Appendix H
Mitigation and Monitoring

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Abbreviations and Acronyms

AIS	automatic identification system
ASR	airport surveillance radar
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
CMP	construction management plan
COP	construction and operations plan
CZM	Office of Coastal Zone Management
dB	decibel
dB re 1 µPa	decibels relative to 1 micropascal
DMA	dynamic management area
DTS	distributed temperature sensing
EIS	environmental impact statement
ESA	Endangered Species Act
ESP	electrical service platform
FAA	Federal Aviation Administration
HAPC	habitat area of particular concern
HDD	horizontal directional drilling
HH:MM	hour:minute
HRG	high-resolution geophysical
ID	identification
IHA	Incidental Harassment Authorization
ITA	Incidental Take Authorization
kHz	kilohertz
MassDEP	Massachusetts Department of Environmental Protection
NA	not applicable
NARW	North Atlantic right whale
NHESP	Natural Heritage and Endangered Species Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OECC	offshore export cable corridor
PAM	passive acoustic monitoring
PATON	private aid to navigation
PPPP	Piping Plover Project Plan
PSO	protected species observer
ROD	Record of Decision
SAR	search and rescue
SMA	seasonal management area
SWDA	Southern Wind Development Area
TMP	traffic management plan
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
UTC	Universal Time Coordinated
WTG	wind turbine generator
Y/N	yes/no
YY-MM-DDT	Year-Month-Day Time Zone
YYYY-MM-DD	Year-Month-Day

H Mitigation and Monitoring

As part of the proposed New England Wind Project (proposed Project), Park City Wind, LLC (applicant) has voluntarily committed to measures to avoid, reduce, otherwise mitigate, or monitor[1] impacts (mitigation and monitoring measures) on the resources discussed in Chapter 3, Affected Environment and Environmental Consequences, and Appendix G, Impact-Producing Factor Tables and Assessment of Resources with Minor (or Lower) Impacts, of the Draft Environmental Impact Statement (EIS). The mitigation and monitoring measures that the applicant has committed to implement are summarized in the Construction and Operations Plan (COP) (Volume III, Section 4; Epsilon 2022).

The Bureau of Ocean Energy Management (BOEM) considers as part of the Proposed Action only those mitigation and monitoring measures that the applicant has committed to in the COP. BOEM may select alternatives or require additional mitigation or monitoring measures as a condition of COP approval to further protect and monitor these resources. Additional potential mitigation and monitoring measures have been developed through reviews under several environmental statutes (National Historic Preservation Act [NHPA], Magnuson-Stevens Fisheries Conservation and Management Act, Endangered Species Act [ESA], and Marine Mammal Protection Act), as discussed in EIS Appendix A, Required Environmental Permits and Consultations. The mitigation and monitoring measures that the applicant has committed to implement (including and in addition to those defined in the COP) are listed in Table H-1. Mitigation and monitoring measures that may result from reviews under the statutes listed above are shown in Table H-2. Some of these mitigation and monitoring measures are outside of BOEM's statutory and regulatory authority but could potentially be adopted and imposed by other governmental entities. Tables H-1 and H-2 provide descriptions of mitigation or monitoring measures, along with the resource or resources to which each measure applies.

If the COP is approved or approved with conditions, it will include mitigation and monitoring measures developed under various consultations and permit reviews (e.g., ESA and Marine Mammal Protection Act) and adopted by the Final EIS Record of Decision (ROD). If BOEM decides to approve the COP, the ROD will state which of the additional mitigation and monitoring measures identified by BOEM in Tables H-1 and H-2 have been adopted; if measures are not adopted, the ROD will state why they were not. If the measures adopted differ substantially from those listed in Tables H-1 and H-2, BOEM will evaluate whether impacts analyses need to be modified to address those changes. The applicant will be required to implement the mitigation and monitoring measures applicable that are adopted in the ROD (Code of Federal Regulations, Title 40, Section 1505.3 [40 CFR § 1505.3]), and it will be required to certify compliance with certain terms and conditions as required under 30 CFR § 585.633(b).

Actions may be required to evaluate the effectiveness of a mitigation and monitoring measure or to identify if resources are responding as predicted to impacts from the proposed Project. The applicant may be required to develop additional monitoring programs in coordination with BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) adapt how a mitigation and monitoring measure identified in the COP or ROD is being implemented, (2) develop or modify future mitigation and monitoring measures for the decommissioning of the proposed Project or for all stages of future projects, and/or (3) contribute to regional efforts intended to gain a better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic. Unless specified, the proposed mitigation and monitoring measures described below would not

[1] According to the Council on Environmental Quality, monitoring is "fundamental for ensuring the implementation and effectiveness of mitigation commitments, meeting legal and permitting requirements, and identifying trends and possible means for improvement" (CEQ 2011).

change the impact ratings on the affected resource, as described in EIS Chapter 3 and Appendix G, but would reduce expected impacts or inform the development of addition mitigation and monitoring measures if required.

Table H-1: Applicant-Proposed Mitigation Measures and Monitoring Efforts Analyzed

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
1.	Construction Management Plan	The applicant will prepare and implement a CMP that will be used by the applicant and its contractors during construction. The CMP will be an integral part of the applicant's effort to ensure that environmental protection and sound construction practices are implemented.	All resources
2.	Dust control plans for onshore construction and laydown areas	The applicant will develop dust control plans for onshore construction areas to minimize impacts from fugitive dust resulting from construction activities.	Air Quality (G.2.1)
3.	Use of low-sulfur fuels	Proposed Project engines and generators will use low-sulfur fuels and meet or emit less than the applicable on-road, non-road, and marine engine emission standards.	Air Quality (G.2.1)
4.	Emissions control technology	Emissions from Outer Continental Shelf sources will meet applicable Massachusetts Best Available Control Technology and Lowest Achievable Emission Rate limits.	Air Quality (G.2.1)
5.	Emissions offsets	The applicant will offset applicable nitrogen oxides and volatile organic compound emissions by acquiring emissions offsets or other means acceptable to the U.S. Environmental Protection Agency.	Air Quality (G.2.1)
6.	Vehicle Fueling	The applicant will prohibit field refueling of vehicles within 100 feet of wetlands or waterways or known private or community potable wells or within any Town of Barnstable water supply Zone I area.	Water Quality (G.2.2)
7.	Spill response	Proper spill containment gear and absorption materials will be maintained for immediate use in the event of any inadvertent spills or leaks. Any onshore substation equipment will be equipped with full containment for any components containing dielectric fluid.	Water Quality (G.2.2)
8.	Tree-clearing restrictions	To be protective of maternity roosts with young bats that are unable to fly, the applicant will avoid clearing of trees (greater than 3 inches diameter at breast height) between June 1 and July 31, unless bat surveys are conducted pursuant to current USFWS protocols and no northern long-eared bats (*Myotis keenii*) are documented.	Bats (G.2.3)
9.	Avian and bat post-construction monitoring program	The applicant will develop and implement a framework for an avian and bat post-construction monitoring program. The applicant expects to model the framework for the proposed Project on the framework developed for the Vineyard Wind 1 Project (Vineyard Wind 1); therefore, the framework for the proposed Project will include, at a minimum: • Acoustic monitoring for birds and bats; • Installation of Motus receivers on WTGs in the SWDA and support with upgrades or maintenance of two onshore Motus receivers; • Deployment of up to 150 Motus tags per year for up to 3 years to track Roseate Terns (*Sterna dougallii*), Common Terns (*Sterna hirundo*), and/or nocturnal passerine migrants; • Pre- and post-construction boat surveys; • Avian behavior point count surveys at individual WTGs; and • Annual monitoring reports that will be used to assess the need for reasonable revisions (based on subject matter expert analysis) to the monitoring plan and may include new technologies as they become available for use in offshore environments. The applicant will work with BOEM to ensure the data is publicly available.	Bats (G.2.3); Birds (G.2.4)
10.	Aircraft detection lighting system	The applicant has committed to use FAA-approved aircraft detection lighting system, which will only activate the FAA hazard lighting when an aircraft is in the vicinity of the wind facility to reduce the visibility of nighttime lighting and, thus, reduce nighttime visual impacts.	Bats (G.2.3); Birds (G.2.4); Cultural Resources (3.10); Recreation and Tourism (3.15); Scenic and Visual Resources (3.16)
11.	Benthic monitoring framework	The applicant will develop a benthic monitoring framework in consultation with BOEM and other agencies as appropriate (COP Appendix III-U; Epsilon 2022), based on the framework prepared for Vineyard Wind 1.	Benthic Resources (3.4)
12.	Sensitive habitat avoidance	Offshore export cable installation will avoid important habitats and those considered habitats areas of particular concern, such as eelgrass beds and hard-bottom sediments, if feasible. The applicant expects to avoid the identified eelgrass resources near Spindle Rock in proximity to the Phase 1 landfall sites, as well as isolated areas of hard bottom may be avoided, such as at Spindle Rock.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5); Finfish, Invertebrates, and Essential Fish Habitat (3.6)
13.	Mid-line anchor buoys	Where feasible and considered safe, vessels deploying anchors will use mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor.	Benthic Resources (3.4); Coastal Habitats and Fauna (3.5); Finfish, Invertebrates, and Essential Fish Habitat (3.6)
14.	Anti-perching	In accordance with safety and engineering requirements, the applicant will consider installing anti-perching devices on WTGs and ESP(s), where and if appropriate, to reduce potential bird perching locations.	Birds (G.2.4)
15.	Bird mortality monitoring	Using a standardized protocol for the proposed Project, the applicant will document any dead or injured birds found on vessels and structures during construction, operations, and decommissioning.	Birds (G.2.4)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
16.	Piping Plover Protection Plan	The applicant has developed a PPPP for the Phase 1 landfall sites and expects to develop a similar plan for the Phase 2 landfall sites (COP Appendix III-R; Epsilon 2022). The applicant expects that activities at the landfall sites will not occur between April 1 and August 31 to avoid and minimize noise impacts on Piping Plover during the breeding season.	Birds (G.2.4)
17.	Piping Plover Protection Plan, HDD Provisions	Prior to HDD operations, construction personnel will be provided with the PPPP to achieve proper implementation. The PPPP includes (at minimum) the following provisions: • Installation of export cable conduits is not expected to be initiated between April 1 and August 31. If HDD activities are initiated between April 1 and August 31, or if work is re-initiated after a 48-hour work stoppage during the Piping Plover nesting season (the aforementioned time period), the Massachusetts NHESP, the USFWS, and BOEM must be notified with the reason, anticipated duration of the work, and any additional information requested by NHESP, the USFWS, and BOEM. • In the unlikely event that disturbance associated with HDD activities to coastal beach occurs, a qualified biologist will survey the site in advance of any equipment access to the beach and ensure no remedial actions will interfere with nesting Piping Plovers or other state-listed species.	Birds (G.2.4)
18.	Piping Plover Protection Plan (pre-construction monitoring)	If HDD activities are initiated between April 1 and August 31, or if work is re-initiated after a 48-hour work stoppage during the Piping Plover nesting season (the aforementioned time period), the applicant will follow the mitigation and monitoring measures outlined in the PPPP. As depicted in the PPPP, a qualified biologist will perform surveys to determine the presence/absence of any nesting Piping Plovers within 200 yards of the work zone. If no nests, scrapes, or territorial pairs are identified within 200 yards of the work zone, the shorebird monitor will document the findings, report to NHESP and the applicant, and the applicant will be cleared to mobilize into the area within 48 hours, with no further monitoring activities required. If nests, scrapes, or territorial pairs are observed within 200 yards of the work zone, locations will be recorded and the following monitoring will be required, based on nests and/or chick proximity to the work zone: • Greater than or equal to 100 yards from work zone and nest monitored once per day at dawn (before 0600 hours) during appropriate weather conditions; • 50 to 100 yards from work zone and nest monitored twice per day at dawn and dusk (before 0600 hours and after 1900 hours) during appropriate weather conditions; and • Less than 50 yards to the work zone and no equipment may be mobilized to the OECC landing sites unless specifically permitted by the NHESP.	Birds (G.2.4)
19.	Sensitive habitat map distribution	Prior to the start of construction, the applicant will provide contractors with a map of sensitive habitats to allow them to plan their mooring positions accordingly. Vessel anchors and legs will be required to avoid known eelgrass beds and other sensitive seafloor habitats (hard/complex bottom), as long as such avoidance does not compromise the vessel's safety or the cable's installation. Where it is considered impossible or impracticable to avoid a sensitive seafloor habitat when anchoring, use of mid-line anchor buoys will be considered, where feasible and considered safe, as a potential measure to reduce and minimize potential impacts from anchor line sweep.	Coastal Habitats and Fauna (3.5)
20.	Oil spill response plan	The applicant will develop an oil spill response plan (COP Appendix I-F; Epsilon 2022).	Coastal Habitats and Fauna (3.5); Water Quality (G.2.2)
21.	Construction lighting reduction	During construction and operations, the applicant will reduce lighting to the extent practicable and down-shield lighting or use down-lighting.	Coastal Habitats and Fauna (3.5); Bats (G.2.3); Birds (G.2.4)
22.	Pre-construction, construction, and post-construction fisheries surveys	The applicant is collecting pre-construction fisheries data in cooperation with University of Massachusetts Dartmouth School of Marine Science and Technology via trawl and drop camera surveys within the SWDA and OECC. The applicant will develop a framework for construction and post-construction fisheries studies within the SWDA and OECC, in coordination with other offshore wind energy developers in the Rhode Island and Massachusetts Lease Areas. All pre-construction, construction, and post-construction survey and monitoring work will be publicly available. The applicant will work with the Responsible Offshore Science Alliance and the Regional Wildlife Science Entity to help streamline and standardize available data across all offshore efforts.	Finfish, Invertebrates, and Essential Fish Habitat (3.6)
23.	Pile driving soft start	The applicant will apply a soft-start procedure to the pile-driving process, in which the pile-driving process includes an initial set of three strikes from the impact hammer at reduced energy, followed by a 1-minute waiting period. This process will be repeated a total of three times prior to initiation of pile driving. Soft start will occur for all impact driving, including at the beginning of the day, and at any time following a cessation of impact pile driving of 30 minutes or longer.	Finfish, Invertebrates, and Essential Fish Habitat (3.6), Marine Mammals (3.7), Sea Turtles (3.8)
24.	Offshore Wind Protected Marine Species Mitigation Fund	The applicant will establish an Offshore Wind Protected Marine Species Mitigation Fund as part of Phase 1. The applicant has committed to provide up to $2.5 million to the Mystic Aquarium in Connecticut to continue evolving the understanding of underwater noise generated by offshore wind farms and the potential impacts on cetacean and pinniped behavior, hearing, and physiology. In addition, this fund will further the investigation of best practices and advance technologies to reduce potential sound impacts and collision threats from offshore wind project development.	Finfish, Invertebrates, and Essential Fish Habitat (3.6), Marine Mammals (3.7), Sea Turtles (3.8)
25.	Pile-driving time-of-year restriction	No pile-driving activities will occur from January 1 to April 30.	Finfish, Invertebrates, and Essential Fish Habitat (3.6), Marine Mammals (3.7), Sea Turtles (3.8)
26.	Pile-driving noise attenuation	The applicant will implement noise attenuation mitigation to reduce sound levels by a target of approximately 12 decibels or greater. Sound source verification monitoring, such as with PAM devices, will be used to verify the level of noise attenuation achieved by noise abatement methods.	Finfish, Invertebrates, and Essential Fish Habitat (3.6), Marine Mammals (3.7), Sea Turtles (3.8)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
27.	Work zones	The applicant will use expanded work zones and construction staging areas where required to accommodate special construction equipment and materials. Wherever possible, these spaces will be located within previously developed areas, such as nearby parking lots, to avoid or minimize disturbance to naturally vegetated areas. Any previously undisturbed areas of wildlife habitat affected by expanded work zones or elsewhere along the onshore export cable routes and grid interconnection routes will be restored in consultation with local officials. For construction within utility right-of-way, any disturbed vegetated areas will be loamed and seeded to match pre-existing vegetation.	Terrestrial Habitats and Fauna (G.2.5); Land Use and Coastal Infrastructure (G.2.7)
28.	Offshore markings and coordination	To minimize hazards to navigation, all proposed Project-related vessels and equipment will display the required marine navigation lighting and day shapes. The applicant will issue Offshore Wind Mariner Update Bulletins and coordinate with the USCG to provide Notices to Mariners to notify recreational and commercial vessels of their intended operations within the offshore development area. The applicant is currently providing and will continue to provide portable digital media with electronic charts depicting locations of proposed Project-related activities.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)
29.	Aids to navigation	Each proposed Project WTG and ESP will be maintained as a PATON in accordance with USCG's PATON marking guidance for offshore wind facilities. The applicant will implement a uniform system of marine navigation lighting and marking for the offshore facilities, which is currently expected to include yellow flashing lights on every WTG foundation and ESP; unique alphanumeric identifiers on the WTGs, ESPs, and/or their foundations; and high-visibility yellow paint on each foundation. Mariner radio activated sound system and AIS transponders are included in the offshore facilities' design to enhance marine navigation safety. Each WTG and ESP will also be clearly identified on navigation charts.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)
30.	Marine coordination	The applicant will employ a Marine Operations Liaison Officer, who will be responsible for safe marine operations. The applicant will also employ a Marine Coordinator during proposed Project construction to coordinate with maritime partners and stakeholders (e.g., the USCG, U.S. Navy, port authorities, state and local law enforcement, marine patrol, commercial operators, etc.).	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Navigation and Vessel Traffic (3.13); Recreation and Tourism (3.15)
31.	Funding for fisheries research and education	As part of Phase 1, The applicant has committed to provide up to $2.5 million to support fisheries research and education as part of a new initiative launched by the University of Connecticut to improve the understanding of potential environmental impacts from offshore wind. Additionally, as part of Phase 1, The applicant will allocate up to $7.5 million in funds to support environmental initiatives, assist Connecticut fishermen, and further bolster local communities in Connecticut where offshore wind development activities are taking place.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Demographics, Employment, and Economics (3.11); Environmental Justice (3.12)
32.	Avoid identified shipwrecks, debris fields, and submerged landform features that can be avoided	The applicant is required to avoid the shipwrecks, potentially significant debris fields, and as many as possible of the submerged, landform features identified during marine archaeological surveys of the SWDA and OECC. While avoidance of shipwrecks and debris fields is typically simple, avoidance of all submerged landform features is typically not possible due to their size and orientation.	Cultural Resources (3.10)
33.	Gay Head Lighthouse repair funds	The applicant will contribute up to $150,000 each for Phase 1 and Phase 2 to fund ongoing maintenance and repair work at the Gay Head Lighthouse. Such work may include, but is not limited to, the repair of exterior metalwork including the lantern curtain wall, kick plate, cast iron sills, railings, stanchions, stiles, and other metalwork. Additionally, such work may include repair and repointing of the structure to secure the envelope and reduce potential water infiltration.	Cultural Resources (3.10)
34.	Vineyard Sound and Moshup's Bridge traditional cultural property mitigation fund	Pursuant to consultations between the applicant and the Wampanoag Tribe of Gay Head (Aquinnah), the applicant will contribute up to $150,000 each for Phase 1 and Phase 2 to support public education purposes on Moshup and Moshup's Bridge. The applicant will consult with the tribe to determine the most appropriate use of the funds and the scope of work.	Cultural Resources (3.10)
35.	Apply no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey Paint Color to the turbines	The applicant is required to paint the WTGs off-white/light grey (no lighter than RAL 9010 Pure White and no darker than RAL 7035 Light Grey) to reduce visual impacts during daylight hours on historic properties. The applicant has already committed to this measure as part of the NHPA Section 106 process.	Cultural Resources (3.10); Recreation and Tourism (3.15); Visual Resources (3.16)
36.	Fisheries communication plan	Prior to the start of offshore export cable-laying preparatory activities for either phase, the applicant will communicate with commercial fishermen following the protocols outlined in the fisheries communication plan provided in the COP (Appendix III-E; Epsilon 2022) to help avoid potential fishing gear interactions.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Demographics, Employment, and Economics (3.11)
37.	Direct support for economic and community initiatives	During Phase 1, the applicant has committed $26.5 million (nominal) to support the economic and community initiatives such as supply chain integration, workforce development, and offshore wind-related marine and fisheries research, as well as the local communities in Connecticut. The applicant also expects to develop additional community and environmental initiatives in connection with its efforts to secure long-term contracts/power purchase agreements for the electricity generated by Phase 2.	Demographics, Employment, and Economics (3.11); Environmental Justice (3.12)
38.	TMP	Prior to construction, the applicant will work with the Town of Barnstable to develop a TMP for the onshore construction of each proposed Project phase. The TMP will be a living document such that any unanticipated change in construction location, timing, or method previously identified will result in revision of the TMP and approval by the appropriate authorities before any construction changes are implemented. The applicant will restore paved areas at landfall sites and repave roads in accordance with Massachusetts Department of Transportation and Town specifications to as-new conditions and restore disturbed vegetated areas to match pre-existing vegetation.	Demographics, Employment, and Economics (3.11); Land Use and Coastal Infrastructure (G.2.7)

