Appendix G: Mitigation and Monitoring

The Final Programmatic Environmental Impact Statement (PEIS) assesses the potential physical, biological, socioeconomic, and cultural impacts that could result from the construction and installation, operations and maintenance (O&M), and conceptual decommissioning of wind energy projects within the six New York Bight (NY Bight) lease areas, as well as the change in those impacts with avoidance, minimization, mitigation, and monitoring (AMMM) measures. The Proposed Action (Sub-alternative C1 [Preferred Alternative] and Sub-alternative C2) for the Final PEIS is the identification of AMMM measures at the programmatic stage that could avoid, minimize, mitigate, and monitor impacts. The Bureau of Ocean Energy Management (BOEM) may require some or all of these measures as conditions of approval for activities proposed by lessees in Construction and Operations Plans (COPs) submitted for the six NY Bight lease areas. BOEM may require additional or different measures based on future, site-specific National Environmental Policy Act (NEPA) analysis or the parameters of specific COPs. BOEM may also modify the measures at the COP specific NEPA stage to tailor them to the characteristics of the proposed project and the site(s) of proposed activities, and to ensure conformity with project-specific consultations and authorizations. The AMMM measures analyzed in the Final PEIS under the Proposed Action are presented in Table G-1.

BOEM identified the AMMM measures analyzed in the Final PEIS from review of offshore wind COPs; COP environmental impact statements (EISs); scoping comment letters; input from cooperating and participating agencies, and Cooperating Tribal Governments; public comments on the Draft PEIS; internal input; and through previous consultations. BOEM analyzed AMMM measures that would be applicable to more than one NY Bight lease area, are reasonable and enforceable, and allow for flexibility where appropriate. These AMMM measures are considered programmatic insofar as they may be applied to COPs for the six NY Bight lease areas, not because they necessarily will apply to COPs under BOEM's renewable energy program outside of the NY Bight lease areas.

Most of the AMMM measures included in this appendix have been previously required by BOEM as conditions of approval for previous activities proposed by lessees in COPs submitted for the Atlantic OCS or through related consultations while a smaller number of measures have not been previously applied. Table G-1 identifies these measures as "Previously Applied" and "Not Previously Applied" in the last column of the table. As part of the Proposed Action, Sub-alternative C1 includes previously applied measures, and Sub-alternative C2 includes previously applied measures and not previously applied measures.

In addition to the AMMM measures, BOEM has identified Recommended Practices (RPs) for the offshore wind industry in Table G-2. These RPs are not part of the Proposed Action. Please note that not all of these RPs are within BOEM's statutory and regulatory authority; those that are not may be adopted and imposed by other governmental agencies at the subsequent COP NEPA stage.

The environmental decision document for each COP-specific NEPA review will describe the specific terms and conditions of the AMMM measures for which compliance is required (40 Code of Federal

Regulations [CFR] 1505.3). All NY Bight lessees will be required to certify compliance with their COP terms and conditions, under 30 CFR 285.633(a). Furthermore, pursuant to 30 CFR 585.634(b), BOEM will periodically review the activities conducted under the approved COPs for the six NY Bight lease areas with the frequency and extent of the review based on the significance of any changes in available information and on onshore or offshore conditions affecting, or affected by, the activities conducted under the COPs.

Monitoring may be required to evaluate the effectiveness of AMMM measures or to identify if resources are responding as predicted to impacts from each NY Bight project. This monitoring would typically be developed in coordination among BOEM and agencies with jurisdiction over the resource to be monitored. The information generated by monitoring may be used to (1) alter how an AMMM measure identified in the ROD is being implemented, (2) revise or develop new mitigation or monitoring measures for which compliance would be required under the COPs for the six NY Bight lease areas in accordance with 30 CFR 285.633(b)(2), (3) develop measures for future projects, or (4) contribute to regional efforts for better understanding of the impacts and benefits resulting from offshore wind energy projects in the Atlantic (e.g., potential cumulative impact assessment tool).

