCoast Wind must confirm the use of an FAA-approved vendor for ADLS on WTGs and ESPs in the Fabrication and Installation Report. c. SouthCoast Wind is required to light each WTG and ESP in a manner that is visible by mariners in a 360-degree arc around the structure. Conditional on USCG approval, and to minimize the potential of attracting migratory birds, the top of each USCG-required marine navigation light will be shielded to minimize upward illumination. Coordination with the USCG regarding maritime navigation lighting occurs post-COP approval, generally at least 120 calendar days prior to installation. The Service will be afforded an opportunity to review a copy of SouthCoast Wind's application to USCG to establish Private Aids to Navigation (PATON), which includes a lighting, marking, and signaling plan. The PATON application will include design specifications for maritime navigation planning. Following approval of the PATON by the USCG, the BOEM and the Service will work together to evaluate the USCG-approved navigation lighting system, in order to characterize the color, intensity, and duration of any light from maritime lanterns that is likely to reach the typical flight heights of listed birds and will assess the degree to which the light is likely to attract or disorient listed birds. This information will be considered, as appropriate, in future estimates of projected collision levels, in any future updates to the ITS accompanying this BO, and in future iterations of the Compensatory Mitigation Plan, if any.	Birds, Bats	BOEM, BSEE, and USFWS
3	O&M	Collision Risk Model Support	The BOEM has funded the development of SCRAM, which builds on and improves earlier collision risk modeling frameworks. The Service fully supports SCRAM as a scientifically sound method for integrating best available information to assess collision risk for the listed bird species. The first generation of SCRAM was released in early 2023 and still reflects a number of consequential data gaps and uncertainties. The BOEM has already committed to funding Phase 2 of the development of SCRAM. We expect that the current limitations of SCRAM will decrease substantially over time as more tracking data are incorporated into the model (e.g., from more individual birds tagged in more geographic areas, improved bird tracking capabilities, and emerging tracking technologies), and as modeling methods and computing power continue to improve. Via this Conservation Measure, the BOEM commits to continue funding the refinement and advancement of SCRAM, or its	Birds	BOEM, BSEE, and USFWS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			successor, with the goal of continually improving the accuracy and robustness of collision mortality estimates. This commitment is subject to the allocation of sufficient funds to the BOEM from Congress. This commitment will remain in effect until one of the following occurs: iii. the SouthCoast Wind turbines cease operation; iv. the Service concurs that a robust weight of evidence has demonstrated that collision risks to all listed birds from SouthCoast Wind turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or v. the Service concurs that further development of SCRAM (or its successor) is unlikely to improve the accuracy or robustness of collision mortality estimates.		
4	O&M	Collision Risk Model Utilization	The BOEM will work cooperatively with the Service to re-run the SCRAM model (or its successor) for the SouthCoast Wind project according to the following schedule: • At least annually for the first 3 years of WTG operation. • At least every other year for years 4 to 10 of WTG operation (i.e., years 4, 6, 8, and 10). • At least every 5 years between year 10 and the termination of WTG operation (i.e., years 15, 20, 25, and 30). Between these regularly scheduled model runs, the BOEM will also re-run the SCRAM model (or its successor) within 90 days of each major model release or update, and at any time upon request by the Service or SouthCoast Wind, and at any time as desired by the BOEM. Prior to each model run, the BOEM and the Service will reach agreement on model inputs based on best available science, and the agencies may opt for multiple model runs using a range of inputs to reflect uncertainties in the inputs." The above schedule may be altered upon the mutual agreement of the BOEM and the Service. The schedule is subject to sufficient allocation of funds to the BOEM from Congress. This commitment will remain in effect until one of the following occurs: i. the SouthCoast Wind turbines cease operation; ii. the Service concurs that a robust weight of evidence has demonstrated that collision risks to all listed birds from SouthCoast Wind turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or iii. the Service concurs that further model runs are unlikely to improve the accuracy or robustness of collision mortality estimates.	Birds	BOEM, BSEE, and USFWS
5	C, O&M, D	Monitoring and Data Collection	An avian species monitoring plan for ESA-listed species and/or other priority species or groups will be developed and coordinated appropriate state wildlife agencies and the Service and implemented as required. The BOEM will require SouthCoast Wind to develop and implement an Avian and Bat Post- Construction Monitoring Plan (ABPCMP) based on the ABPCMF (SouthCoast BA, Appendix C) in coordination with the BSEE, the Service, appropriate state wildlife agencies, and other relevant regulatory agencies. Annual monitoring reports will be used to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring. Prior to or concurrent with offshore construction activities, SouthCoast Wind must submit an ABPCMP for BOEM, the BSEE and Service review. The BOEM, the BSEE and the Service will review the ABPCMP and provide any comments on the plan within 30 calendar days of its submittal. SouthCoast Wind must resolve all comments on the ABPCMP to the satisfaction of the BOEM, the BSEE and the Service before implementing the plan and prior to the start of WTG operations. The objectives of the monitoring plan will include: (1) to advance understanding of how the target species utilize the offshore airspace and do (or do not) interact with the wind farm; (2) to improve the collision estimates from SCRAM (or its successor) for the three listed bird species; and (3) to inform any efforts aimed at minimizing collisions (see Conservation Measures 1 and 2, above) or other project effects on target species. a. Monitoring. SouthCoast Wind must develop an ABPCMP The ABPCMP will allow for changing methods over time (see Conservation Measure 5.d, below) in order to regularly update and refine collision estimates for listed birds. The plan will include an initial monitoring phase involving deployment of Motus radio tags on listed birds, in conjunction with installation and operation of Motus Wildlife Tracking System (Motus) receiving stations on turbines in the Lease Area, following offshore Motus recommendations. The initial phase may also include deployment of satellite-based tracking technologies (e.g., Global Positioning System [GPS] or Argos tags). b. Annual Monitoring Reports. SouthCoast Wind must submit to the BOEM (at renewable_reporting@boem.gov), the BSEE (via TIMSWeb and at protectedspecies@bsee.gov), and the Service, a comprehensive report after each full year of monitoring (pre- and post-construction) within 12 months of completion of the last avian survey. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. The BOEM, the BSEE, and the Service will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the ABPCMP. The BOEM, the BSEE, and the Service reserve the right to require reasonable revisions to the ABPCMP and may require new technologies as they become available for use in offshore environments.	Birds, Bats	BOEM, BSEE, and USFWS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			c. Post-Construction Quarterly Progress Reports. SouthCoast Wind must submit quarterly progress reports during the implementation of the ABPCMP to the BOEM (at renewable_reporting@boem.gov), the BSEE, and the Service by the 15th day of the month following the end of each quarter during the first full year that the Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered. d. Monitoring Plan Revisions. Within 30 calendar days of submitting the annual monitoring report (pursuant to Conservation Measure 5.b, above), SouthCoast Wind must meet with the BOEM, the BSEE, the Service, and appropriate state wildlife agencies to discuss the following: the monitoring results; the potential need for revisions to the ABPCMP, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If, based on this annual review meeting, the BOEM and the Service jointly determine that revisions to the ABPCMP are necessary, the BOEM will require SouthCoast Wind to modify the ABPCMP. If the projected collision levels, as informed by monitoring results, deviate substantially from the effects analysis included in this BO, SouthCoast Wind must transmit to the BOEM recommendations for new mitigation measures and/or monitoring methods. The frequency, duration, and methods for various monitoring efforts in future revisions of the ABPCMP will be determined adaptively based on current technology and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. The effectiveness and cost of various technologies/methods will be key considerations when revising the plan. Grounds for revising the ABPCMP include, but are not limited to: i. greater than expected levels of collision of listed birds; ii. evolving data input needs (as determined by the BOEM and the Service) for SCRAM (or its successor); iii. changing technologies for tracking or otherwise monitoring listed birds in the offshore environment that are relevant to assessing collision risk; iv. new information or understanding of how listed birds utilize the offshore environment and/or interact with wind farms; and v. a need (as determined by the BOEM and the Service) for enhanced coordination and alignment of tracking, monitoring, and other data collection efforts for listed birds across multiple wind farms/leases on the OCS. The BOEM will require SouthCoast Wind to continue implementation of appropriate monitoring activities for listed birds (under the current and future versions of the ABPCMP) until: i. the SouthCoast Wind turbines cease operation; . the Service concurs that a robust weight of evidence has demonstrated that collision risks to all three listed birds from SouthCoast Wind turbine operation are negligible (i.e., the risk of take from WTG operation is found to be discountable); or i. the Service concurs that further data collection is unlikely to improve the accuracy or robustness of collision mortality estimates and is unlikely to improve the ability of the BOEM and SouthCoast Wind to reduce or offset collision mortality. e. Operational Reporting (Operations). SouthCoast Wind must submit to the BOEM (at renewable_reporting@boem.gov) and the BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition (SCADA) data for all turbines together in tabular format: the proportion of time the turbines were actually spinning each month, the average rotor speed (monthly revolutions per minute) of spinning turbines plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. The BOEM and the BSEE will use this information as inputs for avian collision risk models to assess whether the results deviate substantially from the effects analysis included in this Opinion. f. Raw Data. SouthCoast Wind must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to the BOEM, the BSEE, and the Service, upon request for the duration of the lease. SouthCoast Wind must work with the BOEM to ensure the data are publicly available. All avian tracking data (i.e., from radio and satellite transmitters) will be stored, managed, and made available to the BOEM, the BSEE and the Service following the protocols and procedures outlined in the agency document entitled Guidance for Coordination of Data from Avian Tracking Studies, or its successor.		
6	C, O&M, D	Incidental Mortality and Reporting	SouthCoast Wind must provide an annual report to the BOEM, the BSEE, and the Service documenting any dead (or injured) birds or bats found on vessels and structures or in the ocean during construction, operations, and decommissioning. The report must contain the following information: the name of species (if possible), date found, location, a picture to confirm species identity (if possible), and any other relevant information. Carcasses with Federal or research bands must be reported to the United States Geological Survey's (USGS) Bird Banding Laboratory. Any occurrence of a dead ESA-listed bird or bat must be reported to the BOEM, the BSEE, and the Service as soon as practicable (taking into account crew and vessel safety), ideally within 24 hours and no more than two business days after the sighting. If practicable, the dead specimen will be carefully collected and preserved in the best possible state, contingent on the acquisition of any necessary wildlife permits and compliance with SouthCoast Wind health and safety standards. Species-specific Conservation Measures	Birds, Bats	BOEM, BSEE, and USFWS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			Northern long-eared bat and tri-colored bat • The northern long-eared bat is listed as a species of greatest conservation need in the 2015 Rhode Island Wildlife Action Plan. Northern long-eared bats use maternity roost sites during the summer and hibernacula sites during the winter, and the loss of these habitat features is a threat to northern long-eared bats. On April 8, 2022, SouthCoast Wind contacted RIDEM Division of Fish and Wildlife, for information on northern long- eared bat maternity roosts and hibernacula in the vicinity of the Project. According to her response, dated April 12, 2022, there are no known northern long-eared bat maternity roosts or hibernacula in or near (within 5 miles) the Project area. Conversion of foraging and roosting habitats is also expected to be minimal for the Project as the onshore Project components are planned to be installed primarily within roadways and roadway shoulders to mitigate impacts on rare species and tree clearing will be avoided. • Tree Clearing Time-of-Year Restrictions during construction. The Lessee (SouthCoast Wind) must not clear trees greater than 3 inches (7.6 centimeters) in diameter at breast height from June 1 to July 31 of any year to protect northern long-eared bats. The Lessee may choose to conduct presence/probable absence surveys pursuant to current USFWS protocols for purposes of requesting and obtaining a waiver from this time-of-year restriction on tree clearing. The Lessee must submit any requests for waivers from this time-of-year restriction to the Department of the Interior (DOI) and such requests must be approved in writing by DOI. • SouthCoast Wind will site Project components to avoid locating onshore facilities or landfall sites in or near significant fish and wildlife habitats, including known hibernacula, maternal roosting colonies or other concentration areas as practicable. The proposed onshore substation site and converter station will be constructed in primarily open, developed areas. • SouthCoast Wind will site Project components to avoid locating onshore facilities or landfall sites in or near significant fish and wildlife habitats, including known hibernacula, maternal roosting colonies or other concentration areas as practicable. The proposed onshore substation site and converter station will be constructed in primarily open, developed areas. • SouthCoast Wind will implement a Vegetation Management Plan as approved by National Heritage and Endangered Species Program (NHESP), RIDEM, and the Massachusetts Department of Agricultural Resources. • SouthCoast Wind will consult with BOEM and USFWS to discuss best management practices (BMPs) available to avoid and minimize potential effects from construction/decommissioning on bats. • SouthCoast Wind is requiring construction equipment to be operated such that the construction-related noise levels comply with applicable sections of the MassDEP Air Quality Regulation at 310 CMR 7.10, which would minimize impacts on bats. Sandplain gerardia • Incorporate use of horizontal directional drilling (HDD) at landfall locations to avoid disturbance to shorelines and coastal habitats to the extent practicable.		
Reasonable and Prudent Measures and Terms and Conditions					
1	Pre- O&M and O&M	Collision Minimization Report	Periodically review current technologies and methods for minimizing collision risk of migratory birds with WTGs, including but not limited to: WTG coloration/marking, lighting, avian deterrents, remote sensing such as radar and thermal cameras, and limited WTG operational changes.	Birds	BOEM, BSEE, and USFWS
2	Pre- O&M and O&M	Collision Detection Report	Periodically review current technologies and methods for minimizing collision risk of listed birds. a. Prior to the start of WTG operations at SouthCoast Wind, the BOEM must compile, from existing project documentation (e.g., the BA, other consultation documents, the final EIS, the COP), a stand-alone summary of technologies and methods that the BOEM evaluated to reduce or minimize bird collisions at the SouthCoast Wind WTGs. b. Within 5 years of the start of WTG operation, and then every 5 years for the life of the project, the BOEM must prepare a Collision Minimization Report (CMR), reviewing best available scientific and commercial data on technologies and methods that have been implemented, or are being studied, to reduce or minimize bird collisions at offshore and onshore WTGs. The review must be global in scope. c. The BOEM must distribute a draft CMR to the Service, SouthCoast Wind, and appropriate state agencies for a 60-day review period. The BOEM must address all comments received during the review period and issue the final report within 60 days of the close of the review period. d. Following issuance of the final CMR, the Service may call for a meeting. Within 60 days following a call for such a meeting, the BOEM must convene a meeting with the Service, SouthCoast Wind, and appropriate state agencies to discuss the CMR and seek consensus on whether implementation of any technologies/methods is warranted.	Birds	BOEM, BSEE, and USFWS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
NMFS EFH Conservation Recommendations issued September 23, 2024[1]					
EFH CR 1	Pre-C, C	Turbine installation	To minimize risk of adverse effects on Nantucket Shoals and associated tidal mixing fronts that overlap the lease area, development should first occur in the southern portion of the Lease Area (Project 2). Additional research and monitoring of operational effects on the Nantucket Shoals tidal front should be implemented to inform mitigation options prior to development in the northern portion of the Lease Area (Project 1).	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 2	C	Turbine removal	Should BOEM deem EFH CR #1 as infeasible for adoption, we recommend the maximum number of turbines feasible be removed at the northeastern end of the Lease Area to reduce the extent of impacts on EFH adjacent to Nantucket Shoals and overlap with Atlantic cod spawning areas.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 3	C	Oceanographic features monitoring program	Development and implementation of a monitoring program to evaluate changes to oceanographic features from project operations and understand impacts of those changes on the persistent tidal mixing front of Nantucket Shoals and associated EFH for managed species should be required. Development of the monitoring plan should be conducted in coordination with GARFO and NEFSC. Based on the results of this monitoring program, additional mitigation measures should be identified and implemented.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 4	C	Pile driving timing restriction	To minimize adverse effects on Atlantic cod spawning aggregations within and adjacent to the project area, and to reduce the risk of population-level effects on this species, no pile driving should occur in the Lease Area between November 1 and March 31 of each year.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 5	C	Bottom-disturbing construction activity timing restriction	In-water bottom-disturbing construction activities in the Lease Area or the Brayton Point export cable corridor (ECC) that overlap the Southern New England Habitat Area of Particular Concern (HAPC) should not be permitted to occur inshore of the 50-meter isobath between November 1 and March 31 of each year.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 6	C	UXO timing restriction	To the extent practicable, detonation of UXO/MEC, should not be conducted in the lease area or the Brayton Point ECC that overlaps the Southern New England HAPC from November 1 through March 31 of each year.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 7	C	HRG survey timing restriction	High-resolution geophysical (HRG) sub-bottom profiling (e.g., sparkers, boomers) survey activities should not be permitted to occur inshore of the 50-meter isobath within the Southern New England HAPC from November 1 through March 31 of each year.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 8	Pre-C, C, O&M, D	Passive acoustic and telemetry studies	Develop and implement passive acoustic and telemetry surveys within the Lease Area and the Brayton Point ECC to evaluate Atlantic cod spawning activity in the project area. This should be conducted prior to, during, and post construction to identify the full scope of the area affected by project construction and operation and to assess individual, synergistic, and cumulative effects of the Project on cod spawning activity. a) Specifically, provide continuous monitoring of Atlantic cod spawning aggregations within, and immediately adjacent to, the Lease Area between November 1 and March 31 prior to the construction of the project, during project construction, and a minimum of 5 years post construction. b) Increase coverage of passive acoustic receivers within the Southern New England HAPC and analyze for Atlantic cod spawning activity. c) Add an additional glider and increased tagging of Atlantic cod to the ongoing survey to increase the spatial coverage and extend coverage in the SouthCoast Wind Project area and adjacent areas. The ongoing survey should focus on adding survey coverage (i.e., increase the number of glider tracts) within the Project area to provide detection of cod spawning activity within the project area before, during, and after construction. d) The survey coverage should extend outside the Lease Area within areas where project effects occur (e.g., wind wake effects) to assess individual, synergistic, and cumulative effects of the project construction and operation on the distribution of cod spawning activity.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS

[1] NMFS issued conservation recommendations to BOEM, BSEE, USACE, and EPA for the SouthCoast Wind project via letter dated September 23, 2024. As required by section 305(b)(4)(B) of the Magnuson-Stevens Act, BOEM and co-action agencies will provide a detailed response to these conservation recommendations to NMFS regarding which measures will be adopted, partially adopted, or not adopted. At the time of FEIS issuance, BOEM and co-action agencies have not made final determinations regarding which conservation recommendations each agency intends to adopt or partially adopt. As such, the full list of conservation recommendations received from NMFS is included in this document.