Measure Number	Measure Title	Measure Description	Resource Area Addressed (EIS Section)
39.	Onshore construction public outreach	The applicant will use various methods of public outreach prior to and during construction to keep residents, business owners, and officials updated on the construction schedules, vehicular access, lane closures, detours, other traffic management information, local parking availability, emergency vehicle access, construction crew movement and parking, laydown areas, staging, equipment delivery, nighttime or weekend construction, and road repaving.	Demographics, Employment, and Economics (3.11); Land Use and Coastal Infrastructure (G.2.7)
40.	Onshore cable installation restrictions	The applicant will generally limit installation of onshore duct bank and cables, and construction is anticipated to occur during typical work hours (7:00 a.m. to 6:00 p.m.) Monday through Friday. For some specific instances at some locations, or at the request of the Barnstable Department of Public Works, the applicant may seek municipal approval to work at night or on weekends. Nighttime work will be minimized and performed only on an as-needed basis, such as when crossing a busy road, and will be coordinated with the Town of Barnstable. The applicant will avoid construction activities at the landfall sites and along the onshore export cable route and grid interconnection routes (particularly where the routes follow public roadway layouts) will also likely be subject to significant construction limitations from Memorial Day through Labor Day unless authorized by Barnstable but could extend through June 15 subject to consent from the Department of Public Works. The applicant will consult with the Town of Barnstable regarding the construction schedule.	Land Use and Coastal Infrastructure (G.2.7); Recreation and Tourism (3.15)
41.	Visual screening of substation sites	For the Phase 1 onshore substation, the applicant will plant a vegetated screen on the western and northern boundaries of the onshore substation site; the vegetated screening along the western edge will provide visual screening for existing residences. For Phase 2, depending on the onshore substation site(s) selected, the applicant may plant vegetated screening to provide visual screening for existing residences.	Land Use and Coastal Infrastructure (G.2.7); Scenic and Visual Resources (3.16)
42.	WTG shutdown mechanism	All WTG rotors (blade assemblies) will have control mechanisms operable from the applicant control centers available 24 hours per day, 7 days per week. The control mechanisms will enable control room operators to shut down the requested WTGs within an agreed upon time of notification between the USCG and the applicant. A formal shutdown procedure will be part of the standard operating procedures and periodically tested. Normally, USCG-ordered shutdowns will be limited to those WTGs in the immediate vicinity of an emergency and for as short a period as is safely practicable under the circumstances, as determined by the USCG.	Navigation and Vessel Traffic (3.13)

AIS = automatic identification system; BOEM = Bureau of Ocean Energy Management; CMP = construction management plan; COP = Construction and Operations Plan; EIS = environmental impact statement; ESP = electrical service platform; FAA = Federal Aviation Administration; HDD = horizontal directional drilling; NHESP = Natural Heritage and Endangered Species Program; NHPA = National Historic Preservation Act; OECC = offshore export cable corridor; PAM = passive acoustic monitoring; PATON = private aid to navigation; PPPP = Piping Plover Project Plan; SWDA = Southern Wind Development Area; TMP = traffic management plan; USCG = U.S. Coast Guard; USFWS = U.S. Fish and Wildlife Service; WTG = wind turbine generator.