Table G-1. Proposed Action AMMM Measures

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
Previously Applied					
BB-1	Immediate reporting of injured/dead ESA-listed birds and bats	Any occurrence of dead or injured ESA-listed birds or bats, or eagles protected under the Bald and Golden Eagle Protection Act, must be reported to BOEM, BSEE, and USFWS as soon as practicable (taking into account crew and vessel safety), ideally within 24 hours and no more than 72 hours after the sighting. If practicable, the Lessee must carefully collect the dead specimen and preserve the material in the best possible state, contingent on the acquisition of any necessary wildlife permits and compliance with the Lessee's health and safety standards. Occurrences of bird and bat carcasses must also be reported in the Injury and Mortality Reporting (IMR) System.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied
BB-2	Injured/dead bird and bat reporting	The Lessee must submit an annual report covering each calendar year, due by January 31, documenting any dead or injured birds or bats found on vessels and structures during construction, operations, and decommissioning in the preceding year. The report must be submitted to BOEM, BSEE, 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 United States Geological Survey Bird Band Laboratory. Developers should also report any other form of tag such as MOTUS or satellite. Occurrences of bird and bat carcasses must also be reported in the Injury and Mortality Reporting (IMR) System.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied
BB-3	Bird and bat monitoring	**Bird and Bat Post-Construction Monitoring Plan.** The Lessee must develop and implement a Bird and Bat Post-Construction Monitoring Plan (BBPCMP) based on the Lessee's Bird and Bat Post-Construction Monitoring Framework (RP BB-4), in coordination with USFWS, and other relevant regulatory agencies. Prior to, or concurrent with, offshore construction activities, including seabed preparation activities, the Lessee must submit a BBPCMP for BOEM, BSEE and USFWS (New York and New Jersey Field Offices) review. BOEM, BSEE, and USFWS will review the BBPCMP and provide any comments on the plan within 60 days of its submittal. The Lessee must resolve all comments on the BBPCMP to BOEM's and BSEE's satisfaction before implementing the plan and before commissioning the first WTG. **Monitoring.** The Lessee must conduct monitoring as outlined in the BBPCMP, which must include use of radio-tags to monitor movement of ESA-listed birds in the vicinity of the project. The BBPCMP will allow for changing methods over time in order to regularly update and refine collision estimates for listed birds. Specific to this purpose, the plan must include an initial monitoring phase involving deployment of Motus radio tags, or similar technology, on listed birds or other species of concern in conjunction with installation and operation of Motus receiving stations on WTGs in the lease area following offshore Motus recommendations (https://motus.org/groups/atlantic-offshore-wind/). The initial phase, which will last for the first few years of operation, may also include deployment of satellite-based tracking technologies (e.g., Global Positioning System [GPS], Argos tags, acoustic bat detectors, or integrated multi-sensor systems). The monitoring may also include measurement of avoidance behavior and densities. **Annual Monitoring Reports.** The Lessee must submit to BOEM (at renewable_reporting@boem.gov), USFWS, and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) a comprehensive report after each full year of monitoring within 12 months. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats. BOEM, BSEE, and the USFWS shall use the annual monitoring reports to assess the need for reasonable revisions (based on subject matter expert analysis) to the BBPCMP. BOEM and BSEE reserve the right to require reasonable revisions to the BBPCMP and may require the use of new technologies as they become available for use in offshore environments. **Post-Construction Quarterly Progress Reports**. The Lessee must submit quarterly progress reports during the implementation of the BBPCMP to BOEM (at renewable_reporting@boem.gov), BSEE, and USFWS by the 15th day of the month following the end of each quarter during the first full year that the project is operational. The progress reports must include a summary of all post-construction monitoring performed, an explanation of overall progress, and any technical problems encountered. **Monitoring Plan Revisions.** Within 30 days of submitting the annual monitoring report, the Lessee must meet with BOEM, BSEE, USFWS, and appropriate state agencies to discuss the following: the monitoring results; the potential need for revisions to the BBPCMP, including technical refinements or additional monitoring; and the potential need for any additional efforts to reduce impacts. If, based on this annual review meeting, BOEM, in consultation with USFWS, determines that revisions to the BBPCMP are necessary, BOEM will require the Lessee to modify the BBPCMP. If the projected collision levels, as informed by monitoring results, deviate substantially from the Final COP NEPA effects analysis, the Lessee must transmit recommendations for new mitigation measures and/or monitoring methods to BOEM. In consultation with USFWS, BOEM and BSEE may adjust the frequency, duration, and methods for various monitoring efforts in future revisions of the BBPCMP based on current technology (including its cost) and the evolving weight of evidence regarding the likely levels of collision mortality for each listed bird species. **Operational Reporting (Operations)**. The Lessee must submit to BOEM (at renewable_reporting@boem.gov) and BSEE (via TIMSWeb and at protectedspecies@bsee.gov) an annual report summarizing monthly operational data calculated from 10-minute supervisory control and data acquisition data for all WTGs together in tabular format: the proportion of time the WTGs were operational (monthly revolutions per minute [rpm]), the average rotor speed (rpm) of spinning WTGs plus 1 standard deviation, and the average pitch angle of blades (degrees relative to rotor plane) plus 1 standard deviation. Any operational data considered by the Lessee to be privileged or confidential must be clearly marked as confidential business information and will be handled by BOEM and BSEE in a manner consistent with 30 CFR 585.114. **Raw Data.** The Lessee 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 BOEM, BSEE and USFWS upon request for the duration of the lease. The Lessee must work with BOEM to ensure the data are publicly available. All avian tracking data (i.e., from radio and satellite transmitters) must be stored, managed, and made available to BOEM, BSEE, and USFWS following the protocols and procedures outlined in the agency document entitled *Guidance for Coordination of Data from Avian Tracking Studies*, or its successor applicable at the time the particular data is being stored. All bat data must be stored in the North American Bat Monitoring Program (NABat) database.	Bats, Birds	BOEM, BSEE, and USFWS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
BEN-1	Boulder avoidance, identification, and relocation	The Lessee must avoid boulders greater than 0.5 m in diameter within the lease area and along the export cable corridor; if avoidance is not possible, the Lessee must minimize the distance a boulder must be relocated if necessary for the installation of facilities. If the Lessee needs to relocate boulders, it must submit a Boulder Identification and Relocation Plan. The plan must detail, to the extent technically and/or economically practicable or feasible for the project, how the Lessee will relocate boulders as close as practicable to areas immediately adjacent to existing similar habitat. The plan must be submitted to BOEM and BSEE to coordinate with NMFS for review prior to boulder relocation activities. The Lessee must resolve all comments on the Boulder Relocation Plan to BOEM and BSEE's satisfaction prior to implementation of the plan. If BOEM or BSEE do not provide comments on the plan within 60 days of its submittal, then the Lessee may presume concurrence with the plan. The plan must include sufficient scope to mitigate boulders for facility installation and operation risks.	Benthic; Finfish, Invertebrates, and EFH; Commercial and For-Hire Fishing	BOEM, BSEE, and NMFS	Previously Applied
MUL-41 (Previously BEN-2)	Foundation scour protection monitoring	The Lessee must inspect scour protection performance. The Lessee must submit an Inspection Plan to BSEE with the appropriate FDR submittal. BSEE will review the Inspection Plan and provide comments, if any, on the plan within 60 days of its submittal. The Lessee must resolve all comments on the Inspection Plan to BSEE's satisfaction and receive BSEE's concurrence prior to initiating the inspection program. If BSEE does not send comments within 60 days, the Lessee may presume concurrence. • The Lessee must carry out an initial foundation scour inspection of each foundation within 6 months of completing installation of that foundation, thereafter at intervals not greater than 5 years, and within 180 days after a storm event (as defined by the Post-Storm Event Monitoring Plan, described in MUL-16). • The Lessee must provide BSEE with a foundation scour monitoring report within 90 days of completing each foundation scour inspection. If multiple foundation locations are inspected within a single survey effort, the foundation scour monitoring reports for those locations may be combined into a single foundation scour monitoring report to be provided within 90 days of completing the last foundation scour inspection within this single survey effort. The schedule of reporting must be included in the Inspection Plan and concurred with by BSEE. • If scour protection losses develop within 10% of the maximum loss allowance, edge scour develops within 10% of the maximum allowance, or if spud depressions from installation affect scour protection stability, the Lessee must submit a plan for additional monitoring and/or mitigation to BSEE for review and concurrence.	Benthic; Finfish, Invertebrates, and EFH	BOEM, BSEE, and NMFS	Previously Applied
BIR-1	Bird-Deterrent Devices and Plan	To minimize attracting birds to operating WTGs, the Lessee must install bird perching-deterrent device(s) on each WTG and OSS. The Lessee must submit a plan to deter perching on offshore infrastructure by roseate terns and other marine birds for BOEM and BSEE to review in coordination with USFWS and with the FIR ("Bird Perching Deterrent Plan"). BOEM, BSEE, and USFWS will review the Bird Perching Deterrent Plan and provide any comments on the plan within 60 days of its submittal. The Lessee must resolve all comments on the Bird Perching Deterrent Plan to the satisfaction of BOEM and BSEE before implementing the plan. The Bird Perching Deterrent Plan must include the type(s) and locations of bird perching-deterrent devices and a monitoring plan for the life of the project, must allow for modifications and updates as new information and technology becomes available, and must track the efficacy of the deterrents. The plan must be based on best available science regarding the effectiveness of perching-deterrent devices on minimizing collision risk. The location of bird perching-deterrent devices must be proposed by the Lessee based on BMPs applicable to the appropriate operation, effectiveness, and safe installation of the devices. The Lessee must also provide the location and type of bird-deterrent devices as part of the as-built submittals to BSEE.	Birds	BOEM, BSEE, and USFWS	Previously Applied
BIR-2	Light impact reduction for birds	Nothing in this condition supersedes or is intended to conflict with lighting, marking, and signaling requirements of FAA, USCG, or BOEM. The Lessee must use lighting technology that minimizes impacts on avian species to the extent practicable, including lighting designed to minimize upward illumination. The Lessee must provide USFWS with a courtesy copy of the final Lighting, Marking, and Signaling Plan, and the Lessee's approved application to USCG to establish Private Aids to Navigation (PATON).	Birds	FAA, USCG, BOEM, and BSEE	Previously Applied
BIR-3	Compensatory Mitigation Plan for Piping Plover and Red Knot	At least 180 days prior to the start of commissioning of the first WTG, the Lessee would distribute a Compensatory Mitigation Plan for piping plovers and red knot to BOEM, BSEE, and USFWS for review and comment. BOEM, BSEE, and USFWS would review the Compensatory Mitigation Plan and provide any comments on the plan to the Lessee within 60 days of its submittal. The Lessee would resolve all comments on the Compensatory Mitigation Plan to BOEM, BSEE, and USFWS's satisfaction before implementing the plan and before commissioning of the first WTG. The Compensatory Mitigation Plan would provide compensatory mitigation actions to fully offset the impact of the incidental take of piping plover and red knot. The Compensatory Mitigation Plan would require that the compensatory mitigation be implemented by the fifth year of WTG operation. The Lessee will review the effectiveness of the plan with BOEM, BSEE and USFWS at regular (5-year) intervals thereafter or as new information becomes available, during which alternative and adaptive strategies might be considered. The Compensatory Mitigation Plan would include: (1) a quantification of the level of offsets to fully offset the impact of the incidental take expressed in the Incidental Take Statement, based on scientifically recognized techniques and methodologies for each of the impacted species: piping plover and red knot; (2) detailed description of the mitigation actions for each species (Piping plover examples: Habitat enhancement, predator control, reduction of disturbance at wintering sites, etc. Rufa red knot examples: habitat restoration, reduce displacement from peregrine falcons, red tide rehabilitation, etc.); (3) the specific location for each mitigation action; (4) a timeline for completion of the mitigation measures; (5) details of the mitigation mechanisms (e.g., conservation bank, in-lieu fee, applicant-proposed mitigation); (6) best available science linking the compensatory mitigation action(s) to the projected level of collision mortality; and (7) monitoring and reporting to ensure the effectiveness of the mitigation actions in offsetting take.	Birds	BOEM, BSEE, and USFWS	Previously Applied
COMFIS-2	Scour and cable protection plan	The Lessee must prepare and implement a Scour and Cable Protection Plan(s) that includes descriptions and specifications for all scour and cable protection materials. The plan(s) must include depictions of the location and extent of scour and cable protection, the habitat delineations for the areas of cable protection measures, and detailed information on the proposed scour or cable protection materials for each area and habitat type. The Scour and Cable Protection Plan(s) must demonstrate consistency with the Micrositing Plan(s) and Sequencing Plan(s), as appropriate. a. The Lessee must avoid the use of engineered stone or concrete mattresses in complex habitat, as practicable and feasible. The Lessee must ensure that all materials used for scour and cable protection measures consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-	Commercial and For-Hire Fishing	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		dimensional complexity in height and in interstitial spaces, as practicable and feasible. If concrete mattresses are necessary, bioactive concrete (i.e., with bio-enhancing admixtures) must be used as practicable as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth. b. Cable protection measures must have tapered or sloped edges to reduce hangs for mobile fishing gear. The Lessee must avoid the use of plastics/recycled polyesters/net material (i.e., rock-filled mesh bags, fronded mattresses) for scour protection. c. The Scour and Cable Protection Plan(s) must be submitted to BOEM and BSEE for coordination with other agencies as appropriate for review prior to placement of scour and cable protection within the area covered by the scope of the Plan(s). The Scour and Cable Protection Plan(s) must be concurred with by BOEM and BSEE prior to BSEE issuing a no-objection to the relevant FDR. d. The Lessee must resolve all comments on each Plan to BOEM's and BSEE's satisfaction before placement of the scour and cable protection materials. The final version of the Scour and Cable Protection Plan(s) must be provided to BOEM, BSEE, NMFS and USACE.			
COMFIS-3	Fisheries & Benthic Habitat Monitoring Plan	The Lessee shall develop and implement a Fisheries and Benthic Habitat Monitoring Plan that should include shellfish, such as surfclam and scallop. The Lessee must submit to BOEM and BSEE a Fisheries and Benthic Habitat Monitoring Plan (FBHMP). The Lessee must conduct fisheries and benthic monitoring according to their FBHMP to assess fisheries and benthic habitat status in the project area.	Commercial and For-Hire Fishing; Benthic	BOEM, BSEE, and NMFS	Previously Applied
COMFIS-6	Fisheries compensatory mitigation	The Lessee will implement the following compensation programs consistent with BOEM's draft guidance for mitigating impacts on commercial fisheries and for-hire recreational fishing (https://www.boem.gov/sites/default/files/documents/renewable-energy/DRAFT%20Fisheries%20Mitigation%20Guidance%2006232022_0.pdf): • A gear loss and damage compensation program to address the impact-producing factor for presence of structures during construction, operations, and decommissioning 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. ○ The Lessee shall establish a compensation/mitigation fund consistent with BOEM's draft Guidance for Mitigating Impacts to Commercial and Recreational Fisheries on the Outer Continental Shelf Pursuant to 30 CFR 585 to compensate commercial and for-hire recreational fishermen for loss of income due to unrecovered economic activity resulting from displacement from fishing grounds due to project construction and operations and to shoreside businesses for losses indirectly related to the project. For losses to commercial and for-hire recreational fishermen, the fund shall be based on the revenue exposure for fisheries based out of ports listed in an individual project's EIS. For losses to shoreside businesses, the Lessee shall analyze the impacts on shoreside seafood businesses adjacent to ports listed in an individual project's EIS.	Commercial and For-Hire Fishing	BOEM, BSEE, NJDEP, and NYDEP	Previously Applied
CUL-2	Marine cultural resources avoidance or additional investigation	BOEM will establish, and the Lessee must comply with, requirements for all avoidance buffers required by BOEM for each marine cultural resource (i.e., archaeological resource and ASLFs) based on the size and dimension of the resource. Avoidance buffers will extend outward from the maximum discernable limit of each resource and are intended to minimize the risk of disturbance during construction. If an adverse effect cannot be avoided, the Lessee will be required to conduct further investigations to minimize or resolve effects on these historic properties. If avoidance of an unevaluated resource is infeasible, additional investigations must be conducted for the purpose of determining eligibility for listing in the NRHP.	Cultural Resources	BOEM or BSEE	Previously Applied
CUL-3	Ancient submerged landform feature (ASLF) monitoring program and marine archaeological post-review discovery plan	BOEM will establish, and the Lessee must comply with, monitoring and post-review discovery plans outlining processes to document and review impacts of construction or any seabed-disturbing activities on marine cultural resources. Such plans may be developed in the course of BOEM's project-level NEPA review and Section 106 consultation on marine archaeological resources. A post-review discovery plan approved by BOEM is also required in the event that an unanticipated discovery and/or inadvertent impact of a marine archaeological resource occurs.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
CUL-4	Terrestrial archaeological resource avoidance or additional investigation	BOEM will establish avoidance criteria for any identified terrestrial archaeological historic property or any unevaluated terrestrial archaeological resource. The Lessee must avoid impacts on identified terrestrial archaeological historic properties or unevaluated resources. If avoidance is infeasible, the Lessee must develop a plan to be submitted to BOEM that addresses the adverse effect on the terrestrial archaeological resource. The Lessee may develop this plan in the course of BOEM's project-level NEPA review and Section 106 consultation on terrestrial archaeological resources. Avoidance would entail the development and implementation of avoidance buffers around each historic property and unevaluated resource. If avoidance of an unevaluated resource is infeasible, additional investigations must be conducted for the purpose of determining eligibility for listing in the NRHP.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
CUL-5	Terrestrial archaeological resource monitoring program and terrestrial archaeological post-review discovery plan	BOEM will establish, and the Lessee must comply with, monitoring and post-review discovery plans outlining processes to document and review impacts of construction or any ground-disturbing activities on terrestrial archaeological resources. A monitoring plan may be developed in the course of BOEM's project-level NEPA review and Section 106 consultation on terrestrial archaeological resources. A monitoring plan may be required for certain areas, identified through consultation, to ensure impacts on resources are avoided or minimized. A post-review discovery plan will be required for the purposes of establishing a protocol in the event of an unanticipated discovery and/or inadvertent impact on a terrestrial archaeological resource.	Cultural Resources	BOEM, BSEE, or other agencies that have statutory enforcement authority over cultural resources	Previously Applied
MM-1	Reporting of all NARW detections	If a NARW is observed at any time by PSOs or personnel on any project vessels, or during any project-related activity including during vessel transit, the Lessee must immediately report the sighting information to BOEM (renewable_reporting@boem.gov), BSEE (TIMSWeb and notification email to protectedspecies@bsee.gov), the NMFS hotline, the WhaleAlert App (https://www.whalealert.org/), and to the USCG via channel 16, as soon as feasible but no later than 24 hours after the sighting. • If in the Greater Atlantic Region (ME to VA/NC border), call (866-755-6622); • If in the Southeast Region (NC to FL), call (877-WHALE-HELP or 877-942-5343); or • If calling the hotline is not possible, reports can also be made to the U.S. Coast Guard via channel 16. The sighting report must include the time in Coordinated Universal Time (UTC; HH:MM), date (YYYY-MM-DD), location (latitude/longitude in decimal degrees; coordinate system used) of the sighting, number of whales, animal description/certainty of sighting (provide photos/video if taken), closest point of approach,	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		activities at time of detection, vessel speed, animal behavior, lease area/project name, PSO/personnel name, PSO provider company [if applicable], and reporter's contact info. If a NARW is detected via PAM, the date, time, location (i.e., latitude and longitude of recorder) of the detection as well as the recording platform that had the detection must be reported to nmfs.pacmdata@noaa.gov as soon as feasible, but no longer than 24 hours after the detection. Full detection data and metadata must be submitted monthly on the 15th of every month for the previous month via the webform on the NMFS North Atlantic Right Whale Passive Acoustic Reporting System website at https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates. The Lessee must send a summary report within 24 hours to NMFS GARFO-PRD and NMFS-OPR with the information submitted to the hotline/template and confirmation the sighting/detection was reported to the respective hotline, the vessel/platform from which the sighting/detection was made, activity the vessel/platform was engaged in at time of sighting/detection, project construction and/or survey activity ongoing at time of sighting/detection (e.g., pile driving, cable installation, HRG survey), distance from vessel/platform to animal at time of initial sighting/detection, closest point of approach of whale to vessel/platform, vessel speed, and any mitigation actions taken in response to the sighting/detection.			
MM-3	Long-term PAM monitoring	The Lessee must conduct long-term monitoring of ambient noise as well as baleen whale and commercially-important fish vocalizations in the lease area before, during, and following construction. The Lessee must conduct continuous recording at least 1 year before construction, during construction, initial operation, and for at least 3 but no more than 10 full calendar years of operation to monitor for potential noise impacts. The Lessee must meet with BOEM and BSEE at least 60 days prior to conclusion of the third full calendar year of operation monitoring (and at least 60 days prior to the conclusion of each subsequent year until monitoring is concluded) to discuss: 1) monitoring conducted to-date, 2) the need for continued monitoring, and 3) if monitoring is continued, whether adjustments to the monitoring are warranted. The instrument(s) must be configured to ensure that the specific locations of vocalizing NARW anywhere within the lease area could be identified, based on the assumption of a 10 km detection range for their calls. The lessee may execute the implementation of this condition through Option 1 or Option 2, as below, but must notify BOEM of its choice at least 120 days before pile driving is scheduled to begin. The timing requirement (i.e., monitoring for at least 3 but no more than 10 full calendar years of operation) will be reevaluated by BOEM and BSEE at the end of the third year and each year subsequently thereafter at the request of the Lessee (at a maximum frequency of requests of once per year). **A. Option 1 - Lessee Conducts Long-term Passive Acoustic Monitoring (PAM).** The Lessee must conduct PAM, including data processing and archiving following the Regional Wildlife Science Collaborative (RWSC) best practices to ensure data comparability and transparency. PAM instrumentation must be deployed to allow for identification of any NARW that vocalize anywhere within the lease area. The sampling rate (minimum 10 kHz) of the recorders must prioritize baleen whale detections, but must also have a minimum capability to record noise from vessels, pile driving, and WTG operation in the lease area. The system must be configured for continuous recording over the entire year. If temporal gaps in recording are expected, the Lessee must ensure that additional recorders can be deployed to fill gaps. The Lessee must use trawl-resistant moorings to ensure that instruments are not lost and must replace any lost instruments as soon as possible. The Lessee must also notify BOEM if such loss and replacement occur. The Lessee must follow the best practices outlined in the RWSC best practices document, unless otherwise required through conditions of COP approval or related consultation. The best practices include engaging with the RWSC, calibrating the instruments, running QA/QC on the raw data, following the templates for reporting species vocalizations, and preparing the data for archiving at National Centers for Ecological Information (NCEI). In terms of data processing, the Lessee must document the occurrence of whale vocalizations (calls of NARW, humpback, sei, fin, and minke whales, as well as odontocete clicks, as available based on sample rate) using automatic or manual detection methods. In addition, data must be processed with either manual or automatic detection software to detect vocalizations of spawning cod. The Lessee must submit a log of these detections as well as the detection methodology to BOEM (at renewable_reporting@boem.gov), BSEE (at protectedspecies@bsee.gov) and NMFS (at nmfs.nec.pacmdata@noaa.gov.) within 120 days following each recorder retrieval. All raw data must be sent to the NCEI Passive Acoustic Data archive on an annual basis and the Lessee must follow NCEI guidance for packaging the data and must pay the fee. • Long-term Passive Acoustic Monitoring Plan. The Lessee must prepare and implement a Long-term PAM Plan under this option. No later than 120 days prior to instrument deployment and before any construction begins, the Lessee must submit to BOEM and BSEE (renewable_reporting@boem.gov and OSWsubmittals@bsee.gov) the Long-term PAM Plan that describes all proposed equipment (including number and configuration of instruments), deployment locations, mooring design, detection review methodology, and other procedures and protocols related to the required use of PAM. As the Lessee prepares the Long-term PAM Plan, it must coordinate with the RWSC. BOEM and BSEE will review the Long-term PAM Plan and provide comments, if any, on the plan within 45 days of its submittal. The Lessee may be required to submit a modified Long-term PAM Plan based on feedback from BOEM and BSEE. The Lessee must address all outstanding comments to BOEM's and BSEE's satisfaction and will need to receive written concurrence from BOEM and BSEE. If BOEM or BSEE do not provide comments on the Long-term PAM Plan within 45 days of its submittal, the Lessee may conclusively presume BOEM's and BSEE's concurrence with the Long-term PAM Plan. **B. Option 2 – Economic and Other Contributions to BOEM's Environmental Studies Program.** As an alternative to conducting Long-term PAM in the lease area, the Lessee may opt to make an economic contribution to BOEM's Environmental Studies Partnership for an Offshore Wind Energy Regional Observation Network (POWERON) initiative on an annual basis and cooperate with the POWERON team to allow access to the lease area for deployment, regular servicing, and retrieval of instruments. In the event the Lessee selects this option, BOEM and the Lessee will enter into a separate agreement. The Lessee's economic contribution will provide for all activities necessary to conduct PAM within the lease area, such as vessel and staff time for regular servicing of instruments, QA/QC on data, data processing to obtain vocalizations of sound-producing species and ambient noise metrics, as well as long-term archiving of data at NCEI. At the Lessee's request, the amount of the economic contribution will be estimated by BOEM's Environmental Studies Program. The Lessee will also be invited to contribute to discussions about the scientific approach of the POWERON initiative via the RWSC. The Lessee may request temporary withholding of the public release (placement into the NCEI public data archive) of raw acoustic data collected within the lease area for up to 180 days after it is collected. During this temporary hold, the Lessee may be provided a copy of the raw PAM data that was collected in the lease area or ROW after it has been cleared for any national security concerns under the RWSC best practices document.	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
MM-5	Marine Mammal Vessel Strike Management Plan	All project vessels transiting between the operations and maintenance facility and the lease area must travel at 10 knots (18.5 kilometers per hour) or less while operating in a Seasonal Management Area (SMA), unless the Lessee receives concurrence from BOEM and BSEE on its Marine Mammal Vessel Strike Management Plan. The Lessee must submit the Marine Mammal Vessel Strike Management Plan to BOEM, BSEE, and NMFS at least 180 days prior to the Plan's implementation. The plan must describe the location of each transit corridor (with a map); how PAM, in combination with visual observations, will be conducted to ensure highly effective monitoring for the presence of right whales in the transit corridor; and the protocols that will be in place for vessel speed restrictions following detection of a right whale via PAM or visual observation. The Lessee should coordinate with NMFS and monitor updates to the 2022 Proposed Rule, Amendments to the North Atlantic Right Whale Vessel Strike Reduction Rule, on additional vessel speed restrictions (https://www.fisheries.noaa.gov/action/amendments-north-atlantic-right-whale-vessel-strike-reduction-rule). This measure does not supersede any regulatory requirements.	Marine Mammals	BOEM, BSEE, and NMFS	Previously Applied
MMST-1	Reduced Visibility Monitoring Plan/Nighttime Pile Driving Monitoring Plan	The Lessee must submit the Reduced Visibility Monitoring (RVMP)/ Nighttime Pile Driving Monitoring Plan (or plans if submitted separately) to BOEM, BSEE, USACE, and NMFS GARFO PRD at least 180 days before pile driving is planned to begin unless a different time period is identified in the project-specific MMPA LOA. BOEM, BSEE, and NMFS will provide comments to the Lessee within 45 days of receipt of the plan. If issues are identified, the Lessee must submit a modified plan to BOEM, BSEE, USACE, and NMFS GARFO PRD within 30 days of the receipt of the comments and at least 15 days before the start of pile driving and associated activity. The plan may not be implemented, and therefore pile driving may not begin, until BOEM and BSEE inform the Lessee that they concur with the plan. • The plan must contain a thorough description of how the Lessee will monitor pile-driving activities during reduced visibility conditions (e.g. rain, fog) and at night, including proof of the efficacy of monitoring devices (e.g., mounted thermal/infrared camera systems, hand-held or wearable night vision devices, spotlights) in detecting ESA-listed marine mammals and sea turtles over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones (determined at the project-specific stage) can be effectively and reliably monitored in reduced visibility conditions. The plan must identify the efficacy of the technology at detecting marine mammals and sea turtles in the clearance and shutdown zones. The plan must include a full description of the proposed technology, monitoring methodology, and data demonstrating that marine mammals and sea turtles can reliably and effectively be detected within the clearance and shutdown zones for monopiles before, during, and after impact pile driving at night. Additionally, this plan must contain a thorough description of how the Lessee will monitor pile-driving activities during daytime when unexpected changes to lighting or weather occur during pile driving that prevent visual monitoring of the full extent of the clearance and shutdown zones. Without concurrence on this plan, no pile driving may be initiated later than 1.5 hours prior to civil sunset.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-2	Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving	The Lessee must submit a Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving to BOEM, BSEE, USACE, NMFS GARFO PRD, and NMFS OPR at least 180 days before any foundation pile driving is planned. BOEM, BSEE, NMFS GARFO PRD, and NMFS OPR will review the plan and provide comments within 45 days of receipt of the plan. If the plan is determined to be insufficient, the Lessee must submit a modified plan that addresses the identified issues no more than 30 days after receipt of comments from NMFS; at that time, BOEM, BSEE, NMFS GARFO PRD, and NMFS OPR will discuss a timeline for review and approval of the modified plan to meet the Lessee's schedule to the maximum extent practicable. The Lessee must obtain BOEM's and BSEE's concurrence with the Marine Mammal and Sea Turtle Monitoring Plan before starting any pile driving. The plan(s) must include: a description of how all relevant mitigation and monitoring requirements contained in the project-specific NMFS BiOp ITS will be implemented, a pile driving installation summary and sequence of events, a description of all training protocols for all project personnel (PSOs, PAM Operators, trained crew lookouts, etc.), a description of all monitoring equipment and evidence (i.e., manufacturer's specifications, reports, testing) that the Lessee can use to effectively monitor and detect ESA-listed marine mammals and sea turtles in the identified clearance and shutdown zones (i.e., field data demonstrating reliable and consistent ability to detect ESA-listed large whales and sea turtles at the relevant distances in the conditions planned for use), communications and reporting details, and PSO monitoring and mitigation protocols (including number and location of PSOs) for effective observation and documentation of sea turtles and ESA-listed marine mammals during all pile-driving events. The plan(s) must demonstrate sufficient PSO and PAM Operator staffing (in accordance with watch shifts), PSO and PAM Operator schedules, and contingency plans for instances if additional PSOs and PAM Operators are required. The Plan must detail all plans and procedures for sound attenuation, including procedures for adjusting the noise attenuation system(s) and available contingency noise attenuation measures/systems if distances to modeled isopleths of concern are exceeded during SFV. The plan must also describe how the Lessee would determine the number of sea turtles exposed to noise above the 175 dB harassment threshold during impact pile driving of WTG and OSS foundations and how the Lessee would determine the number of ESA-listed whales exposed to noise above the Level B harassment threshold during impact pile driving of WTG and OSS foundations. If any clearance or shutdown zones are expanded, the Lessee must submit a proposed monitoring plan describing the location of all PSOs to NMFS, BOEM, and BSEE for review. The Lessee must resolve BOEM's and BSEE's comments to the proposed monitoring plan to the Bureaus' satisfaction and must conduct activities in accordance with the plan.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-3	Pile-driving clearance and shutdown zone adjustments	Based on sound field verification results, the agencies (BOEM, BSEE, NMFS, and USACE, when applicable) will discuss the possibility of either increasing or decreasing the clearance zones, shutdown zones, and monitoring and mitigation measures for pile driving. The agencies will communicate with the Lessee about how to proceed.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-4	Establishment of foundation pile-driving measures	1. If shutdown is called for but the Lessee determines shutdown is not technically feasible due to human safety concerns or to maintain installation feasibility, reduced hammer energy must be implemented when the lead engineer determines it is technically feasible to do so. 2. Time of Day Restrictions: Foundation pile driving may commence only during daylight hours, unless an RVMP/Nighttime Pile Driving Monitoring Plan has been submitted and approved (see MMST-1). Foundation pile driving may begin no earlier than 1 hour after (civil) sunrise. Foundation pile driving may not be initiated any later than 1.5 hours before (civil) sunset. Foundation pile driving may continue after dark only when the installation of the same pile began during daylight hours (1.5 hours before civil sunset), when clearance zones were fully visible for at least 30 minutes and only when they must proceed for human safety or installation feasibility reasons. 3. The Lessee must deploy at least two PSOs on duty on the foundation pile-driving platform, or nearby construction vessel in the immediate vicinity of the foundation pile-driving platform, at all times during foundation pile driving to visually monitor for marine mammals.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		4. Monitoring must take place from 60 minutes immediately prior to initiation of foundation pile-driving activity through 30 minutes post-completion of foundation pile-driving activity. Acoustic PSOs (at least one PAM operator) must review data from at least 24 hours prior to pile driving and actively monitor hydrophones for 60 minutes prior to pile driving. 5. For all foundation pile-driving activity, the Lessee must implement designated clearance zones. 6. Foundation pile driving may only commence when the clearance zones are fully visible (e.g., not obscured by darkness, rain, fog), unless an RVMP/Nighttime Pile Driving Monitoring Plan (see MMST-1) has been submitted and approved, and only when clearance zones are clear of marine mammals for at least 30 minutes immediately prior to foundation pile driving, as determined by the lead PSO. 7. If a marine mammal is visually detected entering or within designated shutdown zones after foundation pile driving has commenced, a shutdown of foundation pile driving must be implemented. 8. Following a shutdown, foundation pile driving may not commence until appropriate conditions (i.e., measures 1–5 above) have been met. 9. Pile driving of wind turbine foundations and OSSs in the lease area must not occur from January 1 through April 30. Impact pile driving must not occur in December unless unanticipated delays due to weather or technical problems arise, notified to and approved by BOEM, that necessitate extending impact pile driving into December. **For sea turtles:** To ensure that foundation 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 shutdown zone (determined at the project-specific stage) for all foundation pile-driving activities. Adherence to the shutdown zones must be reflected in the PSO reports. Any visual detection of sea turtles within the shutdown zones must trigger the required shutdown in pile installation. Upon a visual detection of a sea turtle entering or within the shutdown zone during foundation pile driving, the Lessee must shut down the pile-driving hammer (unless activities must proceed for human safety or for concerns of installation feasibility) from when the PSO observes, until: • The lead PSO verifies that the animal(s) voluntarily left and headed away from the clearance area; or • 30 minutes have elapsed without re-detection of the sea turtle(s) or detection of any sea turtles by the lead PSO.			
MMST-5	PSO coverage of expanded pile-driving clearance/shutdown zones	The Lessee must ensure that, if the clearance and/or shutdown zones are expanded due to sound field verification results (see MMST-3), PSO coverage is sufficient to reliably monitor the expanded clearance and/or shutdown zones. Additional observers must be deployed on additional platforms for every 4,921 feet (1,500 meters) that a clearance or shutdown zone is expanded beyond the distances modeled prior to verification. In the event that the clearance or shutdown zone for sea turtles needs to be expanded, the Lessee must submit a proposed monitoring plan for the expanded zones to BOEM and BSEE, who will coordinate with NMFS GARFO-PRD prior to granting approval. Expansion of the zones will be reconsidered after additional sound attenuation measures are in place that reduce distances to at or below those modeled assuming 10 dB, as verified by SFV. The implementation of expanded clearance/shutdown zone monitoring must be described in the Marine Mammal and Sea Turtle Monitoring Plan (MMST-2).	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-6	Pile-driving visibility requirements	PSOs must have effective visual monitoring in all directions, and pile driving must not commence until all clearance zones are fully visible (i.e., are not obscured by darkness, rain, fog, etc.) for at least 30 minutes. Unless otherwise authorized under an approved RVMP/ Nighttime Pile Driving Monitoring Plan (see MMST-1), construction activities must not be initiated until the full extent of all clearance zones are fully visible if conditions (e.g., darkness, rain, fog) prevent the visual detection of marine mammals in the clearance zones. The lead PSO will make a determination as to when there is sufficient visibility to ensure effective visual monitoring can be accomplished in all directions.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-7	PSO coverage and training requirements for pile driving	The Lessee must ensure that PSO coverage is sufficient to reliably detect whales and sea turtles at the surface in clearance and shutdown zones to execute any pile driving delays or shutdown requirements. If, at any point prior to or during construction, BOEM and BSEE determine the PSO coverage that is included as part of the Proposed Action for the COP NEPA analysis is not sufficient to reliably detect ESA-listed whales and sea turtles within the clearance and shutdown zones, additional PSOs and/or platforms will be deployed. Determinations prior to construction will be based on review of the Marine Mammal and Sea Turtle Monitoring Plan for Pile Driving (MMST-2). Determinations during construction will be based on review of the weekly pile-driving reports and other information, as appropriate. The Lessee must use independent, dedicated, qualified PSOs provided by a third party. The PSOs' sole project-related duty must be to observe, collect and report data, and communicate with and instruct relevant vessel crew regarding the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards). PSOs or any PAM operators serving as PSOs must have completed a commercial PSO training program for the Atlantic with an overall examination score of 80% or greater.[1] Training certificates for individual PSOs must be provided to BOEM or BSEE upon request. PSOs and PAM operators must be approved by NMFS prior to the start of construction activities. Application requirements to become an NMFS-approved PSO for construction activities can be found on the NOAA website[2]. The Lessee must provide to BOEM, upon request, documentation of NMFS approval for individual PSOs. At least one lead PSO must be on duty at any given time as the lead PSO or PSO monitoring coordinator during pile driving. 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 must be deployed to record data in real time and effectively monitor the affected area for the project, including visual surveys in all directions around a pile, PAM, and continuous monitoring of sighted NARWs in the area. The number of PSOs must meet the requirements for enhanced seasonal monitoring.	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