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			e) Data and results from this study should be made available to NOAA Fisheries Habitat and Ecosystem Services Division (HESD) at NMFS.GAR.HESDoffshorewind@noaa.gov.		
EFH CR 9		Converter station relocation	Relocate the converter station (and associated cooling water intake system [CWIS]) offshore of the overlapping benthic ridge feature (located at the 45-meter isobath) to locations closer to 50 meters or greater depths to minimize impacts on existing biogenic habitat, EFH from entertainment of eggs and larvae that are concentrated in this area as a result of the Nantucket Shoals tidal front, and to reduce impacts on Atlantic cod spawning activity.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 10	C	Converter station technology	The converter station CWIS should be retrofitted with a closed-cycle cooling system when the technology is made commercially viable. If a closed-loop system is deemed infeasible at the time of construction, the feasibility of upgrading the proposed CWIS with a closed-cycle cooling system and/or incorporating best available technologies should be evaluated every 5 years upon re-application of the National Pollutant Discharge Elimination System (NPDES) permit for operation of the converter station. This should be included as a condition of Construction and Operation Plan (COP) approval and the NPDES permit.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 11	C	Converter station	The converter station CWIS should be required to use one dedicated intake pump or dual pump operation at reduced capacity equipped with a variable frequency drive (VFD) to minimize water withdrawals and reduce the extent of entrainment of eggs and larvae.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 12	C, O&M, D	Ichthyoplankton and Zooplankton monitoring	Ichthyoplankton and zooplankton monitoring at the converter station (and associated CWIS) should be required for the life of the project. All data and results from the ichthyoplankton and thermal monitoring should be made available to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 13	Pre-C	Ichthyoplankton and Zooplankton monitoring plan	An ichthyoplankton and zooplankton monitoring plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov for review and comment prior to finalizing requirements of the NPDES permit to determine if increased sampling frequency and/or additional recommendations are necessary.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 14	Pre-C, C	Seabed preparation	Seabed preparation and associated IAC cable installation should not be permitted to occur in the Lease Area where comprehensive, high-resolution geotechnical and geophysical surveys and benthic habitat mapping have not been conducted and their results analyzed.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 15	Pre-C, C	Acoustic survey data	Collection of acoustic data (bathymetry, multi-beam backscatter, side-scan sonar) and ground truthing of the habitats that occur in the Lease Area through comprehensive, high-resolution benthic surveys with seafloor sampling for CR#14 should be required prior to construction. Survey data should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov to determine if additional conservation recommendations (CRs) are needed, including recommendations for micrositing IACs to minimize impacts on sensitive habitats.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 16	C	Benthic habitat avoidance	Site the Brayton Point ECC (between KP Segments 55–58) along the northeastern edge of the cable corridor to avoid and minimize sensitive benthic habitats associated with Brown's Ledge. KP Segment numbers are based on labels identified in the benthic data viewer. Compensatory mitigation should be provided for unavoidable impacts.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 17	C	Microsite WTGs	Microsite WTGs off of benthic ridge features with associated biogenic habitats formed by the active tidal front areas. Benthic ridge features are delineated based on the high-resolution multibeam backscatter, side scan sonar, and sediment profile and plan view imaging (SPI/PV) data provided in the benthic data viewer. Specifically, the following WTGs should be microsited: a) BK39 should be shifted the maximum allowable distance west. b) BL38 should be shifted the maximum allowable distance west. c) BL39 should be sifted the maximum allowable distance west. d) BL42 should be shifted the maximum allowable distance east. e) BL43 should be sited outside of the active tidal front and associated benthic ridge feature. f) BM40 should be shifted the maximum allowable distance east. g) BM41 should be shifted the maximum allowable distance east.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
EFH CR 18	C	Dredge material placement	Dredge material should not be placed within sensitive benthic habitats for any required dredging along the Brayton Point ECC. Habitat maps (based on high-resolution multibeam backscatter, side scan sonar, and boulders) delineating sensitive benthic habitat areas should be provided to vessel operators to facilitate avoidance of these areas.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 19	C	Boulder relocation	To minimize impacts on sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders and cobbles should (i) be relocated in areas immediately adjacent to existing similar complex bottom; (ii) placed in a manner that does not hinder navigation or impede commercial fishing; and (iii) avoid impacts on existing complex habitats. To minimize impacts on sensitive benthic habitats from boulder/cobble removal/relocation activities, boulders that will be relocated using boulder "pick" methods should be relocated outside the area necessary to clear and placed along the edge of existing complex habitats such that the placement of the relocated boulders will result in a marginal expansion of complex habitats into soft-bottom habitats.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 20	C	Boulder relocation	A boulder plow should not be permitted to be used for boulder relocation in the project area due to the limited control the plow has on avoiding adverse impacts on existing sensitive habitats and fishing operations.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 21	Pre-C	Boulder study results	Results from SouthCoast Wind's boulder study, which is planned to be completed in the third and/or fourth quarter of 2024 should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction to determine if additional CRs are needed. The report should include information on how EFH CR #17 and EFH #18 will be implemented into boulder relocation activities.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 22	Pre-C, C, O&M, D	Seafloor surveying and monitoring	In all project areas where seafloor preparation activities include the use of plows, jets, grapnel runs or similar methods, post-construction acoustic surveys capable of detecting bathymetry changes of 0.5 meter or less, should be completed to demonstrate how the bottom was modified by preparation and construction activities. Post-construction acoustic survey data should be provided to NMFS HESD in a viewable format at NMFS.GAR.HESDoffshorewind@noaa.gov.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 23			Berms exceeding three feet (from existing grade) that are created through the use of plows, jets, or other similar methods should be restored to pre-construction conditions.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 24	C	Anchoring	Avoid anchoring or placing jack-up barge spud cans or footings on/in sensitive benthic habitats including any area where large boulders (>/= 0.5 meter in diameter) or medium to high multibeam backscatter returns occur. Habitat maps (based on high-resolution multibeam backscatter, side scan sonar, and boulders) delineating sensitive benthic habitat areas should be provided to vessel operators to facilitate avoidance of these areas.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 25	C	Anchoring	During cable installation, anchor lines should be extended to the extent practicable to minimize the number of times the anchors must be raised and lowered to reduce the amount of habitat disturbance.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 26	C	Anchoring	Vessels must remain stationary, and dynamic positioning systems (DPS) or mid-line buoys on anchor chains should be required to minimize impacts on benthic habitats.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 27	C	Vessel Anchoring Plan	Results from SouthCoast Wind's comprehensive vessel anchoring plan should include information on how EFH CRs # 22-24 will be implemented into anchoring activities for the Lease Area and entirety of Brayton Point ECC and provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction to determine if additional CRs are needed.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 28	C	Scour protection material	Use natural or engineered stone of consistent grain size that mimics natural seafloor substrates (rock option proposed in the EFH assessment) to minimize the impacts of habitat conversion from cable protection and scour protection. At a minimum, any exposed surface layer should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes (e.g., mixed stone sizes) and rounded edges (e.g., tumbled stone), and be sloped such that outer edges match the natural grade of the seafloor. Should the use of concrete mattresses be necessary, use bioactive concrete (i.e., with bio-enhancing	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			admixtures) as the primary scour protection (e.g., concrete mattresses) or veneer of natural or engineered rounded stone with bio-enhancing admixtures should be overlaid to support biotic growth.		
EFH CR 29	C	Scour protection material	Plastics/recycled polyesters/net material (i.e., rock-filled mesh bags, fronded mattresses) should not be used as cable protection or scour protection outside temporary use (6 months or less) during construction activities.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 30	C	Temperate reef mitigation plan	Mitigate for permanent loss of temperate reefs within the Southern New England HAPC resulting from installation of the Brayton Point ECC and the use of cable protection. Specifically, the mitigation plan should identify (i) type of cable protection used between KP segments 76-84; (ii) estimated extent of area affected by installation of cable protection; and (iii) a plan outlining specifically how permanent impacts on temperate reefs between KP 84 and KP 76 will be offset/compensated. The mitigation plan should be provided to NMFS HESD atNMFS.GAR.HESDoffshorewind@noaa.gov for a 60 day review and comment prior to installation of cable protection.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 31	C	Marine debris removal	Retain and discard to an upland facility any debris encountered during site preparation grapnel runs. Do not abandon debris in place or return debris overboard.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 32	C	Suction bucket foundations	Suction bucket foundations should be installed where feasible to minimize acoustic effects on EFH and Atlantic cod spawning.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 33	C	Noise Mitigation Plan	The use of noise mitigating measures should be required during pile driving construction in the nearshore and offshore project areas, including the use of soft start procedures and the deployment of noise dampening equipment such as bubble curtains or double-bubble curtains.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 34	C	Fish Kill Notification Plan	Notify NMFS HESD within 24 hours of any evidence of a fish kill observed during construction activity. Notification should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov along with contingency plans to resolve the issue. a) During occurrences of at least 10 dead non-ESA-listed fish observed within established shutdown or clearance zones, Protected Species Observers (PSOs) or project staff should collect images and representative samples of different sized cohorts from each species present for subsequent necropsies. Depending on the magnitude of the observed occurrence, PSOs should aim to collect up to 30 individuals, representative of the observed size range of each species, if less than 30 individuals are observed for any one species then all individuals should be collected. Collected images and necropsy results should be shared with NMFSHESD at NMFS.GAR.HESDoffshorewind@noaa.gov. b) If dead non-ESA-listed fish are observed repeatedly within established shutdown or clearance zones in association with pile driving activities, and necropsies find evidence of construction-related trauma and/or mortality (acoustic trauma, barotrauma, etc.), further investigations should be required to understand the underlying mechanism resulting in mortality. Specifically, if more than 100 individuals are observed in a single occurrence, or cumulatively reported across multiple shutdown or clearance zones, subsequent pile driving activities should be monitored in-situ. Potential techniques include the use of ROVs or BRUVs. c) A contingency plan outlining in-situ monitoring techniques and additional proposed mitigation measures should be provided with notification of a fish kill that meets or exceeds the threshold of more than 100 individuals as described above. A draft contingency plan should be developed prior to commencement of pile driving activities and adapted as needed based on conditions in the field. Monitoring results should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov. Additional recommendations may be provided based on our review of monitoring results.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 35	Pre-C, C	Minimization to impacts on benthic habitat	Locate the Brayton Point ECC onshore (Alternative C in the EIS) to avoid adverse impacts on the Narragansett Bay Estuary and associated sensitive benthic habitats, including, HAPC for juvenile Atlantic cod, temperate reefs, and sensitive life stages for federally managed species that rely on the Sakonnet River and Mount Hope Bay.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 36	C	Microsite cables	Microsite the Brayton Point ECC (between KP segments 31 - 41) to avoid and minimize impacts on sensitive benthic features. Habitat maps (based on high-resolution multibeam backscatter, side scan sonar, and boulders) delineating sensitive habitat areas should be	Benthic, Finfish, Invertebrates, and	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			provided to vessel operators to facilitate avoidance of these areas.	Essential Fish Habitat	
EFH CR 37	Pre-C, C	Temperate reef mitigation plan	Mitigate for permanent loss of temperate reefs at the mouth of the Sakonnet River resulting from installation of the Brayton Point ECC between KP segments 33-35, and 37-42. Specifically, the mitigation plan should identify (i) type of cable protection used between KP segments listed above; (ii) estimated extent of area affected by installation of cable and cable protection; and (iii) a plan outlining specifically how permanent impacts on temperate reefs between KP segments listed above will be offset/compensated. The mitigation plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov for a 60 day review and comment prior to installation of Brayton Point ECC and cable protection.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 38	Pre-C, C	Benthic mitigation plan	Mitigate for permanent loss of rocky habitats (pebble-gravel, cobble, boulder, and Crepidula spp. beds with/without attached macroalgae) within juvenile Atlantic cod and summer flounder HAPC in the Sakonnet River and Mount Hope Bay resulting from the installation of the Brayton Point ECC and the use of cable protection between KP segments 0-2, 6-10, 15-19, 20-27, and 33-35. Specifically, the mitigation plan should identify (i) type of cable protection used between KP segments listed above; (ii) estimated extent of area affected by installation of cable and cable protection; and (iii) a plan outlining specifically how permanent impacts on juvenile cod HAPC between the KP segments listed above will be offset/compensated. The mitigation plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov for a 60 day review and comment prior to installation of Brayton Point ECC and cable protection.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 39	C	Landfall option	Require the use of the eastern shoreline option for the sea-to-shore transition of the Brayton Point ECC to Brayton Point to avoid the biogenic habitats (i.e., tube-building polychaete beds) at the western shoreline landfall.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 40	C	Microsite cables	Microsite the Brayton Point ECC to avoid important biogenic habitats (i.e., tube-building polychaete beds) in Mount Hope Bay. Targeted video and/or still imagery must be conducted in Mount Hope Bay to delineate the extent of biogenic habitats to inform micrositing within the cable corridor. Compensatory mitigation should occur for unavoidable permanent impacts from habitat conversion.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 41	Pre-C, C	Minimization to impacts on benthic habitats	Undertake sampling for contaminated sediments in Mount Hope Bay throughout the project area, including along the cable route and the HDD exit pits prior to commencement of seabed preparation and cable installation. Results of the sediment sampling should be provided to NMFS HESD for review to determine if any additional EFH CRs are warranted.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	USACE and NMFS
EFH CR 42	C	Trench avoidance in open nearshore/ estuarine waters	Use confined dredging with a closed clamshell/environmental bucket dredge for excavation at the HDD exit pits in areas that contain elevated levels of contaminants. Dispose of all excavated material at a suitable upland location, and backfill the HDD exit pits with suitable, clean material.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	USACE and NMFS
EFH CR 43	C	In-water work time restrictions: estuarine/ inshore (back bay waters)	Avoid in-water work including seabed preparation, cable installation, HDD pit excavation, cable protection installation, and other extractive or turbidity/sediment generating activities from January 15 through October 14 of any year to minimize impacts on winter flounder early life stages (eggs, larvae) in the nearshore waters to depths of 5 m, diadromous fish migrations, and shellfish.	Finfish, Invertebrates, and Essential Fish Habitat	USACE and NMFS
EFH CR 44	Pre-C, C	Minimization to impacts on benthic habitats	In all inshore/estuarine habitats where seafloor preparation and cable installation activities will occur, impacts on benthic habitats should be avoided and minimized through the use of HDD with confined dredging of excavation pits.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	USACE and NMFS
EFH CR 45	C	Anchoring	Anchoring associated with cable installation for the Brayton Point ECC should be consistent with the Project's easements. Consultation should be re-initiated for any anchoring activities that occur outside the easement.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 46	Pre-C	Frac-out plans	Frac-out plans should be developed for all areas where HDD is proposed to be used. A copy of the final plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov prior to construction.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
EFH CR 47	Pre-C	Shellfish survey	A shellfish survey should be conducted prior to the commencement of dredging at all the HDD exit pits to identify high densities of shellfish. Shellfish beds that are identified should be relocated in coordination with Rhode Island Department of Environmental Management (RIDEM) and Massachusetts Division of Marine Fisheries (MA DMF) prior to commencement of in-water work.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 48	Pre-C	Benthic and Fisheries Habitat Monitoring Plans	We recommend the Monitoring Plans (Fisheries and Benthic) be updated to include the following: a) Pre-construction/baseline monitoring for a minimum of three years prior to any construction activities and continue annually for a minimum of five years post construction. This is particularly relevant to the fisheries monitoring surveys and the cable-associated physical disturbance survey. b) Expansion of the sexual maturity staging and spawning condition lab investigation to include Atlantic cod. Deceased cod should be collected, opportunistically, from the ventless trap and trawl surveys to better understand the spawning conditions present within the project area. c) Expand the number of cable segment replicates in the hard-bottom novel surfaces survey. Specifically, include at least three segments for each type of material used for cable armoring (if multiple types of materials are used for cable armoring) replicated across four distinct areas where the project proposes the use of cable armoring; inter-array cables, offshore export cable, and inshore export cable areas including three armored segment survey stations within both Narragansett Bay and Rhode Island Sound. If cable armoring is used in Mt. Hope Bay, one of the Narragansett Bay sites should be within Mt. Hope Bay. d) Invasive species (e.g., Didemnum vexillum) monitoring as a discrete data analysis component within both the hard-bottom-novel surfaces and cable-associated physical disturbance surveys to track the fragmentation and spread of invasive and non-native species across the lease as a result of project development. e) Project-wide collection of acoustic data (multibeam bathymetry and backscatter and side scan sonar) post-construction to measure the total area subject to physical change as a result of lease development. Post-construction acoustic surveys should be able to answer 1.) How much soft-bottom habitat across the lease has been converted to hard bottom; 2.) How much hard-bottom habitat across the lease has been converted to soft-bottom; 3.) How much natural hard-bottom habitat across the lease has been converted into man-made hard-bottom; 4.) How much total man-made hard bottom has been introduced into the project area (Lease Area and OECC); 5.) How much hard-bottom habitats have been impacted (i.e., relocated, fragmented, reduced in complexity, etc.) by the project compared with pre-construction surveys.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 49	Pre-C, C, O&M, D	In-situ Monitoring Program	Develop an in situ project specific monitoring program to address impacts of the operation of the SouthCoast Wind project on EFH and federally managed species. This monitoring recommendation is consistent with principles outlined in NOAA's Mitigation Policy for Trust Resources which highlights the use of the best available scientific information, such as results of surveys and other data collection efforts when existing information is not sufficient for the evaluation of proposed actions and mitigation, or when additional information would facilitate more effective or efficient mitigation recommendations. Incorporation of this monitoring recommendation would further align the monitoring efforts at SouthCoast Wind with the NOAA Fisheries and BOEM Federal Survey Mitigation Strategy which has evaluation and integration of wind energy monitoring studies with NOAA Fisheries surveys as a primary goal. The project specific, in-situ, monitoring program should measure the stressors created by project operation on the ecosystem from operational noise, electromagnetic fields (EMF), wind wake effects, and the presence of structures. Studies should also evaluate the biological effects of those stressors on commercially important species in the project area such as American lobster (*Homarus americanus*), Atlantic cod, Atlantic sea scallops (*Placopecten magellanicus*), black sea bass (*Centropristis striata*), hard clam (*Mercenaria mercenaria*), Jonah crab (*Cancer borealis*), monkfish (*Lophius americanus*), scup, skates, summer flounder, channeled whelk (*Busycotypus canaliculatus*) and knobbed whelk (*Busycon carica*). Monitoring plans should include the collection of a minimum of three years of baseline data, during construction, and a minimum of five years of post-construction data collection. Plans should be incorporated into a comprehensive monitoring strategy and be provided to NOAA Fisheries GARFO and NEFSC for review and comment within 90 days of ROD issuance. A response to NOAA Fisheries comments should be provided. These monitoring studies should be developed in partnership with NOAA Fisheries and other scientific institutions to aid in addressing the following questions: a) How far do effects on sound pressure, particle motion, and substrate vibration extend from the individual WTGs and the SouthCoast Wind Farm collectively? How far do effects on sound pressure, particle motion, and substrate vibration extend from the individual WTGs and the SouthCoast Wind Farm collectively? i. What effect do these operational noise effects have on the distribution of larvae for species with designated EFH in the project area and prey for these species (i.e., sand lance)? b) What is the spatial distribution of the EMF emissions around inter-array and export cables? The EMF study for the export cables should include measures to monitor EMF emissions from the inter-array cables and the export cables and address the following: i. What is the behavioral response to the altered EMF of fisheries resource species/life stages with known EMF-sensitivity? ii. Do the inter-array and export cables create a physical barrier (either from the presence of structure or from EMF exposure) to mobile benthic species, particularly whelks and Jonah crab	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			c) How far does the marine and atmospheric wind wake extend from the SouthCoast Wind Farm during operation? (See EFH CR#3) i. What are the effects on physical water column properties, primary and secondary production, and larval dispersal for species with designated EFH in the project area?		
EFH CR 50	C, O&M, D	Spill preventative measures	Require the implementation of preventive measures to reduce the risk of contaminant emissions or accidental release of chemicals. Such measures may include backup systems, secondary containments, closed-loop systems, and/or recovery tanks.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 51	C, O&M	Anti-corrosion protection measures	Any anti-corrosion protection methods or systems proposed should be identified. If sacrificial anodes are used, Al anodes should be selected over Zn anodes. Any application of anti-corrosion coatings should be allowed to cure fully on land, and BMPs for reducing spills should be implemented if reapplied offshore.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
EFH CR 52	C	Reinitiation of consultation	The EFH consultation should be reinitiated a) If the proposed action deviates in any way from what is described in the EFH assessment for Project 1 and/or Project 2; b) Once data is collected and processed for IAC routes; c) Prior to the construction and installation of Project 2, including activities associated with the construction and operation of the Falmouth contingency cable; d) Prior to decommissioning WTGs to ensure that the impact to EFH as a result of the decommissioning activities have been fully evaluated and minimized to the extent practicable. Pre-consultation coordination related to decommissioning should occur at least five years prior to proposed decommissioning.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat	BOEM, BSEE, and NMFS
FWCA CR 1	C, O&M, D	Fish and Wildlife Coordination Act (FWCA): Scientific Surveys	The lessee should be required to mitigate the major impacts on NOAA Fisheries scientific surveys consistent with NOAA Fisheries-BOEM Federal Survey Mitigation Strategy - Northeast U.S. Region. SouthCoast Wind's plans to mitigate these impacts at the project and regional levels should be provided to NOAA Fisheries for review and approval prior to BOEM's decision on its acceptance. Mitigation is necessary to ensure that NOAA Fisheries can continue to accurately, precisely, and timely execute our responsibilities to monitor the status and health of trust resources.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing	USACE and NMFS
FWCA CR 2	C	FWCA: Notification of location of relocated boulders, created berms, and scour protection	Locations of relocated boulders, created berms, and scour protection, including cable protection measures (i.e., concrete mattresses) should be provided to NOAA Fisheries, all other federal agencies with maritime jurisdiction, and the public as soon as possible to help inform all interested parties of potential gear obstructions.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing	USACE and NMFS
FWCA CR 3	C, O&M, D	FWCA: Whelk and hard clam survey plan	A whelk and hard clam survey plan should be developed for review and comment by NMFS. This survey may be incorporated as part of the Fisheries Monitoring Plan for the project. The survey should specifically investigate the potential changes in distribution and abundance of the species throughout the project area, pre- and post- development with an emphasis on the impacts within the inshore portion of the OECC within Narragansett Bay. The survey should focus on specific impact producing factors and the in-situ responses to those factors by individuals. Of particular concern, is the creation of artificial boundaries (i.e., EMF exposure from the OECC, berms created from scour protection, etc.) that may limit the movement of the species, the fragmentation of contiguous hard clam beds, and the biological response of hard clams to EMF exposure. The plan should be provided to NMFS HESD at NMFS.GAR.HESDoffshorewind@noaa.gov for a 60 day review and comment as soon as possible and at least 120 days prior to commencement of construction.	Benthic, Finfish, Invertebrates, and Essential Fish Habitat; Commercial Fisheries and For-Hire Recreational Fishing	USACE and NMFS
Draft NMFS Biological Opinion Reasonable and Prudent Measures dated October 24, 2024[2]					

[2] On October 24, 2024, NMFS provided draft RPMs to BOEM, USACE, BSEE and EPA for review as part of the ESA Section 7 consultation process for the SouthCoast Wind project. ESA Section 7 consultation was still ongoing at the time preparation of the FEIS was completed. The Lessee must adhere to the Biological Opinion, including the finalized RPMs and implementing terms and conditions, issued by NMFS for the SouthCoast Wind project.

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
RPM 1	C	WTG and OSP installation	Effects on ESA-listed species must be minimized and monitored during WTG and OSP foundation installation.	ESA-listed Fish, Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS
RPM 2	C	UXO detonation	Effects to ESA-listed species must be minimized and monitored during UXO/MEC detonations.	ESA-listed Fish, Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS
RPM 3	O&M	Hydrodynamic monitoring	Effects to North Atlantic right whales from hydrodynamic effects (wakes) around foundations must be monitored.	Marine Mammals	BOEM, BSEE, and NMFS
RPM 4	C, O&M, D	Onsite observation and reporting	Effects to, or interactions with, ESA-listed species must be properly documented during all phases of the proposed action, and all incidental take must be reported to NMFS GARFO.	ESA-listed Fish, Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS
RPM 5	C	Review of plans	Plans must be prepared that describe the implementation of activities and/or monitoring protocols for which the details were not available at the time this consultation was completed. All required plans must be submitted to NMFS GARFO in advance of the applicable activity with sufficient time for review, comment, and any required concurrence.	ESA-listed Fish, Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS
RPM 6	C, O&M, D	Onsite observation and inspection	BOEM, BSEE, NMFS OPR, and USACE must exercise their authorities to assess and ensure compliance with the implementation of measures to avoid, minimize, monitor, and report incidental take of ESA-listed species during activities described in this Opinion. On-site observation and inspection by appropriate agency personnel must be allowed to gather information on the implementation of measures, and the effectiveness of those measures, to minimize and monitor incidental take during activities described in this Opinion, including its Incidental Take Statement.	ESA-listed Fish, Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS
DOD Measures Resulting from Military Aviation and Installation Assurance Siting Clearinghouse Review dated August 10, 2022					
1	Pre- O&M and O&M	NORAD notification and Radar adverse impact management (RAM)	1) The Lessee will notify NORAD 30-60 days ahead of project completion and when the project is complete and operational for RAM scheduling. 2) The Lessee will contribute funds ($80,000) toward the execution of the RAM. 3) The Lessee will curtail when necessary for National Security or Defense Purposes as described in the agreement executed between BOEM and the Lessee for lease of the Project site.	Other uses (Military Use)	BOEM, BSEE, DoD
2	Pre- O&M and O&M	Distributed optical fiber sensing	BOEM will require that the Lessee provide information regarding deployment of distributed fiber-optic sensing technology to facilitate a Department of the Navy risk assessment and will require the Lessee to mitigate risk to national security, if identified.	Other uses (Military Use)	BOEM, BSEE, DoD/DON

[a] Pre-C = prior to construction; C = construction; O&M = operations and maintenance; D = Decommissioning

AMP = alternative monitoring plan; ASLF = ancient submerged landform feature; BiOP = biological opinion; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = code of federal regulations; COP = Construction and Operations Plan; dB = decibel; DMA = Dynamic Management Area; DOI = Department of the Interior; DPS = distinct population segment; ESA = Endangered Species Act; GPR = global pocket reader; GPS = global positioning system; HPTP = Historic Property Treatment Plan; HVAC = high-voltage alternating current; HVDC = high-voltage direct current; IHA = Incidental Harassment Authorization; IOOS = Integrated Ocean Observing System; ITA = incidental take authorization; ITS = incidental take statement; JPEG = joint photographic experts group; km = kilometer; km/hr = kilometer per hour; LOA = Letter of Authorization; mph = mile per hour; MMPA = Marine Mammal Protection Act; NARW = North Atlantic right whale; NAVTEX = Navigational Telex; NCEI = National Centers for Environmental Information; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRHP = National Register of Historic Places; OCS = Outer Continental Shelf; OSP = offshore substation platform; PAM = passive acoustic monitoring; PDM = pile-driving monitoring; PIT = passive integrated transponder; PSO = protected species observer; RPM = Reasonable and Prudent Measure; SFVP = Sound Field Verification Plan; SMA = Seasonal Management Area; STDN = Sea Turtle Disentanglement Network; TIFF = tag image file format; USACE = United States Army Corp of Engineers; USCG = United States Coast Guard; USFWS = United States Fish and Wildlife Service; VHF = Very High Frequency; WTG = wind turbine generator

G.3 Additional Mitigation and Monitoring Measures

Table G-2 identifies agency-proposed mitigation measures that have been proposed to mitigate and/or monitor potential impacts from the Project. The paragraphs below provide additional information regarding the mitigation measures.

Table G-3. Additional Mitigation and Monitoring Measures

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
BOEM-Proposed Air Quality Mitigation Measures					
AQ-1	C, O&M, D	Engines that meet or exceed emission control requirements	Use engines manufactured and installed to meet or exceed emission control requirements. Engine manufacturers will incorporate pollution control measures into their designs. Techniques used could include: ensuring complete combustion in the engines, by control of the combustion air, controlling fuel flow, ensuring complete mixing, and staging combustion; avoiding hot spots in the combustion process that can form NO_x, by staging combustion, injecting water, recirculating flue gas, and otherwise cooling the system; and using post- combustion controls to remove air pollutants after they have formed, by adding particulate filters, oxidation catalysts, and selective catalytic reduction systems.	Air Quality	Best practice – not an enforceable measure
AQ-2	C, O&M, D	Vessel engines that meet or exceed applicable marine engine standards	Vessel engines will use a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards, including: The International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI (for foreign vessels); 40 CFR Part 89 (for Tier 1 and 2 domestic marine diesel engines smaller than 37 kW); Control of Emissions from Marine Compression-Ignition Engines; 40 CFR Part 94 (for Tier 1 and 2 domestic marine diesel engines larger than 37 kW); and Control of Emissions from New and In- Use Marine Compression-Ignition Engines and Vessels, 40 CFR Part 1042 (for Tier 3 and 4 domestic marine diesel engines). On-road engines, nonroad engines, and aircraft engines will meet or exceed similar standards.	Air Quality	Best practice – not an enforceable measure
AQ-3	C, O&M, D	Best available engines/fuels	Use the best available engines/fuels. Construction vessels will be supplied by contractors for temporary use on the Project. For O&M, SouthCoast Wind can specify the vessel used through long-term contracting or outright purchase. Nonroad engine emissions will be minimized using engines compliant with 40 CFR 1039, Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines, i.e., "Tier 4" engines, where practicable.	Air Quality	Best practice – not an enforceable measure
AQ-4	C, O&M, D	Marine diesel fuel will comply with the fuel sulfur limit of 15 ppm	Marine diesel fuel will comply with the fuel sulfur limit of 15 ppm per 40 CFR 80, which is the same limit as onshore ULSD. For heavier residual fuel oils used in Category 2 and Category 3 engines, and for engines on foreign vessels, the Project will comply with the fuel oil sulfur content limit of 1,000 ppm set in MARPOL VI and corresponding USEPA regulations. Nonroad engines will use ULSD. The use of clean fuels will minimize emissions from fuel impurities and allow for cleaner combustion.	Air Quality	Best practice – not an enforceable measure
AQ-5	Pre-C, C, O&M, D	BMPs, innovative tools and/or technologies to minimize emissions from vessel operations	Implement BMPs and investigate the use of innovative tools and/or technologies to minimize air emissions from vessel operations. Specifically, SouthCoast Wind will optimize construction and O&M activities to minimize vessel operating times and loads. This will include weather monitoring, forecasting, and Project tracking to minimize emissions resulting from non-productive time, and incentives for contractor fuel savings.	Air Quality	Best practice – not an enforceable measure
AQ-6	Pre-C, C, O&M, D	Meet or exceed permit requirements and comply with all applicable air quality regulatory requirements	Air permit requirements will be met or exceeded, and SouthCoast Wind will comply with all applicable air quality regulatory requirements. A key element will be obtaining the OCS air permit. SouthCoast Wind will comply with other air- related regulatory requirements by using engines manufactured and maintained in compliance with the appropriate standards, which include New Source Performance Standards, National Emissions Standards for Hazardous Air Pollutants, and federal standards for nonroad and marine diesel engines. If onshore stationary equipment triggers any requirement to obtain a Massachusetts or Rhode Island air permit, as applicable (including obtaining coverage under a general permit), SouthCoast Wind will obtain the required permit.	Air Quality	USEPA and state (Massachusetts or Rhode Island, as applicable)
AQ-7	Pre-C	Document in OCS air permit compliance with air quality requirements	Any required OCS air permit will address documentation of compliance with ambient air standards, documentation of no adverse impact on air quality related values at Class I Areas, control technology review, and emission offsets.	Air Quality	USEPA and state (Massachusetts or Rhode Island, as applicable)
AQ-8	O&M	Use SF_6-free switchgear	This mitigation measure requires that the applicant use SF_6-free switchgear. BOEM is proposing additional mitigation requirements to minimize SF_6 emissions in the event that the applicant is not able to use SF_6-free switch gear. The additional mitigation is as follows:	Air Quality	BOEM