Table H-2: Other Potential Mitigation Measures and Monitoring Efforts Analyzed

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
1.	Construction	Tree-clearing limitations	The applicant will not clear trees (greater than 3-inch-diameter at breast height) from April 1 to October 31. Should presence/probable absence surveys be conducted pursuant to current USFWS protocols and no northern long-eared bats are documented, this measure may not be necessary for ESA compliance relative to the species.	Bats (G.2.3)	BOEM BSEE
2.	Operations	Acoustic bat detectors	The applicant will deploy acoustic bat detectors on a subset of WTGs or ESPs to refine the understanding of bat use of the Outer Continental Shelf and SWDA. Deployment configuration and number of detectors will be determined in consultation with applicable stakeholders.	Bats (G.2.3)	BOEM BSEE
3.	Construction, Operations, Decommissioning	Optical surveys of benthic invertebrates and habitat	The applicant will conduct optical surveys. Stations will be placed on a 0.9-mile (1.5-kilometer) grid, with four samples taken at each station twice per year. The drop camera surveys emulate the drop camera survey conducted in the lease area in 2012 and 2013 to support a before-after control impact study design (SMAST 2019). The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders. The applicant will consult with NMFS and BOEM prior to conducting surveys and address any agency comments in the survey plan.	Benthic Resources (3.4)	NMFS
4.	Operations	Monitoring and minimizing foundation scour protection	The applicant will conduct post-construction monitoring to document habitat disturbance and recovery at offshore wind turbine foundations per the benthic habitat monitoring plan. Additionally, the applicant will inspect scour protection performance at 20% of locations every 3 years starting in Year 3. The applicant will consult with NMFS and BOEM prior to conducting inspections and address any agency comments prior to implementation. As appropriate, based on proposed Project design and engineering, the applicant will apply foundation scour protection to only the minimum area needed for sufficient protection.	Benthic Resources (3.4)	NMFS
5.	Construction, Operations, Decommissioning	Plankton surveys	The applicant will conduct plankton surveys to estimate the relative abundance and distribution of planktonic species such as larval lobster using a towed neuston net to allow for comparison with 2019 baseline sampling (SMAST 2020). Plankton tows will be conducted at each survey location concurrently with the ventless trap surveys (i.e., two times per month from May 15 to October 31). The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders.	Benthic Resources (3.4)	NMFS
6.	Operations	Post-construction bird monitoring	The applicant will finalize a post-construction bird monitoring plan prior to the start of operations, including (at minimum) the following components: • Within the first year of operations, the applicant will install digital very high frequency telemetry automated receiving stations and acoustic monitoring devices to estimate the exposure of threatened and endangered species and other migratory birds to the operating wind facility. • The applicant will install acoustic detectors for birds and provide periodic monitoring progress reports plus comprehensive annual reports, followed by a discussion of each year's results with BOEM and BSEE (and USFWS by request), including the potential need for reasonable revisions to the monitoring plan. All data generated as part of pre- and post-construction monitoring will be made available to the public through BOEM's website.	Birds (G.2.4)	BOEM BSEE
7.	Construction, Operations, Decommissioning	Bird and bat mortality reporting	The applicant must submit an annual report covering each calendar year, due by January 31 of the following year, documenting any dead (or injured) birds or bats found on vessels and structures during construction, operations, and decommissioning. The report must be submitted to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) and USFWS. The report must contain the following information: the name of species, 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 U,S, Geological Survey Bird Band Laboratory (https://www.usgs.gov/labs/bird-banding-laboratory). Any occurrence of dead ESA birds or bats must be reported to BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting. If practicable, carefully collect the dead specimen and preserve the material in the best possible state.	Birds (G.2.4)	BOEM BSEE
8.	Operations	Bird deterrent devices	The applicant will install bird deterrent devices to minimize bird attraction to operating WTGs and ESPs. The location of bird-deterrent devices must be proposed by the applicant based on best management practices applicable to the appropriate operation and safe installation of the devices. The applicant must confirm the locations of bird-deterrent devices with a monitoring plan to track the efficacy of the deterrents as part of the as-built documentation it must submit with the facility design report for the proposed Project.	Birds (G.2.4)	USFWS BSEE
9.	Construction, Operations, Decommissioning	Offshore lighting restrictions	The applicant will use minimal lighting intensity necessary on vessels, WTGs, and ESPs to permit safe construction, operations, and decommissioning activities while reducing potential attraction of birds and sea turtles to proposed Project vessels and components. Conditional on USCG approval, to minimize the potential of attracting migratory birds, the top of each light will be shielded to prevent upward illumination.	Birds (G.2.4); Sea Turtles (3.8)	USFWS USCG
10.	Construction	Dredging and cable installation methods and timing	The applicant will conduct dredging and cable installation activities using the least environmentally harmful method effective in each area, as well as updated habitat information (Table H-2, Measure #14) to avoid/minimize impacts on benthic habitat to the maximum extent practicable. Avoid perpendicular crossings of sand wave features where feasible and safe. Require all vessels deploying anchors to use, whenever feasible and safe, mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. Require nearshore cable-laying activities to avoid high concentrations of fishing activities and natural resource events (spawning and egg laying). The non-HDD cable-laying activities in the northern part of the offshore export cable area within Nantucket Sound waters will occur outside of April to June. Should cable laying be required in the northern part of the export cable route within Nantucket Sound in April to June due to environmental or technical reasons, the applicant must provide justification to BOEM, MassDEP, Massachusetts Division of Marine Fisheries, and NMFS.	Coastal Habitats and Fauna (3.5)	MassDEP 401 Water Quality Certification NMFS Essential Fish Habitat
11.	Construction, Operations, Decommissioning	Anchoring plan	The applicant will implement an anchoring plan for all areas where anchoring is being used to avoid construction impacts on sensitive habitats, including hard-bottom and structurally complex habitats. The applicant will consider any new data on benthic habitats (Table H-2, Measure #14) to avoid/minimize impacts on benthic habitat to the maximum extent practicable. The anchoring plan must include the planned location of anchoring activities, sensitive habitats and locations, seabed features, potential hazards, and any related facility installation activities such as cables, WTGs, and ESPs, as appropriate. The applicant will require all vessels deploying anchors to use, whenever feasible and safe, mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor. The anchoring plan must be provided for BOEM and NOAA review and comment before construction begins.	Coastal Habitats and Fauna (3.5)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
12.	Construction	Benthic monitoring plan	The applicant will consider any new data on benthic habitats when refining the plan. The applicant will be required to consult with NMFS and the MassDEP and the Massachusetts Division of Marine Fisheries and address any agency comments before finalizing and implementing the monitoring plan. If recovery is not observed within 5 years, the applicant, BOEM, and NMFS will confer regarding potential additional monitoring. The monitoring plan must evaluate if the cable protection (including different types of cable projection) used is mitigating impacts on juvenile cod HAPC. In addition, for the portion of the proposed work in Town of Nantucket waters, (1) the applicant must obtain the approval of MassDEP for the final benthic monitoring plan, (2) the applicant must provide an annual report to the Nantucket Conservation Commission demonstrating the condition of the area in and around the cable installation to clearly demonstrate any impacts, and (3) if a report shows an impact, the applicant must provide a detailed mitigation or restoration plan to the conservation commission. In addition, the applicant must provide an annual report to MassDEP, the Massachusetts Division of Marine Fisheries, NMFS, and BOEM discussing the type(s) and scale(s) of any impacts identified.	Coastal Habitats and Fauna (3.5)	MassDEP 401 Water Quality Certification BOEM BSEE Nantucket Conservation Commission.
13.	Construction	Final cable protection in hard bottom	The applicant will install cable protection measures within complex hard-bottom habitat as defined in the COP, Essential Fish Habitat Assessment (BOEM 2019, 2020), and additional data from Measure #14 will consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-dimensional complexity, both in height and in interstitial spaces. The applicant will consider nature-inclusive designs for optimized cable protection (Hermans et al. 2020). Additionally, per the Nantucket Order of Conditions (Nantucket Conservation Commission 2019), cable protection, where required in Town of Nantucket waters, must consist of natural materials that mimic the surrounding seafloor. The applicant will consult with NMFS and BOEM prior to the implementation of hard-bottom cable protection measures. BOEM will make recommendations regarding the final selection of engineered stone in consultation with NMFS. The effectiveness of natural and engineered stone as a mitigation measure to minimize impacts on juvenile cod HAPC will be evaluated/monitored as a component of a finalized benthic monitoring plan (Table H-2, Measure #12).	Coastal Habitats and Fauna (3.5)	Massachusetts CZM BOEM BSEE
14.	Construction	Evaluation of additional benthic habitat data prior to cable laying	At a minimum, the applicant will process 75 benthic grabs over the entire length of the OECC (with approximately 42 in the eastern Muskeget section) and 60 underwater video transects over the entire length of the OECC (with 28 transects in the eastern Muskeget section). This information will be used to update habitat maps to resolve and delineate seafloor habitats consistent with NOAA's May 2020 Recommendations for Mapping Fish Habitat (NOAA 2020). Based on this review, the applicant will use the additional data to avoid eelgrass and hard-bottom/structurally complex habitats (including juvenile cod HAPC) to the maximum extent practicable while also maintaining a feasible route.	Coastal Habitats and Fauna (3.5)	BOEM BSEE
15.	Construction	Dredge disposal sites	Where dredging is necessary, the applicant will clearly identify a limited number of dredge disposal sites within known sand wave areas, and to the maximum extent practicable, ensuring that these sites do not contain resources that will be damaged by sediment deposition. To do this, the applicant will use the additional habitat data collected under Measure #13. In addition, the applicant will report the locations of dredge disposal sites to BOEM, NOAA, MassDEP, and Massachusetts CZM within 30 days of disposal of materials. These locations must be reported in latitude and longitude degrees to the nearest 10 thousandth of a decimal degree (roughly the nearest meter) or as precise as practicable.	Coastal Habitats and Fauna (3.5)	USACE MassDEP Massachusetts CZM
16.	Construction	Bottom profiling	Prior to cable installation in Town of Nantucket waters, the applicant will provide updated bottom profiling detailing pre-construction bottom composition, sediment profiles, species composition, and topography of the area to be disturbed during cable installation and include at a minimum high-resolution video monitoring.	Coastal Habitats and Fauna (3.5)	Nantucket Conservation Commission
17.	Construction, Operations, Decommissioning	PAM	The applicant will develop mitigation and monitoring measures similar to those in the Vineyard Wind 1 COP (Appendix III-M Table 31). The applicant will use PAM buoys or autonomous PAM devices to record ambient noise and marine mammal species vocalizations in the lease area (before, during, and after construction [at least 2 years of operation]) to monitor impacts including vessel noise, pile driving, WTG operation, and large whale detections in the SWDA. Results must be provided within 90 days of buoy collection and again within 90 days of the 1-year and 2-year anniversary of collection. The underwater acoustic monitoring must follow standardized measurement and processing methods and visualization metrics developed by the Atlantic Deepwater Ecosystem Observatory Network for the U.S. Mid- and South Atlantic Outer Continental Shelf (UNH Undated). At least two buoys must be independently deployed within the lease area, or one or more buoys must be deployed in coordination with other acoustic monitoring efforts in the Rhode Island and Massachusetts Lease Areas.	Marine Mammals (3.7)	BOEM BSEE
18.	Construction	Pile-driving monitoring plan and PSO requirements	The applicant will submit a pile-driving monitoring plan to BOEM and NMFS for review and approval a minimum of 90 days prior to the commencement of pile-driving activities. The plan must: • Contain information on the visual and PAM components of the monitoring plan; • Confirm that the full extent of the harassment distances from piles (as defined in other mitigation and monitoring measures) are monitored for marine mammals to ensure that all potential take is documented; • Include number of PSOs and/or Native American monitors that will be used, the platforms and/or vessels upon which they will be deployed, and contact information for the PSO provider(s); and • Include measures for enhanced monitoring capabilities in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. The plan may also include deploying additional observers, using night vision goggles, or using PAM with the goal of ensuring the ability to maintain all exclusion zones in the event of unexpected poor visibility conditions. A communication plan detailing the chain of command, mode of communication, and decision authority must be described. PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone. The size of the exclusion zone may vary with specific time-of-year requirements for NARWs (*Eubalaena glacialis*) and should be described in the plan.	Marine Mammals (3.7)	NMFS NHPA