[1] https://repository.library.noaa.gov/view/noaa/15851
[2] https://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-more/protected-species-observer-information-new-england-mid-atlantic-and-southeast

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		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 (Baker et al. 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 Lessee 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 clearance and shutdown zones, to determine the distance to protected species during surveys, to record sightings and verify species identification, and to record data. PSOs must conduct observations while free from distractions and in a consistent, systematic, and diligent manner.			
MMST-9	Vessel crew and Protected Species Observer (PSO) training requirements	The Lessee must provide project-specific training to all vessel crew members, PSOs, and trained lookouts on the identification of sea turtles and marine mammals, vessel strike avoidance and reporting protocols, how and when to communicate with the vessel operator, the authority of the PSOs, and the associated regulations for avoiding vessel collisions with protected species prior to the start of in-water construction or detonation activities. The Lessee must make available aboard all project vessels reference materials for identifying sea turtles and marine mammals, copies of the Marine Mammal and Sea Turtle Monitoring Plan (MMST-1) and the Marine Mammal Vessel Strike Management Plan (MM-5). Confirmation of the training and understanding of the requirements must be documented on a training course log sheet, and the Lessee must provide the log sheets to BOEM and BSEE upon request. The Lessee must communicate to all crew members its expectation for them to report sightings of sea turtles and marine mammals to the designated vessel contacts. The Lessee must communicate the process for reporting sea turtles and marine mammals (including live, entangled, and dead individuals) to the designated vessel contact and all crew members. The Lessee must post the reporting instructions, including communication channels, in highly visible locations aboard all project vessels.	Marine Mammals, Sea Turtles	BOEM and BSEE	Previously Applied
MMST-10	Reporting of ESA-Listed Species within Shutdown Zone During Active Pile Driving	The Lessee must report any threatened or endangered species that is observed within the identified shutdown zone during active pile driving (vibratory or impact) or drilling. The Lessee must file a report within 48 hours of the incident and include the following: description of the activity (i.e., drilling, vibratory or impact pile driving) and duration of pile driving or drilling prior to the detection of the animal(s), location of PSOs and any factors that impaired visibility or detection ability, time of first and last detection of the animal(s), distance of animal at first detection, closest point of approach of animal to pile, behavioral observations of the animal(s), time the PSO called for shutdown, hammer log (number of strikes, hammer energy), time the pile driving began and stopped, and any measures implemented (e.g., reduced hammer energy) prior to shutdown. If shutdown was determined not to be feasible, the report must include an explanation for that determination and the measures that were implemented (e.g., reduced hammer energy).	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MMST-12	Marine mammal and sea turtle geophysical survey clearance and shutdown zones and mitigations	To avoid injury of and minimize any potential disturbance to protected species, the Lessee must implement the following measures for all vessels using boomer, sparker, bubble gun, and chirp sub-bottom profiler categories of equipment. Shutdown, pre-start clearance, and ramp-up procedures are not required during HRG survey operations using only other sources (e.g., ultra-short baselines, fathometers, parametric shallow penetration sub-bottom profilers, hull-mounted non-parametric SBP, side-scan sonars, pingers, acoustic releases, echosounders, and instruments attached to submersible vehicles (HOV/AUV/ROVs)). • For situational awareness of marine mammals and ESA-listed species that may be in the survey area, during times third-party protected species observers (PSOs) are on duty, they must monitor to the farthest extent practicable, with a primary focus being 200 m around geophysical survey vessels (i.e., the Clearance Zone). At all times PSOs are on duty, any observed species must be recorded (see reporting requirements below). • Any observations of a marine mammal or ESA-listed species by crew members aboard any vessel associated with the survey must be relayed to the PSO on duty. • To minimize exposure of ESA-listed species of marine mammal to noise that could be disturbing, a 200 m Shutdown Zone for North Atlantic right whales and unidentified whales, and a 100-m Shutdown Zone for all other ESA-listed whales visible at the surface must be established around the sound source operating boomer, sparker, or bubble gun equipment. If the Shutdown Zone(s) cannot be adequately monitored for ESA-listed species presence (i.e., PSO discretion determines conditions, including night or other low visibility conditions, are such that listed species cannot be reliably sighted within the Shutdown Zone(s) with the available monitoring equipment), no equipment that requires PSO monitoring can be deployed until such time that the Shutdown Zone(s) can be effectively monitored. • The Shutdown Zone(s) must be monitored by third-party PSOs at all times when boomer, sparker, bubble gun, or Chirp sub-bottom profiler categories of equipment are being operated and all observed ESA-listed species must be recorded. • If an ESA-listed whale is detected within or entering the respective Shutdown Zone, any boomer, sparker, or bubble gun categories of equipment that requires PSOs must be shut off until the minimum separation distance is re-established, and the clearance measures are carried out (200 m for North Atlantic right whales and 100 m for other ESA-listed whales). • A PSO must notify the survey crew that a shutdown of all active boomer, sparker, and bubble gun acoustic sources 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. • For all protected species, Clearance Zones of 200 m for all ESA-listed species of marine mammal must be clear of all animals for 30 minutes before ramp-up or any deployed survey equipment is activated. • If any protected species is observed within the respective Clearance Zone during the 30-minute pre-clearance period, the relevant acoustic sources must not be initiated until the ESA-listed whale (or unidentified whale) is confirmed by visual observation to have exited the relevant zone, or, until 30 minutes have elapsed with no further sighting of the animal. • A “ramp up” of the boomer, sparker, or bubble gun survey equipment must occur at the start or re-start of geophysical survey activities when technically feasible. A ramp up must begin with the power for the geophysical survey equipment ramped up to half power for 5 minutes, and then to full power. • Following a shutdown for any reason, ramp up of the equipment may begin immediately only if: (a) the shutdown is less than 30 minutes, (b) visual monitoring of the Shutdown Zone(s) continued throughout the shutdown, (c) the animal(s) causing the shutdown was visually followed and confirmed by PSOs to be outside of	Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		the Shutdown Zone(s) and heading away from the vessel, and (d) the Shutdown Zone(s) remains clear of all ESA-listed species. If all the conditions above (a, b, c, and d) are not met, the Clearance Zone distance must be monitored for all ESA-listed species for 30 minutes of pre-clearance observation before noise-producing equipment can be turned back on. • No geophysical surveys may be conducted at night or during low-visibility conditions unless PSOs are able to effectively monitor the full extent of the Clearance and Shutdown Zone(s). • An Alternative Monitoring Plan (AMP) for geophysical surveys must be included with a survey plan detailing the monitoring methodology that will be used during nighttime and low-visibility conditions. The AMP must demonstrate how it will support effective monitoring for the presence of whales and sea turtles in the Clearance and Shutdown Zone(s). The AMP should include information about the distances that whales can be effectively detected using the identified technology/equipment, and any limitations posed by sea state(s) or vessel equipment (e.g., deck lights) that may inhibit the field of view. • The AMP must include technologies that have the technical feasibility to detect all ESA-listed species in the Clearance and Shutdown Zone(s). Low-light equipment (i.e., night-vision goggles and/or infrared technology) must be available for use during low visibility (e.g., inclement weather, nighttime) monitoring. • PSOs must be trained and experienced with any AMP technology used. The AMP must describe how calibration will be performed, for example, by including observations of known objects at set distances and under various lighting conditions. This calibration should be performed during mobilization and periodically throughout the survey operation. • PSOs shall make nighttime observations from a platform with no visual barriers, due to the potential for the reflectivity from bridge windows or other structures to interfere with the use of the night vision optics. • Boomer, sparker, bubble gun, or Chirp sub-bottom profiler sound sources used within the Southeast Right Whale Critical Habitat Unit 2 during the calving and nursing season (December-March) shall not operate at frequencies between 7 kHz and 35 kHz at night or poor visibility (i.e., anytime AMP methods are required). • During good conditions (e.g., daylight hours; Beaufort scale 3 or less) when survey equipment is not operating, to the maximum extent practicable (accounting for recommended shift schedules and vessel activities), PSOs should conduct observations for listed species for comparison of sighting rates and behavior with and without use of active geophysical survey equipment. Any observed listed species must be recorded regardless of any mitigation actions required.			