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			• Follow manufacturer recommendations for limiting leaks and for service and repair of the affected breakers and switches. • Perform repairs promptly when significant leaks are detected. • Conduct visual inspections of the switchgear and monitoring equipment according to manufacturer recommendations. • Create alarms based on the pressure readings in the breakers and switches, so leaks can be detected when substantial SF_6 leakage occurs. Upon a detectable pressure drop that is greater than 10% of the original pressure (accounting for ambient air conditions), perform maintenance to fix seals as soon as feasible. If an event requires removal of SF_6, the affected major component(s) will be replaced with new component(s). • Capture and recycle any SF_6 removed from breakers and switches during maintenance. Keep a log of all detected leaks and maintenance procedures potentially affecting SF_6 emissions from circuit breakers/switches.		
BOEM-Proposed Scenic and Visual Mitigation Measures					
SV-1	C, O&M	Scenic and Visual Impact Monitoring Plan	In coordination with BOEM, SouthCoast Wind will prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the wind farm during construction and O&M (daytime and nighttime) to the findings in the COP Visual Impact Assessment and verifies the accuracy of the visual simulations (photo and video). The monitoring plan should include monitoring and documenting the meteorological influences on actual wind turbine visibility over a duration of time from selected onshore key observation points, as determined by BOEM and the developer. In addition, SouthCoast Wind will include monitoring the operation of ADLS in the monitoring plan. SouthCoast Wind will monitor the frequency that the ADLS is operative documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures are to be included in the plan.	Scenic and Visual Resources	BOEM and BSEE
BOEM-Proposed Bird and Bat Mitigation Measures					
BRT-1	C, O&M	Compensatory Mitigation for Piping Plover, Red Knot, and Roseate Tern	At least 180 days prior to the start of commissioning of the first WTG, the Lessee must distribute a Compensatory Mitigation Plan to BOEM, BSEE, and the USFWS for review and comment. BOEM, BSEE, and USFWS will review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee must resolve all comments on the Compensatory Mitigation Plan to BOEM's and BSEE's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan must provide compensatory mitigation actions to offset take of Piping Plover, Red Knot, and Roseate Tern for the first 5 years of WTG operation. The Compensatory Mitigation Plan must include a) detailed description of the mitigation actions; b) the specific location for each mitigation action; c) a timeline for completion of the mitigation measures; d) itemized costs for implementing the mitigation actions; e) details of the mitigation mechanisms (e.g., mitigation agreement, applicant-proposed mitigation; and f) monitoring to ensure the effectiveness of the mitigation actions in offsetting take.	Birds	BOEM, BSEE, USFWS
BOEM-proposed Nantucket Shoals Mitigation Measures					
NS-1	O&M	HVDC open-loop cooling system avoidance area	To minimize potential impacts on zooplankton from impingement and entrainment in offshore wind HVDC converter station open-loop cooling systems, no open-loop cooling systems would be permitted in the enhanced mitigation area of the Lease Area. No geographic restrictions on the offshore export cable corridor, nor the installation of an HVAC OSP are included in this mitigation measure.	Finfish and Invertebrates, Marine Mammals	BOEM and NMFS
NS-2	C, O&M	Pile-driven foundations only	Only monopile or piled jacket foundations may be used in the enhanced mitigation area, which would minimize the overall structure impact on benthic prey species.	Benthic Resources	BOEM and NMFS
NS-3	C	Vessel-strike avoidance	A real-time detection and reporting PAM system must be implemented during the construction period. The PAM system must operate in the enhanced mitigation area 24 hours per day. The system must be capable of detection of NARW vocalizations, report the detections to a PAM operator in near-real time, and share all detections with NMFS. Upon a confirmed detection of a NARW, all project construction and crew transfer vessels of all sizes must travel at 10 knots or less in a 10-square-kilometer area around the location of the detection. Speed restriction must remain in place until there are no PAM detections within 48 hours of implementation of the speed restrictions, or daily aerial surveys result in no NARW sightings within 48 hours of implementation of the speed restrictions.	Marine Mammals	BOEM, BSEE, and NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
NS-4	C	Pile-driving time of Year restriction in enhanced mitigation area	Pile driving within the enhanced mitigation area will occur only between June 1 to October 31 when NARW presence is at its lowest.	Marine Mammals, Sea Turtles, and Finfish and Invertebrates	BOEM, BSEE, and NMFS
NS-5	C	Pile driving shut down provisions in enhanced mitigation area	SouthCoast Wind will be required to implement a real-time monitoring system (PAM or aerial imagery) capable of detecting and localizing the direction of NARW calls in the enhanced mitigation area (Figure G-1). If directly measured or modeled Level A or Level B received sound levels from offshore pile driving occur within the enhanced mitigation area when NARW are detected, subsequent pile driving shall be suspended until NARWs are confirmed through acoustic monitoring or visual surveillance to be clear of the enhanced mitigation area for 48 hours.	Marine Mammals	BOEM, BSEE, and NMFS
Other Agency-Proposed Mitigation Measures					
OU-1	C, O&M	Federal survey mitigation implementation strategy for the Northeast U.S. region	BOEM is committed to working with NOAA toward a long-term regional solution to account for changes in survey methodologies because of offshore wind farms. NOAA Fisheries and BOEM published (December 2022) a Federal Survey Mitigation Strategy for the Northeast U.S. Region to address anticipated impacts of offshore wind energy development on NOAA Fisheries' scientific surveys. This strategy also defines stakeholders, partners, and other ocean users that will be engaged throughout the process and identifies potential resources for successful implementation. Activities described in the strategy are designed to mitigate the effect of offshore wind energy development on NOAA Fisheries surveys and is referred to as the Federal Survey Mitigation Program. The mitigation program will include survey-specific mitigation plans for each affected survey including both vessel and aerial surveys. The strategy is intended to guide the implementation of the mitigation program through the duration of wind energy development in the Northeast U.S. region.	Other Uses – Scientific Research and Surveys	BOEM, BSEE, and NMFS
OU-2	C, O&M	High-frequency radar system mitigation	High-Frequency Radar Interference Analysis and Mitigation The Lessee's Project has the potential to interfere with oceanographic high-frequency (HF) radar systems in the U.S. Integrated Ocean Observing System (IOOS®), which is managed by the IOOS Office within the National Oceanic and Atmospheric Administration (NOAA) pursuant to the Integrated Coastal and Ocean Observation System Act of 2009 (Pub. L. No. 111-11), as amended by the Coordinated Ocean Observation and Research Act of 2020 (Pub. L. No. 116-271, Title I), codified at 33 U.S.C. 3601–3610 (referred to herein as "IOOS HF-radar"). IOOS HF-radar measures the sea state, including ocean surface current velocity and waves in near real time. These data have many vital uses ("mission objectives"), including tracking and predicting the movement of spills of hazardous materials or other pollutants, monitoring water quality, and predicting sea state for safe marine navigation. The U.S. Coast Guard also integrates IOOS HF-radar data into its Search and Rescue systems. The Lessee's Project is within the measurement range of one IOOS HF-radar system operated by University of Massachusetts Dartmouth in Nauset, MA (NAUS), two IOOS HF-radar system operated by Woods Hole Oceanographic Institute (WHOI) and four IOOS HF-radar systems operated by Rutgers University in Amagansett, New York (AMAG), Block Island, RI Long-range SeaSonde (BLCK), Martha's Vineyard, MA (MVCO), and Nantucket, MA SeaSonde (NANT). 1.1 Mitigation Requirement Due to the potential interference with IOOS HF-radar and the risk to public health, safety, and the environment, the Lessee must mitigate unacceptable interference with IOOS HF-radar from the Project. The Lessee must mitigate interference before commissioning the first WTG or before blades start spinning, whichever is earlier, and interference mitigation must continue throughout operations and decommissioning until the point of decommissioning where all rotor blades are removed. Interference is considered unacceptable if, as determined by BOEM in consultation with NOAA's IOOS Office, IOOS HF-radar performance falls or may fall outside any of the specific radar systems' operational parameters or fails or may fail to meet IOOS's mission objectives. 1.2 Mitigation Review The Lessee must submit to BOEM documentation demonstrating how it will mitigate unacceptable interference with IOOS HF-radar systems in accordance with Section 1.1. The Lessee must submit this documentation to BOEM at least 120 days prior to commissioning the first WTG or the start of blades spinning, whichever is earlier. If, after consultation with the NOAA IOOS Office, BOEM deems the mitigation acceptable, the Lessee must conduct activities in accordance with the proposed mitigations. If, after consultation with NOAA IOOS Office, BOEM deems the mitigation unacceptable, the Lessee must resolve all comments on the documentation to BOEM's satisfaction. 1.3 Mitigation Agreement	Other Uses – Radar Systems	BOEM and NOAA IOOS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			The Lessee is encouraged to enter into an agreement with the NOAA IOOS Office to implement mitigation measures, and any such Mitigation Agreement may satisfy the requirement to mitigate unacceptable interference with IOOS HF-radar. The point of contact for the development of a Mitigation Agreement with the NOAA IOOS Office is the Surface Currents Program Manager, whose contact information is available at https://ioos.noaa.gov/about/meet-the-ioos-program-office/ and upon request from BOEM. If the parties reach a mitigation agreement, the Lessee must submit the agreement to BOEM. The Lessee may satisfy its obligations under Section 1.2 by providing BOEM with an executed Mitigation Agreement between the Lessee and NOAA IOOS. If there is any discrepancy between Section 1.2 and the terms of a Mitigation Agreement, the terms of the Mitigation Agreement will prevail. 1.4 Mitigation Data Requirements Mitigation required under Section 1.2 must address the following: 1.4.1 Before commissioning the first WTG or before blades start spinning, whichever is earlier, and continuing throughout the life of the Lessee's Project until the point of decommissioning when all rotor blades are removed, the Lessee must make publicly available via NOAA IOOS near real-time, accurate numerical telemetry of surface current velocity, wave height, wave period, wave direction, and other oceanographic data measured at the Lessee's Project locations selected by the Lessee in coordination with the NOAA IOOS Office. 1.4.2 If requested by the NOAA IOOS Office, the Lessee must share with IOOS accurate numerical time-series data of blade rotation rates, nacelle bearing angles, and other information about the operational state of each WTG in the Lease Area to aid interference mitigation. 1.5 Additional Notification and Mitigation 1.5.1 If at any time the NOAA IOOS Office or an HF-radar operator informs the Lessee that the Lessee's Project will cause unacceptable interference to an HF-radar system, the Lessee must notify BOEM of the determination and propose new or modified mitigation pursuant to Section 1.5.2 as soon as possible and no later than 30 days from the date on which the determination was communicated. 1.5.2 If a mitigation measure other than that identified in Section 1.2 is proposed, then the Lessee must submit information on the proposed mitigation measure to BOEM for its review and concurrence. If, after consultation with the NOAA IOOS Office, BOEM deems the mitigation acceptable, the Lessee must conduct activities in accordance with the proposed mitigations. The Lessee must resolve all comments on the documentation to BOEM's satisfaction, in consultation with the NOAA IOOS Office, prior to implementation of the mitigation.		
CF-2	C, O&M	Compensation for lost fishing income	The lessee shall implement a compensation program for lost income for commercial and recreational fishermen and other eligible fishing interests for construction and operations consistent with BOEM's draft guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 or as modified in response to public comment.	Commercial Fisheries and For-Hire Recreational Fisheries	BOEM
CF-3	O&M	Mobile gear friendly cable protection measures	Cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure chiefly ensures that seafloor cable protection does not introduce new hangs for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered/sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the lessee should consider using materials that mirror the benthic environment.	Commercial Fisheries and For-Hire Recreational Fisheries	BOEM
CF-4	C, O&M, D	Fishing Gear and Anchor Strike Incident Reporting	SouthCoast Wind will report fishing gear and anchor strike incidents that fall below or are not captured by the regulatory thresholds outlined in 30 CFR §§ 285.832 and 285.833. Reports will be filed annually during construction and decommissioning, and every 5 years during operations.	Commercial Fisheries and For-Hire Recreational Fisheries	BOEM, USCG
CF-5	C, O&M	Shoreside seafood business analysis	In addition to the compensation proposed by SouthCoast Wind, BOEM would require SouthCoast Wind to ensure that compensation includes losses to shoreside businesses. The lessee shall analyze the impacts on shoreside seafood businesses adjacent to ports. The shoreside seafood business analysis would be used to further supplement funds available for settling claims of lost (unrecovered) economic activity as a result of the SouthCoast Wind project.	Commercial Fisheries and For-Hire Recreational Fisheries	BOEM
NAV-1	C, O&M	Consult on aid to navigation impacts	Prior to cable installation, SouthCoast Wind will consult with USCG regarding potential impacts on federal aids to navigation from cable installation and maintenance.	Navigation	BOEM, BSEE
NAV-2	O&M	Operations Center	SouthCoast Wind will operate a 24-hour operations center with direct communications with the USCG.	Navigation	BOEM, BSEE

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
NAV-3	Pre-C, C, O&M, D	Mariner Communication and Outreach Plan	SouthCoast Wind will develop and implement a Mariner Communication and Outreach Plan that covers all project phases from pre-construction to decommissioning and that facilitates coordination with all mariners, including the commercial shipping industry, commercial and for-hire fishing industries, and other recreational users. The Mariner Communication and Outreach Plan will include the following components: e. During Project design, coordinating in-water construction activities to avoid and minimize disruptions; f. At least 90 days prior to commencing in-water construction activities in any construction season, consultation with stakeholders on an approximate schedule of activities and existing uses within the Project area. Make good faith efforts to accommodate those existing uses. The results of these good faith consultations can be summarized in a report and submitted to the federal agency(ies) prior to the start of each construction season; g. Following COP approval, notice of proposed changes which have the potential to impact fishing or maritime resources or activities; h. Notices to commence construction activities, conduct maintenance activities, and commence decommissioning; i. Status reports during construction with specific information on construction activities and locations for upcoming activities in the next 1–2 weeks; j. Post-construction notice of: (i) all cable protection measure locations (including protection type and charted location); (ii) any areas where the identified burial depth is less than target burial depth; and (iii) other obstructions to navigation created by the Project; and Post all notices described above to the Project website with information on how to opt-in for alerts.	Navigation	BOEM, BSEE
MA-1	C	Sand Wave Leveling and Boulder Clearance	Sand wave leveling and boulder clearance should be limited to the extent practicable. Best efforts should be made to microsite to avoid these areas.	Benthic Resources; EFH	BOEM, BSEE
MA-2	C, O&M	Long-Term Passive Acoustic Monitoring	The Lessee must conduct long-term monitoring of ambient noise, marine mammal and commercially important fish vocalizations in the Lease Area before, during, and following construction. The Lessee must conduct continuous recording at least 1 year before construction, during construction, initial operation, and for at least 3 but no more than 10 full calendar years of operation to monitor for potential noise impacts. The Lessee must meet with BOEM and BSEE at least 60 days prior to conclusion of the third full calendar year of operation monitoring (and at least 60 days prior to the conclusion of each subsequent year until monitoring is concluded) to discuss: 1) monitoring conducted to-date, 2) the need for continued monitoring, and 3) if monitoring is continued, whether adjustments to the monitoring are warranted. The instrument(s) must be configured to ensure that the specific locations of vocalizing NARW anywhere within the Lease Area could be identified, based on the assumption of a 10 km detection range for their calls. The lessee may execute the implementation of this condition through Option 1 or Option 2, as below. The timing requirement (i.e., monitoring for at least 3 but no more than 10 full calendar years of operation) will be reevaluated by BOEM and BSEE at the end of the third year and each year subsequently thereafter at the request of the Lessee (at a maximum frequency of requests of once per year). a. Option 1 - Lessee Conducts Long-term Passive Acoustic Monitoring. The Lessee must conduct PAM, including data processing and archiving following the Regional Wildlife Science Collaborative (RWSC) best practices to ensure data comparability and transparency. PAM instrumentation must be deployed to allow for identification of any NARW that vocalize anywhere within the Lease Area. The sampling rate (minimum 10 kHz) of the recorders must prioritize baleen whale detections but must also have a minimum capability to record noise from vessels, pile-driving, and WTG operation in the Lease Area. The system must be configured for continuous recording over the entire year. If temporal gaps in recording are expected, the Lessee must ensure that additional recorders can be deployed to fill gaps. The Lessee must use trawl-resistant moorings to ensure that instruments are not lost and must replace any lost instruments as soon as possible. The Lessee must also notify BOEM if this occurs. The Lessee must follow the best practices outlined in the RWSC best practices document, unless otherwise required through conditions of COP approval. The best practices include engaging with the RWSC, calibrating the instruments, running QA/QC on the raw data, following the templates for reporting species vocalizations, and preparing the data for archiving at National Centers for Ecological Information (NCEI). Although section III of the RWSC best practices document specifies steps for Section 106	Marine Mammals	BOEM, BSEE

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			compliance, the Lessee must instead follow the conditions outlined in Section 7.13 and the Section 106 Memorandum of Agreement. In terms of data processing, the Lessee must document the occurrence of whale vocalizations (calls of NARW, humpback, sei, fin, and minke whales, as well as odontocete clicks, as available based on sample rate) using automatic or manual detection methods. In addition, data must be processed with either manual or automatic detection software to detect vocalizations of spawning cod. The Lessee must submit a log of these detections as well as the detection methodology to BOEM (at renewable_reporting@boem.gov), BSEE (at protectedspecies@bsee.gov) and NMFS (at nmfs.pacmdata@noaa.gov) within 120 days following each recorder retrieval. All raw data must be sent to the NCEI Passive Acoustic Data archive on an annual basis and the Lessee must follow NCEI guidance for packaging the data and pay the fee. iv. Long-term Passive Acoustic Monitoring Plan. The Lessee must prepare and implement a Long-term PAM Plan under this option. No later than 120 days prior to instrument deployment and before any construction begins, the Lessee must submit to BOEM and BSEE (renewable_reporting@boem.gov and OSWsubmittals@bsee.gov) the Long-term PAM Plan that describes all proposed equipment (including number and configuration of instruments), deployment locations, mooring design, detection review methodology, and other procedures and protocols related to the required use of PAM. As the Lessee prepares the Long-term PAM Plan, it must coordinate with the RWSC. BOEM and BSEE will review the Long-term PAM Plan and provide comments, if any, on the plan within 45 days of its submittal. The Lessee may be required to submit a modified Long-term PAM Plan based on feedback from BOEM and BSEE. The Lessee must address all outstanding comments to BOEM's and BSEE's satisfaction and will need to receive written concurrence from BOEM and BSEE. If BOEM or BSEE do not provide comments on the Long-term PAM Plan within 45 days of its submittal, the Lessee may conclusively presume BOEM's and BSEE's 's concurrence with the Long-term PAM Plan. Option 2 – Economic and Other Contributions to BOEM's Environmental Studies Program. As an alternative to conducting long-term PAM in the Lease Area, the Lessee may opt to make an economic contribution to BOEM's Environmental Studies Partnership for an Offshore Wind Energy Regional Observation Network (POWERON) initiative on an annual basis and cooperate with the POWERON team to allow access to the Lease Area for deployment, regular servicing, and retrieval of instruments. The Lessee's economic contribution will provide for all activities necessary to conduct PAM within the Lease Area, such as vessel and staff time for regular servicing of instruments, QA/QC on data, data processing to obtain vocalizations of sound-producing species and ambient noise metrics, as well as long-term archiving of data at NCEI. At the Lessee's request, the amount of the economic contribution will be estimated by BOEM's Environmental Studies Program. The Lessee will also be invited to contribute to discussions about the scientific approach of the POWERON initiative via the RWSC. The Lessee may request temporary withholding of the public release (placement into the NCEI public data archive) of raw acoustic data collected within the Lease Area for up to 180 days after it is collected. During this temporary hold, the Lessee may be provided a copy of the raw PAM data that was collected in the Lease Area or ROW after it has been cleared for any national security concerns under the RWSC best practices document.		

G.4 Lessee Authorization and Permit Conditions

Table G-4 to be included with lessee authorization and permit conditions from CZMA, USEPA, NMFS, and USACE in the Final EIS if finalized.

Table G-4. Lessee authorization and permit conditions

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
Federal Consistency Conditions Issued [Date] **Massachusetts Office of Coastal Zone Management Consistency Conditions Issued October 21, 2024**					
1	Pre-C	Permitting	SCW Project 2 – SCW LLC shall obtain and provide to CZM the required signed final MassDEP Chapter 91 license (and associated Wetlands Protection Act Order of Conditions or Superseding Order of Conditions) for the offshore export cable in state waters with a	Multiple	MACZM