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
19.	Construction	Protocol when marine mammals are sighted during pre-pile-driving exclusion zones	If a marine mammal is observed entering or within the relevant exclusion zones prior to the initiation of pile-driving activity, pile-driving activity must be delayed (unless activities must proceed due to human safety considerations) until: • The animal is verified to have voluntarily left and heading away from the exclusion area; or • 30 minutes have elapsed without re-detection (for mysticetes, sperm whales [*Physeter macrocephalus*], Risso's dolphins [*Grampus griseus*], and pilot whales); or • 15 minutes have elapsed without re-detection of other marine mammals.	Marine Mammals (3.7)	BOEM, NOAA BSEE
20.	Construction	Enhanced time-of-year pile-driving shutdown and restart procedures for NARWs (May 1 to May 14 and November 1 to December 31)	If a NARW is observed or otherwise detected within the exclusion zone, pile-driving activities must stop (unless activities must proceed for human safety or installation feasibility concerns) and may not resume until: • The following day, or until a follow-up aerial or vessel-based survey is able to confirm all NARW(s) have departed the 6.2-mile extended exclusion zone, as determined by the lead PSO after 1 full day of monitoring to confirm NARW(s) have left the 6.21-mile exclusion zone (May 1 to 14); • Confirmation that all NARW(s) have left the 6.21-mile exclusion zone (November 1 to December 31); or • Confirmation that all of NARW(s) have left the 0.62-mile exclusion zone after 60 minutes of monitoring (May 15 to October 31).	Marine Mammals (3.7)	BOEM, NOAA BSEE
21.	Construction	Exclusion zones (no-go zones) for marine mammals	The applicant will reduce impact on marine mammals through the use of continuous PAM, visual monitoring by PSOs, or Native American monitors during pile-driving activities following standard protocols and data collection requirements specified by BOEM. PSOs will establish the following exclusion zones for NARWs 60 minutes prior to pile-driving activities through 30 minutes post-completion of pile-driving activity: • At all times of year that pile driving takes place, for purposes of monitoring the exclusion zone, any large whale sighted by a PSO within 3,281 feet (1,000 meters [a NARW exclusion zone]) that cannot be identified to species must be treated as if it were a NARW. Additionally, a NARW observation at any distance from the pile must be treated as an observation within the exclusion zone and trigger any required delays or shutdowns in pile installation. • From November 1 to December 31 and May 1 to May 14, the applicant must establish a 6.2-mile (10-kilometer) exclusion zone for NARWs (the applicant has the option to use aerial or vessel-based surveys from May 1 to May 14). • For any piles driven May 15 to May 31, the exclusion zone must be extended from 3,281 feet (1,000 meters) to 6,562 feet (2,000 meters) for monopiles and 5,249 feet (1,600 meters) for jacket (i.e., half distance to Level B threshold) to minimize the extent of any take of NARWs. • For any pile driving June 1 to October 31, the applicant must establish a 5,249-foot (1,000-meter) clearance zone for NARW with the exception as follows. Where the predicted Level B harassment zone will overlap with a DMA or Right Whale Slow Zone, the exclusion zone must be extended from 3,281 feet to 6,562 feet (1,000 to 2,000 meters) for monopiles and 5,249 feet (1,600 meters) for jacket piles (i.e., half distance to Level B threshold) to minimize the extent of any take of NARWs. For all pile-driving activity, the applicant must designate clearance zones with radial distances as follows: • All other mysticete whales (including humpback [*Megaptera novaeangliae*], fin [*Balaenoptera physalus*], sei [*Balaenoptera borealis*], and minke [*Balaenoptera acutorostrata*] whale): 1,649-foot (500-meter) exclusion zone at all times; • Harbor porpoise [*Phocoena phocoena*]: 394-foot (120-meter) exclusion zone at all times; and • All other marine mammals not listed above (including dolphin and pinnipeds): 164-foot (50-meter) exclusion zone at all times. Monitoring for marine mammals must occur over the entire Level B distance for all marine mammals to document impacts and any potential take.	Marine Mammals (3.7)	BOEM, NMFS NOAA BSEE
22.	Construction	NARW PAM monitoring	The applicant will prepare and submit a PAM plan describing all equipment, procedures, and protocols to BOEM and NMFS at least 90 days prior to initiation of pile-driving activities. The PAM system must be designed such that detection capability extends to 6.21 miles (10 kilometers) from the pile-driving location. If the PAM operator has at least 75% confidence that a vocalization originated from a NARW within 6.21 miles (10 kilometers) of the pile-driving location, the PAM operator must determine that a NARW has been detected. The applicant must continue to deploy the PAM system that is in place for May 1 to May 14 through May 31 and implement an extended PAM monitoring zone of 6.21 miles (10 kilometers) around any pile to be driven with all detections of NARWs provided to the visual PSO to increase situational awareness and to be considered as pile driving is planned. At all times of year that pile driving takes place, any PAM detection of a NARW within the clearance/exclusion zone (see Measure #21) surrounding a pile must be treated the same as a visual observation and trigger any required delays in pile installation. Between June 1 and October 31, if a DMA or Right Whale Slow Zone is designated that overlaps with a predicted Level B harassment zone (monopile foundation: 13,520 feet [4.1 kilometers], jacket foundation: 10,564 feet [3.2 kilometers]) from a pile to be installed, the PAM system in place during this period must be extended to the largest practicable detection zone to increase situational awareness of the visual PSOs and for purposes of planning pile installation. At all times of year any visual or PAM detection in the seasonal exclusion zones must be treated the same as a visual observation and trigger any required delays or shutdowns in pile installation.	Marine Mammals (3.7)	BOEM, NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
23.	Construction	Protocols for shutdown and power-down when marine mammals are sighted during pile driving	If a marine mammal is observed entering or within the relevant exclusion during pile driving, the hammer must be shut down (unless activities must proceed for human safety or installation feasibility) until: • The animal is verified to have voluntarily left and heading away from the exclusion area; or • 30 minutes have elapsed without re-detection (for mysticetes, sperm whales, Risso's dolphins, and pilot whales); or • 15 minutes have elapsed without re-detection of other marine mammals; or • Enhanced time-of-year NARW protocols are followed. If shutdown is called for but the applicant 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.	Marine Mammals (3.7)	BOEM, NMFS NOAA BSEE
24.	Construction, Operations, Decommissioning	PSO training requirements	The applicant will provide PSOs through a third-party provider. PSOs must have no tasks other than to conduct observational effort, collect and report data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards). PSOs and PAM operators must have completed a commercial PSO training program for the Atlantic Ocean with an overall examination score of 80% or greater (Baker et. al 2013). Training certificates for individual PSOs must be provided to BOEM upon request. PSOs and PAM operators must be approved by NMFS prior to the start of a survey. Application requirements to become a NMFS-approved PSO for construction activities can be found at https://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-and-opportunities/protected-species-observers or for geological and geophysical surveys by sending an inquiry to nmfs.psoreview@noaa.gov. The applicant must provide documentation of NMFS approval for individual PSOs to BOEM upon request. For the following activities, lead PSOs must be deployed as part of the minimum number of PSOs as follows: at least one lead PSO must be on duty at any given time as the lead PSO or PSO monitoring coordinator during pile driving; at least one lead PSO must be present on each HRG survey vessel; PSOs on transit vessels must be trained but do not need to be authorized as a lead PSO. Any required lead PSOs must have prior approval from NMFS to be a lead or unconditionally approved PSO. PSOs on duty must be clearly listed on daily data logs for each shift. A sufficient number of PSOs, which will be consistent with the NMFS Biological Opinion and as prescribed in the final Incidental Harassment Authorization, must be deployed to record data in real time and effectively monitor the affected area for the proposed Project, including visual surveys in all directions around a pile, PAM, and continuous monitoring of sighted NARWs in the area to meet the number of PSOs required for enhanced seasonal monitoring requirements. PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period (NMFS 2013) unless an alternative schedule is approved by BOEM. Visual monitoring must occur from the most appropriate vantage point on the associated operational platforms that allows for 360-degree visual coverage around a vessel. The applicant must ensure that suitable equipment is available to PSOs, including binoculars, range-finding equipment, a digital camera, and electronic data recording devices (e.g., a tablet), to adequately monitor the distance of the watch and exclusion zones, determine the distance to protected species during surveys, record sightings and verify species identification, and record data. Observations must be conducted while free from distractions and in a consistent, systematic, and diligent manner.	Marine Mammals (3.7)	BOEM NOAA BSEE
25.	Construction, Operations, Decommissioning	Vessel strike avoidance of marine mammals (non-geophysical survey vessels)	Vessel operators and crews must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any marine mammal as long as it is safe to do so. Vessel speeds must be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed within the path of the vessel. **Large whales:** Avoidance measures must occur for listed whales or any other unidentified whale sighted within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard) at a distance of 1,640 feet (500 meters) or less from a survey vessel. Trained crew or PSOs must notify the vessel captain of any whale within 1,640 feet of vessel within this area. The vessel captain must immediately implement strike-avoidance procedures to maintain a separation distance of 1,640 feet from all listed species of whales including changing vessel direction or reducing vessel speed to allow the animal to travel away from the vessel. Any time a listed whale is within 656 feet of an underway vessel, a full stop is required if safety permits. 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 take appropriate action to avoid the animal. **Small cetaceans and seals**: For small cetaceans and seals, all vessels must maintain a minimum separation distance of 164 feet to the maximum extent practicable with an exception made for those animals that approach the vessel. When marine mammals are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral and not engage the engines until animals are clear of the area.	Marine Mammals (3.7)	BOEM NMFS BSEE

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26.	Construction, Operations, Decommissioning	Geophysical survey clearance of exclusion zone and restart protocols following shutdowns	At the beginning of each survey, active sparker and other sub-bottom profiling acoustic sound sources less than 180 kHz requiring exclusion zones (excludes the Innomar), must not be activated until a PSO has verified the 656-foot exclusion zone to be clear of all whales for a full 30 minutes and a 328-foot exclusion zone to be clear for other marine mammals for a full 15 minutes. Any time a marine mammal is sighted within the exclusion zone, the PSO will require the resident engineer or other authorized individual to cause a shutdown of the survey equipment. Geophysical survey equipment may be allowed to continue operating if marine mammals voluntarily approach the vessel (e.g., to bow ride) when the sound sources are at full operating power. The vessel operator must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown. Following a shutdown, ramp up of the equipment may begin immediately only if visual monitoring of the exclusion zone continues throughout the shutdown, the animals causing the shutdown were visually followed and confirmed by PSOs to be outside of the exclusion zone and heading away from the vessel, and the exclusion zone remains clear of all protected species All shutdowns of geophysical survey equipment due to protected species sightings that are not re-sighted require the following monitoring periods before ramp-up procedures: 15 minutes for small cetaceans and seals and 30 minutes for ESA-listed whales, humpback whales, Kogia, and beaked whales. Geophysical exclusion, survey power-up, and post-shutdown exclusion protocols must be followed for all ESA-listed species, in addition to any future ITA requirements under the Marine Mammal Protection Act for marine mammals. For non-ESA-listed marine mammals, requirements must be followed as required by NMFS through proposed Project-specific mitigation and monitoring requirements of ITAs. If an ITA is not obtained, the applicant must follow the measures above for non-listed species.	Marine Mammals (3.7)	BOEM BSEE
27.	Construction, Operations, Decommissioning	Vessel speed requirements November 1 through May 14	From November 1 through May 14, all vessels associated with the proposed Project must travel at 10 knots or less when transiting to, from, or within the SWDA, except within Nantucket Sound (unless an active DMA is in place) and except in crew transfer vessels as described below. From November 1 through May 14, crew transfer vessels may travel at more than 10 knots if there is at least one visual observer on duty at all times aboard the vessel to visually monitor for large whales and real-time PAM is conducted. If a NARW is detected via visual observation or PAM within or approaching the transit route, all crew transfer vessels must travel at 10 knots or less for the remainder of that day.	Marine Mammals (3.7)	BOEM NOAA BSEE
28.	Construction, Operations, Decommissioning	Vessel speed requirements in DMAs	All vessels, regardless of length, must travel at 10 knots or less within any NMFS-designated DMA, with the exception of crew transfer vessels as described above. Crew transfer vessels traveling within any designated DMA must travel at 10 knots or less, unless NARWs are confirmed to be clear of the transit route and SWDA for 2 consecutive days, as confirmed by either vessel-based surveys conducted during daylight hours and PAM, or by an aerial survey conducted once the lead aerial observer determines adequate visibility. If confirmed clear by one of these measures, vessels transiting within a DMA must employ at least two visual observers on duty to monitor for NARWs. If a NARW is observed within or approaching the transit route, vessels must operate at 10 knots or less until clearance of the transit route for 2 consecutive days is confirmed by the procedures described above.	Marine Mammals (3.7)	NOAA BSEE
29.	Construction, Operations, Decommissioning	Reporting of all NARW sightings	If a NARW is observed at any time by PSOs or personnel on any proposed Project vessels, during any Project-related activity, or during vessel transit, the applicant must immediately report the sighting information to NMFS and BOEM (the time, location, and number of animals) to the NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622), the USCG via channel 16, and through the WhaleAlert app (Whale Alert Undated).	Marine Mammals (3.7)	NMFS NOAA BSEE
30.	Construction	Adaptive refinement of exclusion zones and monitoring protocols	The applicant will reduce unanticipated impacts on marine trust resources through near-term refinement of exclusion zones by refining pile-driving monitoring protocols based on monthly or annual monitoring results, in coordination with BOEM and NMFS. The NMFS Biological Opinion and Incidental Harassment Authorization will identify minimum sizes of exclusion zones and any modifications will increase the zones and not decrease the zones.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE
31.	Construction	Pile-driving sound field verification plan	The applicant will conduct field verification during pile driving to ensure that noise attenuation requirements are met. A sound source verification plan will be submitted to the USACE and BOEM at renewablereporting@boem.gov, and to NMFS at incidental.take@noaa.gov for review and approval 90 days prior to the commencement of field activities for pile driving. Sound field verification must be carried out for the first of each type (monopile, jacket and bottom-frame) of foundation to be installed, including vibratory and impact pile driving. To ensure that the entire action is within scope of the Project design envelope, further pile-driving installations must be monitored to effectively represent the entire construction operation, as every pile is capable of producing impact. At minimum, sound field verification must be performed at: • Two installations at representative depths (one shallower, one deeper) of each pile size and each foundation type installed; • One foundation installed each in November and December if any are installed in those months; • One foundation in each calendar year of installation; and • The installation of the largest hammer used in each of the above situations. The plan must be sufficient to document sound propagation from the pile and distances to isopleths for potential injury and harassment. The measurements must be compared to the Level A and Level B harassment zones for marine mammals (and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon).	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
32.	Construction	Pile-driving weather and time restrictions	To minimize the impacts of sun glare on visibility, no pile driving may begin until at least 1 hour after (civil) sunrise to ensure effective visual monitoring can be accomplished in all directions. To minimize the impacts of sun glare on visibility and to minimize the potential for pile driving to continue after sunset when visibility will be impaired, no pile driving may begin within 1.5 hours of (civil) sunset unless an approved alternative monitoring plan is implemented. Pile driving must only commence when all exclusion zones are fully visible (i.e., are not obscured by darkness, rain, fog, etc.) for at least 30 minutes. If conditions (e.g., darkness, rain, fog, etc.) prevent the visual detection of marine mammals and sea turtles in the exclusion zones, construction activities must not be initiated until the full extent of all exclusion zones are fully visible. The lead PSO will determine as to when there is sufficient light to ensure effective visual monitoring can be accomplished in all directions and when the alternative monitoring plan will be implemented. The applicant must develop and implement measures for enhanced monitoring in the event that poor visibility conditions unexpectedly arise, and pile driving cannot be stopped due to safety or operational feasibility. The applicant must prepare and submit an alternative monitoring plan to NMFS and BOEM for NMFS' review and approval at least 90 days prior to the planned start of pile driving. This plan may include deploying additional observers, alternative monitoring technologies (i.e., night vision, thermal, infrared), and/or use of PAM with the goal of ensuring the ability to maintain all exclusion zones for all ESA-listed species in the event of unexpected poor visibility conditions.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS BSEE
33.	Construction, Operations	Marine debris awareness and elimination	Marine debris is defined by BSEE as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper, or any other human-made item or material that is lost or discarded in the marine environment. The applicant must ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the COP are briefed on marine debris prevention. BOEM must ensure that the applicant employees and contractors receive training to understand and implement best practices to ensure that debris is not intentionally or accidentally discharged into coastal or marine environments. Training must occur for all employees and contract personnel on the proper storage and disposal practices at-sea to reduce the likelihood of accidental discharge of marine debris at all at-sea and dockside operations that can affect protected species through entanglement or incidental ingestion. Training must include the environmental and socioeconomic impacts associated with marine trash and debris, as well as their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into coastal and marine environments. By January 31 of each year, the applicant must submit to the U.S. Department of the Interior an annual report that describes its marine trash and debris awareness training process, number of people trained, estimated related costs, and certifies that the training process has been followed for the previous calendar year. Reports must be submitted to BOEM (renewable_reporting@boem.gov) and to BSEE (marinedebris@bsee.gov). In the event that any materials unexpectedly enter the water, personnel must follow best practices to recover it if conditions are safe to do so, or notify the appropriate officials if conditions are unsafe. Briefing materials on marine debris awareness, prevention, and protected species are available at www.bsee.gov/debris. Incidents of lost debris must be reported to BSEE with a full description, including date, global positioning system coordinates, description of debris (dimensions, composition, float/sink, markings, description/characteristics), efforts to recover, and recovery success.	Marine Mammals (3.7); Sea Turtles (3.8)	BSEE BSEE
34.	Construction	Pile-driving reports	During the pile driving/construction period, the applicant must compile and submit weekly reports that document start and stop of all pile driving daily, the start and stop of associated observation periods by the PSOs, details on the deployment of PSOs, and a record of all observations of marine mammals and sea turtles. These weekly reports must be submitted by the PSO providers to BOEM at renewable_reporting@boem.gov and NMFS at incidental.take@noaa.gov and can consist of raw data. Weekly reports are due on Wednesday for the previous week (Sunday through Saturday). Required data and reports 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 effort during construction activities and every week thereafter until the final reporting period. Weekly reports are due on Wednesday for the previous week. Any editing, review, and quality assurance checks must only be completed by the PSO provider prior to submission. Monthly summary reports must be submitted by the applicant in coordination with PSO providers as needed. Qualified PSOs must monitor watch and exclusion zones when using geological and geophysical equipment that may affect protected species. **Reporting Instructions** The applicant must submit a monthly summary report of construction activities on the 15th of each month including summaries of pile driving, vessel operations (including port departures, number, type of vessel, and route), protected species sightings, vessel strike-avoidance measures taken, and any shutdowns or takes that may have potentially occurred, as follows: • The applicant must require PSO providers to submit PSO data in Excel format every 7 days. • Data must be collected in accordance with standard reporting forms, software tools, or electronic data forms approved by BOEM for the particular activity. • Forms must be filled out for each vessel with PSOs aboard. • Do not use NA for unfilled cells; leave them empty. • Submit report in Word and Excel formats (do not submit a pdf). • All dates must be entered as YYYY-MM-DD. • All times must be entered in 24 Hour UTC as HH:MM. • New entries should be made on the Effort form each time a pile segment or weather conditions change and at least once an hour as a minimum. • Both weekly and monthly reports must be submitted to BOEM at renewable_reporting@boem.gov. Always check forms for completeness and resolve any problems before submittal. Name the file: Lease#_ ProjectName_PSOData_YearMonthDay to YearMonthDay.xls The applicant will report the following Project, Operations, Detection, and Effort data fields in Excel format as weekly reports during construction. These data may be generated through software applications or otherwise recorded electronically by PSOs. Applications developed to record PSO data are encouraged as long as the data fields listed below can be recorded and exported to Excel. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields available upon request.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE

			Project Information for Pile Driving • Project name • Lease number • State coastal zones • PSO contractor(s) • Vessel name(s) • Reporting dates • Sound sources including hammer type(s) and power levels used • Visual monitoring equipment used (e.g., bionics, magnification, infrared cameras, etc.) • Distance-finding method used • PSO names and training • Observation height above sea surface **Operations Information for Pile Driving** • Date • Hammer type (make and model) • Greatest hammer power used for each pile • Pile identifier and pile number for the day (e.g., pile two of three for the day) • Pile diameters • Pile length • Pile locations (latitude and longitude) • Time pre-exclusion visual monitoring began in UTC (HH:MM) • Time pre-exclusion monitoring ended in UTC (HH:MM) • Time pre-exclusion PAM monitoring began in UTC (HH:MM) • Time PAM monitoring ended in UTC (HH:MM) • Duration of pre-exclusion and PAM visual monitoring • Time power up/ramp up began • Time equipment full power was reached • Duration of power up/ramp up • Time pile driving began (hammer on) • Time pile-driving activity ended (hammer off) • Duration of activity • Shutdown/power-down occur (Y/N) • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) • Record any habitat or prey observations • Record any marine debris sighted **Detection Information for Protected Species** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day) (multiple sightings of same animal or group should use the same ID) • Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF =source off) • Latitude (decimal degrees dd.ddddd), longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Precipitation • Visibility (kilometers) • Cloud coverage (%) • Glare • Sightings including common name, scientific name, or family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes) • If any bow-riding behavior observed, record total duration during detection (HH:MM) • Initial heading of animal(s) (degrees) • Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shut-down or power-down occurrences • Detections with PAM **Monitoring Effort Information for Pile Driving** • Date • Effort (ON=source on; OFF=source off) • If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Swell (meters) • Water depth (meters) • Visibility (kilometers) • Glare severity • Block name and number • Location: Latitude and Longitude		
35.	Construction, Operations	Monthly reporting for protected species	The applicant will provide monthly Excel format reports on geological and geophysical surveys including the data fields specified below. These reports must be submitted by the PSO provider on the 15th of each month for each vessel until the last reporting period for a survey. Any editing, review, and quality assurance checks must only be completed by the PSO provider prior to submission. These data may be generated through software applications or otherwise recorded electronically by PSOs. Applications developed to record PSO data are encouraged as long as the data fields listed below can be recorded and exported to Excel. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields available upon request. Final reports should be submitted by the applicant in coordination with PSO providers 90 days following completion of a survey. Final reports must contain departure and return ports, PSO names and training certifications, the PSO provider contact information, dates of the survey, a vessel track, a summary of all PSO sightings, shutdowns that occurred, vessel strike-avoidance measures taken, takes that occurred, and any injured or dead protected species that were observed. PSOs must be approved by NMFS prior to the start of a survey. Application requirements to become a NMFS-approved PSO for geological and geophysical surveys can be obtained by sending an inquiry to nmfs.psoreview@noaa.gov. PSO names and training must be provided in all reports and the applicant must provide to BOEM, upon request, documentation of NMFS approval for individual PSOs. **Project Information for Surveys** • Project name • Lease number • State coastal zones • Survey contractor • Vessel name	Marine Mammals (3.7): Sea Turtles (3.8)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Survey type (typically HRG) • Reporting start and end dates • Sound sources including equipment type, power level, and frequencies used • Greatest root mean squared source level • Visual monitoring equipment used (e.g., bionics, magnification, infrared cameras, etc.) • Distance-finding method used • PSO names and training • Observation height above sea surface **Operations Information for Surveys** • Date • Time pre-exclusion visual monitoring began in UTC (HH:MM) • Time pre-exclusion monitoring ended in UTC (HH:MM) • Duration of pre-exclusion visual monitoring • Day or night pre-exclusion • Time power up/ramp up began • Time equipment full power was reached • Duration of power up/ramp up • Time survey activity began (equipment on) • Time survey activity ended (equipment off) • Duration of activity • Shutdown/power-down occur (Y/N) • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) • Vessel positions must be logged every 30 seconds • Record any habitat or prey observations • Record any marine debris sighted **Detection Information for Protected Species** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day; multiple sightings of same animal or group should use the same ID) • Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF =source off) • Latitude (decimal degrees dd.ddddd), Longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Precipitation • Visibility (kilometers) Cloud coverage (%) • Glare • Sightings including common name, scientific name, or Family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals • Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order • If any bow-riding behavior observed, record total duration during detection (HH:MM)		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Initial heading of animal(s) (degrees) • Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shutdown or power-down • Detected with infrared (Y/N) **Monitoring Effort Information for Surveys** • Date • Effort (ON=source on; OFF=source off) • If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Swell (meters) • Water depth (meters) • Visibility (kilometers) • Glare severity • Block name and number • Location: Latitude and Longitude		
36.	Construction, Operations, Decommissioning	Vessel crew training requirements	The applicant will provide Project-specific training for all vessel crew prior to the start of in-water construction activities. Confirmation of the training and understanding of the requirements must be documented on a training course log sheet. The log sheets must be provided to BOEM upon request. All vessel crewmembers must be briefed in the identification of sea turtles and marine mammals and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all proposed Project vessels for identification of sea turtles and marine mammals. The expectation and process for reporting of sea turtles and marine mammals (including live, entangled, and dead individuals) must be clearly communicated and posted in highly visible locations aboard all proposed Project vessels; there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain) and a communication channel and process for crew members.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BOEM BSEE
37.	Construction	Daily pre-construction surveys	The applicant will conduct PAM and visual surveys each day before pile driving begins to establish the numbers, surface presence, behavior, and travel directions of protected species in the area. These surveys will follow standard protocols and data collection specified by BOEM. In addition to standard daily surveys, the applicant must include an enhanced survey plan for November through December and May 1 through May 31 to minimize risk of exposure of NARWs to pile-driving noise that includes daily pre-construction surveys.	Marine Mammals (3.7); Sea Turtles (3.8)	NOAA
38.	Construction	Submittal of raw field data collection of marine mammals and sea turtles in the pile-driving exclusion zone	If a marine mammal or sea turtle in the exclusion zone results in a shutdown or a power-down, the applicant must report the event to BOEM within 24 hours at renewable reporting@boem.gov. In addition, the data report, which is the raw data collected in the field, must be submitted by the PSO provider and include the daily form, including the date, time, species, pile identification number, global positioning system 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 exclusion zone, time the pile driver was restarted or powered back up, and any photographs that may have been taken. This data report must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
39.	Construction, Operations	PSO and reporting requirements for pile driving	PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone. Daily PSO forms, including electronic effort, survey, and sightings forms, must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities. Required data and reports may be archived, analyzed, published, and disseminated by BOEM. **Detection Information for Protected Species** • Date (YYYY-MM-DD) • Sighting ID (V01, V02, or sequential sighting number for that day) (multiple sightings of same animal or group should use the same ID)	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Date and time at first detection in UTC (YY-MM-DDT HH:MM) • Time at last detection in UTC (YY-MM-DDT HH:MM) • PSO name(s) (Last, First) • Effort (ON=source on; OFF=source off) • Latitude (decimal degrees dd.ddddd), Longitude (decimal degrees dd.ddddd) • Compass heading of vessel (degrees) • Water depth (meters) • Swell height (meters) • Douglas sea scale • Beaufort scale • Precipitation • Visibility (kilometers) • Cloud coverage (%) • Glare • Sightings including common name, scientific name, or family • Certainty of identification • Number of adults • Number of juveniles • Total number of animals • Bearing to animal(s) when first detected (ship heading + clock face) • Range from vessel (reticle distance in meters) • Description (include features such as overall size; shape of head; color and pattern; size, shape, and position of dorsal fin; height, direction, and shape of blow, etc.) • Detection narrative (note behavior, especially changes in relation to survey activity and distance from source vessel) • Direction of travel/first approach (relative to vessel) • Behaviors observed: indicate behaviors and behavioral changes observed in sequential order (use behavioral codes) • If any bow-riding behavior observed, record total duration during detection (HH:MM) • Initial heading of animal(s) (degrees) • Final heading of animal(s) (degrees) • Source activity at initial detection • Source activity at final detection (on or off) • Exclusion zone size during detection (meters) • Animal inside or outside the exclusion zone • Closest distance to vessel (reticle distance in meters) • Time at closest approach (UTC HH:MM) • Time animal entered exclusion zone (UTC HH:MM) • Time animal left exclusion zone (UTC HH:MM) • If observed/detected during ramp up/power up: first distance (reticle distance in meters), closest distance (reticle distance in meters), last distance (reticle distance in meters), behavior at final detection • Shut-down or power-down occurrences • Detections with PAM **<u>Monitoring Effort Information for Pile Driving</u>** • Date • Effort (ON=source on; OFF=source off) • If visual, number of PSOs on watch at one time • PSO name(s) (Last, First) • Start time of observations • End time of observations • Duration of visual observation • Wind speed (knots), from direction • Beaufort scale • Swell (meters) • Douglas sea scale • Water depth (meters) • Visibility (kilometers)		