MMST-14	Vessel strike mitigation measures for marine mammals and sea turtles	The Lessee must comply with the following vessel strike avoidance conditions for any construction, operations, or decommissioning vessel transits associated with the project, unless the safety of the vessel or crew necessitates deviation from these requirements. The Lessee must report any such deviations as set forth in MUL-32.
		• PSO Requirements. The Lessee must ensure that vessel operators and crew members maintain a vigilant watch for marine mammals and sea turtles, and reduce vessel speed, alter the vessel's course, or stop the vessel as necessary to avoid striking marine mammals or sea turtles, consistent with identified requirements.
		  ○ All vessels must have a visual observer on board who is responsible for monitoring the vessel strike avoidance zone for marine mammals and sea turtles. Visual observers may be PSO or Trained Lookouts (if PSOs are not required), but Trained Lookouts responsible for these duties must be provided sufficient training by the Lessee to distinguish marine mammals and sea turtles from other phenomena and must be able to identify a marine mammal as a NARW, other whale (defined in this context as sperm whales or baleen whales other than NARW), or other marine mammal, as well as sea turtles. Any crew designated as Trained Lookouts must also receive training on vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements.
		  ○ If the Trained Lookout is a vessel crew member, this must be their designated role and primary responsibility on shift. Crew members serving as visual observers must not have other duties while observing for marine mammals while the vessel is operating over 10 knots.
		• Vessel captains/ operators must reduce vessel speed to 10 knots (18.5 kilometers per hour) or less for the remainder of that day when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel when safety permits. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised.
		• Alternative monitoring technology (e.g., night vision, thermal cameras) must be available on all vessels to maintain a vigilant watch at night and in any other low-visibility conditions. All observations must be recorded per reporting requirements. The trained lookout must check the Sea Turtle Sighting Hotline (https://seaturtlesightings.org/) before each trip and report any detections of sea turtles in the vicinity of the planned transit to all vessel operators or captains and lookouts on duty that day.
		• Vessel captain and crew must maintain a vigilant watch for all protected species and reduce speed, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any listed species. If pinnipeds or small delphinids of Delphinus, Lagenorhynchus, Stenella, or Tursiops are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel speed reduction, course alteration, and shutdown are not required.
		• If a vessel is underway, a PSO must monitor a protected species separation distance of 100 m for sea turtles and 500 m or greater for marine mammals visible at the surface, to ensure detection of that animal in time to take necessary measures to avoid striking the animal. If the vessel does not require a PSO for the type of activity being conducted, crew may be used as a Trained Lookout to meet this requirement.
		• All vessel crew members must be briefed in the identification of protected species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of listed species. The expectation and process for reporting protected species sightings during surveys must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. Vessel crew members must be provided with an Atlantic reference guide to help identify marine mammals and sea turtles that may be encountered. Vessel personnel must also be provided material regarding NARW SMAs, DMAs, visually triggered Slow Zones, sightings information, and reporting.
		• A minimum separation distance of 500 m from all ESA-listed whales (including unidentified large whales) must be maintained around all surface vessels at all times.
			Marine Mammals, Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• If a large whale is identified within 500 m of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 knots (18.5 km/hr) or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle if feasible. • If a large whale is sighted within 200 m of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m. If stationary, the vessel must not engage engines until the large whale has moved beyond 500 m. • If a sea turtle or manta ray is sighted at any distance within the operating vessel's forward path, the vessel operator must slow down to 4 knots and steer away (unless unsafe to do so). The vessel may resume normal vessel operations once the vessel has passed the turtle or ray. • On vessels operating north of the Virginia/North Carolina border between June 1 and November 30, the Lessee must post a trained lookout on all vessel transits during all phases of the project to observe for sea turtles. The trained lookout must communicate any sightings, in real time, to the vessel operator so that the requirements can be implemented. • On vessels operating south of the Virginia/North Carolina border, the Lessee must post a trained lookout on all vessel transits during all phases of the project to observe for sea turtles. The trained lookout must communicate any sightings, in real time, to the vessel operator so that the requirements can be implemented. • The trained lookout must maintain a vigilant watch and monitor a Vessel Strike Avoidance Zone (500 m) at all times to avoid potential vessel strikes of ESA-listed sea turtle species. Alternative monitoring technology (e.g., night vision, thermal cameras, etc.) must be available and utilized by the lookout to ensure effective watch at night and in any other low visibility conditions. If the trained lookout is a vessel crew member, this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. • If a sea turtle is sighted within 100 m or less of the operating vessel's forward path, the vessel operator must slow down to 4 knots (unless unsafe 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 100 m at which time the vessel may resume normal operations. Vessel transits to and from the wind project area that require PSOs must maintain a speed that will allow, considering weather conditions, effective detection of sea turtles prior to reaching the 100 m avoidance measure. If a sea turtle is sighted within 50 m 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. The vessel may resume normal operations once it has passed the turtle. • Vessel captains/ operators must avoid transiting through areas of visible jellyfish aggregations or floating Sargassum lines or mats. In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas. • Vessels operating in water depths with less than four feet of clearance between the vessel and the bottom should maintain speeds no greater than 4 kts to minimize risk of vessel strikes on sturgeon and sawfish. • All vessel crew members must be briefed in the identification of sea turtles and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of sea turtles. The expectation and process for reporting of sea turtles (including live, entangled, and dead individuals) must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so. • The only exception to the requirements regarding vessel speed and avoiding jellyfish, Sargassum, and/or sea turtles is when the safety of the vessel or crew during an emergency necessitates deviation from these requirements. If any such incidents occur, they must be reported to BSEE and NMFS GARFO-PRD within 24 hours. • If a vessel is carrying a PSO or trained lookout for the purposes of maintaining watch for NARWs, an additional lookout is not required and this PSO or trained lookout must maintain watch for whales and sea turtles. • Vessel transits to and from the project area that require PSOs must maintain a speed commensurate with weather conditions and effectively detecting sea turtles prior to reaching the 100 m separation distance mentioned above, at which point the vessel must reduce speed and avoid sea turtles. • Any observations of a marine mammal or ESA-listed species by crew members aboard any vessel associated with the project must be relayed to the PSO on duty and/or captain of the vessel. • Regardless of monitoring duties, all crew members responsible for navigation duties must receive site-specific training on ESA-listed species sighting/reporting and vessel strike avoidance measures. • Vessels underway must not divert their course to approach any ESA-listed species and marine mammals. • Regardless of vessel size, vessel operators must reduce vessel speed to 10 knots (18.5 kph) or less while operating in any Seasonal Management Area (SMA) and Dynamic Management Area (DMA) or Slow Zone for North Atlantic right whales, unless the vessel is operating in a designated DMA or Slow Zone where right whales have not been detected and it is not reasonable to expect the presence of North Atlantic right whales (e.g., Long Island Sound, shallow harbors). Information about active SMAs, DMAs, and Slow Zones can be accessed at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales. • Year-round, all vessel operators must monitor the project's Situational Awareness System, WhaleAlert, USCG VHF Channel 16, and the Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs once every 4-hour shift during project-related activities. The PSO and PAM operator monitoring teams for all activities must also monitor these systems no less frequently than every 12 hours. If a vessel operator is alerted to a NARW detection within the project area, the operator must immediately convey this information to the PSO and PAM teams. For any UXO/MEC detonation, vessel operators must monitor these systems for 24 hours prior to detonating any UXO/MEC.			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		The following measures, in addition to the PSO measures outlined in MUL-10d, also apply to all vessels associated with any survey activities (transiting or actively surveying): • For monitoring around ASVs controlled from a manned vessel, regardless of the equipment the vessel may be operating, a dual thermal/HD camera must be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. A dedicated operator must be able to monitor the real-time output of the camera on hand-held computer tablets. Images from the cameras must be able to be captured and reviewed to assist in verifying species identification. A monitor must also be installed in the bridge displaying the real-time images from the thermal/HD camera installed on the front of the ASV itself, providing a further forward view of the craft. In addition, night-vision goggles with thermal clip-ons and a handheld spotlight must be provided and used such that PSOs can focus observations in any direction around the mother vessel and/or the ASV. • Survey plans must include identification for vessel strike avoidance measures, including procedures for equipment shut down and retrieval, communication between PSOs/Trained Lookouts, equipment operators, and the captain, and other measures necessary to avoid vessel strikes while maintaining vessel and crew safety. If any circumstances are anticipated that may preclude the implementation of this measure, they must be clearly identified in the survey plan and alternative procedures outlined in the plan to ensure minimum distances are maintained and vessel strikes can be avoided. • To monitor the minimum separation distance, a PSO (or Trained Lookout if PSOs are not required) must be posted during all times a vessel is underway (transiting or surveying) to monitor for listed species within a 180-degree direction of the forward path of the vessel (90 degrees port to 90 degrees starboard). • Visual observers monitoring the minimum separation distance can be either PSOs or Trained Lookouts (if PSOs are not required). If the Trained Lookout is a vessel crew member, this must be their designated role and primary responsibility on shift. Any crew designated as Trained Lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements.			
MUL-1	Marine debris awareness and elimination	"Marine trash and debris" is defined as any object or fragment of wood, metal, glass, rubber, plastic, cloth, paper or any other solid, human-made item or material that is lost or discarded in the marine environment by the Lessee or an authorized representative of the Lessee (collectively, the "Lessee") while conducting activities on the OCS in connection with a lease, grant, or approval issued by the BOEM or BSEE. To understand the type and amount of marine debris that may be generated, and to minimize the risk of entanglement in and/or ingestion of marine debris by protected species, the Lessee must implement the following: • Marine Debris Awareness Training and Certification: The Lessee must ensure that all vessel operators, employees, and contractors engaged in a project's offshore activities complete marine trash and debris awareness training initially (i.e., prior to engaging in offshore activities pursuant to the approved COP) and annually. Operators must implement a marine debris awareness training and certification process that ensures that their employees and contractors are adequately trained. The training and certification process must include the following elements: (1) viewing of either a marine debris video or training slide pack posted on the BSEE website (https://www.bsee.gov/debris) or by contacting BSEE; (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements; and (3) documented certification that all personnel listed above have completed their initial and annual training. The Lessee must make this certification available for inspection by BSEE upon request. The marine trash and debris training videos, training slide packs, and other marine debris related educational material may be obtained at https://www.bsee.gov/debris or by contacting BSEE at marinedebris@bsee.gov. The training videos, slides, and related material may be downloaded directly from the website. • Training Compliance Report: By January 31 of each year, the Lessee must submit to BSEE an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year. • Marking: Any materials, equipment, tools, containers, and other items that are used in OCS activities and that are of such shape or configuration that make them likely to snag or damage fishing devices or be lost or discarded overboard, must be clearly marked with the vessel or facility identification number, and must be properly secured to prevent loss overboard. All markings must clearly identify the owner and must be able to resist the effects of the environmental conditions to which they may be exposed. • Recovery and Prevention: Discarding trash or debris in the marine environment is prohibited. Debris accidentally released by the Lessee into the marine environment while performing any activities associated with the project must be recovered within 24 hours when the marine debris is likely to (a) cause undue harm or damage to natural resources (e.g., entanglement or ingestion by protected species); or (b) interfere with OCS uses (e.g., snagging or damaging fishing equipment, or presenting a hazard to navigation). If the marine debris was lost within the boundaries of an archaeological resource/avoidance area, or a sensitive ecological/benthic resource area, the Lessee must contact BSEE for concurrence before conducting any recovery efforts. The Lessee must take steps to prevent similar releases of marine debris and must submit a description of these preventative actions to BSEE within 30 days from the date on which the release of marine debris occurred. • Notification: The Lessee must notify BSEE within 24 hours of any releases of marine debris and indicate whether the released marine debris was immediately recovered. If the marine debris was not recovered, the Lessee must provide its rationale for not recovering the marine debris (e.g., marine debris is located within the boundaries of a sensitive area, recovery was not possible because conditions were unsafe, or recovery was not practicable and warranted because the released marine debris is not likely to result in items (a) or (b) listed in above). • Remedial Recovery: After reviewing the notification and rationale for any decision by the Lessee to forgo recovery, BSEE may order the Lessee to recover the marine debris if BSEE finds that the reasons provided by the Lessee in the notification are insufficient and the marine debris would cause undue harm or damage to natural resources or interfere with OCS uses. • Recovery Plan: If BSEE requires the Lessee to recover the marine debris, the Lessee must submit a Recovery Plan to BSEE within 10 days after receiving BSEE's order. Unless BSEE objects within 48 hours after the Recovery Plan has been accepted or is in review status by BSEE in TIMSWeb, the Lessee may proceed with the	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Water Quality; Sea Turtles	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		activities described in the Recovery Plan. Recovery activities must be completed 30 days from the date on which marine debris was released, unless BSEE grants the Lessee an extension. • Recovery Completion Notification: Within 30 days after the marine debris is recovered, the Lessee must provide notification to BSEE that recovery was completed and, if applicable, describe any substantial variance from the activities described in the Recovery Plan that was required during the recovery efforts. • Monthly Reporting: The Lessee must submit to BSEE a monthly report, no later than the fifth day of the month, of all marine debris lost or discarded during the preceding month, including, if applicable, information related to 24 Hour Reporting and Recovery Plan and the referenced TIMSWeb Submittal ID (SID). The Lessee is not required to submit a report for those months in which no marine debris was lost or discarded. The monthly report must include the following: a. Project identification and contact information for the Lessee and for any operators or contractors involved; b. Date and time of the incident; c. Lease number, OCS area and block, and coordinates of the object's location (latitude and longitude in decimal degrees); d. A detailed description of the dropped object to include dimensions (approximate length, width, height, and weight), composition (e.g., plastic, aluminum, steel, wood or paper), and buoyancy (floats or sinks); e. Pictures, data imagery, data streams, and/or a schematic or illustration of the object, if available; f. Indication of whether the lost or discarded item could be detected as a magnetic anomaly of greater than 50 nanotesla (nT), a seafloor target of greater than 1.6 feet (0.5 meter), or a sub-bottom anomaly of greater than 1.6 feet (0.5 meter) when operating a magnetometer or gradiometer, side scan sonar, or sub-bottom profiler; g. Explanation of how the object was lost; and h. Description of immediate recovery efforts and results, including photos. • Annual Surveying and Reporting – Periodic Underwater Surveys, Reporting of Monofilament and Other Fishing Gear Around WTG Foundations: The Lessee must monitor indirect impacts associated with charter and recreational fishing gear lost from expected increases in fishing around WTG foundations by annually surveying at least 10 of the WTGs in the lease area for the first three years following COP approval and every 5 years thereafter. The Lessee may conduct surveys by remotely operated vehicles, divers, or other means to determine the frequency and locations of marine debris. The Lessee must report the results of the surveys to BOEM and BSEE in an annual report, submitted by January 31, for the preceding calendar year. Annual reports must be submitted in both Microsoft Word and Adobe PDF format. Photographic and videographic materials (TIFF or Motion JPEG 2000) must be provided in TIMSWeb with the submittal of the annual report. Photographic and videographic files can also be submitted to marinedebris@bsee.gov if the files cannot be uploaded in TIMSWeb. Survey design and effort (i.e., the number of WTGs and frequency of reporting) may be modified only upon review and concurrence by BOEM and BSEE. a. Annual reports must include a summary of the survey reports that includes survey date(s); 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). Annual reports must also include claim data attributable to the project from the Lessee's corporate gear loss compensation policy and procedures. Required data and reports may be archived, analyzed, published, and disseminated by BOEM and BSEE. • Site Clearance and Decommissioning: The Lessee must include and address information on unrecovered marine debris in the description of the site clearance activities provided in the decommissioning application required under 30 C.F.R. § 285.906.			
MUL-2	Anchoring plan	The Lessee must prepare and implement an Anchoring Plan(s) for all areas where anchoring or buoy placement occurs and jack-up barges are used during construction and operations/maintenance within 1,640 feet (500 meters) of habitats, resources, and submerged infrastructure that are sensitive, including sensitive benthic habitats; boulders greater than or equal to 0.5 m; ancient submerged landform features (ASLFs); known and potential shipwrecks; potentially significant debris fields; potential hazards; third-party infrastructure; and any related facility installation activities (such as cable, WTG, and ESP installation). The plan will require that the Lessee consider any new data on benthic habitats and cultural resources to avoid/minimize impacts on these resources to the maximum extent practicable. It 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 Lessee must provide the anchoring plan to BOEM and BSEE to coordinate with NMFS for review before anchoring activities and construction begin. The Lessee must resolve all comments on the anchoring plan to BOEM and BSEE's satisfaction before conducting any OCS seabed-disturbing activities that require anchoring. For operations and decommissioning, the Lessee must provide proposed anchoring plats to BOEM and BSEE for review and concurrence before anchoring activities occur. The proposed anchoring plats must include avoidances identified above and as-placed anchor plats must be submitted to BOEM and BSEE after completion of an activity (including during operations) or construction of a major facility component (e.g., buoys, export cable installation, WTG or OSS installation and interarray cable installation) or decommissioning to demonstrate that seabed-disturbing activities complied with avoidance requirements for seabed features and hazards, archaeological resources, and/or anomalies. As-placed plats must show the "as-placed" location of all anchors and any associated anchor chains and/or wire ropes and relevant locations of interest or avoidance on the seabed for all seabed-disturbing activities. The plats must be at a scale of 1 inch = 1,000 feet (300 meters) with Differential GPS accuracy.	Benthic; Commercial and For-Hire Fishing; Cultural Resources; Finfish, Invertebrates, and EFH; Water Quality	BOEM, BSEE, and NMFS	Previously Applied
MUL-3	Berm survey and report	Where plows, jets, grapnel runs, or other similar methods are used, post-construction geophysical surveys required as part of the Post-Installation Cable Monitoring must be capable of detecting bathymetry changes of 0.5 meters or less and must be completed to determine the height and width of any created berms. The Lessee must capture bathymetry changes greater than 3 feet during the first and second post-installation surveys along the cable routes. If there are bathymetric changes in berm height greater than 1 meter above grade after the second survey, the Lessee must develop and implement a Berm Remediation Plan to restore created berms to match adjacent natural bathymetric contours (isobaths), as technically and/or economically practical or feasible. The Lessee must submit the Berm Remediation Plan to BOEM and BSEE for a review (in coordination with NMFS) within 90 days of completion of the post-construction survey where the change was detected. The Lessee	Benthic; Finfish, Invertebrates, and EFH	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		must resolve all comments on the Berm Remediation Plan to BOEM's and BSEE's satisfaction prior to initiating restoration activities. The final version of the Berm Remediation Plan must be provided to BOEM, BSEE, NMFS, and USACE.			
MUL-4	Final cable protection in hardbottom	The Lessee must avoid the use of engineered stone or concrete mattresses in complex habitat, as practicable and/or feasible. The Lessee must ensure that all materials used for scour and cable protection measures consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-dimensional complexity in height and in interstitial spaces, as practicable and feasible. If concrete mattresses are necessary, bioactive concrete (i.e., with bio-enhancing admixtures) must be used as practicable as the primary scour protection (e.g., concrete mattresses) or veneer to support biotic growth.	Benthic; Finfish, Invertebrates, and EFH	BOEM, BSEE, and NMFS	Previously Applied
MUL-8	Gear identification	To facilitate identification of gear on any entangled animals, all trap/pot gear used in the surveys must be uniquely marked to distinguish it from other commercial or recreational gear. Using yellow and black striped duct tape, place a 3-foot-long mark within 2 fathoms of a buoy. In addition, using black and white paint or duct tape, place three additional marks on the top, middle, and bottom of the line. These gear marking colors are proposed as they are not gear markings used in other fisheries and are therefore distinct. Any changes in marking would not be made without notification and approval from NMFS.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-9	Lost survey gear	The Lessee must ensure that any lost fishery and benthic monitoring survey gear is reported and recovered according to the Marine Debris Awareness and Elimination (MUL-1) measure. All lost gear must also be reported to NMFS GARFO-PRD and BSEE within 24 hours (or as required in the MMPA Incidental Take Authorization (ITA)) of the documented time when gear is discovered to be missing or lost. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-10a	Avoid live bottom features during data collection and site survey activities	All vessel anchoring and any seafloor-sampling activities are restricted from seafloor areas with deep/cold-water coral reefs and shallow/mesophotic reefs. All vessel anchoring and seafloor sampling must also occur at least 150 m from any known locations of threatened or endangered coral species. All sensitive live bottom habitats (eelgrass, cold-water corals, etc.) should be avoided as practicable. All vessels in coastal waters will operate in a manner to minimize propeller wash and seafloor disturbance and transiting vessels should follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon habitat.	Finfish, Invertebrates, and EFH; Benthic	BOEM, BSEE, and NMFS	Previously Applied
MUL-10d	Third-party PSO requirements during data collection and site survey activities	The Lessee must use qualified third-party PSOs to observe Clearance and Shutdown Zones, and implement mitigation measures as outlined in the conditions in MMST-12 and MMST-14. Additionally: • All PSOs must have completed a training program with BOEM-approved PSO training materials. PSOs must also have received NMFS approval to act as a PSO for geophysical surveys. Application requirements to become an NMFS-approved PSO for surveys are available by sending an inquiry to nmfs.psoreview@noaa.gov. The Lessee must provide to BOEM upon request, documentation of NMFS approval as PSOs for geophysical activities in the Atlantic and copies of the most recent training certificates of individual PSOs' successful completion of a commercial PSO training course with an overall examination score of 80% or greater. Instructions and application requirements to become a NMFS- approved PSO can be found at: https://www.fisheries.noaa.gov/national/endangered-species-conservation/protected-species-observers. • For situations where Trained Lookouts are used when PSOs are not required, training must include protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. • PSOs deployed for mitigation, monitoring, and reporting of geophysical survey activities must be employed by a third-party observer provider. While the vessel is underway, they must have no other tasks other than to conduct observational effort, record data, communicate with and instruct relevant vessel crew to the presence of listed species and implement required mitigation and monitoring measures. PSOs on duty must be clearly listed on daily data logs for each shift. o Non-third-party observers may be approved by NMFS on a case-by-case basis for limited, specific duties in support of approved, third-party PSOs. • A minimum of one PSO must be on duty for observing listed species on each vessel at all times, including times with low visibility (e.g., night time, fog) that noise-producing equipment is operating, or the survey vessel is actively transiting. The Lessee must include a PSO schedule showing that the number of PSOs used is sufficient to effectively monitor the affected area for the project (e.g., surveys) and record the required data. 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. • Visual monitoring must occur from the most appropriate vantage point on the associated operational platform that allows for maximum possible 360-degree field of view around the sound source and vessel. If 360-degree field of view is not possible from a single vantage point, multiple PSOs must be on watch to ensure such coverage to ensure both geophysical survey and vessel strike avoidance requirements for ESA-listed species can be implemented. • The Lessee must ensure that suitable equipment is available to each PSO to adequately observe the full extent of the Clearance and Shutdown Zones prior to and during all geophysical survey activity respectively and meet all reporting requirements. The following equipment must be available. o Visual observations must be conducted using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. o Rangefinders (at least one per PSO, plus backups) or reticle binoculars (e.g., 7 x 50) of appropriate quality (at least one per PSO, plus backups) to estimate distances to listed species located in proximity to the Clearance and Shutdown Zone(s). o Digital cameras with a telephoto lens that is at least 300 mm or equivalent on a full-frame single lens reflex (SLR). The camera or lens should also have an image stabilization system. Used to record sightings and verify species identification when possible. o A laptop or tablet to collect and record data electronically. o Global Positioning Units (GPS) if data collection/reporting software does not have built-in positioning functionality. o Any other tools deemed necessary to adequately perform PSO tasks.	Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
MUL-10e	PSO Reporting requirements during site characterization and site assessment/data collection activities	These reporting requirements pertain to site characterization (HRG, geotechnical, and biological surveys) and site assessment/data collection (deployment, operation, and retrieval of meteorological and oceanographic data buoys) activities associated with Atlantic OCS leases. To ensure compliance and evaluate effectiveness of mitigation measures, regular reporting of survey activities and information on listed species will be required as follows. Only vessel surveys which require third-party PSOs will be required to meet reporting requirements. Reporting requirements must be completed if applicable regardless of survey type or type of observer. PSO data must be collected in accordance with standard data reporting, software tools, and electronic data submission standards approved by BOEM and NMFS for the particular activity. • **Monthly Survey Reports.** Monthly reporting of raw PSO data collected during geophysical survey activities must be submitted to BOEM (renewable_reporting@boem.gov) and BSEE (via TIMS Web Portal and protectedspecies@bsee.gov) by the PSO provider on the 15th of each month for each vessel conducting survey work. Any editing, review, and quality assurance checks must be completed only by the PSO provider prior to submission to BOEM and ensure use of standard field codes and formats. Monthly data reporting from all PSO observations must be recorded based on standard PSO collection and reporting requirements. PSOs must use standardized electronic data forms to record data. The PSOs may record data electronically in data collection software, but the data fields listed below must be recorded and exported to an Excel file for submittal. Alternatively, BOEM has developed an Excel spreadsheet with all the necessary data fields that is available upon request. • **Final Survey Reports.** Final survey reports must be submitted to BOEM in coordination with PSO Providers within 90 calendar days following completion of a survey. Final reports must contain all survey activity included under each submitted survey plan, but include individual vessel 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 documented sightings of protected species, survey equipment shutdowns that occurred, any vessel strike-avoidance measures taken, takes of protected species that occurred, and any observed injured or dead protected species. The DOI will work with the Lessee to ensure that DOI does not release confidential business information found in the monitoring reports. • **Instructions for Geophysical Survey Reports**. The following data fields for PSO reports of geophysical surveys must be reported in Excel format (.xml file) along with metadata defining all data fields. **Survey Information:** ○ Project name ○ Lease number ○ State Coastal Zones ○ Survey Contractor ○ Survey Type ○ Reporting start and end dates ○ Visual monitoring equipment used (e.g., bionics, magnification, IR cameras, etc.); ○ Distance finding method used ○ PSO names (last, first), training certification, and affiliation ○ PSO location and observation height above sea surface **Operations Information:** ○ Vessel name(s) ○ Sound sources including equipment type, power levels, and frequencies used ○ Greatest RMS source level ○ Dates of departures and returns to port with port name **Monitoring Effort Information:** ○ Date (YYYY-MM-DD) ○ Source status at time of observation (on/off) ○ Number of PSOs on duty ○ Start time of observations for each shift in UTC (YY-MM-DDT HH:MM) ○ End time of observations for each shift in UTC (YY-MM-DDT HH:MM) ○ Duration of visual observations of protected species ○ Weather ○ Wind speed (knots), direction (cardinal direction) ○ Beaufort Scale sea state ○ Water depth (meters) ○ Visibility (km) ○ Glare severity related to monitoring area (none, slight, moderate, extreme) ○ Time pre-clearance visual monitoring began in UTC (YY-MM-DDT HH:MM) ○ Time pre-clearance monitoring ended in UTC (YY-MM-DDT HH:MM)	Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Duration of pre-clearance visual monitoring ○ Time of day of pre-clearance began (day/night) ○ Time power-up/ramp-up began ○ Time equipment full power was reached ○ Duration of power-up/ramp-up (if conducted) ○ Time survey activity began (equipment on) in UTC ○ Time survey activity ended (equipment off) in UTC ○ Survey Duration ○ Did a shutdown/power-down occur? • Time shutdown was called for (UTC) • Time equipment was shut down (UTC) ○ Vessel location (latitude/longitude, decimal degrees) when survey effort begins and ends; vessel location at beginning and end of visual PSO duty shifts; recorded at :30 intervals if obtainable from data collection software ○ Habitat or prey observations (narrative) ○ Marine debris sightings (narrative) **Detection Information (in addition to the Survey, Operation, and Monitoring fields)** ○ Date (YYYY-MM-DD) ○ Sighting ID (multiple sightings of the same animal or group should use the same ID) ○ Time at first detection in UTC (YY-MMDDT HH:MM) ○ Time at last detection in UTC (YY-MM-DDT HH:MM) ○ PSO name(s) (Last, First) on duty ○ Observer location ○ Number of observes on duty ○ Watch Status (On effort PSO, off effort PSO, opportunistic, crew, alternate vessel/platform) ○ Effort (ON=Device On; OFF=Device Off) ○ Start time of observations ○ End time of observations ○ Location of vessel when detection occurs: Latitude and Longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort sea state ○ Wind speed (knots/direction) ○ Swell Height (meters) ○ Weather/Precipitation ○ Visibility (kilometers) ○ Cloud coverage (%) ○ Glare severity related to monitoring area (none, slight, moderate, extreme) ○ Species (Species Code) ○ Certainty of identification ○ Number of adults (high, low, best) ○ Number of juveniles (high, low, best) ○ Total number of animals or estimated group size ○ Sighting cue (Blow, Breach, White water, Flukes, Body) ○ Bearing to animal(s) when first detected (ship heading in degrees + clock face direction to animal) ○ Distance determination method (use code) ○ Distance from vessel (e.g., reticle distance in meters) ○ Description of unidentified animals (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)			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ If any bow-riding behavior observed, record total duration during detection (YY-MM-DDT HH:MM) ○ Initial heading of animal(s) (ship heading in degrees + clock face direction to animal) ○ Final heading of animal(s) (ship heading in degrees + clock face direction to animal) ○ Shutdown zone size during detection (meters) ○ Was the animal inside the shutdown zone? (Y/N) ○ Closest distance to vessel (reticle distance in meters) ○ Time at closest approach (UTC YY-MM-DDT HH:MM) ○ Time animal entered shutdown zone (UTC YY-MM-DDT HH:MM) ○ Time animal left shutdown zone (UTC YY-MM-DDT 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 ○ Did a shutdown/power-down occur? (Y/N) ○ Time shutdown was called for (UTC) ○ Time equipment was shut down (UTC)			
MUL-13	Protected Species Training for trawl and trap survey staff	The Lessee must ensure all vessels have at least one survey team member onboard each trawl survey and ventless trap survey who has completed Northeast Fisheries Observer Program training (within the last 5 years) or equivalent training (i.e., another training in protected species identification, safe handling, inclusive of taking genetic samples from Atlantic sturgeon). Reference materials for identification, disentanglement, safe handling, and genetic sampling procedures must be available on board each survey vessel. The Lessee must provide documentation of training to NMFS and BSEE at least 7 days prior to the start of the trawl surveys and at any later time that a different observer is deployed on the survey. If the Lessee will deploy non-NEFOP trained observers, the Lessee must submit a training plan to BSEE, BOEM and NMFS GARFO-PRD describing the training that will be provided to the survey observers. The Lessee must submit the PSO Training Plan for Trawl Surveys no later than 7 days prior to the start of trawl surveys. This plan must include a description of the elements of the training (i.e., curriculum, virtual or hands on, etc.) and identify who will carry out the training and their qualifications. Once the training is complete, confirmation of the training and a list of trained survey staff must be submitted to NMFS; this list must be updated if additional staff are trained for future surveys. The Lessee must submit a list of trained survey staff to NMFS GARFO-PRD at least one business day prior to the beginning of the survey. The Lessee must obtain BOEM and BSEE's concurrence with this plan before starting any trawl surveys.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-14a	UXO/MEC avoidance	The Lessee must develop and implement standard protocols for addressing unexploded ordnance (UXOs) risks, including implementation of best available technology to avoid or minimize exposure of protected species and sensitive habitats. Where *in situ* disposal is demonstrated to be necessary for the project, the Lessee must consult with state and federal agencies regarding seasonal restriction windows or other precautions. The Lessee must avoid, to the maximum extent practicable, interactions with UXO/Munitions and Explosives of Concern (MEC). If avoidance is not possible, submitted plans should follow all guidance (see Munitions and Explosives of Concern Survey Methodology and In-Field Testing for Wind Energy Areas on the Atlantic Outer Continental Shelf (pnnl.gov) at: https://tethys.pnnl.gov/sites/default/files/publications/Carton-et-al-2017-BOEM.pdf; Supporting National Environmental Policy Act Documentation for Offshore Wind Energy Development Related to Munitions and Explosives of Concern and Unexploded Ordinances (MEC-UXO White Paper [boem.gov]) at: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/MEC-UXO%20White%20Paper.pdf; or any other applicable regulation regarding interaction with UXO/MEC).	Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and USACE	Previously Applied
MUL-16	Post-storm event monitoring plan	The Lessee must provide a plan for post-storm event monitoring of the facility infrastructure, foundation scour protection, and cables to BSEE with the relevant FDR. The plan must describe how the Lessee will measure and monitor environmental conditions and duration of storm events; specify the environmental condition thresholds (and their associated technical justification) above which post-storm event monitoring or mitigation is necessary; describe potential monitoring, mitigation, and damage identification methods; and state when the Lessee must notify BSEE of post-storm event related activities. At a minimum, initial post-storm event inspections must be conducted for each OSS, met tower, and 10% of the WTGs including associated scour protection, following each storm where any condition(s) exceed one-half the design return period. For example, a WTG platform designed for 50-year environmental conditions must be inspected following a storm event that exceeds 25-year environmental conditions. Environmental condition thresholds are subject to change based on lessons learned during operations. To change the post-storm event inspection environmental condition threshold, the Lessee must submit a revised plan to BSEE for review and concurrence. BSEE reserves the right to require post-storm mitigations and additional inspections to address conditions that could result in safety risks and/or impacts on the environment.	Benthic; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM and BSEE	Previously Applied
MUL-19	Post-installation cable monitoring	The Lessee must conduct an inspection of each interarray, interconnector, and export cable to determine cable location, burial depths, the state of the cable, and site conditions within 6 months following installation of a cable segment. Additional inspections must be conducted within 1 year following completion of the initial post-construction inspection, and every 3 years thereafter until decommissioning. These surveys must also be conducted within 180 days of a storm event (as defined by the post-storm event monitoring plan, described in MUL-16). The Lessee must provide BSEE and BOEM with a cable monitoring report within 90 days following each inspection. Inspections of the interarray and export cables must include HRG methods, involving, for example, multibeam bathymetric survey equipment, and identify seabed features, natural and human-made hazards, and site conditions along federal sections of the cable routing. • If BSEE determines that conditions along the cable corridor warrant adjusting the frequency of inspections (e.g., due to changes in cable burial or seabed conditions that may impact cable stability or other users of the seabed), then BSEE may require the Lessee to submit a revised inspection schedule for review and concurrence.	Benthic; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE	Previously Applied