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			landfall site in Somerset, Massachusetts. SCW Project 2 proposes to use the same offshore export cable corridor assessed by MassDEP for the SCW Project 1 Chapter 91 License.		
Rhode Island Coastal Resources Management Council Consistency Conditions Issued December 19, 2023					
1	C	Cable installation	Regarding all export cable installation activity subject to the Council's federal consistency review authority, SouthCoast Wind Energy LLC shall use all reasonable efforts to locate and install export cables outside complex and sensitive benthic habitat areas and, where siting outside of such areas is not possible, use reasonable efforts to micro-site cable locations to minimize adverse impacts on pertinent coastal resources. In any circumstance, SouthCoast Wind Energy LLC is not required to act against its own business interests by taking every possible action to avoid impacts, incur unlimited costs, or take unlimited time in meeting this condition. Avoidance, minimization, and mitigation will reduce the reasonably foreseeable effects on Rhode Island coastal resources and uses, including effects on those resources and uses with the same characteristics, values, and resources as found in Rhode Island State Waters.	Benthic, Commercial Fisheries and For-Hire Recreational Fishing	RICRMC
2	C	Cable burial depth	In furtherance of using reasonable efforts to avoid and minimize impacts on complex and sensitive benthic habitat areas, SouthCoast Wind Energy LLC shall provide notice to the Council of locations where the target cable burial depth range of 3.2 feet to 13.1 feet has not been achieved and the locations of secondary cable protection (i.e., mattresses, rock bags, etc.). Such notice shall consist of a written description of the area and a map(s) sufficient to see details of the project cable burial paths in order to overlay with tow lines. At a minimum, the written description must include the cable burial depth achieved and a description of the surrounding benthic conditions. Notice shall be provided to the Council within 30 days of SouthCoast Wind completing the as-built survey for each export cable.	Benthic, Commercial Fisheries and For-Hire Recreational Fishing	RICRMC
3	C	Boulder relocation	Where applicable, SouthCoast Wind Energy LLC shall make all reasonable efforts to relocate boulders within the same area/environment and group boulders with nearby existing boulders. Furthermore, where boulders are relocated, SouthCoast Wind Energy LLC shall provide notice to the Council of the original boulder locations as well as the new boulder locations. Notice shall be the same as the notice requirement stated in Condition 2. The relocation/grouping of boulders with existing boulders will further avoid, minimize, and mitigate impacts on resource habitats and minimize the creation of new hangs for the fishing industry to the extent practicable.	Benthic, Commercial Fisheries and For-Hire Recreational Fishing	RICRMC
4	C	Cable installation	Cables shall be no further apart than necessary for installation, maintenance, and operational activities in order to minimize unnecessary impacts on coastal uses and resources.	Multiple	RICRMC
5	Pre-C	Fisheries and benthic research and monitoring plan	SouthCoast Wind Energy LLC shall conduct the fisheries research and monitoring plan and the benthic habitat research and monitoring plan that receive final approval from the Bureau of Ocean Energy Management as part of the Record of Decision approving SouthCoast Wind Construction and Operations Plan. Findings from each relevant monitoring plan shall be supplied to the Council on an annual basis once reports are available to SouthCoast Wind. This information will facilitate the Coastal Resources Management Council's continued monitoring of activities described in the Outer Continental Shelf (OCS) plans to make certain that activities continue to conform to both federal and State requirements.	Benthic, Commercial Fisheries and For-Hire Recreational Fishing	RICRMC
NMFS Proposed Incidental Take Regulations and Associated 5-year Letter of Authorization Issued [Draft Issued on June 27 2024]					
1	General Conditions	Pre-C, C, O&M, D	SouthCoast Wind must comply with the following general measures: a) A copy of any issued LOA must be in the possession of SouthCoast Wind and its designees, all vessel operators, visual protected species observers (PSOs), passive acoustic monitoring (PAM) operators, pile driver operators, and any other relevant designees operating under the authority of the issued LOA; b) SouthCoast Wind must conduct training for construction supervisors, construction crews, and the PSO and PAM team prior to the start of all construction activities and when new personnel join the work in order to explain responsibilities, communication procedures, marine mammal monitoring and reporting protocols, and operational procedures. A description of the training program must be provided to NMFS at least 60 days prior to the initial training before in-water activities begin. Confirmation of all required training must be documented on a training course log sheet and reported to NMFS Office of Protected Resources prior to initiating project activities; c) SouthCoast Wind is required to use available sources of information on North Atlantic right whale presence to aid in monitoring efforts. These include daily monitoring of the Right Whale Sighting Advisory System, consulting of the WhaleAlert	Marine Mammals	NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			app, and monitoring of the Coast Guard's Very High Frequency (VHF) Channel 16 to receive notifications of marine mammal sightings and information associated with any Dynamic Management Areas (DMA) and Slow Zones; d) Any marine mammal observation by project personnel must be immediately communicated to any on-duty PSOs and PAM operator(s). Any large whale observation or acoustic detection by any project personnel must be conveyed to all vessel captains; e) If an individual from a species for which authorization has not been granted or a species for which authorization has been granted but the authorized take number has been met is observed entering or within the relevant clearance zone prior to beginning a specified activity, the activity must be delayed. If an activity is ongoing and an individual from a species for which authorization has not been granted or a species for which authorization has been granted but the authorized take number has been met is observed entering or within the relevant shutdown zone, the activity must be shut down (i.e., cease) immediately unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability. The activity must not commence or resume until the animal(s) has been confirmed to have left the clearance or shutdown zones and is on a path away from the applicable zone or after 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species; f) In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-North Atlantic right whale, it must be treated as if it were a North Atlantic right whale for purposes of mitigation; (7) For in-water construction heavy machinery activities listed in section 1(a), if a marine mammal is detected within or about to enter 10 meters (m) (32.8 feet (ft)) of equipment, SouthCoast Wind must cease operations until the marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment; g) All vessels must be equipped with a properly installed, operational Automatic Identification System (AIS) device and SouthCoast Wind must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources prior to use of any project vessels; h) By accepting a LOA, SouthCoast Wind consents to on-site observation and inspections by Federal agency personnel (including NOAA personnel) during activities described in this subpart, for the purposes of evaluating the implementation and effectiveness of measures contained within this LOA; and i) It is prohibited to assault, harm, harass (including sexually harass), oppose, impede, intimidate, impair, or in any way influence or interfere with a PSO, PAM operator, or vessel crew member acting as an observer, or attempt the same. This prohibition includes, but is not limited to, any action that interferes with an observer's responsibilities or that creates an intimidating, hostile, or offensive environment. Personnel may report any violations to the NMFS Office of Law Enforcement.		
2	Pre-C, C, O&M, D	Vessel Strike Avoidance	SouthCoast Wind must comply with the following vessel strike avoidance measures while in the specific geographic region unless a deviation is necessary to maintain safe maneuvering speed and justified because the vessel is in an area where oceanographic, hydrographic, and/or meteorological conditions severely restrict the maneuverability of the vessel; an emergency situation presents a threat to the health, safety, life of a person; or when a vessel is actively engaged in emergency rescue or response duties, including vessel-in distress or environmental crisis response. An emergency is defined as a serious event that occurs without warning and requires immediate action to avert, control, or remedy harm. Speed over ground will be used to measure all vessel speeds: a) Prior to the start of the Project's activities involving vessels, all vessel personnel must receive a protected species training that covers, at a minimum, identification of marine mammals that have the potential to occur in the specified geographical region; detection and observation methods in both good weather conditions (i.e., clear visibility, low winds, low sea states) and bad weather conditions (i.e., fog, high winds, high sea states, with glare); sighting communication protocols; all vessel strike avoidance mitigation requirements; and information and resources available to the project personnel regarding the applicability of Federal laws and regulations for protected species. This training must be repeated for any new vessel personnel who join the project. Confirmation of the vessel personnel training and understanding of the LOA requirements must be documented on a training course log sheet and reported to NMFS within 30 days of completion of training, prior to personnel joining vessel operations; b) All vessel operators, operating at any speed and regardless of their vessel's size, and dedicated visual observers must maintain a vigilant watch for all marine mammals and operators must slow down, stop their vessel, or alter course to avoid striking any marine mammal; (3) All transiting vessels operating at any speed must have a dedicated visual observer on duty at all times to monitor for marine mammals within a 180 degrees (°) direction of the forward path of the vessel (90° port to	Marine Mammals	NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			90° starboard) located at an appropriate vantage point for ensuring vessels are maintaining required separation distances. Dedicated visual observers may be PSOs or crew members, but crew members responsible for these duties must be provided sufficient training by SouthCoast Wind to distinguish marine mammals from other phenomena and must be able to identify a marine mammal as a North Atlantic right whale, other large whale (defined in this context as sperm whales or baleen whales other than North Atlantic right whales), or other marine mammals. Dedicated visual observers must be equipped with alternative monitoring technology (e.g., night vision devices, infrared cameras) for periods of low visibility (e.g., darkness, rain, fog, etc.). The dedicated visual observer must not have any other duties while observing and must receive prior training on protected species detection and identification, vessel strike avoidance procedures, how and when to communicate with the vessel captain, and reporting requirements in this subsection and LOA; c) At the onset of transiting and continuously thereafter, vessel operators and dedicated visual observers must monitor the U.S. Coast Guard VHF Channel 16, over which North Atlantic right whale sightings are broadcasted. At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew member(s) must also monitor the project's Situational Awareness System (if applicable), WhaleAlert, and relevant NOAA information systems such as the Right Whale Sighting Advisory System (RWSAS) for the presence of North Atlantic right whales; d) Prior to transit, vessel operators must check for information regarding the establishment of Seasonal and Dynamic Management Areas, Slow Zones, and any information regarding North Atlantic right whale sighting locations; e) All vessel operators must abide by vessel speed regulations (50 CFR 224.105). Nothing in this subsection exempts vessels from any other applicable marine mammal speed or approach regulations; f) All vessel operators, regardless of their vessel's size, must immediately reduce vessel speed to 10 knots (11.5 mph) or less for at least 24 hours when a North Atlantic right whale is sighted at any distance by any project-related personnel or acoustically detected by any project-related PAM system. Each subsequent observation or acoustic detection in the Project area shall trigger an additional 24-hour period. If a North Atlantic right whale is reported by project personnel or via any of the monitoring systems (see paragraph (b)(4)) within 10 km of a transiting vessel, that vessel must operate at 10 knots (11.5 mph) or less for 24 hours following the reported detection; g) In the event that a DMA or Slow Zone is established that overlaps with an area where a project-associated vessel is operating, that vessel, regardless of size, must transit that area at 10 knots (11.5 mph) or less; h) Between November 1st and April 30th, all vessels, regardless of size, must operate at 10 knots (11.5 mph) or less in the specified geographical region, except for vessels while transiting in Narragansett Bay or Long Island Sound; i) All vessels, regardless of size, must immediately reduce speed to 10 knots (11.5 mph) or less when any large whale (other than a North Atlantic right whale), mother/calf pairs, or large assemblages of non-delphinid cetaceans are observed within 500 m (0.31 mi) of a transiting vessel; j) If a vessel is traveling at any speed greater than 10 knots (11.5 mph) (i.e., no speed restrictions are enacted) in the transit corridor (defined as from a port to the Lease Area or return), in addition to the required dedicated visual observer, SouthCoast Wind must monitor the transit corridor in real-time with PAM prior to and during transits. If a North Atlantic right whale is detected via visual observation or PAM within or approaching the transit corridor, all vessels in the transit corridor must travel at 10 knots (11.5 mph) or less for 24 hours following the detection. Each subsequent detection shall trigger a 24-hour reset. A slowdown in the transit corridor expires when there has been no further North Atlantic right whale visual or acoustic detection in the transit corridor in the past 24 hours; k) All vessels must maintain a minimum separation distance of 500 m from North Atlantic right whales. If underway, all vessels must steer a course away from any sighted North Atlantic right whale at 10 knots (11.5 mph) or less such that the 500-m minimum separation distance requirement is not violated. If a North Atlantic right whale is sighted within 500 m of an underway vessel, that vessel must turn away from the whale(s), reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m; l) All vessels must maintain a minimum separation distance of 100 m (328 ft) from sperm whales and non-North Atlantic right whale baleen whales. If one of these species is sighted within 100 m (328 ft) of an underway vessel, the vessel must turn away from the whale(s), reduce speed, and shift the engine(s) to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 100 m (328 ft); m) All vessels must maintain a minimum separation distance of 50 m (164 ft) from all delphinid cetaceans and pinnipeds with an exception made for those that approach the vessel (e.g., bow-riding dolphins). If a delphinid cetacean or pinniped is sighted		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			within 50 m (164 ft) of a transiting vessel, that vessel must turn away from the animal(s), reduce speed, and shift the engine to neutral, with an exception made for those that approach the vessel (e.g., bow-riding dolphins). Engines must not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m (164 ft); n) All vessels underway must not divert or alter course to approach any marine mammal; and o) SouthCoast Wind must submit a Marine Mammal Vessel Strike Avoidance Plan 180 days prior to the planned start of vessel activity that provides details on all relevant mitigation and monitoring measures for marine mammals, vessel speeds and transit protocols from all planned ports, vessel-based observer protocols for transiting vessels, communication and reporting plans, and proposed alternative monitoring equipment in varying weather conditions, darkness, sea states, and in consideration of the use of artificial lighting. If SouthCoast Wind plans to implement PAM in any transit corridor to allow vessel transit above 10 knots (11.5 mph), the plan must describe how PAM, in combination with visual observations, will be conducted. If a plan is not submitted and approved by NMFS prior to vessel operations, all project vessels must travel at speeds of 10 knots (11.5 mph) or less. SouthCoast Wind must comply with any approved Marine Mammal Vessel Strike Avoidance Plan.		
3	C	WTG and OSP foundation installation	The following requirements apply to vibratory and impact pile driving activities associated with the installation of WTG and OSP foundations: a) Foundation pile driving activities must not occur January 1 through May 15 throughout the Lease Area. From October 16 through May 31, impact and vibratory pile driving must not occur at locations in SouthCoast's Lease Area within the North Atlantic right whale Enhanced Mitigation Area (NARW EMA; defined as 20 km (12.4 mi) of the 30-m (98-ft) isobath on the west side of Nantucket Shoals); b) Outside of the NARW EMA, foundation pile driving must not be planned for December; however, it may occur only if necessary to complete planned pile driving within a given year and with prior approval by NMFS and implementation of enhanced mitigation and monitoring in accordance with an approved Enhanced Mitigation and Monitoring Plan. SouthCoast Wind must notify NMFS in writing by September 1 of that year if circumstances are expected to necessitate pile driving in December; c) In the NARW EMA, SouthCoast must install foundations as quickly as possible and sequence them from the northeast corner of the Lease Area to the southwest corner such that foundation installation in positions closest to Nantucket Shoals are completed during the period of lowest North Atlantic right whale occurrence in that area; d) Monopiles must be no larger than a tapered 9/16-m diameter monopile design and pin piles must be no larger than 4.5-m diameter design. The minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Impact hammer energies must not exceed 6,600 kilojoules (kJ) for monopile installations and 3,500 kJ for pin pile installations; e) SouthCoast must not initiate pile driving earlier than 1 hour after civil sunrise or later than 1.5 hours prior to civil sunset unless SouthCoast submits and NMFS approves a Nighttime Pile Driving Monitoring Plan that demonstrates the efficacy of their low visibility visual monitoring technology (e.g., night vision devices, Infrared (IR) cameras) to effectively monitor the mitigation zones in low visibility conditions. SouthCoast must submit this plan or plans (if separate Daytime Reduced Visibility and Nighttime Monitoring Plans are prepared) at least 180 calendar days before foundation installation is planned to begin. SouthCoast must submit a separate Plan describing daytime reduced visibility monitoring if the information in the Nighttime Monitoring Plan does not sufficiently apply to all low-visibility monitoring. f) SouthCoast Wind must utilize a soft-start protocol at the beginning of foundation installation for each impact pile driving event and at any time following a cessation of impact pile driving for 30 minutes or longer; g) SouthCoast Wind must deploy, at minimum, a double-bubble curtain during all foundation pile driving; i. The double-bubble curtain must distribute air bubbles using an air flow rate of at least 0.5 m3 /(min*m). The double-bubble curtain must surround 100 percent of the piling perimeter throughout the full depth of the water column. In the unforeseen event of a single compressor malfunction, the offshore personnel operating the bubble curtain(s) must make adjustments to the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved. ii. The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100-percent seafloor contact.	Marine Mammals	NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			iii. No parts of the ring or other objects may prevent full seafloor contact with a bubble curtain ring. iv. SouthCoast Wind must inspect and carry out maintenance on the noise attenuation systems prior to every pile driving event and prepare and submit a Noise Attenuation System (NAS) inspection/performance report. For piles for which Thorough SFV (T-SFV) is carried out, this report must be submitted no later than when the interim T-SFV report is submitted for the respective pile. Performance reports for all Abbreviated SFV (A-SFV) conducted for subsequent piles must be submitted with the weekly pile driving reports. All reports must be submitted by email to pr.itp.monitoringreports@noaa.gov h) SouthCoast Wind must utilize PSOs. Each monitoring platform must have at least three on-duty PSOs. PSOs must be located on the pile driving vessel as well as on a minimum of three PSO-dedicated vessels inside the NARW EMA June 1 through July 31 and outside the NARW EMA June 1 through November 30, and a minimum of four PSO-dedicated vessels within the NARW EMA August 1-October 15 and throughout the Lease Area May 16-31 and December 1-31 (if pile driving in December is deemed necessary and approved by NMFS); i) Concurrent with visual monitoring, SouthCoast Wind must utilize PAM operator(s), as described in a NMFS-approved PAM Plan, who must conduct real-time acoustic monitoring of marine mammals for 60 minutes before, during, and 30 minutes after completion of impact and vibratory pile driving for each pile. PAM operators must immediately communicate all detections of marine mammals to the Lead PSO, including any determination regarding species identification, distance, and bearing and the degree of confidence in the determination; j) To increase situational awareness prior to pile driving, the PAM operator must review PAM data collected within the 24 hours prior to a pile installation; k) The PAM system must be able to detect marine mammal vocalizations, maximize baleen whale detections, and detect North Atlantic right whale vocalizations up to a distance of 10 km (6.2 mi) and 15 km (9.3mi) during pin pile and monopile installation, respectively. NMFS recognizes that detectability of each species' vocalizations will vary based on vocalization characteristics (e.g., frequency content, source level), acoustic propagation conditions, and competing noise sources), such that other marine mammal species (e.g., harbor porpoise) may not be detected out to 10 km (6.2 mi) or 15 km (9.3 mi); l) SouthCoast Wind must submit a Passive Acoustic Monitoring Plan (PAM Plan) to NMFS Office of Protected Resources for review and approval at least 180 days prior to the planned start of foundation installation activities and abide by the Plan, if approved. m) SouthCoast Wind must establish clearance and shutdown zones, which must be measured using the radial distance from the pile being driven. All clearance zones must be monitored by PSOs for at least 60 minutes prior to monitoring prior to, during, and 30 minutes after each foundation installation and must be confirmed to be free of marine mammals for 30 minutes immediately prior to the beginning of soft-start procedures or vibratory pile driving. If a marine mammal (other than a North Atlantic right whale) is detected within or about to enter the applicable clearance zones during this 30-minute time period, vibratory and impact pile driving must be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings. The specific time periods are 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species; n) For North Atlantic right whales, any visual observation by a PSO at any distance, or acoustic detection within the 10-km (6.2-mi) (pin pile) and 15-km (9.32-mi) (monopile) PAM clearance and shutdown zones must trigger a delay to the commencement or shutdown of pile driving. Within the NARW EMA August 1- October 15 and throughout the Lease Area May 16-31 and December 1-31 (if pile driving in December is deemed necessary and approved by NMFS), for any acoustic detection within the North Atlantic right whale PAM clearance and shutdown zones or sighting of 1 or 2 North Atlantic right whales, SouthCoast Wind must delay commencement of or shutdown pile driving for 24 hours. For any sighting of 3 or more North Atlantic right whales, SouthCoast Wind must delay commencement of or shutdown pile driving for 48 hours. Prior to beginning clearance at the pile driving location after these periods, SouthCoast must conduct a vessel-based survey to visually clear the 10-km (6.2-mi) zone, if installing pin piles that day, or 15-km (9.32- mi) zone, if installing monopiles; o) If visibility decreases such that the entire clearance zone is not visible, at minimum, PSOs must be able to visually clear (i.e., confirm no marine mammals are present) the minimum visibility zone. The entire minimum visibility zone must be visible (i.e., not obscured by dark, rain, fog, etc.) for the full 60 minutes immediately prior to commencing impact and vibratory pile driving;		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			p) If a marine mammal is detected (visually or acoustically) entering or within the respective shutdown zone after pile driving has begun, the PSO or PAM operator must call for a shutdown of pile driving and SouthCoast Wind must stop pile driving immediately, unless shutdown is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the lead engineer determines there is risk of pile refusal or pile instability. If pile driving is not shut down due to one of these situations, SouthCoast Wind must reduce hammer energy to the lowest level practicable to maintain stability; q) If pile driving has been shut down due to the presence of a marine mammal other than a North Atlantic right whale, pile driving must not restart until either the marine mammal(s) has voluntarily left the species-specific clearance zone and has been visually or acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections. The specific time periods are 30 minutes for all non-North Atlantic right whale baleen whale species and sperm whales and 15 minutes for all other species. In cases where these criteria are not met, pile driving may restart only if necessary to maintain pile stability at which time SouthCoast Wind must use the lowest hammer energy practicable to maintain stability; r) SouthCoast Wind must submit a Pile Driving Marine Mammal Monitoring Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation pile driving and abide by the Plan, if approved. SouthCoast Wind must obtain both NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division's concurrence with this Plan prior to the start of any pile driving; s) SouthCoast Wind must perform T-SFV measurements during installation of, at minimum, the first three WTG monopile foundations, first four WTG pin piles, and all OSP jacket foundation pin piles; t) T-SFV measurements must continue until T-SFV of at least three consecutive monopiles or four consecutive pin piles demonstrate noise levels are at or below those modeled, assuming 10 decibels (dB) of attenuation. Subsequent T-SFV measurements are also required should larger piles be installed or if additional monopiles or pin piles supporting jacket foundations are driven that may produce louder sound fields than those previously measured (e.g., from higher hammer energy, greater number of strikes); i. T-SFV measurements must be made at a minimum of four distances from the pile(s) being driven along a single transect in the direction of lowest transmission loss (i.e., projected lowest transmission loss coefficient), including, but not limited to, 750 m (2,460 ft) and three additional ranges selected such that measurement of modeled Level A harassment and Level B harassment isopleths are accurate, feasible, and avoids extrapolation (i.e., recorder spacing is approximately logarithmic and significant gaps near expected isopleths are avoided). At least one additional measurement at an azimuth 90 degrees from the transect array at 750 m (2,460 ft) must be made. At each location, there must be a near bottom and mid-water column hydrophone (acoustic recorder); ii. If any of the T-SFV results indicate that distances to harassment isopleths were exceeded, then SouthCoast Wind must implement additional measures for all subsequent foundation installations to ensure the measured distances to the Level A harassment and Level B harassment threshold isopleths do not exceed those modeled assuming 10-dB attenuation. SouthCoast Wind must also increase clearance, shutdown, and/or Level B harassment zone sizes to those identified by NMFS until T-SFV measurements on at least three additional monopiles or four pin piles demonstrate distances to harassment threshold isopleths meet or are less than those modeled assuming 10-dB of attenuation. For every 1,500 m (4,900 ft) that a marine mammal clearance or shutdown zone is expanded, additional PSOs must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded clearance and/or shutdown zone(s), with each PSO responsible for scanning no more than 120 degrees (°) out to a radius no greater than 1,500 m (4,900 ft). SouthCoast Wind must optimize the sound attenuation systems (e.g., ensure hose maintenance, pressure testing) to, at least, meet noise levels modeled, assuming 10-dB attenuation, within three monopiles or four pin piles, or else foundation installation activities must cease until NMFS and SouthCoast Wind can evaluate potential reasons for louder than anticipated noise levels. Alternatively, if SouthCoast determines T-SFV results demonstrate noise levels are within those modeled assuming 10-dB attenuation, SouthCoast may proceed to the next pile after submitting the interim report to NMFS; u) SouthCoast Wind also must conduct A-SFV, using at least one acoustic recorder (consisting of a bottom and mid-water column hydrophone) for every foundation for which T-SFV monitoring is not conducted. All A-SFV data must be included in weekly reports. Any indication that distances to the identified Level A harassment and Level B harassment threshold		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			isopleths for marine mammals may be exceeded based on this abbreviated monitoring must be addressed by SouthCoast Wind in the weekly report, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent foundations. SouthCoast Wind must meet with NMFS within two business days of SouthCoast Wind's submission of a report that includes an exceedance to discuss if any additional action is necessary; v) The SFV measurement systems must have a sensitivity for the expected sound levels from pile driving received at the nominal ranges throughout the installation of the pile. The frequency range of SFV measurement systems must cover the range of at least 20 hertz (Hz) to 20 kilohertz (kHz). The SFV measurement systems must be designed to have omnidirectional sensitivity so that the broadband received level of all pile driving exceeds the system noise floor by at least 10 dB. The dynamic range of the SFV measurement system must be sufficient such that signals are detected at each location, and the signals avoid poor signal-to-noise ratios for low amplitude signals and avoid clipping, nonlinearity, and saturation for high amplitude signals; w) SouthCoast must ensure that all hydrophones used in SFV measurements systems have undergone a full system, traceable laboratory calibration conforming to International Electrotechnical Commission (IEC) 60565, or an equivalent standard procedure from a factory or accredited source, at a date not to exceed 2 years before deployment, to guarantee each hydrophone receives accurate sound levels. Additional in situ calibration checks using a pistonphone must be performed before and after each hydrophone deployment. If the measurement system employs filters via hardware or software (e.g., high-pass, low-pass), which is not already accounted for by the calibration, the filter performance (i.e., the filter's frequency response) must be known, reported, and the data corrected for the filter's effect before analysis; x) SouthCoast Wind must be prepared with additional equipment (e.g., hydrophones, recording devices, hydrophone calibrators, cables, batteries), which exceeds the amount of equipment necessary to perform the measurements, such that technical issues can be mitigated before measurement; y) If any of the SFV measurements from any pile indicate that the distance to any isopleth of concern is greater than those modeled assuming 10-dB attenuation, before the next pile is installed, SouthCoast Wind must implement the following measures, as applicable: identify and propose for review and concurrence; additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS Office of Protected Resources supporting that determination, and request concurrence to proceed; and, following NMFS Office of Protected Resources' concurrence, deploy those additional measures on any subsequent piles that are installed (e.g., if threshold distances are exceeded on pile 1, then additional measures must be deployed before installing pile 2); z) If SFV measurements indicate that ranges to isopleths corresponding to the Level A harassment and Level B harassment thresholds are less than the ranges predicted by modeling (assuming 10-dB attenuation) for three consecutive monopiles or four consecutive pin piles, SouthCoast Wind may submit a request to NMFS Office of Protected Resources for a modification of the mitigation zones for non-North Atlantic right whale species. Mitigation zones for North Atlantic right whales cannot be decreased; aa) SouthCoast must measure background noise (i.e., noise absent pile driving) for 30 minutes before and after each pile installation; bb) SouthCoast must conduct SFV measurements during turbine operations to estimate turbine operation source levels, in accordance with a NMFS-approved WTG Operational SFV Plan; and cc) SouthCoast Wind must submit SFV Plans for T-SFV and A-SFV for foundation installation to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation installation activities and abide by the Plan if approved. Pile driving may not occur until NMFS provides SouthCoast concurrence that implementation of the Foundation Installation SFV Plan meets the requirements in the LOA.		
4	C	UXO/MEC detonation	The following requirements apply to Unexploded Ordnances and Munitions and Explosives of Concern (UXO/MEC) detonation: a) Upon encountering a UXO/MEC, SouthCoast Wind can only resort to high-order removal (i.e., detonation) if all other means of removal are impracticable (i.e., As Low As Reasonably Practicable (ALARP) risk mitigation procedure)) and this determination must be documented and submitted to NMFS; b) UXO/MEC detonations must not occur December 1 through April 30;	Marine Mammals	NMFS

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			c) UXO/MEC detonations must only occur during daylight hours (1 hour after civil sunrise through 1.5 hours prior to civil sunset; d) No more than one detonation can occur within a 24-hour period. No more than 10 detonations may occur throughout the effective period of the LOA; e) SouthCoast Wind must deploy, at minimum, a double-bubble curtain during all UXO/MEC detonations and comply with the following requirements related to noise abatement; i. The bubble curtain(s) must distribute air bubbles using an air flow rate of at least 0.5 m3 /(min*m). The bubble curtain(s) must surround 100 percent of the UXO/MEC detonation perimeter throughout the full depth of the water column. In the unforeseen event of a single compressor malfunction, the offshore personnel operating the bubble curtain(s) must make adjustments to the air supply and operating pressure such that the maximum possible noise attenuation performance of the bubble curtain(s) is achieved; ii. The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100-percent seafloor contact; iii. No parts of the ring or other objects may prevent full seafloor contact; iv. Construction contractors must train personnel in the proper balancing of airflow to the ring. Construction contractors must submit an inspection/performance report for approval by SouthCoast Wind within 72 hours following the performance test. SouthCoast Wind must then submit that report to NMFS Office of Protected Resources; v. Corrections to the bubble ring(s) to meet the performance standards in this paragraph (5) must occur prior to UXO/MEC detonations. If SouthCoast Wind uses a noise mitigation device in addition to the bubble curtain, SouthCoast Wind must maintain similar quality control measures as described in this paragraph (5); and vi. (vi) SouthCoast Wind must inspect and carry out maintenance on the noise attenuation system prior to every UXO/MEC detonation and prepare and submit a Noise Attenuation System (NAS) inspection/performance report as soon as it is available to NMFS Office of Protected Resources. f) SouthCoast Wind must conduct SFV during all UXO/MEC detonations at a minimum of three locations (with hydrophones at two water depths at each location) along a transect from each detonation site in a direction toward deeper water, in accordance with the following requirements: i. SouthCoast Wind must empirically determine source levels (peak and cumulative sound exposure level), the ranges to the Level A harassment and Level B harassment threshold isopleths and the transmission loss coefficient(s). SouthCoast Wind may estimate ranges to the Level A harassment and Level B harassment isopleths by extrapolating from in situ measurements conducted at several distances from the detonation location; ii. The SFV measurement systems must have a sensitivity for the expected sound levels from detonations received at the nominal ranges throughout the detonation. The dynamic range of the SFV measurement systems must be sufficient such that at each location, the signals avoid poor signal-to noise ratios for low amplitude signals and the signals avoid clipping, nonlinearity, and saturation for high amplitude signals; iii. All hydrophones used for SFV measurements are required to have undergone a full system, traceable laboratory calibration conforming to International Electrotechnical Commission (IEC) 60565, or an equivalent standard procedure, from a factory or accredited source to ensure the hydrophone receives accurate sound levels, at a date not to exceed 2 years before deployment. Additional in-situ calibration checks using a pistonphone are required to be performed before and after each hydrophone deployment. If the measurement system employs filters via hardware or software (e.g., high-pass, low-pass, etc.), which is not already accounted for by the calibration, the filter performance (i.e., the filter's frequency response) must be known, reported, and the data corrected before analysis; iv. SouthCoast Wind must be prepared with additional equipment (e.g., hydrophones, recording devices, hydrophone calibrators, cables, batteries, etc.), which exceeds the amount of equipment necessary to perform the measurements, such that technical issues can be mitigated before measurement; v. SouthCoast Wind must submit SFV reports within 72 hours after each UXO/MEC detonation; vi. If SFV measurements collected for a UXO/MEC detonation event indicate ranges to the isopleths, corresponding to Level A harassment and Level B harassment thresholds, are greater than the ranges predicted by modeling (assuming 10 dB attenuation), SouthCoast Wind must implement additional noise mitigation measures prior to the		