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
			• Glare severity • Block name and number • Location: latitude and longitude		
40.	Construction, Operations, Decommissioning	Injured/protected species reporting	The applicant will report immediately any observation of potential takes, strikes, or dead/injured protected species, regardless of the cause, to the NMFS Protected Resources Division, incidental.take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); and BOEM at renewable_reporting@boem.gov. In the event that an injured or dead marine mammal or sea turtle is sighted, the applicant must report the incident to NMFS Protected Resources Division, incidental.take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622); and BOEM at renewable_reporting@boem.gov as soon as feasible but no later than 24 hours from the sighting. The report must include the following information: (1) time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); (2) species identification (if known) or description of the animal(s) involved; (3) condition of the animal(s) (including carcass condition if the animal is dead); (4) observed behaviors of the animal(s), if alive; (5) if available, photographs or video footage of the animal(s); and (6) general circumstances under which the animal was discovered. Staff responding to the hotline call will provide any instructions for handling or disposing of any injured or dead animals by individuals authorized to collect, possess, and transport sea turtles. In the event of a suspected or confirmed vessel strike of a sea turtle by any proposed Project vessel, the applicant must report the incident to NMFS Protected Resources Division, incidental.take@noaa.gov; NOAA Fisheries 24-hour Stranding Hotline (866-755-6622); and BOEM at renewable_reporting@boem.gov as soon as feasible. The report must include the following information: (1) time, date, and location (latitude/longitude) of the incident; (2) species identification (if known) or description of the animal(s) involved; (c) vessel's speed during and leading up to the incident; (4) vessel's course/heading and what operations were being conducted (if applicable); (5) status of all sound sources in use; (6) 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; (7) environmental conditions (e.g., wind speed and direction, Beaufort scale, cloud cover, visibility) immediately preceding the strike; (8) estimated size and length of animal that was struck; (9) description of the behavior of the animal immediately preceding and following the strike; (11) 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 (12) to the extent practicable, photographs or video footage of the animal(s). In addition, any occurrence of dead non-ESA-listed fish of 10 or more individual fish within established exclusion or monitoring zones must also be reported to BOEM at renewable_reporting@boem.gov as soon as feasible.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE
41.	Construction, Operations, Decommissioning	Vessel observer requirements	The applicant must ensure that vessel operators and crew maintain a vigilant watch for marine mammals or sea turtles by slowing down, altering course, or stopping the vessel to avoid striking marine mammals or sea turtles. Vessel personnel must be provided an Atlantic reference guide that includes and helps identify marine mammals and sea turtles that may be encountered in the proposed Project area and material regarding NARW SMAs, sightings information, and reporting. When not on active watch duty, members of the monitoring team must consult NMFS' NARW reporting systems for the presence of NARWs in the proposed Project area. A visual observer aboard the vessel must monitor a vessel strike-avoidance zone around the vessel. All vessels transiting to and from the SWDA and traveling over 10 knots must have a visual observer on duty at all times. The applicant must also have a trained lookout on all vessels during all stages of the proposed Project between June 1 and November 30 to observe for sea turtles and communicate with the captain to take required avoidance measures as soon as possible if one is sighted. If a vessel is carrying a visual observer for the purposes of maintaining watch for NARWs, an additional lookout is not required, and this visual observer must maintain watch for whales and sea turtles. If the trained lookout is a vessel crewmember, this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew observers should be trained in the identification of sea turtles and in regulations and best practices for avoiding vessel collisions. The trained lookout must monitor seaturtlesightings.org prior to each trip and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators/captains and lookouts on duty that day.	Marine Mammals (3.7); Sea Turtles (3.8)	NMFS NOAA BSEE
42.	Construction, Operations, Decommissioning	Vessel speed requirements in SMAs	All vessels greater than or equal to 65 feet in overall length must comply with the 10-knot speed restriction in any SMA (NOAA 2022).	Marine Mammals (3.7); Sea Turtles (3.8)	NOAA
43.	Construction, Operations, Decommissioning	Vessel communication of threatened and endangered species sightings	Whenever multiple proposed Project vessels are operating, the applicant will communicate any visual observations of listed species (marine mammals and sea turtles) to a PSO or vessel captains associated with other proposed Project vessels.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
44.	Construction, Operations, Decommissioning	Marine mammal and sea turtle geophysical survey exclusion zones	For sparkers and similar sub-bottom profiler equipment operating below 180 kHz or within the hearing ranges of each hearing group (excluding the Innomar), minimum exclusion zone distances for ESA-listed species of marine mammals and sea turtles must be monitored at all times and be demarcated within the watch zone with effective distance-finding methods (e.g., reticle binoculars, range-finding sticks, monitoring system software). A 1,640-foot watch zone will be established in every direction around each survey vessel. All threatened and endangered species within this distance will be monitored by a third-party PSOs. A 656-foot exclusion zone must be established around each survey vessel for endangered and threatened marine mammals and sea turtles. Exclusion zones for non-ESA-listed marine mammals must be followed as required by NMFS through proposed Project-specific mitigation and monitoring requirements of ITAs. If an ITA is not required, the applicant must monitor default exclusion zones of 328 feet for all non-listed marine mammals. The exclusion zones must be established within the watch zone with accurate distance-finding methods (e.g., reticle binoculars, range-finding sticks, calibrated video cameras, and software). If the exclusion zones cannot be adequately monitored for animal presence (i.e., a PSO determines conditions are such that ESA-listed species cannot be reliably sighted within the exclusion zones), the survey must be stopped until such time that the exclusion zones can be reliably monitored. This monitoring must be carried out by approved PSOs (see specific details on PSO requirements below). For marine mammals, these requirements are for sound sources that are operating within the hearing range of marine mammals (below 180 kHz).	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
45.	Construction, Operations, Decommissioning	Geophysical survey off-effort PSO monitoring	During good daylight conditions during periods when survey equipment is not operating (e.g., daylight hours; Douglas sea state scale 3 or less), to the maximum extent practicable, visual PSOs must conduct observations for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
46.	Construction, Operations, Decommissioning	Geophysical survey vessel whale strike-avoidance and equipment shutdown protocols	Avoidance measures must occur for listed whales or any other unidentified whale sighted within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard) at a distance of 1,640 feet or less from a survey vessel. PSOs must notify the vessel captain of any whale within 1,640 feet of vessel within this area. The vessel captain must immediately implement strike-avoidance procedures to maintain a separation distance of 1,640 feet) from listed whales including changing vessel direction or reducing vessel speed to allow the animal to travel away from the vessel. Any time a listed species (sea turtles, whales, and manta rays) is within a 656-foot avoidance zone in any direction around a survey vessel, PSOs must notify the vessel captain that a full stop is required if safety permits. The PSO must also notify the resident engineer that a shutdown of all active sparker sources below 180 kHz is immediately required. The vessel operator and crew must comply immediately with any call for a shutdown by the PSO. Any disagreement or discussion must occur only after shutdown.	Marine Mammals (3.7); Sea Turtles (3.8)	BOEM BSEE
47.	Construction, Operations, Decommissioning	Periodic underwater surveys, reporting, and monofilament and other fishing gear cleanup around WTG foundations	The applicant will monitor indirect impacts associated with charter and recreational gear lost from expected increases in fishing around WTG foundations. Surveys by remotely operated vehicles, divers, or other means will inform frequency and locations of debris removal to decrease ingestion by and entanglement of marine species. The results of the surveys will be reported to BOEM (renewable_reporting@boem.gov) by April 30 for the preceding calendar year in which the survey is performed. Reports will 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 will include daily survey reports that include the 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.	Marine Mammals (3.7), Sea Turtles (3.8); Birds (G.2.4)	BOEM BSEE
48.	Construction, Operations, Decommissioning	Sea turtles avoidance and exclusion zones during geophysical surveys	Vessel operators and crews must maintain a vigilant watch for all protected marine species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any ESA-listed species. The presence of a single species at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised. A visual observer aboard the vessel must monitor a vessel strike-avoidance zone (species-specific distances detailed below) around the vessel according to the parameters stated below to ensure the potential for strike is minimized. Minimum exclusion zone distances for ESA-listed sea turtles must be monitored at all times and demarcated within the watch zone with effective distance-finding methods (e.g., reticle binoculars, range-finding sticks, monitoring system software). A 1,640-foot watch zone will be established in every direction around each survey vessel. All threatened and endangered species within this distance will be monitored by third-party PSOs and survey operations and listed species data recorded. A 656-foot exclusion zone must be established around each survey vessel for endangered and threatened sea turtles. The exclusion zone is the distance within which vessel avoidance measures to maintain a distance of 656-feet or greater is not possible, and a sparker or boomer source must be shut down. Exclusion zone requirement applies when a sound source is used within the hearing range of sea turtles. Survey vessel crewmembers responsible for navigation duties must receive site-specific training on ESA-listed species sighting/reporting and vessel strike-avoidance measures. Visual observers monitoring the vessel strike-avoidance zone can be either third-party PSOs or crewmembers, but crewmembers responsible for these duties must be provided sufficient training to distinguish ESA-listed species to broad taxonomic groups and have no other responsibilities during the time of observation. If the exclusion zones cannot be adequately monitored for animal presence (i.e., a PSO determines conditions are such that ESA-listed species cannot be reliably sighted within the exclusion zones), the survey must be stopped until such time that the exclusion zones can be reliably monitored. This monitoring must be carried out by NMFS-approved PSOs.	Sea Turtles (3.8)	BOEM BSEE
49.	Construction	Pile-driving monitoring plan and PSO reporting requirements for sea turtles	The applicant will submit a pile-driving monitoring plan to BOEM and NMFS for review and approval a minimum of 90 days prior to the commencement of pile-driving activities. The plan must: • Confirm that the full extent of the harassment distances (175 decibels root mean squared) from piles are monitored for sea turtles to ensure that all potential take is documented; • Include (1,640 feet) exclusion zones and exclusion zone modification protocols and approvals required; • Include number of PSOs and/or Native American monitors that will be used, the platforms and/or vessels upon which they will be deployed, and contact information for the PSO provider(s); and • Include measures for enhanced monitoring capabilities if poor visibility conditions unexpectedly arise, and pile driving cannot be stopped. The plan may also include deploying additional observers and using night vision goggles with the goal of ensuring the ability to maintain all exclusion zones in the event of unexpected poor visibility conditions. A communication plan detailing the chain of command, mode of communication, and decision authority must be described. PSOs must be previously approved by NMFS to conduct mitigation and monitoring duties for pile-driving activity. An adequate number of PSOs must be used to adequately monitor the area of the exclusion zone. Daily PSO forms, including electronic effort, survey, and sightings forms, must be submitted to BOEM at renewable_reporting@boem.gov monthly on the 15th day of each month for the previous calendar month of activities. Required data and reports may be archived, analyzed, published, and disseminated by BOEM.	Sea Turtles (3.8)	NMFS NOAA BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
50.	Construction	Pile-driving noise reporting and clearance zone adjustment for sea turtles	Before driving any additional piles following underwater noise measurements, the applicant must review the initial field measurement results and make any necessary adjustments to the sound attenuation system and/or the sea turtle exclusion or monitoring zones as detailed below. If the initial field measurements indicate that the isopleths of concern are larger than those considered, in coordination with BOEM, NMFS, and the USACE, the applicant must ensure that additional sound attenuation measures are in place before additional piles are installed. Additionally, the exclusion and monitoring zones must be expanded to match the actual distances to the isopleths of concern. If the exclusion zones are expanded beyond 1.5 kilometers (0.9 mile), additional observers must be deployed on additional platforms, with each observer responsible for maintaining watch in no more than 180 degrees an area with a radius no greater than 1.5 kilometers (0.9 mile). The applicant must provide the initial results of the field measurements to NMFS, BOEM, and the USACE as soon as they are available; NMFS, BOEM, and the USACE will discuss these as soon as feasible with a target for that discussion within 2 business days of receiving the results. BOEM and NMFS will provide direction to the applicant on whether any additional modifications to the sound attenuation system or changes to the exclusion or monitoring zones are required. BOEM must also discuss the potential need for re-initiation of consultation, if appropriate, with NMFS.	Sea Turtles (3.8)	NMFS BSEE
51.	Construction	Pile-driving exclusion zones (no-go zones) for sea turtles	To ensure that 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-mile) exclusion zone for all pile-driving activities.	Sea Turtles (3.8)	NMFS BSEE
52.	Construction, Operations, Decommissioning	Vessel strike avoidance of sea turtles (non-geophysical survey vessels)	During all phases of the proposed Project, Project vessel operators and crews must maintain a vigilant watch for all sea turtles and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any sea turtles as long as it is safe to do so. All vessels must maintain a minimum separation distance of 328 feet from sea turtles whenever possible. Trained crew lookouts must monitor seaturtlesightings.org daily and prior to each trip to note and report any observations of sea turtles in the vicinity of the planned transit to all vessel operators and captains and lookouts on duty that day. If a sea turtle is sighted within 328 feet of the operating vessels' forward path, the vessel operator must slow down to 4 knots (unless unsafe to do so) and may resume normal vessel operations once the vessel has passed the sea turtle. If a sea turtle is sighted within 164 feet 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 turtle at a speed of 4 knots or less until there is a separation distance of at least 328 feet at which time normal vessel operations may be resumed. Between June 1 and November 30, vessels must avoid transiting through areas of visible jellyfish aggregations or floating vegetation 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.	Sea Turtles (3.8)	NMFS BSEE
53.	Construction, Operations, Decommissioning	Geophysical survey exclusion zone, power-up, and restart procedures	The applicant will apply the following limitations and conditions to geophysical surveys: • At the beginning of each survey, active acoustic sound sources operating at less than 200 kHz must not activated until a PSO has verified the 656-foot pre-survey exclusion zones to be clear of all sea turtles for a full 30 minutes. Any time a sea turtle is sighted within the exclusion zone, the PSO will require the resident engineer or other authorized individual to shut down the survey equipment if power-up procedures have started. The vessel operator must comply immediately with any call for a shutdown by the PSO. Any disagreement should be discussed only after shutdown. • At full power, a shutdown of sparker equipment must occur any time a sea turtle is sighted within 164 feet of the vessel. Following a shutdown for any reason or when sea turtles are sighted within 164 feet of the survey vessel, ramp up of the equipment may begin immediately only if visual monitoring of the exclusion zone continues throughout the shutdown and all animals are confirmed by PSOs to be outside of the exclusion zone throughout the shutdown. All shutdowns of geophysical survey equipment due to protected species sightings that are not re-sighted require the 30-minute clearance period before ramp-up procedures.	Sea Turtles (3.8)	BOEM BSEE
54.	Operations	Post-installation cable monitoring	The applicant must provide BOEM and NOAA with a cable monitoring report within 45 calendar days following each inter-array and export cable inspection to determine cable location, burial depths, state of the cable, and site conditions. An inspection of the inter-array cable and export cable is expected to include HRG methods, such as a multi-beam bathymetric survey equipment, and identify seabed features, natural and human-made hazards, and site conditions along federal sections of the cable routing. In federal waters, the initial inter-array and export cable inspection will be carried out within 6 months of commissioning, and subsequent inspections will be carried out at years 1, 2, and every 3 thereafter, and after a major storm event. Major storm events are defined as when metocean conditions at the facility meet or exceed the 1 in 50-year return period calculated in the metocean design basis, to be submitted to BOEM with the facility design report. Post-storm surveys will be focused on areas of concern following an analysis of the DTS data. If conditions warrant adjustment to the frequency of inspections following the Year 2 survey, a revised monitoring plan may be provided to BOEM for review. In addition to inspection, the export cable will be monitored continuously with the as-built DTS system. If DTS data indicate that burial conditions have deteriorated or changed significantly and remedial actions are warranted, the DTS data, a seabed stability analysis, and report of remedial actions taken or scheduled must be provided to BOEM within 45 calendar days of the observations. The DTS data, cable monitoring survey data, and cable conditions analysis for each year must be provided to BOEM as part of the annual compliance reports, required by 30 CFR § 585.633(b).	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE
55.	Construction, Operations, Decommissioning	Fisheries compensation program	The applicant will implement the following compensation programs consistent with BOEM's draft guidance for mitigating impacts on commercial fisheries and for-hire recreational fishing): • A gear loss and damage compensation program to address the impact-producing factor for presence of structures during construction and operations by reducing impacts resulting from loss of gear associated with uncharted obstructions resulting from the proposed Project. • A compensation program for lost income from commercial fisheries and for-hire recreational fishing activities and other eligible fishing interests for lost income during construction and a minimum of 5 years post-construction.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
56.	Construction, Operations	Trawl-friendly cable protection design	The applicant will design cable protection measures to reflect the existing conditions at the site and specifically avoid introducing new hangs for mobile fishing gear by making cable protection measures "trawl-friendly" with tapered/sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, the applicant will use materials that mirror that benthic environment.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	BOEM BSEE
57.	Construction, Operations, Decommissioning	Daily two-way communication during construction	The applicant will establish clear daily two-way communication channels between fishermen and the proposed Project Marine Coordinator (or suitable surrogate) during construction. The applicant will be responsible for ensuring this applies to contractors and sub-contractors.	Commercial Fisheries and For-Hire Recreational Fishing (3.9)	NMFS
58.	Construction, Operations	Trawl survey for finfish and squid	To support a before-after control impact analysis, sampling will occur before, during, and 1 year after construction both within the proposed Project footprint, as well as at control sites. A total of 40 tows, 20 in the proposed Project area and 20 in control areas, will be conducted four times per year. The applicant will collect and process stomach and otolith samples from sampling and provide this information to BOEM and NOAA. The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Other Uses (3.14)	NMFS BSEE
59.	Construction, Operations	Ventless trap surveys	Ventless trap surveys will be conducted to allow for comparison with 2019 baseline sampling. Surveys will occur before, during, and 1 year after construction. The ventless trap survey will follow the protocols of the coast-wide ventless trap survey, with six traps alternating between vented and ventless; this method has been adopted by New York, Connecticut, Rhode Island, Massachusetts, and New Hampshire, and has been accepted by the Atlantic States Marine Fisheries Commission. There will be 15 sampling sites in the 501N study area and 15 in the control area, for a total of 30 stations. Each location will be sampled two times per month from May 15 to October 31 with a target soak time of 3 to 5 days. To alleviate concerns relative to NARWs, the traps will use weak-link technology to minimize whale entanglement, and no sampling may occur between November and early May, when NARWs may be in the area. Additionally, the applicant will tag lobsters, which it is currently doing voluntarily, and record all reported recaptures of tagged lobsters. The applicant is currently equipping some pots with sensors to record bottom temperature, salinity, pH, and dissolved oxygen, and the applicant will discuss these data in survey reports. The survey methodology may be adapted over time based on the results obtained and feedback from various stakeholders.	Commercial Fisheries and For-Hire Recreational Fishing (3.9); Other Uses (3.14)	NMFS BSEE
60.	Construction	Conduct additional investigations of any previously identified submerged landform features that cannot be avoided	The applicant will fund a mitigation plan to resolve impacts on the unavoidable submerged landform features identified during marine archaeological surveys of the SWDA and OECC that remain in the area of potential effects. The mitigation plan will include collection of up to two additional vibracores in each of the unavoidable submerged landform features; laboratory analyses of subsamples collected from the cores where terrestrial soils were identified (Carbon 14 dating, bulk geochemical analysis of nitrogen, pollen analysis, and microdebitage analysis); and a professional report of results suitable for technical audiences. Tribal representatives will have the opportunity to be present for all stages of work, including core collection, core opening, and core sub-sampling. The mitigation plan will also include the development of educational and documentary materials, including PowerPoint presentations prepared for a non-technical audience, digital geodatabase in ArcGIS documenting the landform features and the study activities (known boundaries of landforms, core locations), assistance to tribes in configuring their own geographic information system software on their own computers, and an in-person presentation on the study prepared for non-technical audience.	Cultural Resources (3.10)	BOEM BSEE
61.	Construction	Avoid or investigate submerged potential historic properties identified as a result of future marine archaeological resources identification surveys	The applicant will avoid or investigate potential submerged archaeological resources identified as a result of future marine archaeological resources identification surveys that will be performed in any portions of the area of potential effects not previously surveyed, including: • Any *potential archaeological resource* (i.e., one or more geophysical survey anomalies or targets with the potential to be an archaeological resource) will be avoided. If avoidance is not possible, the anomaly or target will be assessed to BOEM's satisfaction using industry-standard ground-truthing techniques to determine whether it constitutes an identified archaeological resource. • Any *identified archaeological resource* will be avoided. If avoidance is not possible, additional investigations will be performed to determine eligibility for listing in the National Register of Historic Places. • Any *submerged landform features* that may be contributing elements to the Nantucket Sound traditional cultural property or are outside the boundaries of the Nantucket Sound traditional cultural property and are considered contributing elements to a cultural landscape will be avoided or additional mitigations will be required for resolving adverse effects pursuant to 36 CFR § 800.6. If avoidance is not possible, each unavoidable landform feature will be subject to the same mitigation plan and will be used to resolve effects to the known unavoidable submerged landform features to conduct additional investigations and development of educational and documentary materials, as discussed above. • Any *archaeological resources determined eligible for listing on the National Register of Historic Places* (i.e., historic properties) will be avoided or subjected to a Phase III data recovery plan, pursuant to 36 CFR § 800.6.	Cultural Resources (3.10)	BOEM BSEE
62.	Construction	Onshore archaeological monitoring	The applicant will provide archaeological monitoring during onshore construction in areas identified as having high or moderate archaeological sensitivity and implement a terrestrial post-review discoveries plan to reduce potential impacts on any previously undiscovered archaeological resources (if present) encountered during construction by preventing further physical impacts on the archaeological resources.	Cultural Resources (3.10)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
63.	Construction, Operations, Decommissioning	Environmental data sharing with federally recognized Native American tribes	The applicant will share with federally recognized Native American tribes with which it is engaged in government-to-government consultation on the proposed Project (unless a tribe specifically requests not to receive the information) the data and reports generated as a result of the benthic monitoring plan; optical surveys of benthic invertebrates and habitat; evaluation of additional benthic habitat data in Muskeget Channel prior to cable lay operations; PAM; trawl survey for finfish and squid; reporting of all NARW sightings; injured/protected species reporting; NARW PAM monitoring; reporting of marine mammals and sea turtles in the pile-driving exclusion zone; PSO elements of weekly and monthly pile-driving reports; monthly construction summaries, including pile-driving reports; PSO and reporting requirements for pile driving; monthly reporting for protected species; vessel strike reporting for sea turtles; and other injured/dead protected species reporting. The federally recognized tribes with which the data and reports must be shared include, but are not limited to, the Delaware Nation; the Delaware Tribe of Indians; the Mashantucket (Western) Pequot Tribal Nation; the Mashpee Wampanoag Tribe of Massachusetts; the Mohegan Tribe of Indians of Connecticut; the Narragansett Tribe; the Shinnecock Indian Nation; and the Wampanoag of Gay Head (Aquinnah).	Cultural Resources (3.10)	Federally recognized Native American tribes
64.	Construction, Operations, Decommissioning	Coordination with federally recognized Native American tribes in local hiring plan	The applicant will coordinate with federally recognized Native American tribes in the local hiring plan to facilitate its direct hiring of members of federally recognized Native American tribes, when possible and appropriate.	Cultural Resources (3.10); Environmental Justice (3.12)	Federally recognized Native American tribes
65.	Construction	Engagement with federally recognized Native American tribes regarding fishing compensation, trust, and innovation funds	The applicant will develop and implement an engagement plan to increase awareness of and potential participation in proposed commercial fishery and other compensation funds among environmental justice communities, including federally recognized Native American tribes. The applicant will be required to host at least one outreach event, held virtually online or in person, with each of the federally recognized Native American tribes that are interested and eligible, based on geographic location, to participate in the listed programs.	Cultural Resources (3.10), Environmental Justice (3.12)	Federally recognized Native American tribes
66.	Construction, Operations, Decommissioning	Local hiring plan	The applicant will prepare and implement a local hiring plan to maximize its direct hiring of residents of southeastern Massachusetts and Connecticut. Components of the plan will include coordination with unions, training facilities, and schools.	Environmental Justice (3.12)	BOEM BSEE
67.	Construction, Operations, Decommissioning	Submarine cable system burial plan	A copy of the submarine cable system burial plan, depicting the precise planned locations and burial depths of the entire cable system will be submitted by the applicant as part of its facility design report and fabrication and installation report. This plan will be reviewed by the USCG and BOEM. The USCG review will specifically address potential impacts on federal aids to navigation.	Navigation and Vessel Traffic (3.13)	USCG Recommended Mitigation 1c BSEE
68.	Construction	Boulder relocation reporting	The applicant will report the locations of any boulders (which will protrude less than 6.5 feet [2 meters]) or more on the sea floor) relocated during cable installation activities to BOEM, MassDEP, Massachusetts CZM, the USCG, NOAA, and the local harbormaster within 30 days of relocation. These locations must be reported in latitude and longitude degrees to the nearest 10 thousandth of a decimal degree (roughly the nearest meter), or as precise as practicable.	Navigation and Vessel Traffic (3.13)	BOEM BSEE
69.	Construction, Operations, Decommissioning	Vessel safety practices	All proposed Project vessels involved in construction, operations, and decommissioning activities will comply with U.S. or International Convention for the Safety of Life at Sea standards, as applicable, with regard to vessel construction, vessel safety equipment, and crewing practices.	Navigation and Vessel Traffic (3.13)	USCG
70.	Construction, Operations, Decommissioning	WTG and ESP marking	The applicant will mark each WTG and ESP with PATONs, subject to the approval of the Commander (dpw-1), First Coast Guard District. The applicant will: • Provide BOEM and USCG with a proposed lighting, marking, and signaling plan, which must be approved by BOEM after consultation with the USCG. The plan should conform to the International Association of Marine Aids to Navigation and Lighthouse Authorities Recommendation O-139, The Marking of Man-Made Offshore Structures. Should any part of the recommendation conflict with federal law or regulation, or if the applicant seeks an alternative to the recommendation, the applicant must consult with the USCG. • Mark each individual WTG and ESP with clearly visible, unique, alphanumeric identification characters. • Light each WTG and ESP in a manner that is visible by mariners in a 360-degree arc around the WTG and ESP. • Apply to the First Coast Guard District to establish PATONs for the facility. Approval for all PATONs must be obtained before installation of structures begins. • Ensure each WTG is lighted with red obstruction lighting consistent with the FAA Advisory Circular 70/7460-1L Change 2 (FAA 2018), so long as this requirement does not preclude the use of an aircraft detection lighting system. • Provide signage that covers 360 degrees of the wind turbine structures warning vessels of the air draft of the turbine blades as determined at highest astronomical tide. • Cooperate with the USCG and NOAA to ensure that cable routes and wind turbines are depicted on appropriate government produced and commercially available nautical charts. • Provide mariner information sheets on the applicant's website with details on the location of the turbines and specifics such as blade clearance above sea level.	Navigation and Vessel Traffic (3.13)	USCG
71.	Construction, Operations, Decommissioning	USCG training and exercises	The applicant will participate in periodic USCG-coordinated training and exercises to test and refine notification and shutdown procedures and to provide SAR training opportunities for USCG vessels and aircraft.	Navigation and Vessel Traffic (3.13)	USCG