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		• If BSEE determines that burial conditions have deteriorated or changed significantly and remedial actions are warranted, BSEE will notify the Lessee that the Lessee must submit the following via TIMS Web within 90 days of being notified: a seabed stability analysis, a remedial action plan, and a schedule for completing remedial actions. All remedial actions must be consistent with the approved COP. BSEE will review the plan and schedule and provide any comments within 60 days of receiving the plan. The Lessee must resolve all comments to BSEE's satisfaction. • If the Lessee determines that burial conditions have deteriorated or changed significantly and remedial actions are warranted, the Lessee must submit the following to BSEE via TIMS Web within 90 days of making the determination: the data used to make the determination, a seabed stability analysis, a plan for remedial actions, and a schedule for the proposed work. All remedial actions must be consistent with those described in the approved COP. BSEE will review the plan and schedule and provide comments within 60 days, if applicable. The Lessee must resolve all comments to BSEE's satisfaction.			
MUL-20	Soft start for impact pile driving	The Lessee must use a soft start protocol for impact pile driving of monopiles. Soft start must be used at the beginning of each day's monopile installation, and at any time following a cessation of impact pile driving of 30 minutes or longer. If a marine mammal or sea turtle is detected within or about to enter the applicable clearance zones, prior to the beginning of soft-start procedures, impact pile driving must be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings (i.e., 15 minutes for small odontocetes and 30 minutes for all other marine mammal species and sea turtles).	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-29	Sound Field Verification (SFV) Process, Plan and Reporting	The purpose of the Sound Field Verification (SFV) process is to document sound propagation from foundation installation to verify that the modeled acoustic fields are within expected ranges. The Lessee must perform "Thorough SFV" (defined as recording along a minimum of two radials with at least one radial containing recorders at three or more distances) on the first installation represented by each modeling scenario used. The Lessee must also perform Thorough SFV on the first three foundation installations of the project. The Lessee must also perform "Abbreviated SFV," placing a single recorder approximately 2460 feet (750 meters) from the foundation, on the installation of any foundations not requiring "thorough." If levels measured in any SFV (Thorough or Abbreviated) imply the exceedance of agency-identified ranges to regulatory thresholds, the Lessee must take mitigative actions in consultation with the federal permitting agencies. The Lessee must submit an SFV plan for review by BOEM, BSEE, NMFS, and USACE (when applicable). The Lessee must obtain written concurrence of the SFV plan from BOEM and BSEE before the planned commencement of field activities for pile driving. The plan must include measurement procedures and results reporting that meet ISO standard 18406:2017 (Underwater acoustics – Measurement of radiated underwater sound from percussive pile driving). See Chapter three of *BOEM Nationwide Recommendations for Impact Pile Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* for more information. The submission of raw acoustic data or data products associated with SFV to BOEM may be required. The Lessee must follow the approved plan. The SFV plan should include approximations of the expected variation of key parameters (e.g., difficulty to drive, predicted number of necessary strikes, foundation type, pile size, installation method, hammer energy rating, water depth, seabed composition, and season) across the project and an estimate of how many thorough monitoring locations will be required to cover this variability. The plan must describe how the Lessee selected the Thorough SFV locations, identifying which modeled scenarios match to which foundation locations and therefore to what ranges the results of those SFVs will be compared. The SFV process must be sufficient to assess sound propagation from the foundation and the distances to regulatory acoustic thresholds. The measurements must be compared to the modeled Level A and Level B harassment zones for marine mammals and the injury and behavioral disturbance zones for sea turtles and Atlantic sturgeon. The plan must include a template of both Thorough and Abbreviated SFV interim reports. Thorough SFV interim reports must be submitted to BOEM, BSEE (TIMS), NMFS, and USACE (when applicable) within 48 hours of completion of foundation installation. Thorough SFV interim reports must include expected received level limits for future Abbreviated SFVs that are associated with the same modeled scenario and the Lessee must obtain BOEM and BSEE concurrence on these assumptions. Abbreviated SFV reports must also be submitted to BOEM, BSEE (TIMS), NMFS, and USACE (when applicable) but may be submitted in weekly batch reports as long as Abbreviated SFV measurements are at or below the received level limits defined in Thorough SFVs. The Lessee is referred to the BOEM *Nationwide Recommendations for Impact Pile-Driving Sound Exposure Modeling and Sound Field Measurement for Offshore Wind Construction and Operations Plans* (https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Nationwide%20Recommendations%20for%20Impact%20Pile%20Driving%20Sound%20Exposure%20Modeling%20and%20Sound%20Field%20Measurement.pdf) for other recommendations on what should be contained in the report. A final SFV Report must be submitted for review to agencies within 90 days of the cessation of foundation installation each calendar year. The Lessee must respond to requests for edits and updates in a timely manner.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
MUL-31	Fisheries Sampling gear removal between seasons	No wet storage of trap/pot gear is permitted. All trap/pot gear must be hauled at least once every 30 days, and all gear must be removed from the water and stored on land between survey seasons to minimize risk of entanglement.	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM and BSEE	Previously Applied
MUL-32	Weekly, monthly, and final PSO reporting requirements (including foundation pile driving)	PSOs must collect data consistent with standard reporting forms, software tools, or electronic data forms authorized by BOEM for the particular activity. PSOs must fill out report forms for each vessel with PSOs aboard. Unfilled cells must be left empty and must not contain "NA." The reports must be submitted in Microsoft Word and Excel formats (not as a PDF). Enter all dates as YYYY-MM-DD. Enter all times in 24 Hour Coordinated Universal Time (UTC) as HH:MM. The PSO must create a new entry on the Effort form each time a pile segment changes, or weather conditions change, and at least once an hour as a minimum. The PSO must review and revise all forms for completeness and resolve incomplete data fields before submittal. The file name must follow this format: Lease#_ ProjectName_PSOData_YearMonthDay toYearMonthDay.xls. Data fields must be reported in Excel format. Data categories must include Project, Operations,	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