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			next UXO/MEC detonation. SouthCoast Wind must provide written notification to NMFS Office of Protected Resources of the changes planned for the next detonation within 24 hours prior to implementation. Subsequent UXO/MEC detonation activities must not occur until NMFS and SouthCoast Wind can evaluate the situation and ensure future detonations will not exceed noise levels modeled assuming 10-dB attenuation; and vii. SouthCoast Wind must optimize the noise attenuation systems (e.g., ensure hose maintenance, pressure testing) to, at least, meet noise levels modeled, assuming 10-dB attenuation. g) SouthCoast Wind must establish and implement clearance zones for UXO/MEC detonations using both visual and acoustic monitoring. UXO/MEC clearance zones are specific to the known charge weight size of the UXO/MEC to be detonated; if charge weight is unknown or uncertain then the clearance zone identified for the largest charge weight (i.e., E12) must be implemented; h) At least three on-duty PSOs must be stationed on each monitoring platform and monitoring for 60 minutes prior to, during, and 30 minutes after each UXO/MEC detonation. The number of platforms is contingent upon the size of the UXO/MEC detonation and must be sufficient such that PSOs are able to visually clear the entire clearance zone. Concurrently, at least one PAM operator must be actively monitoring for marine mammals with PAM 60 minutes before, during, and 30 minutes after detonation. SouthCoast must identify the number of platforms planned for each size class and describe all monitoring protocols in the UXO/MEC Detonation Marine Mammal Monitoring Plan; and i) All clearance zones must be confirmed to be acoustically free of marine mammals for 30 minutes prior to a detonation. If a marine mammal is observed entering or within the relevant clearance zone prior to the initiation of a detonation, detonation must be delayed and must not begin until either the marine mammal(s) has voluntarily left the specific clearance zones and have been visually and acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections. The specific time periods are 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species.		
5	C	HRG Surveys	The following requirements apply to HRG surveys operating sub-bottom profilers (SBPs) (e.g., boomers, sparkers, and Compressed High Intensity Radiated Pulse (CHIRPS)) (hereinafter referred to as "acoustic sources"): a) SouthCoast Wind must establish and implement clearance and shutdown zones for HRG surveys using visual monitoring. These zones must be measured using the radial distance(s) from the acoustic source(s) currently in use; b) SouthCoast must utilize PSO(s), as described in Section 4(a). Visual monitoring must begin no less than 30 minutes prior to initiation of specified acoustic sources and must continue until 30 minutes after use of specified acoustic sources ceases. Any PSO on duty has the authority to delay the start of survey operations or shutdown operations if a marine mammal is detected within the applicable zones. When delay or shutdown is instructed by a PSO, the mitigative action must be taken and any dispute resolved only following deactivation; c) Prior to starting the survey and after receiving confirmation from the PSOs that the clearance zone is clear of any marine mammals, SouthCoast Wind is required to ramp-up acoustic sources to half power for 5 minutes prior to commencing full power, unless the equipment operates on a binary on/off switch (in which case rampup is not required). Any ramp-up of acoustic sources may only commence when visual clearance zones are fully visible (e.g., not obscured by darkness, rain, fog, etc.) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to the initiation of survey activities using a specified acoustic source. Ramp-ups must be scheduled so as to minimize the time spent with the source activated; d) Prior to a ramp-up procedure starting, the acoustic source operator must notify the Lead PSO of the planned start of ramp-up. The notification time must not be less than 60 minutes prior to the planned ramp-up or activation in order to allow the PSO(s) time to monitor the clearance zone(s) for 30 minutes prior to the initiation of ramp-up or activation (pre-start clearance). During this 30-minute clearance period, the entire applicable clearance zones must be visible e) A PSO conducting clearance observations must be notified again immediately prior to reinitiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed. f) If a marine mammal is observed within a clearance zone during the 30 minute clearance period, ramp-up or acoustic surveys may not begin until the animal(s) has been observed voluntarily exiting its respective clearance zone or until a specific time period has elapsed with no further sighting. The specific time periods are 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species;	Marine Mammals	NMFS

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			g) In any case when the clearance process has begun in conditions with good visibility, including via the use of night vision/reduced visibility monitoring equipment (infrared (IR)/thermal camera), and the Lead PSO has determined that the clearance zones are clear of marine mammals, survey operations may commence (i.e., no delay is required) despite periods of inclement weather and/or loss of daylight. Ramp-up may occur at times of poor visibility, including nighttime, if required visual monitoring has occurred with no detections of marine mammals in the 30 minutes prior to beginning ramp-up; h) Once the survey has commenced, SouthCoast Wind must shut down acoustic sources if a marine mammal enters a respective shutdown zone. In cases when the shutdown zones become obscured for brief periods (less than 30 minutes) due to inclement weather, survey operations would be allowed to continue (i.e., no shutdown is required) so long as no marine mammals have been detected. The shutdown requirement does not apply to small delphinids of the following genera: Delphinus, Stenella, Lagenorhynchus, and Tursiops. If there is uncertainty regarding the identification of a marine mammal species (i.e., whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown. Shutdown is required if a delphinid that belongs to a genus other than those specified in this paragraph of this section is detected in the shutdown zone; i) If an acoustic source has been shut down due to the presence of a marine mammal, the use of an acoustic source may not commence or resume until the animal(s) has been confirmed to have left the Level B harassment zone or until a full 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species have elapsed with no further sighting. If an acoustic source is shut down for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up only if PSOs have maintained constant observation and no additional detections of any marine mammal occurred within the respective shutdown zones. If an acoustic source is shut down for a period longer than 30 minutes, then all clearance and ramp-up procedures must be initiated; j) If multiple HRG vessels are operating concurrently, any observations of marine mammals must be communicated to PSOs on all nearby survey vessels; and k) Should an autonomous survey vehicle (ASV) be used during HRG surveys, the ASV must remain with 800 m (2,635 ft) of the primary vessel while conducting survey operations; two PSOs must be stationed on the mother vessel at the best vantage points to monitor the clearance and shutdown zones around the ASV; at least one PSO must monitor the output of a thermal high-definition camera installed on the mother vessel to monitor the field-of-view around the ASV using a hand-held tablet, and during periods of reduced visibility (e.g., darkness, rain, or fog), PSOs must use night-vision goggles with thermal clip-ons and a hand-held spotlight to monitor the clearance and shutdown zones around the ASV.		
6	C, O&M	Fisheries monitoring surveys	The following measures apply during fisheries monitoring surveys and must be implemented by SouthCoast Wind: a) Marine mammal monitoring must be conducted within 1 nm (1.85 km) from the planned survey location by the trained captain and/or a member of the scientific crew for 15 minutes prior to deploying gear, throughout gear deployment and use, and for 15 minutes after haul back; b) All captains and crew conducting fishery surveys must be trained in marine mammal detection and identification; c) Gear must not be deployed if there is a risk of interaction with marine mammals. Gear must not be deployed until a minimum of 15 consecutive minutes have elapsed during which no marine mammal sightings within 1 nm (1,852 m) of the sampling station have occurred; d) If marine mammals are sighted within 1 nm of the planned location (i.e., station) within the 15 minutes prior to gear deployment, then SouthCoast Wind must move the vessel away from the marine mammal to a different section of the sampling area. If, after moving on, marine mammals are still visible from the vessel, SouthCoast Wind must move again to an area visibly clear of marine mammals or skip the station; e) If a marine mammal is at risk of interacting with deployed gear or set, all gear must be immediately removed from the water. If marine mammals are sighted before the gear is fully removed from the water, the vessel must slow its speed and maneuver the vessel away from the animals to minimize potential interactions with the observed animal; f) Survey gear must be deployed as soon as possible once the vessel arrives on station and after fulfilling the requirements in (f)(1) and (f)(3);	Marine Mammals	NMFS

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			g) SouthCoast Wind must maintain visual marine mammal monitoring effort during the entire period of time that gear is in the water (i.e., throughout gear deployment, fishing, and retrieval). If marine mammals are sighted before the gear is fully removed from the water, SouthCoast Wind will take the most appropriate action to avoid marine mammal interaction; h) All fisheries monitoring gear must be fully cleaned and repaired (if damaged) before each use/deployment; i) SouthCoast Wind's fixed gear must comply with the Atlantic Large Whale Take Reduction Plan regulations at 50 CFR 229.32 during fisheries monitoring surveys; j) Trawl tows must be limited to a maximum of 20 minute trawl-time and trawl tows must not exceed at a speed of 3.0 knots (3.5 mph); k) All gear must be emptied as close to the deck/sorting area and as quickly as possible after retrieval; l) During trawl surveys, vessel or scientific crew must open the cod end of the trawl net close to the deck in order to avoid injury to animals that may be caught in the gear; m) All fishery survey-related lines must include the breaking strength of all lines being less than 1,700 pounds (lbs; 771 kilograms (kg)). This may be accomplished by using whole buoy line that has a breaking strength of 1,700 lbs (771 kg); or buoy line with weak inserts that result in line having an overall breaking strength of 1,700 lbs (771 kg); n) During any survey that uses vertical lines, buoy lines must be weighted and must not float at the surface of the water. All groundlines must be composed entirely of sinking lines. Buoy lines must utilize weak links. Weak links must break cleanly leaving behind the bitter end of the line. The bitter end of the line must be free of any knots when the weak link breaks. Splices are not considered to be knots. The attachment of buoys, toggles, or other floatation devices to groundlines is prohibited; o) All in-water survey gear, including buoys, must be properly labeled with the scientific permit number or identification as SouthCoast Wind's research gear. All labels and markings on the gear, buoys, and buoy lines must also be compliant with the applicable regulations, and all buoy markings must comply with instructions received by the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division; p) All survey gear must be removed from the water whenever not in active survey use (i.e., no wet storage); q) All reasonable efforts that do not compromise human safety must be undertaken to recover gear; r) Any lost gear associated with the fishery surveys must be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division within 24 hours.		
7	C, O&M, D	PSO and PAM operator qualifications	SouthCoast Wind must implement the following measures applicable to PSOs and PAM operators: a) SouthCoast Wind must use NMFS-approved PSOs and PAM operators that are employed by a third-party observer provider. PSOs and PAM operators must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant personnel regarding the presence of marine mammals and mitigation requirements; b) All PSOs and PAM operators must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences. The educational requirements may be waived if the PSO or PAM operator has acquired the relevant experience and skills for visually and/or acoustically detecting marine mammals in a range of environmental conditions (e.g., sea state, visibility) within zone sizes equivalent to the clearance and shutdown zones required by these regulations. Requests for such a waiver must be submitted to NMFS Office of Protected Resources prior to or when SouthCoast Wind requests PSO and PAM operator approvals and must include written justification describing alternative experience. Alternate experience that may be considered includes, but is not limited to, conducting academic, commercial, or government-sponsored marine mammal visual and/or acoustic surveys or previous work experience as a PSO/PAM operator. All PSO's and PAM operators should demonstrate good standing and consistently good performance of all assigned duties; c) PSOs must have visual acuity in both eyes (with correction of vision being permissible) sufficient enough to discern moving targets on the water's surface with the ability to estimate the target size and distance (binocular use is allowable); ability to conduct field observations and collect data according to the assigned protocols, writing skills sufficient to document observations and the ability to communicate orally by radio or in-person with project personnel to provide real-time information on marine mammals observed in the area; d) All PSOs must be trained in northwestern Atlantic Ocean marine mammal identification and behaviors and must be able to conduct field observations and collect data according to assigned protocols. Additionally, PSOs must have the ability to work	Marine Mammals	NMFS

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			with all required and relevant software and equipment necessary during observations (as described in paragraphs (b)(2) and (b)(3) of this section); e) All PSOs and PAM operators must have successfully completed a PSO, PAM, or refresher training course within the last 5 years and obtained a certificate of course completion that must be submitted to NMFS. This requirement is waived for any PSOs and PAM operators that completed a relevant training course more than five years prior to seeking approval but have been working consistently as a PSO or PAM operator within the past five years; f) At least one on-duty PSO and PAM operator, where applicable, per platform must be designated as a Lead during each of the specified activities; g) PSOs are responsible for obtaining NMFS' approval. NMFS may approve PSOs as conditional or unconditional. An unconditionally approved PSO is one who has completed training within the last 5 years and attained the experience (i.e., demonstrate experience with monitoring for marine mammals at clearance and shutdown zone sizes similar to those produced during the respective activity) or for PSOs who completed training more than five years previously and have worked in the specified role consistently for at least the past 5 years. A conditionally approved PSO may be one who has completed training in the last 5 years but has not yet attained the requisite field experience. To qualify as a Lead PSO, the person must be unconditionally approved and demonstrate that they have a minimum of 90 days of at-sea experience in the specific role, with the conclusion of the most recent relevant experience not more than 18 months previous to deployment and must also have experience specifically monitoring baleen whale species; h) PSOs for HRG surveys may be unconditionally or conditionally approved. A conditionally approved PSO for HRG surveys must be paired with an unconditionally approved PSO; i) PSOs and PAM operators for foundation installation and UXO detonation must be unconditionally approved; j) For all prospective project PSOs and PAM operators, SouthCoast Wind must submit resumes, NMFS approval letters, and certificates of completion of NMFS-approved PSO and/or PAM training/courses to NMFS' Office of Protected Resources for review and confirmation of their approval for specific roles at least 90 days prior to commencement of the activities requiring PSOs/PAM operators, or at least 30 days prior to when new PSOs/PAM operators are required after activities have commenced. Resumes must include information related to relevant education, experience, and training, including role, deployment dates and duration (i.e., number of days as a PSO or PAM operator per project), location and description of each prior PSO or PAM operator experience (i.e., zone sizes monitored, how monitoring supported mitigation, PAM system/software utilized); k) For prospective PSOs and PAM operators not previously approved by NMFS or for PSOs and PAM operators whose approval is not current (i.e., approval date is more than 5 years prior to the start of monitoring duties), SouthCoast Wind must submit the list of pre-approved PSOs and PAM operators for qualification verification at least 60 days prior to PSO and PAM operator use. Resumes must include information detailed in 217.335(a)(9). Resumes must be accompanied by certificate of completion of a NMFS-approved PSO and/or PAM training/course l) PAM operators are responsible for obtaining NMFS' approval. To be approved as a PAM operator, the person must meet the following qualifications: the PAM operator must have completed a PAM Operator training course, and demonstrate prior experience using PAM software, equipment, and real-time acoustic detection systems. They must demonstrate that they have prior experience independently analyzing archived and/or real-time PAM data to identify and classify baleen whale and other marine mammal vocalizations by species, including North Atlantic right whale and humpback whale vocalizations, and experience with deconflicting multiple species' vocalizations that are similar and/or received concurrently. PAM operators must be independent observers (i.e., not construction personnel), trained to use relevant project-specific PAM software and equipment, and must also be able to test software and hardware functionality prior to beginning real-time monitoring. The PAM operator must be able to identify and classify marine mammal acoustic detections by species in real-time (prioritizing North Atlantic right whales and noting other marine mammal vocalizations, when detected). At a minimum, for each acoustic detection, the PAM operator must be able to categorically determine whether a North Atlantic right whale is detected, possibly detected, or not detected, and notify the Lead PSO of any confirmed or possible detections, including baleen whale detections that cannot be identified to species. If the PAM software is capable of localization of sounds or deriving bearings and distance, the PAM operators must demonstrate experience using this technique; m) PSOs may work as PAM operators and vice versa if NMFS approves each individual for both roles; however, they may only perform one role at any one time and must not exceed work time restrictions, which must be tallied cumulatively; and		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			n) All PSOs and PAM operators must complete a Permits and Environmental Compliance Plan training that must be held by the Project compliance representative(s) prior to the start of in-water project activities and whenever new PSOs and PAM operators join the marine mammal monitoring team. PSOs and PAM operators must also complete training and orientation with the construction operation to provide for personal safety.		
8	C, O&M, D	General PSO and PAM operator requirements	The following measures apply to PSOs and PAM operators and must be implemented by SouthCoast Wind: a) All PSOs must be located at the best vantage point(s) on any platform, as determined by the Lead PSO, in order to collectively obtain 360-degree visual coverage of the entire clearance and shutdown zones around the activity area and as much of the Level B harassment zone as possible. PAM operators may be located on a vessel or remotely on-shore but must have a computer station equipped with a data collection software system and acoustic data analysis software available wherever they are stationed, and data or data products must be streamed in real-time or in near real-time to allow PAM operators to provide assistance to on-duty PSOs in determining if mitigation is required (i.e., delay or shutdown); b) PSOs must use high magnification (25x) binoculars, standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals during visual monitoring. During foundation installation, at least three PSOs on each dedicated PSO vessel must be equipped with functional Big Eye binoculars (e.g., 25 x 150; 2.7 view angle; individual ocular focus; height control). These must be pedestal mounted on the deck at the best vantage point that provides for optimal sea surface observation and PSO safety. PAM operators must use a NMFS-approved PAM system to conduct acoustic monitoring; c) During periods of low visibility (e.g., darkness, rain, fog, poor weather conditions), PSOs must use alternative technology (e.g., infrared or thermal cameras) to monitor the mitigation zones; d) PSOs and PAM operators must not exceed 4 consecutive watch hours on duty at any time, must have a 2-hour (minimum) break between watches, and must not exceed a combined watch schedule of more than 12 hours in a 24-hour period; and e) SouthCoast Wind must ensure that PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-effort PSO monitoring must be reflected in the PSO monitoring reports;	Marine Mammals	NMFS
9	C, O&M, D	Reporting	SouthCoast Wind must comply with the following reporting measures: a) Prior to initiation of project activities, SouthCoast Wind must demonstrate in a report submitted to NMFS Office of Protected Resources (pr.itp.monitoringreports@noaa.gov) that all required training for SouthCoast Wind personnel, including the vessel crews, vessel captains, PSOs, and PAM operators has been completed; b) SouthCoast Wind must use a standardized reporting system. All data collected related to the Project must be recorded using industry-standard software that is installed on field laptops and/or tablets. Unless stated otherwise, all reports must be submitted to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov), dates must be in MM/DD/YYYY format, and location information must be provided in Decimal Degrees and with the coordinate system information (e.g., NAD83, WGS84); c) For all visual monitoring efforts and marine mammal sightings, the following information must be collected and reported to NMFS Office of Protected Resources: the date and time that monitored activity begins or ends; the construction activities occurring during each observation period; the watch status (i.e., sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform); the PSO who sighted the animal; the time of sighting; the weather parameters (e.g., wind speed, percent cloud cover, visibility) and water conditions (e.g., Beaufort sea state, tide state, water depth); all marine mammal sightings, regardless of distance from the construction activity; species (or lowest possible taxonomic level possible); the pace of the animal(s); the estimated number of animals (minimum/maximum/high/low/best); the estimated number of animals by cohort (e.g., adults, yearlings, juveniles, calves, group composition, etc.); the description (i.e., as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics); the description of any marine mammal behavioral observations (e.g., feeding or traveling), definitions of any behavioral categories used (e.g., travel means directed movement at moderate speed), and observed changes in behavior, including an assessment of behavioral responses thought to have resulted from the specific activity; the animal's closest distance (i.e., closest point of approach) and bearing from the pile being driven, UXO/MEC detonation site, or specified HRG equipment; estimated time entered or spent within the Level A harassment and/or Level B harassment zone(s); status of any noise attenuation device(s) at time of sighting (e.g., double-bubble curtain on); specific phase of activity (e.g., ramp-up of HRG equipment, HRG acoustic source on/off, soft-start for pile	Marine Mammals	NMFS