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
72.	Construction, Operations, Decommissioning	Mooring attachments and access ladders	The applicant will place mooring attachments (for securing vessels) and access ladders for use in emergencies on each WTG and ESP foundation. Plans for the design and placement of access ladders will be submitted for USCG review and BOEM approval.	Navigation and Vessel Traffic (3.13)	USCG
73.	Construction, Operations, Decommissioning	Marine communications analysis and coordination	The applicant will conduct a marine radar study to evaluate potential radar impacts and identify potential future mitigation measures, the results of which will be discussed with BOEM and the USCG. BOEM and the USCG may later work with the applicant to implement any identified mitigations.	Navigation and Vessel Traffic (3.13)	USCG
74.	Construction, Operations, Decommissioning	Operations and maintenance plan	Prior to operations of the proposed Project, the applicant will submit a written plan for operations and maintenance, which includes control center(s), for review by BOEM and the USCG. The plan must demonstrate that the control center(s) will be adequately staffed to perform standard operating procedures, communications capabilities, and monitoring capabilities. The plan will include, but not be limited to, the following topics, which may be modified through ongoing discussions with the USCG: • Standard Operating Procedures: This includes methods for establishing and testing WTG rotor shutdown; methods of lighting control; method(s) for notifying the USCG of mariners in distress or potential/actual SAR incidents; method(s) for notifying the USCG of any events or incidents that may impact maritime safety or security; and methods for providing the USCG with environmental data, imagery, communications and other information pertinent to SAR or marine pollution response. • Staffing: This includes the number of personnel intended to staff the control center(s) to ensure continuous monitoring of WTG operations, communications, and surveillance systems. • Communications: These are the capabilities to be maintained by the control center(s) to communicate with the USCG and mariners within and in the vicinity of the proposed Project area. Communications capability will at a minimum include very high frequency marine radio and landline and wireless for voice and data. • Monitoring: The control center(s) should maintain the capability to monitor the applicant installation and operations in real time (including night and periods of poor visibility) for determining the status of all PATONs; searching for and locating mariners in distress upon notification of a maritime distress incident; and detection of a survivor who has climbed to the survivor's platform, if installed, on any WTG or ESP.	Navigation and Vessel Traffic (3.13)	USCG
75.	Construction, Operations, Decommissioning	WTG/ESP installation	No WTG/ESP installation work may commence at the proposed Project site (i.e., on or under the water) without prior review by BOEM and the USCG of a plan to be submitted by the applicant that describes the schedule and process for erecting each WTG, including all planned mitigations to be implemented to minimize any impacts on navigation while installation is ongoing. Appropriate Notice to Mariners submissions will accompany the plan.	Navigation and Vessel Traffic (3.13)	USCG BSEE
76.	Construction, Operations, Decommissioning	USCG reporting	**Complaints**: On a monthly basis during installation, the applicant will provide the USCG with a description of any complaints received (either written or oral) by boaters, fishermen, commercial vessel operators, or other mariners regarding impacts on navigation safety allegedly caused by construction vessels, crew transfer vessels, barges, or other equipment. Describe any remedial action taken in response to complaints received. **Correspondence**: The applicant will provide copies of any correspondence received by the applicant from other federal, state, or local agencies that mention or address navigation safety issues to the USCG. **Maintenance schedule**: The applicant will provide its planned WTG maintenance schedule, forecast out to at least 1 quarter, to the USCG. Appropriate Notice to Mariners submissions will accompany each maintenance schedule.	Navigation and Vessel Traffic (3.13)	USCG
77.	Construction, Operations, Decommissioning	Public participation	To ensure sufficient opportunity for the public to receive information directly from the owners/operators of the wind energy facility, the applicant will attend periodic meetings of the Southeastern Massachusetts and Rhode Island Port Safety Forums to provide briefs on the status of construction and operations and on any problems or issues encountered with respect to navigation safety.	Navigation and Vessel Traffic (3.13)	USCG
78.	Construction, Operations, Decommissioning	Helicopter-landing platforms	If the applicant's ESPs include helicopter-landing platforms, those platforms will be designed and built to accommodate USCG HH60 rescue helicopters.	Navigation and Vessel Traffic (3.13)	USCG
79.	Construction, Operations, Decommissioning	AIS on all proposed Project construction and operations vessels, turbines, and ESPs	The applicant will ensure that all vessels associated with construction and operations of the proposed Project are installed with operational AIS to monitor the number of vessels and traffic patterns for analysis and compliance with vessel speed requirements.	Navigation and Vessel Traffic (3.13); Other Uses (3.14)	USCG
80.	Operations	Shared vessel strategy	The applicant will reduce overall vessel usage and number of trips within the areas covered by Lease Area OCS-A 0534 and Lease Area OCS-A 0501 through a shared operational strategy between the New England Wind and Vineyard Wind 1 projects, which will likely reduce environmental impacts and navigational and vessel traffic risks during operations.	Navigation and Vessel Traffic (3.13); Other Uses (3.14)	BOEM BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
81.	Construction, Operations, Decommissioning	Department of Defense airspace and radar systems	The applicant will formally communicate agreement with the following provisions to de-conflict potential impacts on warning area W-105A, Nantucket ASR-9, and Falmouth ASR-8 radar systems and to address potential impacts of distributed acoustic sensing: • Acknowledge that structures can withstand the daily sonic overpressures (sonic booms) and potential falling debris from dispensing chaff and flare; • Confirm that the U.S. Air Force will not be held liable for any damage to property or personnel (Hold and Save Harmless clause); • Notify North American Aerospace Defense Command 30 to 60 days prior to proposed Project completion for radar adverse impact management scheduling; • Contribute $80,000 for radar adverse impact management execution; • Curtail of operations for national security or defense purposes as described in the leasing agreement; and • Coordinate with the Department of Defense and the U.S. Navy on any proposal to use distributed acoustic sensing as part of the proposed Project or associated transmission cables.	Other Uses (3.14)	Department of Defense
82.	Construction, Operations, Decommissioning	Scientific survey mitigation	The applicant will fund and implement a mitigation program to address impacts from the proposed Project on recurring scientific surveys, including: • **Evaluation of survey designs**: Evaluate and quantify impacts of proposed Project-related wind development activities on scientific survey operations and on provision of scientific advice to management. • **Identification and development of new survey approaches**: Evaluate or develop appropriate statistical designs, sampling protocols, and methods, while determining if scientific data quality standards for the provision of management advice are maintained. • **Calibration of new survey approaches**: Design and carry out necessary calibrations and required monitoring standardization to ensure continuity, interoperability, precision, and accuracy of data collections. • **Development of interim provisional survey indices**: Develop interim ad hoc indices from existing non-standard data sets to partially bridge the gap in data quality and availability between pre-construction and operational periods while new approaches are being identified, tested, or calibrated. • **Wind energy monitoring to fill regional scientific survey data needs**: Apply new statistical designs and carryout sampling methods to effectively mitigate survey impacts due to offshore wind activities from the applicant operations for the operational life span of the proposed Project. • **Development and communication of new regional data streams**: Require new data collection, analysis, management, dissemination, and reporting systems. Changes to surveys and new approaches require substantial collaboration with fishery management, fishing industry, scientific institutions, and other partners.	Other Uses (3.14)	NOAA
83.	Operations	Web-based cameras	The applicant will install up to ten strategically placed web-based cameras that the USCG could potentially access to support a SAR event.	Navigation and Vessel Traffic (3.13)	USCG
84.	Construction, Operations, Decommissioning	Onshore lighting restrictions	The applicant will reduce lighting at onshore facilities, including, but not limited to, the use of the minimum number and intensity of lights necessary for safe nighttime operations and the use of full cut-off fixtures to prevent light from illuminating unnecessary areas.	Scenic and Visual Resources (3.16)	BOEM BSEE
85.	Construction, Operations, Decommissioning	BSEE As-bult reports	The applicant will submit the following reports to BSEE (OSWsubmittals@bsee.gov): • As-built anchoring reports, including anchor drop locations, anchor pick-up locations, estimated chain/line on the seafloor (including any line sweep), and maps of all that include representations of sensitive habitats to be avoided/impact minimized; • As-built reports for all dredging and cable installation documenting timing and methods used. Reports must include timing, anchor drop location, anchor pick-up location, estimated chain/line on the seafloor, any line sweep, and maps of all that include representations of sensitive habitats to be avoided/impact minimized; • As-built report of cable protection measures; • Trip reports for bi-annual optical survey work to confirm compliance; • Tri-annual scour protection reports, starting in Year 3, along with reports documenting any subsequent repair/modification of scour protection; • Trip reports for (May through October) bi-monthly plankton survey work; • Copies of pre-construction, construction, and post-construction fisheries surveys (Table H-1, Measure #22); • Copies of benthic monitoring reports (Measure 11) and reports on the analysis of benthic grabs and video transects (Measure #14); • Trawl survey reports (Measure #58); • Ventless trap survey reports (Measure #59); • Boulder relocation reporting (Measure #68); • Pile driving reports (Measures #34, #35, #39); and • Interim (monthly) and final PSO reporting (Measures #44, #45, #46, #48, and #53).	Multiple	BSEE