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		Monitoring Effort, and Detection, as further specified below. All PSO data must be generated through software applications or otherwise recorded electronically by PSOs and provided to BOEM and BSEE in electronic format (CSV files or similar format) and be checked for quality assurance and quality control. Applications developed to record PSO data are encouraged if the data fields listed below can be recorded and exported into Excel. Alternatively, BOEM has developed an Excel spreadsheet, with all the necessary data fields, that is available upon request.
		Weekly Reports. The Lessee must compile and submit weekly reports during construction that document pile driving, HRG survey, and detonation activities, including associated PSO, SFV, and noise abatement activities. These weekly reports must include any information required by a project's final NMFS BiOp and be submitted to NMFS GARFO-PRD, BOEM, and BSEE (protectedspecies@bsee.gov); they may be submitted directly from the PSO providers and may consist of raw data. Weekly reports must be submitted no later than Wednesday for the previous week (Sunday – Saturday). Weekly reports must include:
		• Summaries of pile-driving activities and piles installed, including pile ID, type of pile, pile diameter, start and finish time of each drilling and pile-driving event, hammer log (number of strikes, max hammer energy, duration of piling) per pile, any changes to noise attenuation systems and/or hammer schedule, details on the deployment of PSOs and PAM operators, including the start and stop time of associated observation periods by the PSOs and PAM Operators, and a record of all observations/detections of marine mammals and sea turtles as detailed below;
		• A summary of SFV and NAS implemented with pile driving.
		• Any UXO/MEC detonation activities, including a summary of SFV and NAS implemented during UXO/MEC detonation;
		• Which WTGs become operational and when (a map must be provided);
		• Summaries of HRG survey activities;
		• Vessel operations (including port departures and destinations, number of vessels, type of vessel(s), and route);
		• All protected species detections. This includes: species identification, number of animals, time at initial detection, time at final detection, distance to pile/vessel at initial detection, closest point of approach to pile/vessel, animal direction of travel relative to pile/vessel; description of animal behavior, features used to identify species, and for moving vessels: speed (knots), distance and bearing to animal at initial detection, closest point of approach and bearing to animal, distance and bearing to animal at final detection, and animal direction of travel relative to vessel. Sightings/detections during pile-driving activities (clearance, active pile driving, post-pile driving) and all other (transit, opportunistic, etc.) sightings/detection must be reported and identified as such; and
		• Vessel strike avoidance measures taken.
		Monthly Reports. Starting the first month that in-water activities occur on the OCS, the Lessee must compile and submit monthly reports that include a summary of all project activities carried out in the previous month, including dates and locations of any fisheries surveys, vessel transits (number of transits, name and type of vessel, ports used, and route inclusive of foreign and domestic ports), piles installed (number and ID), HRG surveys conducted, and UXO/MEC detonations, and all observations of ESA-listed whales, sea turtles, and sturgeon (i.e., MM-1, MUL-32, MUL-34, ST-2, MMST-1-2, STF-4 as applicable), inclusive of any mitigation measures taken as a result of those observations. Sightings/detections must include species ID, time, date, initial detection distance, vessel/platform name, vessel activity, vessel speed, bearing to animal, project activity, and if any, mitigation measures taken. These reports must include the information identified in the Project-specific NMFS BiOp, and the Lessee must submit the reports to BOEM, BSEE, and NMFS GARFO-PRD no later than the 15th of the month for the previous month.
		PSOs must collect data consistent with standard reporting forms, software tools, or electronic data forms authorized by BOEM for the particular activity. PSOs must fill out report forms for each vessel with PSOs aboard. Unfilled cells must be left empty and must not contain "NA." The reports must be submitted in Microsoft Word and Excel formats (not as a PDF). Enter all dates as YYYY-MM-DD. Enter all times in 24 Hour Coordinated Universal Time (UTC) as HH:MM. The PSO must create a new entry on the Effort form each time a pile segment changes, or weather conditions change, and at least once an hour as a minimum. The PSO must review and revise all forms for completeness and resolve incomplete data fields before submittal. The file name must follow this format: Lease#_ ProjectName_PSOData_YearMonthDay toYearMonthDay.xls. Data fields must be reported in Excel format. Data categories must include Project, Operations, Monitoring Effort, and Detection, as further specified below. All PSO data must be generated through software applications or otherwise recorded electronically by PSOs and provided to BOEM and BSEE in electronic format (CSV files or similar format) and be checked for quality assurance and quality control. Applications developed to record PSO data are encouraged if the data fields listed below can be recorded and exported into Excel. Alternatively, BOEM has developed an Excel spreadsheet, with all the necessary data fields, that is available upon request.
		Required data fields include:
		• Project Information:
		  ○ Project name
		  ○ Lease number
		  ○ State coastal zones
		  ○ PSO contractors
		  ○ Vessel names
		  ○ Reporting dates (YYYY-MM-DD)
		  ○ Visual monitoring equipment used (e.g., bionics, magnification, IR cameras)
		  ○ Distance finding method used
		  ○ PSO names (Last, First) and training
		  ○ Observation height above sea surface
		• Operations Information:			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Date (YYYY-MM-DD) ○ Hammer type used (make and model) ○ Greatest hammer power used for each pile ○ Pile identifier and pile number for the day (e.g., pile 2 of 3 for the day) ○ Pile diameters ○ Pile length ○ Pile locations (latitude and longitude) ○ Number of vessel transits ○ Types of vessels used ○ Vessel routes used • Monitoring Effort Information: ○ Date (YYYY-MM-DD) ○ Noise source (ON=Hammer On; OFF=Hammer Off) ○ PSO name(s) (Last, First) ○ If visual, how many PSOs on watch at one time? ○ Time pre-clearance visual monitoring began in UTC (HH:MM) ○ Time pre-clearance monitoring ended in UTC (HH:MM) ○ Time pre-clearance PAM monitoring began in UTC (HH:MM) ○ Time PAM monitoring ended in UTC (HH:MM) ○ Duration of pre-clearance PAM and visual monitoring ○ Time power-up or ramp-up began in UTC (HH:MM) ○ Time equipment full power was reached in UTC (HH:MM) ○ Duration of power-up or ramp-up ○ Time pile driving began (hammer on) in UTC (HH:MM) ○ Time pile driving activity ended (hammer off) in UTC (HH:MM) ○ Duration of activity ○ Duration of visual detection ○ Wind speed (kts), from direction • Swell height (m): ○ Water depth (m) ○ Visibility (kilometers) ○ Glare severity ○ Latitude (decimal degrees), longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort scale ○ Precipitation ○ Cloud coverage (%) ○ Did a shutdown/power-down occur? ○ Time shutdown was called for (UTC) ○ Time equipment was shut down (UTC) ○ Habitat or prey observations ○ Marine debris sighted • Detection Information: ○ Date (YYYY-MM-DD) ○ Sighting ID (V01, V02, or sequential sighting number for that day; multiple sightings of the same animal or group must 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=Hammer On; OFF=Hammer Off) ○ If visual, how many PSOs on watch at one time?			

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		○ Start time of observations ○ End time of observations ○ Duration of visual observation ○ Wind speed (kts), from direction ○ Swell height (m) ○ Water depth (m) ○ Visibility (kilometers) ○ Glare severity ○ Latitude (decimal degrees), longitude (decimal degrees) ○ Compass heading of vessel (degrees) ○ Beaufort scale ○ Precipitation ○ Cloud coverage (%) ○ Sightings including common name, scientific name, or family ○ Percent certainty of identification ○ Number of adults ○ Number of juveniles ○ Total number of animals ○ Bearing to animals when first detected (ship heading + clock face) ○ Bearing to animals at closest approach (ship heading+ clock face) ○ Bearing to animal at final detection (ship heading+ clock face) ○ Range from vessel and pile (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 activity and distance from service vessel) ○ Direction of animal travel in first approach relative to vessel and pile ○ 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 (UTC HH:MM) ○ Initial heading of animals (degrees) ○ Final heading of animals (degrees) ○ Shutdown zone size during detection (m) ○ Was the animal inside the shutdown zone? ○ Closest distance to vessel and pile (reticle distance in m) ○ Time at closest approach to vessel and pile (UTC HH:MM) ○ Time animal entered shutdown zone (UTC HH:MM) ○ Time animal left shutdown zone (UTC HH:MM) ○ If observed or detected during ramp-up or power-up: first distance (reticle distance in m), closest distance (reticle distance in m), last distance (reticle distance in m), behavior at final detection ○ Did a shutdown/power-down occur? ○ Time shutdown was called for (UTC HH:MM) ○ Time equipment was shut down (UTC HH:MM) ○ Detections with PAM **Annual Reports**. Beginning one calendar year after the completion of commissioning activities, the Lessee must compile and submit annual reports that include a summary of all project activities carried out in the previous year, including vessel transits (number, type of vessel, ports used, and route), repair and maintenance activities, survey activity, and all observations of ESA-listed species. The annual reports must be submitted to BOEM, BSEE, USACE, and NMFS GARFO. The Lessee must submit these reports by April 1 of each year for the previous calendar year (i.e., the 2026 report is due by April 1, 2027). Upon mutual agreement of NMFS GARFO, BOEM, and BSEE, the frequency of reports can be changed.			
MUL-33	Vessel communication of threatened and endangered species sightings and detections	The Lessee must ensure that whenever multiple project vessels are operating, any detections of ESA-listed species (marine mammals and sea turtles) are communicated in near real time to these personnel on the other project vessels: PSOs, vessel operators, or both. Year-round, all vessel operators must monitor the project's Situational Awareness System, WhaleAlert, USCG VHF Channel 16, and the Right Whale Sighting Advisory System (RWSAS) for the presence of NARWs once every 4-hour shift during project-related activities. The PSO and PAM operator monitoring teams for all activities must also monitor these systems no less frequently	Finfish, Invertebrates, and EFH; Marine	BOEM, BSEE, and NMFS	Previously Applied

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		than every 12 hours. If a vessel operator is alerted to a NARW detection within the project area, the operator must immediately convey this information to the PSO and PAM teams. For any UXO/MEC detonation, vessel operators must monitor these systems for 24 hours prior to detonating any UXO/MEC. Any observations of any large whale by any of the Lessee's staff or contractor, including vessel crew, must be communicated immediately to PSOs and all vessel operators to increase situational awareness.	Mammals; Sea Turtles		
MUL-34	Detected or impacted protected species reporting	The Lessee must report as soon as feasible but no later than 24 hours all observations of injured or dead whales, sea turtles, or sturgeon to BSEE and NMFS GARFO-PRD, including observations and interactions during the fisheries surveys (see STF-4 for additional details on take notification for sea turtles/Atlantic sturgeon during survey activities). The Lessee must ensure its reports reference the project and include the Take Report Form available on NMFS' webpage at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic. The Lessee must ensure reports of Atlantic sturgeon take include a statement as to whether a fin clip sample for genetic sampling was taken. Fin clip samples are required in all cases with the only exception being when additional handling of the sturgeon may result in an imminent risk of injury to the fish or the PSO. Incidents falling within the exception are expected to be limited to capture and handling of sturgeon in extreme weather. Instructions for fin clips and associated metadata are available at https://www.fisheries.noaa.gov/new-england-midatlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic under the "Sturgeon Genetics Sampling" heading. The Lessee must report any suspected or confirmed vessel strike of a sea turtle or sturgeon by any project vessel in any location, including observation of any injured sea turtle/sturgeon or sea turtle/sturgeon parts to BOEM, BSEE, NMFS GARFO-PRD, and to appropriate NOAA stranding hotline (for marine mammals between Maine-Virginia, report to 866-755-6622, and from North Carolina-Florida to 877-942-5343 and for sea turtles from Maine-Virginia, report to 866-755-6622, and from North Carolina-Florida to 844-732-8785) as soon as feasible. The Lessee must include in the report the following information: (a) time, date, and location (latitude/longitude) of the incident; (b) species identification (if known) or description of the animal(s) involved; (c) vessel's speed during and leading up to the incident; (d) vessel's course/heading and what operations were being conducted (if applicable); (e) status of all sound sources in use; (f) 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; (g) environmental conditions (e.g., wind speed and direction, Beaufort scale, cloud cover, visibility) immediately preceding the strike; (h) estimated size and length of animal that was struck; (i) description of the behavior of the animal immediately preceding and following the strike; (j) 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 (k) to the extent practicable, photographs or video footage of the animal(s). In the event that an injured or dead marine mammal or sea turtle is sighted, the Lessee must report the incident to BOEM, BSEE, NMFS GARFO-PRD, and the appropriate hotline (options above), as soon as feasible, but no later than 24 hours from the sighting. The Lessee must include in the report the following information: (a) time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); (b) species identification (if known) or description of the animal(s) involved; (c) condition of the animal(s) (including carcass condition if the animal is dead); (d) observed behaviors of the animal(s), if alive; (e) if available, photographs or video footage of the animal(s); and (f) general circumstances under which the animal was discovered. The Lessee must follow any instructions provided by staff responding to the hotline call for handling or disposing of any injured or dead animals, which may include coordination of transport to shore, particularly for injured sea turtles. **UXO Detonation Reports**. The Lessee must compile and submit reports following any UXO/MEC detonation that provide details on the UXO/MEC that was detonated (e.g., charge size), location of the detonation, the start and stop of associated observation periods by the PSOs and PAM operators, details on the deployment of PSOs and PAM operators, and a record of all observations of marine mammals and sea turtles including time (UTC) of sighting/detection, species ID, behavior, distance (m) from vessel to animal at time of sighting/detection, vessel activity, platform/vessel name, and mitigation measures taken (if any). These reports must include any observations of dead or injured fish or other marine life in the post detonation monitoring period. The Lessee must ensure that the PSO providers submit these reports directly to NMFS GARFO-PRD, BSEE, and BOEM within one week of the detonation. The reports may consist of raw data that has undergone initial QA/QC review, or the raw data must be made available upon request. The Lessee must also ensure that the PSO providers submit all reports of dead or injured ESA listed species directly to NMFS GARFO-PRD, BSEE, and BOEM immediately, but no later than 24 hours following the observation. **Detected or Impacted Dead Non-ESA-Listed Fish**. The Lessee must report any occurrence of at least 10 dead non-ESA-listed fish within established shutdown or monitoring zones to BOEM and to BSEE (via email to protectedspecies@bsee.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting. BOEM or BSEE will notify NMFS GARFO-HESD. The Lessee must confirm the relevant point of contact prior to reporting and confirm the reporting was received. **Protected Species Incident Reporting**. Regardless of activity/survey type or the need to provide a dedicated trained watch stander or PSO, any potential take, strikes, or dead/injured protected species caused by project activities must be reported to the NMFS GARFO Protected Resources Division nmfs.gar.incidental-take@noaa.gov), NOAA Fisheries 24-hour Stranding Hotline – for marine mammals from Maine-Virginia, report to (866) 755-6622, and from North Carolina-Florida to (877) 942-5343 and for sea turtles from Maine-Virginia, report to (866) 755-6622, and from North Carolina-Florida to (844)732-8785, BOEM (at mailto: renewable_reporting@boem.gov), and BSEE (at mailto: protectedspecies@bsee.gov) as soon as practicable, but no later than 24 hours from the time the incident took place (Protected Species Incident Report). The Protected Species Incident Report must include the following information: • Contact info for the person providing the report; • Time, date, and location (latitude/longitude) of the incident; • Species identification (if known) or description of the animal(s) involved; • Condition of the animal(s) (e.g., live, injured, dead); • Observed behaviors of the animal(s), if alive; • If available, photographs or video footage of the animal(s); and	Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• General circumstances (e.g. vessel speed/direction of travel, sound sources in use) under which the animal was impacted. **Dead or Injured Protected Species Reporting**. All dead or injured protected species must be reported, regardless of whether they were observed during operations or directly due to Lessee activities. In the event that an injured or dead marine mammal or sea turtle is sighted, regardless of the cause, the Lessee must report the incident to the NMFS Protected Resources Division (nmfs.gar.incidental-take@noaa.gov), NMFS 24-hour Stranding Hotline number (866-755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at protectedspecies@bsee.gov) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours from the sighting (Dead or Injured Protected Species Report). Staff responding to the hotline call will provide any instructions for the handling or disposing of any injured or dead protected species by individuals authorized to collect, possess, and transport sea turtles. The Protected Species Incident Report must include the following information: • Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable); • Species identification (if known) or description of the animal(s) involved; • Condition of the animal(s) (including carcass condition if the animal is dead); • Observed behaviors of the animal(s), if alive; • If available, photographs or video footage of the animal(s); and • General circumstances under which the animal was discovered.			
MUL-37	Aircraft Detection Lighting System (ADLS)	The Lessee must use an FAA-approved vendor for the ADLS, which will activate the FAA hazard lighting only when an aircraft is in the vicinity of the wind facility to reduce visual impacts at night. The Lessee must confirm the use of an FAA-approved vendor for ADLS on WTGs and OSSs in the FIR.	Birds; Cultural Resources; Marine Mammals; Recreation and Tourism; Sea Turtles; Scenic and Visual Resources	BOEM, BSEE, and FAA	Previously Applied
MUL-40 (Previously NAV-1)	Boulder relocation reporting	The Lessee must provide USCG and NOAA with a comprehensive list and shapefile of positions and areas to which boulders >6.6 feet (>2 meters) will be relocated (latitude, longitude) at least 60 days prior to boulder relocation activities.	Commercial and For-Hire Fishing; Navigation and Vessel Traffic	BOEM, BSEE, USCG, and NOAA	Previously Applied