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			driving, active pile driving); the timing and description of any mitigation-related action implemented, or mitigation-related actions called for but not implemented, in response to the sighting (e.g., delay, shutdown, etc.); other human activity in the area; and other applicable information, as required in any LOA issued under section 5 herein; d) For all PAM deployments, the following information must be recorded and reported to NMFS: location of hydrophone (latitude and longitude; in Decimal Degrees) and site name; bottom depth and depth of recording unit (in meters); recorder (model & manufacturer) and platform type (i.e., bottom-mounted, electric glider, etc.), and instrument ID of the hydrophone and recording platform (if applicable); time zone for sound files and recorded date/times in data and metadata (in relation to Universal Coordinated Time (UTC); i.e., Eastern Standard Time (EST) time zone is UTC-5); duration of recordings (start/end dates and times; in International Organization for Standardization (ISO) 8601 format, yyyymm-ddTHH:MM:SS.sssZ); deployment/retrieval dates and times (in ISO 8601 format); recording schedule (must be continuous); hydrophone and recorder sensitivity (in dB re. 1 microPascal (µPa)); calibration curve for each recorder; bandwidth/sampling rate (in Hz); sample bit-rate of recordings; and, detection range of equipment for relevant frequency bands (in meters); i. For each detection, the following information the following information must be noted: species identification (if possible); call type, number of calls (if known) and number of species (if simultaneous calls detected); temporal aspects of vocalization (date, time, duration, etc.; date times in ISO 8601 format); confidence of detection (detected, or possibly detected); comparison with any concurrent visual sightings; location and/or directionality of call location (if determined) relative to acoustic recorder or construction activities; location of recorder and construction activities at time of call; name and version of detection or sound analysis software used, with protocol reference; duration of detection file and minimum and maximum frequencies viewed/monitored/used in detection (in Hz); and name of PAM operator(s) on duty. e) SouthCoast Wind must compile and submit weekly reports during foundation installation containing marine mammal monitoring and A-SFV data to NMFS Office of Protected Resources (pr.itp.monitoringreports@noaa.gov). Weekly reports are due on Wednesday for the previous week (Sunday – Saturday). In the reports, SouthCoast must provide the daily start and stop of all pile driving; the start and stop of associated observation periods by PSOs; details on the deployment of PSOs; a record of all detections of marine mammals (acoustic and visual); any mitigation actions (or if mitigation actions could not be taken, provide reasons why); and details on the noise attenuation system(s) used and its performance. The weekly report must also identify which turbines were installed, and when/if any become operational (a map must be provided). f) SouthCoast Wind must compile and submit monthly reports to NMFS Office of Protected Resources (pr.itp.monitoringreports@noaa.gov) during foundation installation that include a summary of all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel, MMSI number, and route), number of piles installed, table(s) including all visual and acoustic detections of marine mammals, and any mitigative action taken. Monthly reports are due on the 15th of the month for the previous month. The monthly report must also identify which turbines were installed and when/if any became operational (a map must be provided). Full PAM detection data and metadata must also be submitted monthly on the 15th of every month for the previous month via the webform on the NMFS North Atlantic Right Whale Passive Acoustic Reporting System website at https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reportingsystem-templates; g) SouthCoast Wind must submit a draft annual marine mammal monitoring report to NMFS (PR.ITP.monitoringreports@noaa.gov) no later than March 31, annually, which contains data for all specified activities. The draft and final reports must detail the following: the total number of marine mammals of each species/stock detected and how many were within the designated Level A harassment and Level B harassment zone(s) and a comparison with the number of authorized takes of marine mammals for the associated activity type; marine mammal detections and behavioral observations before, during, and after each activity; what mitigation measures were implemented (i.e., number of shutdowns or clearance zone delays, etc.) or, if no mitigative actions was taken, why; operational details (i.e., days and duration of impact and vibratory pile driving, number of UXO/MEC detonations, days and amount of HRG survey effort, etc.); PAM systems used; the results, effectiveness, and which noise attenuation systems were used during relevant activities (i.e., foundation pile driving); summarized information related to situational reporting; and any other important information relevant to the Project, including additional information that may be identified through the adaptive management process. The final annual report must be prepared and submitted within 30 calendar days following the receipt of any comments from NMFS on the draft report;		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			h) In addition to the 48-hour interim reports, SouthCoast Wind must submit a draft annual SFV report to NMFS (PR.ITP.monitoringreports@noaa.gov) no later than 90 days after SFV is completed for the year. The final annual SFV report must be prepared and submitted within 30 calendar days (or longer upon approval by SouthCoast Wind must submit its draft 5-year report to NMFS Office of Protected Resources (PR.ITP.monitoringreports@noaa.gov) on all visual and acoustic monitoring conducted within 90 calendar days of the completion of activities occurring under the LOA. A 5-year report must be prepared and submitted within 60 calendar days (or longer upon approval by NMFS) following receipt of any NMFS Office of Protected Resources comments on the draft report; i) SouthCoast Wind must provide the initial results of the T-SFV measurements to NMFS Office of Protected Resources (PR.ITP.monitoringreports@noaa.gov) in an interim report after each foundation installation event as soon as they are available, but no later than 48 hours after each completion of T-SFV for a given foundation. The report must include, at minimum: pile identifier name, location of the pile and each hydrophone array in latitude/longitude; depths of each hydrophone; hammer energies/schedule used during pile driving including the total number of strikes and the maximum hammer energy; the model-estimated acoustic ranges (R95%) to compare with the real-world sound field measurements; peak sound pressure level (SPLpk), root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPLrms), and sound exposure level (SEL, in single strike for impact pile driving, SELss and SEL over 1-second interval for vibratory pile driving) for each hydrophone, including at least the maximum, arithmetic mean, minimum, median (L50) and L5 (95 percent exceedance) statistics for each metric; estimated ranges to marine mammal Level A harassment and Level B harassment acoustic isopleths estimated using SFV data, calculated using the maximum-over-depth L5 (95 percent exceedance level, maximum of both hydrophones) of the associated sound metric; comparison of modeled results assuming 10-dB attenuation against the measured marine mammal Level A harassment and Level B harassment acoustic isopleths; estimated transmission loss coefficients; one-third-octave band SEL spectra for impact and vibratory pile driving for each hydrophone; if filtering is applied, full filter characteristics must be reported; and hydrophone specifications including the type, model, and sensitivity. SouthCoast Wind must also report any immediate observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, technical issues with hydrophones or recording devices, interfering noise sources (e.g., vessel traffic). If any in-situ calibration checks for hydrophones reveal a calibration drift greater than 0.75 dB, that pistonphone calibration checks are inconclusive, or that calibration checks are otherwise not effectively performed, SouthCoast Wind must indicate full details of the calibration procedure and results, and any associated issues in the 48-hour interim reports; j) All A-SFV results must be included in the weekly reports. Any indications that distances to the identified Level A harassment and Level B harassment threshold isopleths for marine mammals were exceeded must be addressed by SouthCoast Wind in the reports, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles, if applicable; k) SouthCoast Wind must provide NMFS Office of Protected Resources with notification of planned UXO/MEC detonation as soon as possible but at least 48 hours prior to the planned detonation unless this 48-hour notification requirement would create delays to the detonation that would result in imminent risk of human life or safety. This notification must include the coordinates of the planned detonation, the estimated charge size, and any other information available on the characteristics of the UXO/MEC; l) SouthCoast Wind must submit SFV results for a UXO/MEC detonation in a report submitted to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) prior to detonating a subsequent UXO/MEC, or within the relevant weekly report, whichever comes first; m) SouthCoast must submit bubble curtain performance reports for foundation installations within 48 hours of each bubble curtain deployment; n) The final results of all SFV measurements from each foundation installation and UXO/MEC detonation must be submitted as soon as possible, but no later than 90 days following completion of all annual SFV measurements. The final reports must include all details included in the interim reports and descriptions of any notable occurrences, explanations for results that were not anticipated, and mitigative actions taken during foundation installation to reduce noise levels (e.g., cleaning and redeploying bubble curtain hose). The final report must also include at least the maximum, mean, minimum, median (L50) and L5 (95 percent exceedance) statistics for each metric; the SEL and SPL power spectral density and/or one-third octave band levels (usually calculated as decidecade band levels) at the receiver locations should be reported; range of transmission		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			loss coefficients; the local environmental conditions, such as wind speed, transmission loss data collected on-site (or the sound velocity profile); baseline pre- and postactivity ambient sound levels (broadband and/or within frequencies of concern); a description of depth and sediment type, as documented in the Construction and Operation Plan (COP), at the acoustic buoy and foundation installation and UXO/MEC detonation locations; the measured ranges to the Level A harassment and Level B harassment threshold isopleths; hammer energies required for pile installation and the number of strikes per pile; the hydrophone equipment and methods (i.e., recording device, bandwidth/sampling rate; distance from the pile where recordings were made; the depth of recording device(s)); a description of the SFV measurement hardware and software, including software version used, calibration data, bandwidth capability and sensitivity of hydrophone(s), any filters used in hardware or software, any limitations with the equipment, and other relevant information; the spatial configuration of the noise attenuation device(s) relative to the pile; a description of the noise abatement system and operational parameters (e.g., bubble flow rate, distance deployed from the pile, etc.), and any action taken to adjust the noise abatement system. A discussion which includes any observations that are suspected to have had a significant influence on the results including, but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, technical issues with hydrophones or recording devices, deviation of propagation environment from that assumed for acoustic modeling, vessel noise interference; o) If at any time during the project SouthCoast Wind becomes aware of any issue or issues which may (to any reasonable subject-matter expert, including the persons performing the measurements and analysis) call into question the validity of any measured ranges to Level A harassment or Level B harassment threshold isopleths to a significant degree, which were previously transmitted or communicated to NMFS Office of Protected Resources, SouthCoast Wind must inform NMFS Office of Protected Resources within 1 business day of becoming aware of this issue or before the next pile is driven, whichever comes first. p) If a North Atlantic right whale is acoustically detected at any time by a project-related PAM system, SouthCoast Wind must ensure the detection is reported as soon as possible to NMFS, but no longer than 24 hours after the detection via the 24-hour North Atlantic right whale Detection Template (https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reportingsystem-templates). Calling the hotline is not necessary when reporting PAM detections via the template; q) Full detection data, metadata, and location of recorders (or GPS tracks, if applicable) from all real-time hydrophones used for monitoring during foundation installations and UXO/MEC detonations must be submitted within 90 calendar days following completion of activities requiring PAM for mitigation via the International Organization for Standardization (ISO) standard metadata forms available on the NMFS Passive Acoustic Reporting System website (https://www.fisheries.noaa.gov/resource/document/passive-acousticreportingsystem-templates). Submit the completed data templates to nmfs.nec.pacmdata@noaa.gov. The full acoustic recordings from real-time systems must also be sent to the National Centers for Environmental Information (NCEI) for archiving within 90 days following completion of activities requiring PAM for mitigation. Submission details can be found at: https://www.ncei.noaa.gov/products/passive-acoustic-data; r) SouthCoast Wind must submit situational reports if specific circumstances occur, including but not limited to the following: i. All instances wherein an exemption to any of the requirements in the regulations and/or this LOA is taken must be reported to the NMFS Office of Protected Resources within 24 hours; ii. If a North Atlantic right whale is observed at any time by PSOs or project personnel, SouthCoast Wind must ensure the sighting is immediately (if not feasible, as soon as possible and no longer than 24 hours after the sighting) reported to NMFS, the U.S. Coast Guard, and the Right Whale Sightings Advisory System (RWSAS). If in the Northeast Region (Maine to Virginia/North Carolina border) call (866-755-6622). If in the Southeast Region (North Carolina to Florida) call (877-WHALE-HELP or 877-942- 5343). If circumstances arise where calling NMFS is not possible, reports must be made to the U.S. Coast Guard via channel 16 or through the WhaleAlert app (http://www.whalealert.org/). The sighting report must include the time, date, and location of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), evidence of previous or current entanglement, Lease Area/project name, PSO/personnel name, PSO provider company (if applicable), and reporter's contact information; iii. If a North Atlantic right whale is observed at any time by PSOs or project personnel, SouthCoast Wind must submit a summary report to NMFS Greater Atlantic Regional Fisheries (GARFO; nmfs.gar.incidentaltake@noaa.gov), NMFS		

#	Proposed Project Phase [a]	Mitigation & Monitoring Measures	Description	Resource Area Mitigated	Anticipated Enforcing Agency
			Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and NMFS Northeast Fisheries Science Center (NEFSC; ne.rw.survey@noaa.gov) within 24 hours with the above information and the vessel/platform from which the sighting was made, activity the vessel/platform was engaged in at time of sighting, project construction and/or survey activity at the time of the sighting (e.g., pile driving, cable installation, HRG survey), distance from vessel/platform to sighting at time of detection, and any mitigation actions taken in response to the sighting; iv. In the event that personnel involved in the Project discover a stranded, entangled, injured, or dead marine mammal, SouthCoast Wind must immediately report the observation to NMFS. If in the Greater Atlantic Region (Maine to Virginia) call the NMFS Greater Atlantic Stranding Hotline (866-755-6622); if in the Southeast Region (North Carolina to Florida), call the NMFS Southeast Stranding Hotline (877-942-5343). Separately, SouthCoast Wind must report the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov); if in the Greater Atlantic region (Maine to Virginia), to NMFS Greater Atlantic Regional Fisheries Office (GARFO; nmfs.gar.incidental-take@noaa.gov, nmfs.gar.stranding@noaa.gov); if in the Southeast region (North Carolina to Florida), to NMFS Southeast Regional Office (SERO; secmammalreports@noaa.gov); and to the U.S. Coast Guard, as soon as feasible but within 24-hours. The report (via phone or email) must include contact (name, phone number, etc.), the time, date, and location of the first discovery (and updated location information if known and applicable); species identification (if known) or description of the animal(s) involved; condition of the animal(s) (including carcass condition if the animal is dead); observed behaviors of the animal(s), if alive; if available, photographs or video footage of the animal(s); and general circumstances under which the animal was discovered; and v. In the event of a vessel strike of a marine mammal by any vessel associated with the Project or if project activities cause a non-auditory injury or death of a marine mammal, SouthCoast Wind must immediately report the incident to NMFS. If in the Greater Atlantic Region (Maine to Virginia) call the NMFS Greater Atlantic Stranding Hotline (866-755- 6622) and if in the Southeast Region (North Carolina to Florida) call the NMFS Southeast Stranding Hotline (877-942-5343). Separately, SouthCoast Wind must immediately report the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and, if in the Greater Atlantic region (Maine to Virginia), NMFS GARFO (nmfs.gar.incidental-take@noaa.gov, nmfs.gar.stranding@noaa.gov) or, if in the Southeast region (North Carolina to Florida), NMFS SERO (secmammalreports@noaa.gov). The report must include the time, date, and location of the incident; species identification (if known) or description of the animal(s) involved; vessel size and motor configuration (inboard, outboard, jet propulsion); vessel's speed leading up to and during the incident; vessel's course/heading and what operations were being conducted (if applicable); status of all sound sources in use; description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike; environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike; estimated size and length of animal that was struck; description of the behavior of the marine mammal immediately preceding and following the strike; if available, description of the presence and behavior of any other marine mammals immediately preceding the strike; estimated fate of the animal (e.g., dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and to the extent practicable, photographs or video footage of the animal(s). SouthCoast Wind must immediately cease all on-water activities until the NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. SouthCoast Wind may not resume their activities until notified by NMFS Office of Protected Resources; and s) Any lost gear associated with the fishery surveys must be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division (nmfs.gar.incidentaltake@noaa.gov) as soon as possible or within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.		

References Cited

SouthCoast Wind Energy, LLC (Mayflower Wind). 2024. Mayflower Wind Construction and Operations Plan. https://www.boem.gov/renewable-energy/state-activities/southcoast-wind-formerly-mayflower-wind.

Attachment G-1: SouthCoast Wind Request for Incidental Take Regulations Mitigation Measures

This attachment contains the mitigation measures proposed by SouthCoast Wind in its Request for Incidental Take Regulations application. BOEM anticipates that BOEM, BSEE, and NMFS would be the enforcing agencies for these measures.

Attachment G-2: SouthCoast Wind Draft Post-Construction Avian and Bat Monitoring Framework

11 Mitigation Measures

The monitoring and mitigation methods described below are intended to reduce or eliminate exposure of marine mammals to underwater sound levels that could constitute "take" under the MMPA. Many of the monitoring and mitigation methods are applicable across all Project activities while others will be specific to the following activities:

- WTG and OSP foundation installation using impact pile driving,
- WTG and OSP foundation installation using vibratory pile driving,
- High resolution geophysical (HRG) and remotely operated vehicle (ROV) surveys, and
- UXO detonation.

11.1 Standard Mitigation and Monitoring Requirements for all Project Activities

11.1.1 Protected Species Observer (PSO) and Acoustic Protected Species Observer (APSO) Experience and Responsibilities

11.1.1.1 Observer Qualifications and Training

- All PSOs and APSOs will have met NMFS and BOEM training and experience requirements (including a NMFS-approved PSO training course).
- PSOs and APSOs will be employed by a third-party observer provider.
- Briefings between construction supervisors and crews and the PSO/APSO team will be held prior to the start of all Project activities as well as when new personnel join the vessel(s).
- The PSO team and the APSO team will each have a lead observer (Lead PSO and Lead APSO) who will be unconditionally approved by NMFS and have a minimum of 90 days at-sea experience in a northwestern Atlantic Ocean environment performing the visual (Lead PSO) or acoustic role (Lead APSO), with the conclusion of the most recent relevant experience no more than 18 months previous.
- APSOs responsible for determining if an acoustic detection originated from a NARW will be trained in identification of mysticete vocalizations.

11.1.1.2 *Responsibilities and Authorities of PSOs and APSOs*

- PSOs will not have tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements.
- Lead PSOs carry the same duties as PSOs and also manage the activities associated with the PSO team, PAM team, and SFV team.
- Any PSO or APSO on duty will have authority to delay the start of operations or to call for a shutdown based on their observations or acoustic detections.
- Lead APSOs will be able to troubleshoot the acoustic equipment and assist in making final decisions regarding species identifications, localization, and other acoustic monitoring details that will be relayed to the Lead PSO.
- A clear line and method of communication between the PSOs and APSOs will be established and maintained to ensure mitigation measures are conveyed without delay.

11.1.2 Visual Monitoring

- PSOs and APSOs will be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and will conduct a maximum of 12 hours of observation per 24-hour period.
- Each PSO and APSO will be provided with one 8-hour break per 24-hour period to sleep.
- Observations will be conducted (or electronic monitoring equipment installed) from the best safe vantage point(s) on the vessel or base of operations to ensure visibility of the shutdown zones.
- SouthCoast Wind is exploring opportunities to use currently available technologies to conduct monitoring using PSOs and APSOs who may be stationed in locations other than offshore vessels (e.g., onshore); however, this does not exempt onsite PSO requirements

described throughout section 11 (e.g., PSOs onboard the pile driving vessel, detonation vessel, or HRG survey vessel)
    - Onshore monitoring may include the use of imagery or data transmitted in real time (or near real time) from sensors located offshore. For example, EO, IR, or PAM sensors may be located on a variety of potential platforms.
- When conducting observations during Project activities, PSOs will scan systematically with the unaided eye, high-magnification (25 x 150 mm) binoculars, and/or standard handheld (7 x 50 mm) binoculars or other electronic methods to search continuously for marine mammals during all observational periods.
- When monitoring at night, or in low visibility conditions, PSOs will monitor for marine mammals and other protected species using night-vision devices with thermal clip-ons, a hand-held spotlight, and/or a mounted thermal camera system or other electronic methods.
- PSOs will watch for and record all marine mammal sightings regardless of the distance from the observer and/or sound source.
- Distances to observed animals will be estimated with range finders, reticle binoculars, clinometers when possible, or other electronic methods and based on the best estimate of the PSO when necessary.
- PSOs will record watch effort and environmental conditions on a routine basis.
- Members of the PSO and/or APSO team will consult with NMFS' NARW reporting system for the presence of NARWs in the Project Area.

11.1.3 Visual Monitoring During Vessel Transit

- PSOs and/or trained vessel crew will observe for marine mammals at all times when vessels are transiting to/from and within the Project Area and port.
- PSOs and/or vessel crew will request vessel-strike avoidance measures if necessary (Section 11.1.5).

11.1.4 Acoustic Monitoring

Acoustic monitoring and mitigation measures stated below will be followed during WTG and OSP foundation installation requiring pile driving only.

11.1.4.1 Passive Acoustic Monitoring Methods

- APSOs will rotate on a 4-hour basis when monitoring from a 24-hour operation vessel or base of operations.
- A real-time PAM system will be used to supplement visual monitoring during all pre-start clearance, piling, and post-piling monitoring periods.
- Use of PAM will allow initiation of pile driving when visual observation of the entire pre-start clearance zone is not possible due to poor visibility, including darkness during nighttime operations.
- There will be one APSO on duty during both daytime and nighttime/low visibility monitoring.
- APSOs will immediately communicate all acoustic detections of marine mammals to PSOs performing visual observations including any determination regarding species identification, distance, and bearing of the marine mammal.

- The PAM system will not be located on the pile installation vessel to reduce masking of marine mammal sounds.
- A detailed description of the real-time PAM system will be developed and submitted to NMFS and BOEM for review and approval.

11.1.4.2 *Sound Source Verification*

A detailed plan for Sound Source Verification (SSV) will be developed and submitted to NMFS prior to planned start of pile driving and UXO detonations.

- Pile Driving
    - Measurement of each pile type (monopiles and/or piled jackets) to be installed to determine the sound levels produced and effectiveness of the NAS(s).
    - Procedures for how measurement results will be used to justify any requested changes to planned monitoring and mitigation distances.
    - Measurements of received levels will be taken at 750 m and other various distances and azimuths relative to the pile location designed to gather data on sounds produced during installation scenarios specific to the Project (Figure 14). These measurements will be used to validate the modeled sound levels at 750 and other distances as provided in Appendix G1 of Appendix A to this application. These measurements are designed to assess whether or not the distances to the Level A and Level B harassment isopleths and/or other mitigation action distances align with the distances modelled.
        - SSV will include at least one recorder in each of the four azimuths around the pile (to capture potential directivity of the sound field). Additionally, there will be 3-4 recorders (one bottom and one mid-water column at each location) along one azimuth that is likely to see the lowest propagation loss to allow assessment of the modelled Level A and Level B isopleths.
- UXO Detonation
    - Measurements will be made for each UXO/MEC that must be detonated using the method described above for pile driving.

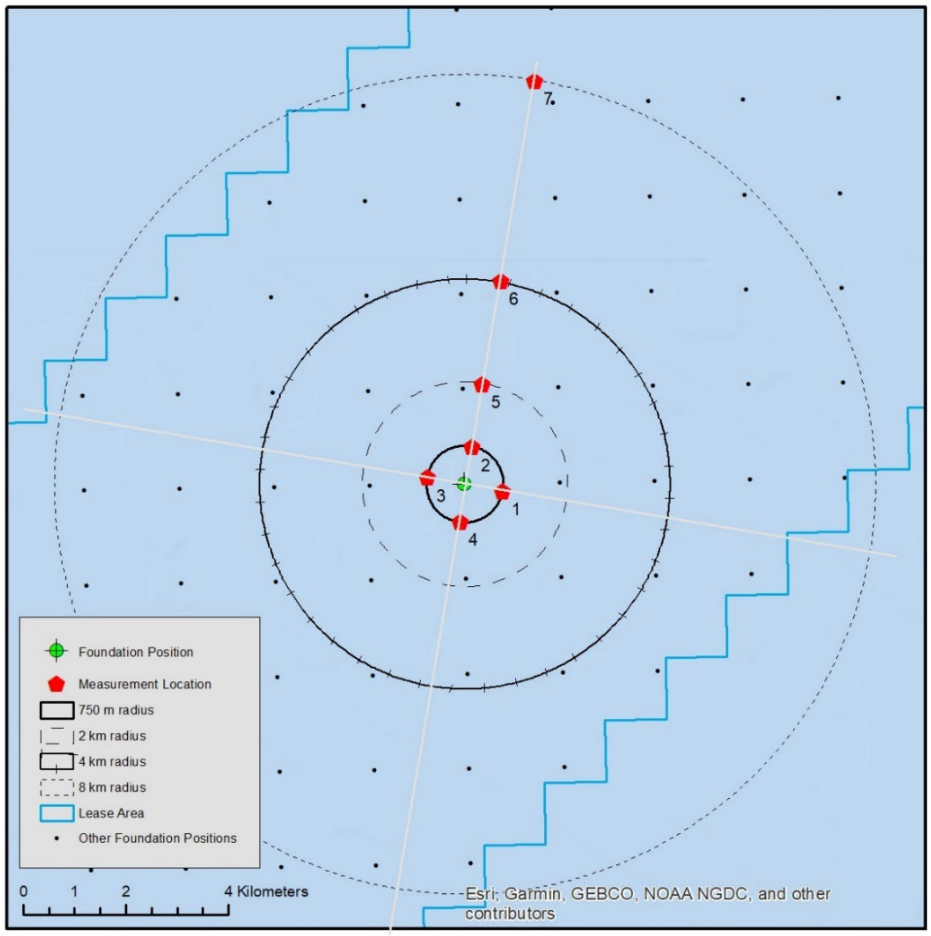

Figure 14. Conceptual design of sound source verification measurement locations relative to a foundation installation.

11.1.5 Vessel Strike Avoidance

All vessels, including those transiting to and from local ports and the Project Area, will follow the vessel strike avoidance measures outlined below, except in cases where following these requirements would put the safety of the vessel or crew at risk.

11.1.5.1 General Measures

- Captain, first mate, and/or designated vessel personnel working offshore will receive training on marine mammal awareness and vessel strike avoidance measures.
- All vessels will have a minimum of one dedicated observer on watch (NMFS-approved PSO or trained crew member with no other concurrent duties) with standard equipment for daytime monitoring (handheld binoculars) and alternative equipment for low visibility conditions (night-vision devices and/or IR sensor). The dedicated observers will be trained in detection and identification of protected species, vessel strike minimization procedures and how and when to communicate with the vessel operator.
- Observers will maintain a vigilant watch for all marine mammals and slow down, change course, slow down or stop vessels to avoid striking protected species.

- PSOs, vessel captains or operators, and dedicated visual observers will continuously monitor all NMFS NARW reporting systems (Right Whale Sighting Advisory System [RWSAS], WhaleAlert, and VHF channel 16).

11.1.5.2 Separation Distances

- Vessels will maintain, to the extent practicable, separation distances of:
  - >500 m distance from any sighted NARW or an unidentified large marine mammal,
  - >100 m from sperm whales and all other baleen whales,
  - >50 m from all other marine mammals, with the exception of animals approaching the vessel (e.g., delphinids and pinnipeds), in which case the vessel operator must avoid excessive speed or abrupt changes in direction.

11.1.5.3 Actions given observed marine mammal

- If underway, all vessels will steer a course away from any sighted NARW at a distance greater than 500 m from the vessel and immediately leave the area at a slow safe speed (10 kts or less):
  - If a NARW comes within 500 m of an underway vessel, the vessel will reduce speed and shift the engines into neutral, if safe to do so;
  - The vessel will not engage engines until the NARW has moved outside of the vessel's path and beyond the 500 m minimum separation distance;
  - If the vessel is stationary, the vessel will not engage engines until the NARW has moved beyond 500 m;
  - If a whale is observed but cannot be confirmed as a species other than a NARW, the vessel operator will assume that it is a NARW and take the appropriate mitigation measures as described above.
- If a vessel comes within 100 m of a non-NARW whale:
  - If underway, the vessel must attempt to remain parallel to the animal's course, reduce speed and shift the engine to neutral, if safe to do so, and must not engage the engines until the whale (e.g., large whale and/or ESA-listed whales besides NARW) has moved outside of the vessel's path and beyond 100 m.
  - If stationary, the vessel must not engage engines until the whale has moved beyond 100 m.
- All underway vessels will, to the maximum extent practicable, attempt to maintain a separation distance of 50 from all delphinid cetaceans and pinnipeds with the exception made for those that approach the vessel (e.g., bow riding dolphins).
  - Underway vessels will not divert to approach any small cetacean, seal, sea turtle, or giant manta ray;
  - If a delphinid cetacean that is not bow riding or a pinniped is sighted within 50 m of an underway vessel, that vessel will shift the engine to neutral. Engines will not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m.
- All sightings of dead or injured marine mammals or sea turtles will be reported within 24 hours (Section 11.1.7).

11.1.5.4 Speed Reduction

- Vessels will comply with current mandatory measures stipulated in the NOAA NARW Vessel Strike Reduction Regulations;
- All vessels, regardless of size, will transit at 10 knots or less within any active NARW SMA and Slow Zone (i.e., DMA or acoustically-triggered Slow Zones)
- During migratory and calving periods from **November 1 to April 30**, all project vessels will operate at 10 knots or less when in the Project Area;
- All vessel speeds will be reduced to ≤10 kts when mother/calf pairs, pods, or large assemblages of marine mammals are observed;
- SouthCoast Wind will implement (or participate in a joint program, if developed) a PAM system designed to detect NARW within the transit corridor and additional visual monitoring measures as described below. A Vessel Strike Avoidance Plan that provides a more detailed description of the equipment and methods to conduct the monitoring summarized here will be provided to NMFS at least 90-days prior to commencement of vessel movements associated with the activities covered by the requested incidental take regulations.
    - Acoustic Monitoring
        - A PAM system consisting of near real-time bottom mounted and/or mobile acoustic monitoring systems will be installed such that NARW and other large whale calls made in or near the corridor can be detected and transmitted to the transiting vessel (either directly or through an operations base).
        - The detections will be used to determine areas along the transit corridor where vessels would be allowed to travel at >10 kts when no other speed restrictions are in place (e.g., 10 knot speed restriction in SMAs and DMAs);
        - Any detection of a large whale (including NARW) via the PAM system within the transit corridor will trigger a 10 knot or less speed restriction for all Project vessels until the whale can be confirmed visually beyond 500 m of the vessel or 24 hours following the detection and any re-detection has passed.
    - If the PAM system temporarily stops working the following procedures will be followed.
        - All vessels, regardless of size, will transit at <10 kts in all SMAs (applicable November 1st to April 30th) and DMAs (at any time of year).
        - Between May 1 and October 31, all vessels, regardless of size, will transit at >10 kts and implement the visual monitoring measures with a dedicated observers as described above.

11.1.6 Data Recording

- All data will be recorded based on standard PSO collection requirements using industry-standard software.
- Data recorded will include information related to ongoing operations, observation methods and effort, visibility conditions, marine mammal detections, and any mitigation actions requested and enacted.