Measure Number	Project Stage[a]	Measure Title	Measure Description	Resource Area Addressed (EIS Section)	BOEM's Identification of the Anticipated Enforcing Agency[b]
86.	Operations	Bird mortality monitoring	Using a standardized protocol for the proposed Project, the applicant will document any dead or injured bats found on vessels and structures during construction, operations, and decommissioning. Reporting will occur within 24 hours of discovery. Handling of injured animals will occur in accordance with protocols developed by the applicant, USFWS, BOEM, and BSEE.	Birds (G.2.4)	BOEM BSEE USFWS
87.	Construction, Operations, Decommissioning	Dark sky lighting	Where safe and feasible, implement the National Park Service's Sustainable Outdoor Lighting Specifications (NPS 2022), including: • Use light-emitting diode fixtures that have a warm color hue (i.e., 2,700 Kelvin); • Use recessed and fully shielded (or "full cut off") light fixtures; • Do not use upward-facing lights; • Use fixtures that include or can accommodate timers, motion detectors, hue adapters, and dimmers; and • Use fixtures with the lowest lumens (light output) possible.	Cultural Resources (3.10); Scenic and Visual Resources (3.16); Land Use and Coastal Infrastructure (G.2.7)	BOEM BSEE NPS
88.	Operations	Prohibit co-located foundations	The applicant will eliminate the option for co-located ESP foundations and require the proposed Project to include no more than one ESP or WTG foundation at each position in the SWDA. This measure would retain the option to mount ESP equipment on WTG platforms.	Navigation and Vessel Traffic (3.13)	BOEM BSEE USCG
89.	Construction, Operations, Decommissioning	Avian and bat monitoring program	At least 45 calendar days before beginning surveys, the applicant must complete, obtain concurrence from the Department of Interior (DOI), and adopt an avian and bat monitoring plan, including coordination with interested stakeholders. DOI will review the avian and bat monitoring plan and provide any comments on the plan within 30 calendar days of its submittal. The applicant must resolve all comments on the avian and bat monitoring plan to DOI's satisfaction before implementing the plan. The applicant may conclude that DOI has concurred in the avian and bat monitoring plan if DOI provides no comments on the plan within 30 calendar days of its submittal date: • Monitoring. Specific monitoring components will be identified as part of consultation with USFWS and will be included in the Final EIS. • Annual monitoring reports. The applicant must submit to BOEM (at renewable_reporting@boem.gov), USFWS, and BSEE (at OSWSubmittals@bsee.gov) a comprehensive report after each full year of monitoring (pre- and post-construction) within 6 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. DOI will use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the avian and bat monitoring plan. DOI reserves the right to require reasonable revisions to the avian and bat monitoring plan and may require new technologies as they become available for use in offshore environments. • Post-construction quarterly progress reports. The applicant must submit quarterly progress reports during the implementation of the avian and bat monitoring plan to BOEM (at renewable_reporting@boem.gov) and the USFWS by the 15th day of the month following the end of each quarter during the first full year that the proposed Project is operational. The progress reports must include a summary of all work performed, an explanation of overall progress, and any technical problems encountered. • Monitoring plan revisions. Within 15 calendar days of submitting the annual monitoring report, the applicant must meet with BOEM and USFWS to discuss the monitoring results; the potential need for revisions to the avian and bat monitoring plan, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If DOI determines after this discussion that revisions to the avian and bat monitoring plan are necessary, DOI may require the applicant to modify the avian and bat monitoring plan. If the reported monitoring results deviate substantially from the impact analysis included in the Final EIS, the applicant must transmit to DOI recommendations for new mitigation measures and/or monitoring methods. • Operational reporting (operations). The applicant must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (at OSWSubmittals@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition for all turbines together in tabular format: the proportion of time the turbines were operational each month, the monthly average rotor speed (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. DOI will use this information as inputs for avian collision risk models to assess whether the results deviate substantially from the impact analysis included in the Final EIS. • Raw data. The applicant 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 DOI and USFWS upon request for the duration of the lease. The applicant must work with BOEM to ensure the data are publicly available. The USFWS may specify third-party data repositories that must be used, such as the Motus Wildlife Tracking System or MoveBank, and such parties and associated data standards may change over the duration of the monitoring plan.	Bats (G.2.3), Birds (G.2.4)	BOEM BSEE USFWS
90.	Construction	Tree-clearing restrictions	In addition to Measure #8 in Table H-1, the applicant will avoid clearing of trees (greater than 3 inches diameter at breast height) between April 1 and October 31, unless bat surveys are conducted pursuant to current USFWS protocols and no northern long-eared bats (*Myotis keenii*) are documented.	Bats (G.2.3)	BOEM BSEE USFWS

AIS = automatic identification system; ASR = airport surveillance radar; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = Code of Federal Regulations; COP = Construction and Operations Plan; CZM = Office of Coastal Zone Management; DMA = dynamic management area; DOI = U.S. Department of the Interior; DTS = distributed temperature sensing; EIS = environmental impact statement; ESA = Endangered Species Act; ESP = electrical service platform; FAA = Federal Aviation Administration; HAPC = habitat area of particular concern; HDD = horizontal directional drilling; HH:MM = hour:minute; HRG = high-resolution geophysical; ID = identification; ITA = Incidental Take Authorization; kHz = kilohertz; MassDEP = Massachusetts Department of Environmental Protection; NA = not applicable; NARW = North Atlantic right whale; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NPS = National Park Service; OECC = offshore export cable corridor; PAM = passive acoustic monitoring; PATON = private aid to navigation; PSO = protected species observer; SAR = search and rescue; SMA = seasonal management area; SWDA = Southern Wind Development Area; USACE = U.S. Army Corps of Engineers; USCG = U.S. Coast Guard; USFWS = U.S. Fish and Wildlife Service; UTC = Universal Time Coordinated; WTG = wind turbine generator; Y/N = yes/no; YY-MM-DDT = Year-Month-Day Time Zone; YYYY-MM-DD = Year-Month-Day

[a] construction = construction and installation; operations = operations and maintenance; decommissioning = conceptual decommissioning

[b] Unless otherwise specified, BSEE compliance and enforcement to reports should be submitted to OSWSubmittals@bsee.gov.

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