OU-1	Mitigation for oceanographic high frequency radars	The Lessee must coordinate with the radar operators and the Surface Currents Program of NOAA Integrated Ocean Observing System (IOOS) Office to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators and NOAA IOOS on mitigation efforts. The following options to mitigate operational impacts on oceanographic high-frequency radars have been identified:
		• Data sharing from turbine operators to include the following:
		  ○ Sharing real-time telemetry of surface currents and other oceanographic data measured at locations in the project with radar operators and into the public domain.
		  ○ Sharing time-series of blade rotation rates, nacelle bearing angles, and other information about the operational state of each of the project's turbines with radar operators to aid interference mitigation.
		• Wind turbine curtailment/curtailment agreement between NOAA IOOS, Lessee and BOEM
		Additional modifications identified for oceanographic high-frequency radar systems to mitigate impacts:
		• Signal processing enhancements.
		• Antenna modifications
		If the Lessee's project causes radar interference to the degree that radar performance is no longer within the specific radar systems' operational parameters or fails to meet NOAA IOOS's mission objectives, at least 120 calendar days prior to commissioning the first WTG or the start of blades spinning, whichever is earlier, the Lessee must enter into a mitigation agreement with the Surface Currents Program of NOAA's Integrated Ocean Observing System (IOOS) Office. Within 15 calendar days of entering into the mitigation agreement, the Lessee must provide BOEM with a copy of the executed mitigation agreement. Within 45 calendar days of completing any requirements in the mitigation agreement, the Lessee must provide BOEM and BSEE with evidence of compliance with those requirements.
			Other Uses	BOEM and BSEE	Previously Applied

OU-3	Mitigation for ARSR-4 and ASR-8/9 radars	The Lessee must coordinate with ARSR-4 and ASR-8/9 radar operators, including the FAA and DoD Clearinghouse, to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators on mitigation efforts. Operational mitigations identified for impacts on airport surveillance radar (ASR)-8/9 include: • Passive aircraft tracking using ADS-B or signal/transponder • Increased aircraft altitude near radar • Sensitivity time control (range-dependent attenuation) • Range azimuth gating (ability to isolate/ignore signals from specific range-angle gates) • Track initiation inhibiting, velocity editing, plot amplitude thresholding (limiting the amplitude of certain signals) Modification mitigations for ARSR-4 and for ASR-8/9 systems include:	Other Uses	BOEM and BSEE	Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• Utilizing the dual beams of the radar simultaneously • In-fill radars			
OU-7	Federal Survey Mitigation Program	There are NMFS scientific surveys that overlap with wind energy development in the northeast region. Consistent with NMFS and BOEM survey mitigation strategy actions 1.3.1, 1.3.2, 2.1.1, and 2.1.2 in the NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy – Northeast US Region (Hare et al. 2022),[3] within 120 days of COP approval, the Lessee must submit to BOEM a survey mitigation agreement between NMFS and the Lessee. The survey mitigation agreement must describe how the Lessee will mitigate the project impacts on the NMFS surveys. The Lessee must conduct activities in accordance with such agreement. If the Lessee and NMFS fail to reach a survey mitigation agreement, then the Lessee must submit a survey mitigation plan to BOEM and NMFS that is consistent with the procedures described below, within 180 days of COP approval. BOEM will review the survey mitigation plan in consultation with NMFS Northeast Fisheries Science Center (NEFSC), and the Lessee must resolve comments to BOEM's satisfaction and must conduct activities in accordance with the plan. • As soon as reasonably practicable, but no later than 30 days after the issuance of the project's COP approval, the Lessee must initiate coordination with NMFS NEFSC to develop the survey mitigation agreement. • Mitigation activities specified under the agreement must be designed to mitigate the project impacts on the NMFS NEFSC surveys that overlap with the project. At a minimum, the survey mitigation agreement must describe actions and the means to address impacts on the affected surveys due to the preclusion of sampling platforms and impacts on statistical designs. NMFS has determined that the project area is a discrete stratum for surveys that use a random stratified design. This agreement may also consider other anticipated project impacts on NMFS surveys, such as changes in habitat and increased operational costs due to loss of sampling efficiencies. • The survey mitigation agreement must identify activities that will result in the generation of data equivalent to data generated by NMFS' affected surveys for the duration of the project. The survey mitigation agreement must describe the implementation procedures by which the Lessee will work with NEFSC to generate, share, and manage the data required by NEFSC for each of the surveys impacted by the project, as mutually agreed upon between the Lessee and NMFS/NEFSC. The survey mitigation agreement must also describe the Lessee's participation in the NMFS NEFSC Northeast Survey Mitigation Program to support activities that address regional-level impacts for the surveys.	Other Uses	BOEM and NMFS	Previously Applied
ST-3	Sea turtle disentanglement	The Lessee must ensure all vessels deploying fixed gear (e.g., pots/traps) have adequate disentanglement equipment (i.e., knife and boathook) onboard. Any disentanglement will occur consistent with the Northeast Atlantic Coast STDN Disentanglement Guidelines (https://www.reginfo.gov/public/do/DownloadDocument?objectID=102486501) and the procedures described in Careful Release Protocols for Sea Turtle Release with Minimal Injury (NOAA Technical Memorandum 580; https://repository.library.noaa.gov/view/noaa/3773).	Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
STF-2	Sea turtle/Atlantic sturgeon identification, handling, and resuscitation guidelines	The Lessee must ensure any live, uninjured animals are returned to the water as quickly as possible after completing the required handling and documentation. Live and responsive sea turtles or Atlantic sturgeon incidentally caught and retrieved in gear used in any fisheries survey must be released according to established protocols and whenever at-sea conditions are safe for those releasing the animal(s). Any unresponsive sea turtles or Atlantic sturgeon caught and retrieved in gear used in fisheries surveys must be handled and resuscitated according to established protocols and whenever at-sea conditions are safe for those handling and resuscitating the animal(s). a. To the extent allowed by sea conditions, the Lessee must give priority to the handling and resuscitation of any sea turtles or sturgeon that are captured in the gear being used, if conditions at sea are safe to do so. Handling times for these species must be minimized (i.e., kept to 15 minutes or less) to limit the amount of stress placed on the animals. b. All survey vessels must be equipped with copies of the sea turtle handling and resuscitation requirements found at 50 C.F.R. § 223.206(d)(1) prior to the commencement of any on-water activity (https://media.fisheries.noaa.gov/dam-migration/sea_turtle_handling_and_resuscitation_measures.pdf). These handling and resuscitation procedures (the latter, when necessary) must be executed any time a sea turtle is incidentally captured and brought onboard a survey vessel. c. For sea turtles that appear injured, sick, distressed, or dead (including stranded or entangled individuals), survey staff must immediately contact the Greater Atlantic Region Marine Animal Hotline at 866-755-6622 for further instructions and guidance on handling, retention, potential coordination of transfer to a rehabilitation facility, and/or disposal of the animal. If survey staff are unable to contact the hotline (e.g., due to distance from shore or lack of ability to communicate via phone), then survey staff must contact the USCG via very high frequency (VHF) marine radio on Channel 16. If required, hard-shelled sea turtles (i.e., non-leatherbacks) may be held on board for up to 24 hours, provided conditions during holding are authorized by the NMFS GARFO-PRD-PRD and safe handling practices are followed. If the hotline or an available veterinarian cannot be contacted and the injured animal cannot be taken to a rehabilitation center, activities that could further stress the animal must be stopped. When sea-to-shore contact with the hotline or an available veterinarian is not possible, the animal must be allowed to recover and be responsive before safely releasing it to the sea. d. The Lessee must make attempts to resuscitate any Atlantic sturgeon that are unresponsive or comatose by providing a running source of water over the gills as described in the Sturgeon Resuscitation Guidelines (https://media.fisheries.noaa.gov/dam-migration-miss/Resuscitation-Cards-120513.pdf). The Lessee shall comply with the version effective at the time of COP approval. e. Carcasses of incidentally caught sea turtles and sturgeon must be held in cold storage (frozen is preferred, although refrigerated is permitted if a freezer is not available) until retention or disposal procedures are authorized by the NMFS GARFO-PRD, which may include transfer to an appropriately permitted partner or	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied

[3] Hare, J.A., Blythe, B.J., Ford, K.H., Godfrey-McKee, S., Hooker, B.R., Jensen, B.M., Lipsky, A., Nachman, C., Pfeiffer, L., Rasser, M. and Renshaw, K., 2022. NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast US Region. NOAA Technical Memorandum 292. Woods Hole, MA. 33 pp.

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		facility on shore. Following reporting of an incidental capture, NMFS may authorize that incidentally captured dead sea turtles or Atlantic sturgeon be retained on board the survey vessel, provided that appropriate cold storage facilities are available on the survey vessel.			
STF-4	Take notification for sea turtles/Atlantic sturgeon during survey activities	The Lessee must notify BOEM, BSEE, and NMFS GARFO-PRD via email within 24 hours of any interaction with a sea turtle or sturgeon and include the NMFS take reporting form (https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-take-reporting-programmatics-greater-atlantic). The report must include, at a minimum, the following: (1) survey name and applicable information (e.g., vessel name, station number); (2) Global Positioning System (GPS) coordinates describing the location of the interaction (in decimal degrees); (3) gear type involved (e.g., bottom trawl, gillnet, longline); (4) soak time, gear configuration and any other pertinent gear information; (5) time and date of the interaction; (6) identification of the animal to the species level (if possible); and (7) a photograph or video of the animal (multiple photographs are suggested, including at least one photograph of the head scutes). If reporting within 24 hours is not possible (e.g., due to distance from shore or lack of ability to communicate via phone, fax, or email), the Lessee must submit reports as soon as possible and must submit late reports with an explanation for the delay. The Lessee must submit an annual report within 90 days of the completion of each survey season to BOEM, BSEE, and NMFS GARFO-PRD. The report must include all information on any observations of and interactions with ESA-listed species and contain information on all survey activities that took place during the season, including location of gear set, duration of soak, and total effort. The report on survey activities must be comprehensive of all activities, regardless of whether ESA-listed species were observed.	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM, BSEE, and NMFS	Previously Applied
WQ-1	Avoid zinc anodes	To the extent it is technically and/or economically practicable or feasible, the Lessee must avoid using zinc sacrificial anodes on external components of WTG and OSS foundations to reduce the release of metal contaminants in the water column.	Water Quality	BOEM and BSEE	Previously Applied
WQ-2	Oil Spill Response Plan	In compliance with 33 U.S.C. 1321, and including information identified in 30 CFR part 254 that is applicable to Lessee activities, the Lessee must submit an Oil Spill Response Plan (OSRP) to the BSEE Oil Spill Preparedness Division (OSPD) at BSEEOSPD_ATL_OSRPs@bsee.gov for review and approval prior to the installation of any component that may handle or store oil on the OCS. The OSRP may be lease-specific, or it may be a regional OSRP covering multiple leases. Facilities and leases covered in a regional OSRP must have the same owner or operator (including affiliates) and must be located in the Atlantic OCS region. For a regional OSRP, subject to BSEE OSPD approval, the Lessee may group leases into sub-regions for the purposes of determining worst-case discharge (WCD) scenarios, conducting stochastic trajectory analyses, and identifying response resources. The Lessee's OSRP must be consistent with the National Contingency Plan, Regional Contingency Plan, and the appropriate Area Contingency Plan(s), as defined in 30 CFR 254.6. To continue operating, the Lessee must operate consistently with the OSRP approved by BSEE. The Lessee's OSRP, including any regional OSRP, must contain the following information: 1. Bookmarks. Appropriately labeled bookmarks that are linked to their corresponding sections of the OSRP. 2. Table of Contents. 3. Record of Change. A table identifying the changes made to the current version of the OSRP and, as applicable, a record of changes made to previously submitted versions of the OSRP. 4. Facility and Oil Information. "Facility," as defined in 30 CFR 585.113, means an installation that is permanently or temporarily attached to the seabed of the OCS. An OSS and WTG, as examples, each meet this definition of facility. "Oil," as defined in 33 U.S.C. 1321(a), means oils of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. Dielectric fluid, as an example, meets this definition of oil. The OSRP must: a. List the latitude and longitude, water depth, and distance to the nearest shoreline for each facility that may handle and/or store oil. b. List the oil(s) by product/brand name and corresponding volume(s) on each type of facility covered under the Lessee's OSRP. c. Include a map depicting the location of each facility that may handle and/or store oil within the boundaries of the covered lease area(s) and their proximity to the nearest shoreline. The map must also feature a compass rose, scale, and legend. 5. Safety Data Sheets. The OSRP must include a safety data sheet for every type of oil present on any OCS facility in quantities equal to or greater than 100 gallons. 6. Response Organization. The OSRP must identify a trained Qualified Individual (QI), and at least one alternate, with full authority to implement removal actions and ensure immediate notification of appropriate federal officials and response personnel. The Lessee must designate personnel to serve as trained members of an Incident Management Team (IMT) and identify them by name and Incident Command System (ICS) position in the OSRP. a. "Qualified Individual" (QI) means an English-speaking representative of the Lessee who is located in the United States, available on a 24-hour basis, and given full authority to obligate funds, carry out removal actions, and communicate with the appropriate federal officials and the persons providing personnel and equipment in removal operations. b. "Incident Management Team" (IMT) means the group of personnel identified within the Lessee's organizational structure who manage the overall response to an incident in accordance with the Lessee's OSRP. The IMT consists of the Incident Commander (IC), Command and General Staff, and other personnel assigned to key ICS positions designated in the Lessee's OSRP. With respect to the IMT, the Lessee must identify at least one alternate in the OSRP for the IC, Planning Section Chief (PSC), Operations Section Chief (OSC), Logistics Section Chief (LSC), and Finance Section Chief (FSC). If a contract has been established with a third-party IMT, the Lessee must provide evidence of such a contract in the Lessee's OSRP. 7. Notification Procedures. The OSRP must describe the procedures for spill notification. Notification procedures must include the 24-hour contact information for: a. The QI and an alternate, including phone numbers and email addresses. b. IMT members, including phone numbers and email addresses. c. Federal, state, and local regulatory agencies that must be notified when a spill occurs, including, but not limited to, the National Response Center.	Water Quality	BOEM and BSEE	Previously Applied