11.1.7 Reporting

The following situations would require reporting as defined below:

- If a stranded, entangled, injured, or dead protected species is observed, the sighting will be reported immediately and within 24 hours to NMFS Sighting Advisory System (SAS) hotline.
- Any NARW sightings will be reported as soon as feasible and no later than within 24 hours to the NMFS Right Whale Sighting Advisory System (RWSAS) hotline (866-755-6622) or via the Whale Alert Application.
- If a marine mammal is taken in a prohibited manner by Project activities, the following actions will occur:
    - Activity operations resulting in the injury/death will cease immediately.
    - The incident will be reported to the NMFS OPR (301-427-8401), NMFS New England Stranding Network Coordinator, and the Greater Atlantic Regional Fisheries Office (GARFO) no later than within 24 hours.
    - Additional reporting by the vessel captain or PSO onboard will be to NMFS Fisheries Marine Mammal and Sea Turtle Stranding and Entanglement Hotline (866-775-6622), or alternative electronic reporting systems as approved by the NMFS stranding program, as well as the U.S. Coast Guard (USCG).
    - The report will include all available information required by the ITR or the NMFS stranding report form.
    - SouthCoast Wind will not resume the activity which resulted in the injury until NMFS OPR is able to review the circumstances of the incident determine the appropriate course of action.
- Actions given an unknown and recent observed dead or injured marine mammal:
    - SouthCoast Wind will immediately report the incident to the NMFS OPR and the NMFS New England Stranding Network Coordinator (as stated above).
    - The report will include the same information identified for a take by construction activity.
    - Activities will continue while NMFS reviews the circumstances of the incident and works with SouthCoast Wind to determine whether modifications to the activities are appropriate.
- Actions given observation of a dead or injured marine mammal not associated with or related to construction activities:
    - SouthCoast Wind will report the incident to the NMFS OPR and the NMFS New England Stranding Network Coordinator, within 24 hours of the discovery.
    - SouthCoast Wind will include any documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network including photographs and video footage if available.
    - Construction activities may continue.

11.1.7.1 Data and Final Reports will be prepared using the following protocols:

- All vessels will utilize a standardized data entry format.
- A quality assurance/ quality control (QA/QC'd) database of all sightings and associated details (e.g., distance from vessel, behavior, species, group size/composition) within and

outside of the designated shutdown zone, monitoring effort, environmental conditions, and Project-related activity will be provided after field operations and reporting are complete.
- During all pile driving activities, weekly reporting summarizing sightings, detections, and activities will be provided to NMFS and BOEM on the Wednesday following a Sunday-Saturday period.
- Monthly reports will be required during all pile driving activities including all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel MMSI number and route), number of piles installed, all detections of marine mammals, and any mitigative actions taken.
- Monthly reports will be submitted to NMFS on the 15th of the month for the previous month.
- Final reports will follow a standardized format for PSO reporting from activities requiring marine mammal mitigation and monitoring.
- An annual report summarizing the prior year's activities will be provided to NMFS and BOEM 90-days after completion of each 12-month period during the effectiveness of the ITRs.

11.2 WTG and OSP Foundation Installation

Monitoring and mitigation protocols applicable to impact and vibratory pile driving during SouthCoast Wind construction are described further in the following subsections. Impact and vibratory pile driving may be initiated after dark or during daytime reduced visibility periods following the protocols in Section 11.2.3 and Section 11.2.4.

11.2.1 Monitoring Equipment

The following types of equipment will be used to monitor for marine mammals from one or more locations.

- Reticle binoculars
- Mounted thermal/IR camera system
    - The camera systems may be automated with detection alerts that will be checked by a PSO on duty; however, cameras may not be manned by a dedicated observer.
- Mounted "big-eye" binocular
- Monitoring station for real time PAM system (impact pile driving only)
- The selected PAM system will transmit real time data to PAM monitoring stations on the vessels and/or shore side monitoring station.
- Hand-held or wearable NVDs
- IR spotlights
- Data collection software system
- PSO-dedicated VHF radios
- Digital single-lens reflex camera equipped with 300-mm lens

11.2.2 Daytime Visual Monitoring

Visual monitoring will occur from the construction vessel and two dedicated PSO vessels. Daytime visual monitoring is defined by the period between nautical twilight rise and set for the region. Visual

monitoring measures below intend to provide complete visual coverage of the pre-start clearance zone during the pre-start clearance period prior to pile driving and the shutdown zones during impact and vibratory pile driving. The following visual monitoring protocols include:

- Three on duty PSOs will keep watch from each platform (the pile driving vessel and two PSO vessels) during the pre-start clearance period, throughout pile driving, and 30 minutes after piling is completed.
- At least three PSOs on duty on each platform during all other daylight periods.
- PSOs will monitor for at least 60 minutes before, during, and 30 minutes after each piling event.
- One PSO will monitor areas closer to the pile being stalled for smaller marine mammals using the naked eye, reticle binoculars and/or other electronic method(s) while two PSOs scan farther from the pile using the mounted big eye binoculars and/or other electronic method(s).
- PSO will monitor the NMFS NARW reporting systems including WhaleAlert and SAS once every 4-hour shift during Project related activities.

11.2.3 Daytime Periods of Reduced Visibility

These measures will apply during the pre-start clearance period, during active pile driving, and 30 minutes after piling is completed.

- If the Level B harassment zone is obscured, the three PSOs on watch will continue to monitor the shutdown zone utilizing thermal camera systems and/or other electronic method(s) and PAM.
- During nighttime or low visibility conditions, the three PSOs on watch will monitor the shutdown zone with the mounted IR camera (further described in 11.2.4), available handheld night vision, and/or other electronic method(s).
- All on-duty PSOs will be in contact with the APSOs who will monitor the PAM systems for acoustic detections of marine mammals that are vocalizing in the area (impact pile driving only).

11.2.4 Nighttime Visual Monitoring

During nighttime operations, night vision equipment (night vision goggles) and infrared/thermal imaging technology will be used. Recent studies have concluded that the use of infrared/thermal imaging technology allow for the detection of marine mammals at night (Verfuss et al. 2018). Guazzo et al (2019) showed that probability of detecting a large whale blow by a commercially available infrared camera was similar at night as during the day; camera monitoring distance was 2.1 km (1.3 mi) from an elevated vantage point at night versus 3 km (1.9 mi) for daylight visual monitoring from the same location. The following nighttime piling monitoring and mitigation methods use the best currently available technology to mitigate potential impacts and result in the least practicable adverse impact.

- During nighttime operations, visual PSOs on-watch will work in three person teams observing with an NVDs and/or monitoring IR thermal imaging camera systems. There will also be an APSO on duty conducting acoustic monitoring in coordination with the visual PSOs.

- The PSOs on duty will monitor for marine mammals and other protected species using night-vision goggles with thermal clip-ons, a hand-held spotlight (one set plus a backup set) and/or other electronic method(s), such that PSOs can focus observations in any direction.
- If possible, deck lights will be extinguished or dimmed during night observations when using the NVDs (strong lights compromise the NVD detection abilities); alternatively, if the deck lights must remain on for safety reasons, the PSO will attempt to use the NVDs in areas away from potential interference by these lights.

SouthCoast will prepare a more detailed description of the anticipated efficacy of the technologies it intends to use during nighttime monitoring and describe how they will be used to monitor the pre-start clearance and shutdown zones. This will be provided to NMFS after publication of the draft ITRs so that it can be considered during preparation of the Final ITRs.

11.2.5 Acoustic Monitoring

Since visual observations within the applicable shutdown zones can become impaired at night or during daylight hours due to fog, rain, or high sea states, visual monitoring with thermal and NVDs will be supplemented by PAM during these periods. An APSO will be on watch during all pre-start clearance, piling, and post-piling monitoring periods (daylight, reduced visibility, and nighttime monitoring). A combination of alternative monitoring measures, including PAM, has been demonstrated to have comparable detection rates (although limited to vocalizing individuals) to daytime visual detections for several species (Smith et al., 2020).

- There will be one APSO on duty who will begin monitoring at least 60 minutes prior to initiation of pile driving, continue throughout piling, and extend at least 30 minutes post installation during both daytime and nighttime/low visibility conditions; All on-duty PSOs will be in contact with the APSO on duty, who will monitor the PAM systems for acoustic detections of marine mammals that are vocalizing in the area.
- For real-time PAM systems, at least one APSO will be designated to monitor each system by viewing data or data products that are streamed in real-time or near real-time to a computer workstation and monitor located on a Project vessel or onshore.
- The PAM operator will inform the PSOs on duty of animal detections approaching or within the applicable mitigation zones via the data collection software system (i.e., Mystcetus or similar system) or other direct forms of communication (radio, phone, messaging app). The PSO will then be responsible for requesting that any necessary mitigation procedures are implemented.
- The PAM system will have the capability of monitoring up to 10 km from the pile.
- A PAM Plan will be submitted to NMFS and BOEM prior to the planned start of pile driving.

11.2.6 Pre-Start Clearance

A pre-start clearance period will be implemented for all foundation installation occurring both inside and outside the 20-km area of concern (as described in Section 1). For foundations installed within

the 20-km area of concern (June 1 through October 15), a minimum visibility zone[1] of 4,900 m for pin pile and 7,500 m for monopile installation will be implemented. For OSP foundations (and WTG jacket foundations, if installed) installed throughout the rest of the Lease Area (outside the area of concern), a minimum visibility zone[2] of 2,600 m for pin pile and 3,700 m for monopile and pin pile installation will be implemented. For impact pile driving, PAM will begin 60 minutes prior to the start of pile driving. Pre-start clearance zones will follow the same zone sizes as presented below in Section 11.2.9.

- Visual monitoring will begin at least 60 minutes prior to the start of impact pile driving and 30 minutes prior to the start of vibratory pile driving;
- To begin the clearance process, PSOs will visually clear (i.e., confirm no observation of marine mammals) the relevant minimum visibility zone for 30 minutes immediately prior to commencing foundation installation activities.
    - If PSOs cannot visually monitor the relevant minimum visibility zone prior to the start of pile driving, pile driving operations will not commence.
- Once the clearance process has begun, visual monitoring will be conducted (including the use of IR and NVD systems, as appropriate) and PAM for at least 60 minutes prior to the start of soft-start;
- If a marine mammal is observed entering or within the relevant clearance zone, pile driving activity will be delayed.
- An acoustic detection localized to a position within the relevant clearance zone(s) will trigger a delay.
- Impact and/or vibratory pile driving may commence when either the marine mammal(s) has voluntarily left the specific clearance zone and been visually or acoustically confirmed beyond that clearance zone, or, when the additional time period has elapsed with no further sighting or acoustic detection (i.e., 15 minutes for odontocetes [excluding sperm whales] and pinnipeds, and 30 minutes for sperm and baleen whales [including NARWs]).
    - In cases where these criteria cannot be met, pile driving may restart only if necessary to maintain pile stability at which time SouthCoast Wind will use the lowest hammer energy practicable to maintain stability.

11.2.7 Soft Start

- Soft start procedures will be followed, to the extent practicable, at the beginning of each pile driving event or any time pile driving has stopped for longer than 30 minutes.
- A soft start procedure will not begin until the relevant clearance zone has been cleared by the visual PSO or APSOs.
- If a marine mammal is detected within or about to enter the relevant clearance zone, prior to or during the soft-start procedure, pile driving will be delayed until the animal has been

[1] The minimum visibility zone sizes implemented during foundation installation of pin piles and monopiles within the 20-km area of concern are set equal to the largest Level B harassment zone (unweighted acoustic ranges to 160 dB re 1 µPa sound pressure level in summer) modeled at for each substructure type assuming 10 dB of noise attenuation.

[2] The minimum visibility zone sizes implemented during foundation installation of pin piles and monopiles occurring throughout the rest of the Lease Area (outside the area of concern) are set equal to the second largest low-frequency Level A SEL_{cum} exposure ranges ($ER_{95\%}$) with 10 dB of noise attenuation for foundation installation across Year 1 and Year 2.

observed exiting the relevant clearance zone or until an additional time period has elapsed with no further sighting (i.e., 15 minutes for odontocetes [excluding sperm whales] and pinnipeds and 30 minutes for sperm and baleen whales [including NARWs]).

11.2.8 Shutdowns

- If conditions change such that PSOs cannot monitor the relevant shutdown zone following the commencement of pile driving, the PSO will request an immediate shutdown.
- If a marine mammal is detected entering or within the respective shutdown zone after pile driving has commenced, an immediate shutdown of pile driving will be requested unless the Chief Engineer or Vessel Captain determine shutdown is not feasible.
- If a shutdown is not feasible at that time in the installation process due to a risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the risk of jeopardizing the installation process (pile refusal or instability), a reduction in the hammer energy of the greatest extent possible will be implemented.
- The shutdown zone will be continually monitored by PSOs and APSOs during any pauses in pile driving.
- If a marine mammal is sighted within the shutdown zone during a pause in piling, resumption of pile driving will be delayed until the animal(s) has exited the relevant shutdown zone or an additional time period has elapsed with no further sighting of the animal that triggered the shutdown (15 minutes for odontocetes [excluding sperm whales] and pinnipeds and 30 minutes for sperm and baleen whales [including NARWs]).
- Following shutdown, pile driving will restart using the same procedure described above in Section 11.2.7.

11.2.9 Shutdown Zones

The shutdown zones below (Section 11.2.9.1 through 11.2.9.6) are based upon the Level A exposure ranges with 10 dB of noise attenuation for foundation installation across Year 1 and Year 2 (further details in Section 6.3). If the shutdown zone is equivalent to the "NAS perimeter", this means the outside perimeter of the NAS. Therefore, any animals occurring within the NAS would trigger a shutdown. The NARW shutdown zones (Section 11.2.9.1 through 11.2.9.6) are based on the requirement that a visual or acoustic observation of a NARW at any distance will result in immediate shutdown measures described in Section 11.2.8. Foundation installations include 9/16 m (tapered) diameter WTG monopiles and 4.5 m WTG and OSP jacket pin piles installed using impact pile driving only during Year 1. During Year 2, foundations may be installed using only impact pile driving or may use a combination of vibratory and impact pile driving. The shutdown zones are the largest zone sizes expected to result from foundation installations for each installation schedule, except in cases where a single species (e.g. fin whales) had a much larger modeled exposure range than other large cetaceans and the next largest zone size was selected. If smaller diameter piles, lower maximum hammer energies and/or total strikes per pile, or more effective NAS are decided upon and used during the construction activities, modeled Level A exposure ranges applicable to those revised parameters would be used, likely resulting in shorter shutdown zone distances than those shown below based on current maximum pile size and hammer energy assumptions.

11.2.9.1 WTG Monopile and WTG Jacket Installations Using Only Impact Driving in Summer

WTG Monopile Impact Driving

- Low-Frequency Cetaceans: 3,500 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 200 m

WTG Jacket Impact Driving

- Low-Frequency Cetaceans: 2,000 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: NAS perimeter

11.2.9.2 WTG Monopile and WTG Jacket Installations Using Only Impact Driving in Winter

WTG Monopile Impact Driving

- Low-Frequency Cetaceans: 3,700 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 200 m

WTG Jacket Impact Driving

- Low-Frequency Cetaceans: 2,300 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 400 m

11.2.9.3 WTG Monopile and Jacket Foundations using Combined Vibratory and Impact Driving (Year 2 only) in Summer

WTG Monopile during Impact driving

- Low-Frequency Cetaceans: 3,500 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 200 m

WTG Monopile during Vibratory driving

- Low-Frequency Cetaceans: 200 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: NAS perimeter

WTG Jacket during Impact driving

- Low-Frequency Cetaceans: 1,900 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: NAS perimeter

WTG Jacket during Vibratory driving

- Low-Frequency Cetaceans: NAS perimeter
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: NAS perimeter

11.2.9.4 Concurrent Installation of One WTG Monopile and Four OSP Jacket Pin Piles in Summer

WTG Monopile during Impact driving

- Low-Frequency Cetaceans: 3,500 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 300 m

11.2.9.5 Concurrent Installation of Four WTG Jacket Pin Piles and Four OSP Jacket Pin Piles in Summer

WTG Jacket during Impact driving

- Low-Frequency Cetaceans: 2,600 m
- NARW: At any distance
- Mid-Frequency Cetaceans: NAS perimeter
- High-Frequency Cetaceans: NAS perimeter
- Seals: 200 m

11.2.10Post-Piling Monitoring

- PSOs will continue to survey the shutdown zone throughout the duration of pile installation and for a minimum of 30 minutes after piling has been completed.

11.2.11 Noise Attenuation

Several recent studies summarizing the effectiveness of noise attenuation systems (NAS) have shown that broadband sound levels are likely to be reduced by anywhere from 7 to 17 dB, depending on the environment, pile size, and the size, configuration and number of systems used . The single bubble curtain applied in shallow water environments regularly achieves 7-8 dB broadband attenuation (Lucke et al. 2011; Rustemeier et al. 2012; Bellmann 2014; Bellman 2019). More recent in situ measurements during installation of large monopiles (~8 m) for WTGs in comparable water depths and conditions indicate that attenuation levels of 10 dB are readily achieved for a single bubble curtain (Bellman 2019; Bellmann et al. 2020). Large bubble curtains tend to perform better and more reliably, particularly when

deployed with two rings (Koschinski and Ludemann 2013; Bellmann 2014; Nehls et al. 2016). A California Department of Transportation study tested several small, single, bubble curtain systems and found that the best attenuation systems resulted in 10-15 dB of attenuation (Buehler et al. 2015). Buehler et al. (2015) concluded that attenuation greater than 10 dB could not be reliably predicted from small, single, bubble curtains because sound transmitted through the seabed and re-radiated into the water column is the dominant sound in the water for bubble curtains deployed immediately around the pile. Combinations of systems (e.g., double big bubble curtain, hydrodsound damper plus single big bubble curtain) potentially achieve much higher attenuation. The type and number of NAS to be used during construction have not yet been determined. Based on prior measurements this combination of NAS are reasonably expected to achieve far greater than 10 dB broadband attenuation of impact pile driving sounds. SouthCoast Wind will operate NAS to meet noise levels modeled (10 dB attenuation) and will not exceed these levels. However, if SSV suggests noise levels are louder than modeled, additional noise attenuation measures will be implemented to further reduce noise levels to at least those modeled.

11.2.12 Sound Source Verification

- SSV measures will be followed as stated in Section 11.1.4.2.

11.2.13 Potential Additional Measures to Protect North Atlantic Right Whales

To complete installation within as few years as possible during the multiple year installation campaign expected for the entire Lease Area build-out, impact pile driving 24-hours per day is deemed necessary.

- The period from January through April is when the highest number of NARW are present in the region which means foundation installations during this period would likely result in greater potential impacts to this species. To reduce the need for foundation installations during this period and associated impacts to the NARW, SouthCoast Wind may conduct nighttime pile driving of monopile or piled jacket foundations during time periods when the fewest number of NARW are likely to be present in the region. Specific measures will include:
    - Concentrating pile driving activities when NARW are less likely to be present within the region (May 15 through December 31), including in the Lease Area.
    - Specific monitoring tools and plans will be developed as a part of the ongoing ITR Application process, but may include the use of advanced infrared systems, near real-time PAM, autonomous underwater vehicles, autonomous aerial vehicles, or other advanced technologies that could improve the probability of detecting marine mammals at night.

As a result of concerns related to potential NARW use of the Nantucket Shoals region outside of the January–April period, additional mitigation and monitoring measures have been proposed in a NARW mitigation and monitoring plan for pile driving. These measures include the commitment to only use impact pile driving in specified areas of the Lease Area (Project 1) and to monitor and mitigate for NARW within the Level B disturbance zones for impact pile driving. These measures also include a commitment that no pile driving for foundation installations will occur from January 1 through May 14 each year. On top of the seasonal description described, no pile driving for WTG or OSP foundation installations will occur within the 20-km area of concern during the month of May or after October 15.

Please refer to the *Supplemental North Atlantic Right Whale Monitoring and Mitigation Plan for Pile Driving* submitted separately for additional details.

11.3 HRG Surveys

HRG survey activities may be required during construction and the operations and maintenance (O&M) phases of the Project. When necessary, HRG survey operations will be conducted 24-hours per day, although some vessels may only operate during daylight hours. The following mitigation and monitoring measures for HRG surveys apply only to sound sources with operating frequencies below 180 kHz. There are no mitigation or monitoring protocols required for sources operating >180 kHz.

Additionally, shutdown, pre-start clearance, and ramp-up procedures will not be conducted during HRG operations using only non-impulsive sources (e.g., USBL and parametric sub-bottom profilers) other than non-parametric sub-bottom profilers (e.g., CHIRPs). Pre-start clearance and ramp-up, but not shutdown will be conducted when using non-impulsive, non-parametric sub-bottom profilers.

11.3.1 Monitoring Equipment

- Two pairs of reticle binoculars;
- Two hand-held or wearable night vision devices (NVDs);
- Two IR spotlights;
- One data collection software system;
- Two PSO-dedicated very high frequency (VHF) radios;
- One digital single-lens reflex camera equipped with a 300-mm lens.

11.3.2 Visual Monitoring

- Four PSOs on board any 24-hour survey vessels.
- Two PSOs on board any daylight survey vessels.
- One PSO on watch during all daylight surveying.
- Two PSOs on watch during nighttime surveying.
- Vessels conducting activities in very-shallow waters:
    - One visual PSO will be onboard
    - The vessel captain (or crew member on watch) will conduct observations when the PSO is on required breaks;
    - The PSO on duty will remain available to confirm sightings and any related mitigation measures while on break.
- PSOs will begin observation of the shutdown zones prior to initiation of HRG survey operations and will continue throughout the survey activity and/or while equipment operation below 180 kHz is in use.
- PSO will monitor the NMFS NARW reporting systems including WhaleAlert and SAS once every 4-hour shift during Project related activities.

11.3.3 Daytime Visual Monitoring

The following protocols will be applied to visual monitoring during daytime surveys:

- One PSO on watch during pre-start clearance periods and all source operations.

- PSOs will use reticle binoculars and the naked eye to scan the shutdown zone for marine mammals.

11.3.4 Nighttime and Low Visibility Monitoring

Visual monitoring during nighttime surveys or periods of low visibility will utilize the following protocols:

- The Lead PSO will determine if conditions warrant implementing reduced visibility protocols.
- Two PSOs on watch during pre-start clearance periods, all operations, and for 30 minutes following use of HRG sources operating below 180 kHz.
- Each PSO will monitor for marine mammals and other protected species using night-vision goggles with thermal clip-ons and a hand-held spotlight (one set plus a back-up set), such that PSOs can focus observations in any direction.

11.3.5 Shutdown Zones

PSOs will establish and monitor marine mammal shutdown zones. Distances to shutdown zones will be from any acoustic sources, not the distance from the vessel. Shutdown zones will be as follows:

- 500 m from NARW for use of impulsive acoustic sources (e.g., boomers and/or sparkers) and non-impulsive nonparametric sub-bottom profilers; and
- 100 m from all other marine mammals for use of impulsive acoustic sources (e.g., boomers and/or sparkers), except for delphinids when approaching the vessel or towed acoustic sources, shutdown is not required.

11.3.6 Pre-Start Clearance

PSOs will establish and monitor pre-start clearance zones. Distances to pre-start clearance zones for HRG surveys will be the same as those for shutdown zones described above.

- PSOs will conduct 30 minutes of pre-start clearance observation prior to the initiation of HRG operations.
- The pre-start clearance zones must be visible using the naked eye or appropriate technology during the entire pre-start clearance period for operations to start. If the pre-start clearance zones are not visible, source operations <180 kHz will not commence.
- Ramp-up may not be initiated if any marine mammal(s) is detected within its respective pre-start clearance zone.
- If a marine mammal is observed entering or within the pre-start clearance zones during the pre-start clearance period, relevant acoustic sources must not be initiated until the marine mammal(s) is confirmed by visual observation to have exited the relevant zone, or, until an additional time period has elapsed with no further sighting of the animal (15 minutes for odontocetes [excluding sperm whales] and pinnipeds and 30 minutes for sperm and baleen whales [including NARWs]).

11.3.7 Ramp-Up

- The ramp-up procedure will not be initiated during periods of inclement conditions or if the pre-start clearance zones cannot be adequately monitored by the PSOs, using the appropriate visual technology for a 30-minute period immediately prior to ramp-up.
- Ramp-up will begin with the power of the smallest acoustic equipment at its lowest practical power output. When technically feasible, the power will then be gradually turned up and other acoustic sources added in a way such that the source level would increase gradually.
- Ramp-up activities will be delayed if marine mammal(s) enters its respective shutdown zone.
- Ramp-up will continue if the animal(s) has been observed exiting its respective shutdown zone, or until an additional time period has elapsed with no further sighting of the animal (15 minutes for odontocetes [excluding sperm whales], and 30 minutes for sperm and baleen whales [including NARW]).

11.3.8 Shutdowns

- Immediate shutdown of impulsive, non-parametric HRG survey equipment other than CHRIP sub-bottom profilers operating at frequencies <180 kHz is required if a marine mammal is observed within or entering the relevant shutdown zone.
- Any PSO on duty has the authority to call for shutdown of acoustic sources. When there is certainty regarding the need for mitigation action on the basis of visual detection, the relevant PSOs must call for such action immediately.
- Upon implementation of a shutdown, survey equipment may be reactivated when all marine mammals that triggered the shutdown have been confirmed by visual observation to have exited the relevant shutdown zone or an additional time period has elapsed with no further sighting of the animal that triggered the shutdown (15 minutes for odontocetes [excluding sperm whales] and pinnipeds, and 30 minutes for sperm and baleen whales [including NARWs]).
- If the acoustic source is shutdown for reasons other than mitigation (e.g., mechanical difficulty) for less than 30 minutes, the acoustic sources may be reactivated as soon as is practicable at full operational level if PSOs have maintained constant visual observation during the shutdown and no visual detections of marine mammals occurred within the applicable shutdown zone during that time.
- If the acoustic source is shutdown for a period longer than 30 minutes or PSOs were unable to maintain constant observation, then ramp-up and pre-start clearance procedures will be initiated as described in Sections 11.3.6 and 11.3.7.
- If delphinids are visually detected approaching the vessel or towed acoustic sources, shutdown is not required.

11.3.9 Sound Source Verification

- In 2019, NMFS expressed concerns with HRG sound source verification measurements previously collected in offshore wind leases in the Northeast and recommended developers requesting incidental take authorization to estimate zones of potential impact using standard modeling guidance (NMFS 2020e) SouthCoast Wind did not collect SSV measurements for 2019-2021 surveys and does not plan to collect SSV measurements as part of the planned surveys pre- and post-construction.

11.4 UXO Detonation

For UXOs that are positively identified in proximity to planned activities on the seabed, several alternative strategies will be considered prior to detonating the UXO in place. These may include relocating the activity away from the UXO (avoidance), moving the UXO away from the activity (lift and shift), cutting the UXO open to apportion large ammunition or deactivate fused munitions, using shaped charges to reduce the net explosive yield of a UXO (low-order detonation), or using shaped charges to ignite the explosive materials and allow them to burn at a slow rate rather than detonate instantaneously (deflagration). Only after these alternatives are considered would a decision to detonate the UXO in place be made. If deflagration is conducted, mitigation and a monitoring measure would be implemented as if it was a high order detonation based on UXO size. Decision on removal method will be made in consultation with a UXO specialist and in coordination with the agencies with regulatory oversite of UXO. For detonations that cannot be avoided due to safety considerations, a number of mitigation measures will be employed by SouthCoast Wind. No more than a single UXO will be detonated in a 24-hour period.

11.4.1 Monitoring Equipment

The equipment to be used during UXO detonations is shown in the table below (Table 58).

Table 58. Equipment use for all marine mammal monitoring vessels during pre-start clearance and post-detonation monitoring.

Item	Daytime Number on Each PSO Vessel
Reticle binoculars	2
Mounted “big-eye” binocular	1
Monitoring station for real time PAM system[1]	1
Data collection software system	1
PSO-dedicated VHF radios	2
Digital single-lens reflex camera equipped with 300-mm lens	1

PSO = protected species observer; VHF=very high frequency.

[1]The selected PAM system will transmit real time data to PAM monitoring stations on the vessels and/or a shore side monitoring station.

11.4.2 Pre-Start Clearance

All mitigation and monitoring zones assume the use of an NAS resulting in a 10 dB reduction of noise levels. Mitigation and monitoring zones specific to marine mammal hearing groups for the five different charge weight bins are presented in Table 59.

- A 60-minute pre-start clearance period will be implemented prior to any UXO detonation;

- The pre-start clearance zone (see distances to low-frequency cetacean thresholds in Table 59) must be fully visible for at least 60 minutes and all marine mammal(s) must be confirmed to be outside of the pre-start clearance zone for at least 30 minutes prior to commencing detonation;
- The pre-start clearance zone size will be dependent on the charge weight of the identified UXO, which will be determined prior to detonation. If the charge weight is determined to be unknown or uncertain, the largest pre-start clearance zone size (charge weight bin E12) will be used throughout the pre-start clearance period.
- All marine mammals must be confirmed to be out of the pre-start clearance zone prior to initiating detonation;
- If a marine mammal is observed entering or within the relevant pre-start clearance zones prior to the initiation of detonation, the detonation must be delayed;
- The detonation may commence when either the marine mammal(s) has voluntarily left the respective pre-start clearance zone and been visually confirmed beyond that pre-start clearance zone, or after 15 minutes for odontocetes [excluding sperm whales] and pinnipeds, and 30 minutes for sperm and baleen whales [including NARWs]) with no further sightings.

Table 59. Mitigation and Monitoring Zones Associated with In-Situ UXO Detonation of Binned Charge Weights, with a 10 dB Noise Attenuation System.

Marine Mammal Hearing Groups	UXO Charge Weight[1]										
	E4 (2.3 kg)		E6 (9.1 kg)		E8 (45.4 kg)		E10 (227 kg)		E12 (454 kg)		
	Pre-Start Clearance Zone[2] (m)	Level B Harassment Zone (m)	Pre-Start Clearance Zone (m)	Level B Harassment Zone (m)	Pre-Start Clearance Zone (m)	Level B Harassment Zone (m)	Pre-Start Clearance Zone (m)	Level B Harassment Zone (m)	Pre-Start Clearance Zone (m)	Level B Harassment Zone (m)	PAM Monitoring Zone (km)
Export Cable Corridor											
Low-Frequency Cetaceans	800	2,800	1,500	4,500	2,900	7,300	4,200	10,300	4,900	11,800	15
Mid-Frequency Cetaceans	100	500	200	800	300	1,300	500	2,100	600	2,500	15
High-Frequency Cetaceans	2,500	6,200	3,500	7,900	4,900	10,100	6,600	12,600	7,400	13,700	15
Phocid Pinnipeds	300	1,300	500	2,200	1,000	3,900	1,900	6,000	2,600	7,100	15
Lease Area											
Low-Frequency Cetaceans	400	2,900	800	4,700	1,800	7,500	3,400	10,500	4,300	11,900	15
Mid-Frequency Cetaceans	50	500	50	800	100	1,300	300	2,200	400	2,600	15
High-Frequency Cetaceans	2,200	6,200	3,200	8,000	4,900	10,300	7,200	12,900	8,700	14,100	15

Phocid Pinnipeds	100	1,500	200	2,400	600	3,900	1,200	6,000	1,600	7,000	15

kg = kilograms; m = meters
[1] UXO charge weights are groups of similar munitions defined by the U.S. Navy and binned into five categories (E4-E12) by weight (equivalent weight in TNT). For this assessment, four project sites (S1-S4) were chosen and modeled (see Hannay and Zykov 2021) for the detonation of each charge weight bin.
[2] Pre-start clearance zones were calculated by selecting the largest Level A threshold (the larger of either the PK or SEL noise metric). The chosen values were the most conservative per charge weight bin across each of the four modeled sites.

11.4.3 Visual Monitoring

- The number of vessels deployed will depend on the pre-start clearance zone size (as described in section 11.4.2) and safety set back distance from the detonation. A sufficient number of vessels will be deployed to cover the clearance and shutdown zones as described in Section 11.4.3.1 and Section 11.4.3.2.
- PSOs will visually monitor the relevant Low Frequency Cetacean pre-start clearance zone depending on the identified charge weight. This zone encompasses the maximum Level A exposure ranges for all marine mammal species except harbor porpoise, where Level A take has been requested due to the large zone sizes associated with High Frequency cetaceans.

11.4.3.1 Detonation Vessel Measures

- Three PSOs on duty on the detonation vessel;
- Three PSOs will maintain watch at all times during the pre-start clearance period and 30 minutes after the detonation event;
    - Each PSO will be responsible for monitoring a 120-degree sector with the unaided eye and reticle binoculars to provide additional coverage beyond the pre-start clearance zone away from the detonation location.
- The three visual PSOs onboard the detonation vessel will monitor out to the relevant pre-start clearance zone (shown in Table 59) at least 30 minutes prior to a detonation event; There will be a PAM operator on duty conducting acoustic monitoring in coordination with the visual PSOs during all pre-start clearance periods and post-detonation monitoring periods.

11.4.3.2 Additional PSO Vessel Measures

- Based on the relevant pre-start clearance zones (determined by the identified charge weight) for low-frequency cetaceans shown in Table 59, an additional PSO vessel will be used for UXO charge weight bins E10 and E12;
- The additional PSO vessel will circle the detonation vessel at or near the relevant pre-start clearance zone distance (4 – 5 km for charge weight bins E10 – E12);
- The additional PSO vessel will circumnavigate the detonation vessel at 7 – 10 knots during the pre-start clearance period, throughout the detonation event (as allowed by safety consideration), and during post-detonation monitoring;
- Visual monitoring will be conducted on the additional PSO vessel following the same methods as described above for the detonation vessel.
    - Additionally, the three PSOs on duty will be responsible for monitoring a 120-degree sector with the unaided eye and reticle binoculars to provide additional coverage inside the relevant pre-start clearance zone towards the detonation vessel as well as beyond the pre-start clearance zone away from the detonation location.

11.4.4 Acoustic Monitoring

- There will be one PAM team for all deployed PSO vessels;
- PAM will be conducted in the daylight only as no UXO will be detonated during nighttime hours;

- There will be a PAM operator stationed on at least one of the dedicated monitoring vessels (primary or secondary) in addition to the PSO; or located remotely/onshore;
- PAM will begin 60 minutes prior to a detonation event;
- PAM operator will be on duty during all pre-start clearance periods and post-detonation monitoring periods;
- Acoustic monitoring will extend beyond the Low Frequency Cetacean pre-start clearance zone for a given charge weight (Section 11.4.2);
- For real-time PAM systems, at least one PAM operator will be designated to monitor each system by viewing data or data products that are streamed in real-time or near real-time to a computer workstation and monitor located on a Project vessel or onshore;
- PAM operator will inform the Lead PSO on duty of animal detections approaching or within applicable ranges of interest to the detonation activity via the data collection software system;
- PAM devices used may include independent (e.g., autonomous or moored remote) systems.
- The PAM system will have the capability of monitoring up to 15 km from the detonation location.

11.4.5 Noise Attenuation

SouthCoast Wind will use an NAS for all detonation events as feasible and will strive to achieving the modeled ranges associated with 10 dB of noise attenuation (see Section 6.3.2). Zones without 10 dB attenuation would be implemented if use of a big bubble curtain was not feasible due to location, depth, or safety related constraints. If a NAS system is not feasible, SouthCoast Wind will implement mitigation measures for the larger unmitigated zone sizes with deployment of vessels adequate to cover the entire pre-start clearance zones.

11.4.6 Seasonal Restriction

- No UXO detonations are planned between January and April.

11.4.7 Post UXO Detonation Monitoring

- Post-detonation monitoring will occur for 30 minutes.

11.4.8 Sound Source Verification

- SSV measurements will be made for each UXO/MEC that must be detonated using the method summarized in Section 11.1.4.2.
- A sound field verification plan for UXO detonation will be submitted to NMFS 180 days prior to planned start of UXO detonations.

Attachment G-3: SouthCoast Wind North Atlantic Right Whale Monitoring and Mitigation Plan for Pile Driving

SOUTHCOAST WIND

SouthCoast Wind Draft Post-Construction Avian and Bat Monitoring Framework

Document Revision B

Issue Date December 6, 2023

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Glossary

Acronym	Definition
ADLS	Aircraft Detection Lighting System
BOEM	Bureau of Ocean Energy Management
cm	centimeter
COP	Construction and Operations Plan
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	feet
FAA	Federal Aviation Administration
GPS	Global Positioning System
kt	knots
m	meter
MA/RI WEA	Massachusetts and Rhode Island Wind Energy Area
MESA	Massachusetts Endangered Species Act
nm	nautical mile
NEPA	National Environmental Policy Act
OCS	Outer Continental Shelf
OEC	Offshore Export Cable
OSP	Offshore Substation Platform
RINHP	Rhode Island Natural Heritage Program
RSZ	Rotor swept zone
USGS	United States Geological Society
USFWS	United States Fish and Wildlife Service
WTG	Wind Turbine Generator

1. Introduction

SouthCoast Wind Energy LLC (SouthCoast Wind; formerly known as Mayflower Wind), a 50:50 joint venture between Shell New Energies US LLC and OW North America LLC, proposes an offshore wind renewable energy generation project (the Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (Lease Area). The Project will consist of 149 positions to be occupied by wind turbine generators (WTGs) and offshore substation platforms (OSPs). This draft *SouthCoast Wind Avian and Bat Monitoring Framework* (the Framework) pertains to the offshore portions of the Project within the Lease Area only and does not apply to the offshore export cables, cable landfall sites, or onshore portions of the Project.

For the development of the Construction and Operations Plan (COP), SouthCoast Wind conducted an Avian Exposure Risk Assessment (COP Appendix I1) and a Bat Risk Assessment (COP Appendix I2). To support the development of the Avian Exposure Risk Assessment, SouthCoast Wind conducted high-definition aerial surveys of the Lease Area from November 2019 through October 2020. The data collected were based on images captured using a grid-based survey design with a 1.5-centimeter (cm) resolution ground sampling distance. Digital still imagery was captured during each survey, each of which employed a global positioning system (GPS)-linked camera platform using a flight management system to ensure the survey tracks were flown with a high degree of accuracy over the SouthCoast Wind Lease Area. The survey altitude was held at approximately 414.5 meters (m; 1,360 feet [ft]) to optimize coverage and minimize interference from cloud cover, and the aircraft was flown at a target ground speed of approximately 120 knots (kt) to reduce motion blur and ensure high image quality. The aerial digital survey captured images along nine lines spaced approximately 2 km across-track within the Lease Area and 1 nautical mile (nm) buffer. The captured images covered a minimum of 40% of the transect area per survey (i.e., approximately 6,233 hectares [15,403 acres]; sample area). Surveys were conducted monthly and sampling effort was increased during the migratory period for terns and other species of concern.

1.1 Avoidance, Minimization, and Mitigation Measures

SouthCoast Wind has taken steps to avoid, minimize, and mitigate impacts to birds and bats during Project construction, operation, and decommissioning. The Lease Area is located approximately 25 nm south of Martha's Vineyard and 20 nm south of Nantucket, Massachusetts. This offshore location for the siting of the WTGs and OSPs will help to avoid exposure to coastal birds and bats.

During construction, SouthCoast Wind will minimize lighting, to the extent practicable, to reduce potential attraction of birds and bats to vessels and structures. SouthCoast Wind will ensure that lighting on WTGs will be executed in accordance with Federal Aviation Administration (FAA) regulations and lighting on OSPs will be minimized to that required for navigation safety to reduce potential attraction of birds and bats to the extent practicable. During operations, SouthCoast Wind will significantly minimize Project lighting that would attract birds and bats by implementing an Aircraft Detection Lighting System (ADLS) that is expected to limit FAA and BOEM required lighting to less than five minutes per year (see COP Appendix Y3, Aircraft Detection Lighting System Efficacy Analysis).

1.2 Monitoring Goals and Objectives

This Framework serves to outline SouthCoast Wind's approach to post-construction avian and bat monitoring, overarching monitoring objectives, proposed monitoring elements, and reporting requirements. The measures proposed herein are intended to support the advancement of the understanding of bird and bat interactions and address the uncertainty on bird and bat use (particularly for federally listed species) of the offshore environment and the potential collision impacts from operating the offshore Project components. The scope of monitoring in this draft Framework is designed to meet federal requirements 30 CFR 585.626(b)(15) and 585.633(b) and is scaled to the size and risk profile of the Project with a focus on species of conservation concern (e.g., federally- and state-listed species). This draft Framework will also support the Bureau of Ocean Energy Management's (BOEM) Endangered Species Act Section 7 Consultation and the Environmental Impact Statement (EIS).

A detailed *Avian and Bat Post-Construction Monitoring Plan* (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, U.S. Fish and Wildlife Service (USFWS), and other relevant regulatory agencies as the National Environmental Policy Act (NEPA) process for the Project progresses. Where feasible, monitoring conducted in the Lease Area will be coordinated with monitoring at other offshore wind projects in the Massachusetts and Rhode Island Wind Energy Areas (MA/RI WEAs) to facilitate integrated analyses across a broader geographic area. **Table 1** below highlights the proposed avian and bat monitoring objectives and methods.

Table 1. Monitoring Objectives, General Approaches to be Used, and Types of Data Generated

Taxa	Monitoring Objective	Approach	Duration	Time of Year, Frequency	Coverage
Bats	Monitor occurrence of bats	Acoustics	At least 2 years	Late winter/ early spring – late fall/early winter, nightly to the extent practicable	Up to 2 OSPs
Birds	Monitor occurrence of birds	Acoustics	At least 2 years	Late winter/ early spring – late fall/early winter, nightly to the extent practicable	Up to 2 OSPs
Birds	Monitor occurrence of ESA-listed birds	Motus tags	At least 3 years	Continuous	TBD based on agency consultation
Birds	Monitor occurrence of nocturnal migratory birds	Radar	Up to 2 years	TBD based on agency consultation	One unit; location TBD
Birds	Monitor movement of marine birds around WTGs	Radar	Up to 2 years	TBD based on agency consultation	One unit; location TBD
Both	Document mortality	Incidental Observations	Project lifetime	Continuous	WTGs and OSPs

2. Bat Acoustic Monitoring

Although little is known about bat migration and movements over marine habitats, both historical and contemporary records have documented bat offshore activity in North America. Several bat species have been observed roosting on ships and offshore installations at sea (Stantec, 2018; Thompson et al., 2015; Ahlén et al., 2009) or at remote islands (Johnson et al., 2011; Cryan & Brown, 2007), suggesting some level of movements over water. SouthCoast Wind plans to conduct bat acoustic monitoring to assess bat activity within the Lease Area, targeting key data gaps related to species presence/composition, temporal patterns of activity, and correlation with weather and atmospheric conditions.

Acoustic monitoring of bat presence will be conducted for at least two years post-construction. Appropriate bat detector devices will be installed on various offshore Project components in the Lease Area (WTGs and OSPs) in early spring or late winter and removed in late fall or early winter after migration. SouthCoast Wind will work with BOEM, USFWS, and other relevant regulatory agencies to determine the optimal monitoring locations and durations. The detector devices will record calls of both cave-hibernating bats, including the northern long-eared bat (*Myotis septentrionalis*), and migratory tree bats. The resulting information can be used to identify bats to species. All acoustic data recorded will be processed with approved software to filter out poor-quality data and identify the presence of bat calls. High-frequency calls can then be classified by an experienced acoustician to the highest resolution possible (e.g., species, genus, family).

Collected bat call data will be identified and analyzed to understand relationships with time of day, season, and weather/atmospheric conditions to the extent practicable. The results will provide information on bat presence offshore and the conditions under which they may occur near offshore Project components.

3. Bird Acoustic Monitoring

Several bird groups are known to migrate offshore at night, including songbirds and shorebirds (Adams et al., 2015; Loring et al., 2021). However, there is limited understanding of the timing, species composition, and total avian abundance of these migratory movements offshore. Birds produce flight calls during migration, which are species-specific vocalizations given primarily during sustained flight (Farnsworth, 2005), and as a result, acoustic detectors can be used to study their presence in the Project Area. The detectors continuously record data during a pre-determined schedule, allowing for high-resolution species occurrence data.

SouthCoast Wind will conduct acoustic monitoring with detectors during the same period as bat acoustic monitoring (early spring or late winter – late fall or early winter, for at least two years of the Project). Due to noise interference with WTGs, bird acoustic detectors will only be installed on OSPs.

Collected bird acoustic data will be identified and analyzed to understand relationships with time of day, season, and weather/atmospheric conditions to the extent practicable. The results will provide information on bird presence offshore and the conditions under which they may occur near offshore Project components.

4. Motus Tracking Network and Use by ESA-Listed Birds Study

A total of 83 marine bird species are known to regularly occur off the coast of the eastern United States (Nisbet et al., 2013). SouthCoast Wind has conducted an Avian Exposure Risk Assessment (COP Appendix I1) to identify

marine and coastal bird species listed as threatened or endangered under the Endangered Species Act (ESA), Massachusetts Endangered Species Act (MESA) (including Special Concern species) and/or Rhode Island Natural Heritage Program (RINHP) that may be present within the Offshore Project Area. To gain a better understanding of the presence and movements of ESA-listed birds in the Lease Area, SouthCoast Wind plans to install offshore automated telemetry receiving stations (Motus receivers) and contribute funding to Motus-tagging efforts to address this existing data gap. The exact species to be studied will be determined in consultation with federal agencies and will depend on existing, ongoing field efforts. The Motus receivers will also provide opportunistic presence/absence data on other species carrying Motus tags, such as migratory songbirds and bats.

Tagging efforts will be conducted post-construction, and movements of Motus-tagged ESA-listed birds in the vicinity of the Lease Area will be monitored for at least three years post-construction, during the spring, summer, and fall. Motus receivers will be installed within the Lease Area to determine the presence/absence of ESA-listed species. The specific number and location of offshore receiver stations will be selected in accordance with current guidance documents, such as the *Draft Guidance for Pre- and Post-Construction Monitoring to Detect Changes in Marine Bird Distributions and Habitat Use Related to Offshore Wind Development*. SouthCoast Wind will work with USFWS to determine appropriate funding and support to be provided to researchers working with ESA-listed birds.

ESA-listed bird presence/absence in the Lease Area will be analyzed by comparing detections within the Lease Area to coastal receiver towers. All detections can be analyzed to understand relationships with time of day, season, and weather.

5. Radar Monitoring: Nocturnal Migrants

Nocturnal migrants, including songbirds and shorebirds, are documented to fly offshore (Adams et al. 2015, Loring et al. 2021). Breeding songbirds that occur in the region are mostly neotropical migrants, flying north to south along the U.S. Atlantic Coast to the tropical regions of Mexico, the Caribbean, and Central and South America. During migration, songbirds mostly travel at night at high altitudes and regularly cross large bodies of water, including the Mediterranean Sea and the Gulf of Mexico (Bruderer & Lietchi, 1999; Gauthreaux & Belser, 1999). Various songbird species may traverse the Lease Area during migration periods. During migration, most songbirds fly at altitudes between 295 to 1,969 ft (90 and 600 m) (NYSERDA, 2015), with a large proportion of migratory movements occurring above the rotor swept zone (RSZ) of most offshore WTGs. However, flight heights vary according to species and conditions. For shorebird species, evidence suggests that many species migrate at flight heights over 2,000 feet (610 m), which are above the RSZ of most offshore WTGs (approximately 837 ft [255 m]) as described in Senner et al. (2018) and Green (2004). It is therefore expected that shorebird occurrence in the Lease Area for most species is possible but is expected to be uncommon and limited to spring and fall migration periods.

Since nocturnal migration events are episodic and cannot be detected during daytime surveys, there is uncertainty on the timing and intensity of migration offshore. Similar to other MA/RI WEA offshore wind projects, SouthCoast Wind will monitor nocturnal migrants with 3D radar for up to two years post-construction to record the passage rates (flux) of migrants and their flight heights. Specific radar system(s), location, time of year, and methodology will be determined in consultation with USFWS closer to the commencement of Project operations. The results of such radar monitoring could be related to time of year and weather conditions, to increase the understanding on when nocturnal migrants may have higher collision risk.

6. Radar Monitoring: Marine Bird Avoidance

Some marine birds, including loons and sea ducks, have been shown to exhibit avoidance of offshore wind farms (Furness et al., 2013). Loons are among the species identified as most vulnerable to displacement (Heinänen et al., 2020; Furness et al., 2013; Garthe & Hüppop, 2004). Sea ducks are also vulnerable to displacement. Avoidance behavior has been documented for several species, including black scoter and common eider (Desholm & Kahlert, 2005, Larsen & Guillemette, 2007) and studies have also documented sea ducks increasing their altitude to avoid WTGs at night (Desholm & Kahlert, 2005). SouthCoast Wind is considering conducting up to 2 years of radar study to collect data on macro (and potentially meso) avoidance rates. The radar would run continuously to collect data at times when birds vulnerable to displacement are present. These data on macro-avoidance would support understanding of both displacement and collision vulnerability.

7. Documentation of Dead and Injured Birds and Bats

Several factors influence the risk of collision with offshore wind project components for birds, including behavior, season, weather, and lighting. In general, species using marine habitats have exhibited lower collision rates than those documented at terrestrial wind facilities, although data from offshore operational sites are very limited (Adams et al., 2017; Thaxter et al., 2017). SouthCoast Wind will implement a reporting system to document dead or injured birds or bats found incidentally on vessels and offshore Project structures during construction, operation, and decommissioning. The location will be marked using GPS, an Incident Reporting Form will be filled out, and digital photographs will be taken. Any animals detected that could be ESA-listed will have their identity confirmed by consulting biologists, and a report will be submitted to the designated staff at SouthCoast Wind who will then report it to BOEM, USFWS, and other relevant regulatory agencies. Carcasses with federal or research bands or tags will be reported to the U.S. Geological Survey (USGS) Bird Band Laboratory at https://www.pwrc.usgs.gov/bbl/.

8. Adaptive Monitoring and Management

Over the course of monitoring, SouthCoast Wind will work with BOEM, USFWS, MassWildlife, RIDEM, and other relevant regulatory agencies to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring based on an ongoing assessment of monitoring results. Potential triggers for adaptive monitoring may include, but are not limited to, equipment failure, an unexpected impact to birds or bats identified through monitoring, or new opportunities to collaborate with other projects in the region. The Monitoring Plan will include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies. In addition to Adaptive Monitoring, SouthCoast Wind will use an Adaptive Management approach in which ongoing bird and bat data collection in offshore wind lease areas will be used to inform Project operations and conservation mitigation strategies, as available and applicable. This should result in reductions of direct and indirect impacts of operations throughout the lifetime of the Project.

9. Reporting

SouthCoast Wind will submit an annual Monitoring Report to BOEM summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. SouthCoast Wind

will consult with BOEM and USFWS, as necessary, to discuss the report and adaptive changes to the Monitoring Plan.

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