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		d. The Oil Spill Removal Organizations (OSRO) and Spill Response Operating Teams (SROT) that are available to respond. e. Other response organizations and subject matter experts that the Lessee will rely on for the Lessee's response. 8. Spill Mitigation Procedures. The OSRP must describe the different discharge scenarios that could occur from the Lessee's facilities and the mitigation procedures that the offshore facility operator and any listed/contracted OSROs would follow when responding to such discharges. The mitigation procedures must address responding to both smaller spills (with slow, low-volume leakage) and larger spills, to include the largest WCD scenario covered under the Lessee's OSRP. To achieve compliance with this section, the OSRP must include the following: a. Procedures for the early detection of a spill (i.e., monitoring procedures for detecting dielectric fluid and other oil-based substances handled or stored on the facility when spilled to the ocean). b. General procedures for ensuring that the source of a discharge is controlled as soon as possible after a spill occurs. c. Procedures to remove oil and oiled debris from shallow waters and along shorelines. d. Procedures to store, transfer, and dispose of recovered oil and oil-contaminated materials and to ensure that all disposal is consistent with federal, state, and local requirements. 9. Resources at Risk. The OSRP must include a concise list of the sensitive resources that could be impacted by a spill. In lieu of listing sensitive resources, the Lessee may identify the areas that could be impacted by a spill from the Lessee's facility and provide hyperlinks to corresponding Environmentally Sensitive Index Maps and Geographic Response Strategies/Plans for those areas from the appropriate Area Contingency Plan(s). 10. OSRO(s) and SROT(s). The OSRO is an entity contracted by the Lessee to provide spill response equipment and/or manpower in the event of an oil spill. The SROT is the trained persons who deploy and operate oil spill response equipment in the event of a spill, threat of a spill, or an exercise. The OSRP must include a list (with contact information) of the OSRO(s) and SROT(s) who are under contract and/or membership agreement to respond to the WCD of oil from the Lessee's offshore facilities. Evidence of such contracts or membership agreements must be provided in the OSRP. 11. Oil Spill Response Equipment. The OSRP must include a list, or a hyperlink to a list, of the oil spill response equipment that is available to the Lessee through a contract and/or membership agreement with the OSRO(s). The OSRP must include a map that shows the oil spill response equipment storage depot(s) and planned/potential staging area(s) for the oil spill response equipment that would be deployed by the facility operators or the OSRO(s) listed in the plan in the event of a discharge. a. The Lessee must ensure that the oil spill response equipment is maintained in proper operating condition. b. The Lessee must ensure that all oil spill response equipment maintenance, modification, and repair records are kept for a minimum of 3 years. c. The Lessee must provide oil spill response equipment maintenance, modification, and repair records to BSEE OSPD upon request. d. The Lessee or the OSRO must provide BSEE OSPD with physical access to the oil spill equipment storage depots and perform functional testing of the equipment upon request. e. BSEE OSPD may require maintenance, modifications, or repairs to oil spill response equipment or require the Lessee to remove response equipment from being listed in the OSRP if it does not operate as intended. 12. Training. The OSRP must include a description of the training necessary to ensure that the QI, IMT, OSRO(s) and SROT(s) are sufficiently trained to perform their respective duties. The Lessee must ensure that the IMT, OSRO(s), and SROT(s) receive annual training. The Lessee's OSRP must provide the most recent dates of applicable training(s) completed by the QI, IMT, OSRO(s) and SROT(s). The Lessee must maintain and retain training records for 3 years and must provide the training records to BSEE upon request. 13. Worst-Case Discharge (WCD) Scenario. The OSRP must describe the WCD scenario for the facility containing the highest cumulative volume of oil(s). For a regional OSRP covering multiple sub-regions, a WCD scenario must be described for each sub-region. a. If multiple candidate WCD facilities contain the same cumulative volume of oil(s), the WCD facility is the one closest to shore. b. The WCD facility must be identified on the facility map consistent with the "Facility and Oil Information" section. c. The OSRP must identify the subset of oil spill response equipment from the inventory listed in the OSRP that will be used to contain and recover the WCD volume. The OSRP must include timeframes for response resources to deploy to the WCD facility. Timeframes must include times for equipment procurement, loadout, travel, and deployment. 14. Stochastic Trajectory Analysis. The OSRP must include a stochastic spill trajectory analysis for the WCD facility. For a regional OSRP containing multiple WCD scenarios, a stochastic trajectory analysis must be included for each WCD scenario. The stochastic trajectory analysis must: a. Be based on the WCD volume. b. Be conducted for the longest period that the discharged oil would reasonably be expected to persist on the water's surface, or 14 days, whichever is shorter. c. Identify the probabilities for oiling on the water's surface and on shorelines, and minimum travel times for the transport of the oil over the duration of the model simulation. Oiling probabilities and minimum travel times must be calculated for exposure threshold concentrations reaching 10 grams per square meter. Stochastic analysis must incorporate a minimum of 100 different trajectory simulations using random start dates selected over a multi-year period. 15. Response Plan Exercise. The OSRP must include a triennial exercise plan for review and concurrence by BSEE to ensure that the Lessee is able to respond quickly and effectively whenever oil is discharged from the Lessee's facilities. Compliance with the National Preparedness for Response Exercise Program guidelines will satisfy the exercise requirements of this section. If the Lessee chooses to follow an alternative exercise program, the OSRP must provide a			

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		description of that program. For a regional OSRP covering multiple sub-regions, the IMT exercise scenarios must be rotated between each sub-region within the triennial exercise period. a. The Lessee must conduct an annual scenario-based notification exercise, an annual scenario-based IMT tabletop exercise (if applicable), and, during the triennial exercise period, at least one functional exercise. b. The Lessee must conduct an annual oil spill response equipment deployment exercise. c. The Lessee must notify BSEE OSPD at least 30 days in advance of any exercise it intends to conduct for compliance with this condition. d. BSEE will advise the Lessee about the options it has to satisfy these requirements and may require changes in the type, frequency, or location of the required exercises, exercise objectives, equipment to be deployed and operated, or deployment procedures or strategies. e. BSEE may evaluate the results of the exercises and advise the Lessee of any needed changes in response equipment, procedures, tactics, or strategies. f. BSEE may periodically initiate unannounced exercises to test the Lessee's spill preparedness and response capabilities. g. The Lessee must maintain and retain exercise records for at least 3 years and must provide the exercise records to BSEE upon request. 16. OSRP Review and Update. The Lessee must review and update the entire OSRP at least once every 3 years and more frequently as needed, starting from the date the OSRP was initially approved. The Lessee must send a written notification to BSEE OSPD upon completion of this review and submit any updates for concurrence. BSEE OSPD may require the Lessee to make changes to the OSRP at any time if it is determined to be outdated or to contain significant inadequacies as discovered through a review of the Lessee's OSRP, information obtained during exercises or actual spill responses, or other relevant information obtained by BSEE OSPD. 17. OSRP Maintenance. The Lessee must submit a revised OSRP to BSEE OSPD within 15 days if any of the following conditions occur: a. The Lessee experiences a change that would significantly reduce its oil spill response capability. b. The calculated WCD volume has significantly increased. c. The Lessee removes a contracted IMT, OSRO, or SROT from the Lessee's plan. d. There has been a significant change to the applicable area contingency plan(s).			
Not Previously Applied					
EJ-1a	Environmental Justice Communications Plan	The Lessee must create an Environmental Justice (EJ) Communications Plan in coordination with populations and communities with EJ concerns that identifies Lessee plans for communicating with these individuals and communities (defined for EJ-1a, and EJ-3 AMMM measures as "communities with environmental justice concerns" as related to Executive Order 14096 and 43 CFR 1508.1(f), referred to herein as "EJ populations"). BOEM will require a Final EJ Communications Plan created in coordination with EJ populations as a term and condition of COP approval, unless, during review of the COP NEPA document and based on COP-specific information on planned activities relative to EJ populations, BOEM determines an EJ Communications Plan is not warranted. The Final EJ Communications Plan shall be submitted to BOEM within 90 calendar days of the Record of Decision on the COP NEPA document. This term and condition would apply to any activity associated with the COP, including those performed by the Lessee's contractor(s). The Final EJ Communications Plan must propose a process for what, how, and to whom the Lessee plans to communicate during activities described in the COP that may affect EJ populations, including construction, operations and maintenance, and decommissioning. Because potential impacts on EJ populations are expected to be much lower during operations and maintenance than during construction or decommissioning, the EJ Communications Plan should reflect different levels of communications, as appropriate, during these different stages. The EJ Communications Plan must be specifically designed for EJ populations and be created in coordination with, at minimum, organizations that serve EJ populations, to inform the Lessee about the best ways to communicate information within EJ populations. The Lessee shall strive to include residents of EJ populations in the creation of the plan. The plan should be made available for review by EJ populations and should outline how the Lessee will advance meaningful engagement on a long-term and continuing basis accounting for each affected community's unique communication and information needs. The EJ Communications Plan must reflect the Lessee's efforts to coordinate with community organizations and leaders in the applicable communities to develop a communication plan that reflects community needs. This AMMM measure is not intended to duplicate communication plan requirements associated with state procurement or state or local permitting processes. The Lessee may utilize efforts or language developed for any state or local requirements to satisfy this Final EJ Communications Plan partially or wholly. The plan shall include EJ populations identified by applicable federal and state-level EJ and related screening tools, or other relevant local information. If states require an EJ Communications Plan with requirements described here, the Lessee may reference the state plan, as applicable. All information must be provided or referenced to fully meet this AMMM measure. In the EJ Communications Plan, the Lessee must: • Describe which EJ populations the EJ Communications Plan will target based on EJ populations identified by the COP NEPA document and any other supplementary information, including communities, organizations, and individual contacts learned about through ongoing engagement activities. The target reach of the EJ Communications Plans should be individuals within communities with environmental justice concerns that may be potentially affected by activities described in the COP. • Describe in detail which activities could impact which areas or populations and at what times; list which activities described in the COP must be included in the EJ Communications Plan and which activities are excluded. • Describe how the EJ Communications Plan was created in coordination with EJ populations and the actions EJ populations want the Lessee to take to demonstrate deep engagement on a long-term continuing basis. • Describe how each potentially affected EJ population desires to be communicated with during activities described in the COP (e.g., communication methods, language needs).	Environmental Justice; Land Use and Coastal Infrastructure	BOEM, BSEE, and USACE	Not Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		• Describe how coordination with other Lessees in the region will occur in advance of communication with EJ populations, especially in cases where onshore activities described in the COP may be in proximity to other projects. The intent of coordination is to reduce engagement redundancy and burden on EJ populations. • Describe how the Lessee will communicate when and where activities described in the COP will take place, who they may affect, and how they may affect EJ populations. • Identify a point of contact to receive reports of impacts throughout the life of the project, and provide notice through appropriate communication methods for the EJ populations potentially affected (e.g., postering, radio announcements) so that this point of contact is available to hear about impacts. • Identify the Lessee's approach to handling reports of impacts. • Describe how the Lessee will respond to any concerns or questions from EJ populations during activities described in the COP, and the process the Lessee will undertake to communicate with EJ populations to ensure these concerns or questions are addressed. Also include (1) how the Lessee will handle any questions or concerns that are not related to that Lessee's activities or applicable to regional offshore wind activities, and (2) how the Lessee will address reports of impacts to EJ populations from the Lessee's activities that are not otherwise addressed by existing AMMM measures or terms and conditions of the COP approval. • Describe when, how, and to whom employment opportunities are advertised and how the Lessee plans to maximize access to those opportunities for EJ populations, including but not limited to the communication and advertising for training programs and hiring processes. • Describe how the Lessee will communicate investment or supply chain opportunities to meet any Lessee commitments to diversity or equal access, including but not limited to those included in NY Bight lease stipulation 7.1. • Include a summary of feedback received from EJ populations on the above bullets (see EJ-3).			
EJ-3	Reporting and feedback requirements for EJ Communications Plan	The Lessee must report its activities under AMMM measure EJ-1a under the annual certification of compliance per 30 CFR 285.633, "How do I comply with my COP?". The Lessee shall provide a summary of any EJ Communications Plan activities that occurred. This report shall describe all actions taken and impacts reported that year through implementation of the EJ Communications Plan. The annual report of implementation of the EJ Communication Plan must provide enough details and description of activities for BSEE to determine if the Lessee is implementing the EJ Communications Plan during construction, operations, and decommissioning. The Lessee is expected to adaptively address communications, as well as address reported impacts, over the life of the project. The Lessee is expected to respond to any recommendations made by EJ populations. All written deliverables may be made publicly accessible on BOEM or BSEE's website; they must be submitted in a ready to publish format that also meets requirements of Section 508 of the Rehabilitation Act (29 U.S.C. 794d), as amended.	Environmental Justice	BOEM, BSEE, and USACE	Not Previously Applied
MUL-22	Received Sound Level Limit (RSLL)	Sound fields generated during impact pile driving of a single foundation in a 24-hour period may not exceed NOAA Fisheries' Level A permanent threshold shift (PTS) limits by the stated date and at the distances below. Current NOAA Fisheries PTS levels that are likely to occur at distances that exceed the proposed ranges are the LF SEL criteria, set at 183 dB (re 1 μPa^2s) weighted LF SEL, and the peak criteria for high-frequency cetaceans (HFC), set at 202 dB re 1 μPa^2 unweighted Lpk, but the Lessee must adhere to any updated thresholds produced by NOAA Fisheries as of the start of installation of piles. • May 1, 2026: After the first three foundations, no exceedance of RSLL beyond 4,921 feet (1,500 meters) from the foundation for 90% of remaining piles. • May 1, 2028: After the first three foundations, no exceedance of RSLL beyond 3,280 feet (1,000 meters) from the foundation for 90% of remaining piles.	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles	BOEM, BSEE, and NMFS	Not Previously Applied
NAV-3	Cable placement for navigation and safety	The Lessee must seek to avoid unfavorable cable placement, including consideration of Federal Aids to Navigation (ATONs), Private Aids to Navigation (PATONs), anchorage areas (including Ambrose Anchorage), Traffic Separation Schemes, and Fairways.	Navigation and Vessel Traffic	BOEM, BSEE, and USCG	Not Previously Applied
OU-2	Mitigation for NEXRAD weather radar systems	The Lessee must coordinate with NEXRAD radar operators, through the Department of Commerce's National Information Telecommunications Administration (NTIA), to assess if the project causes radar interference to the degree that radar performance is no longer within the specified radar system's operation parameters or fails to meet mission objectives. If either is the case, the Lessee must notify BOEM and engage radar operators on mitigation efforts. Operational mitigations to NEXRAD weather radar systems may include the following: • Wind turbine curtailment/curtailment agreement • Phased array radars	Other Uses	BOEM and BSEE	Not Previously Applied
OU-4	Decommissioning in marine minerals resource areas	Infrastructure emplaced in marine minerals resource areas must be removed from the marine mineral resource area during decommissioning. In addition, any request to decommission in place in such areas through a departure request must demonstrate to BOEM's satisfaction that no significant impacts to marine minerals resources or their possible extraction or use will occur.	Other Uses	BOEM and BSEE	Not Previously Applied
STF-5	Trailing suction hopper dredge mitigation	If a trailing suction hopper dredge is used offshore, operators must disengage dredge pumps when the dragheads are not actively dredging and therefore working to keep the draghead firmly on the bottom in order to prevent impingement or entrainment of ESA-listed fish and sea turtle species. A state-of-the-art solid-faced deflector that is attached to the draghead must be used on all hopper dredges at all times. Pumps must be disengaged when lowering dragheads to the bottom to start dredging, turning, or lifting dragheads off the bottom at the completion of dredging.	Finfish, Invertebrates, and EFH; Sea Turtles	BOEM and BSEE	Not Previously Applied
VIS-7	Monitoring impacts on scenic and visual resources	In coordination with BOEM, the Lessee must prepare and implement a scenic and visual resource monitoring plan that monitors and compares the visual effects of the wind project during construction and operations/maintenance (daytime and nighttime) to the findings in the COP Visual Impact Assessment and verifies the accuracy of the visual simulations (photo and video). The monitoring plan must include monitoring and documenting the meteorological influences on actual wind turbine visibility over 3 years of operation, with the possibility of extension depending on consistency in data results, from selected onshore key observation points, as determined by BOEM and the Lessee.	Scenic and Visual Resources	BOEM and BSEE	Not Previously Applied

Measure ID[1]	Measure Name	Description	Resource Area Mitigated	Anticipated Enforcing Agency	Previously Applied or Not Previously Applied
		In addition, the Lessee shall include monitoring the operation of ADLS in the monitoring plan. The Lessee must monitor the frequency that the ADLS is operative, documenting when (dates and time) the aviation warning lights are in the on position and the duration of each event. Details for monitoring and reporting procedures must be included in the plan.			

[1] AMMM measure identification numbers start with a prefix corresponding to the resource or resources for which they were designed to mitigate and are defined as follows: AQ = air quality; BB = Birds and Bats; BEN = Benthic Resources; BIR = Birds; COMFIS = Commercial and For-Hire Recreational Fishing; CUL = Cultural Resources ; EJ = Environmental Justice; MM = Marine Mammal; MMST = Marine Mammals and Sea Turtles; MUL = Multiple; NAV = Navigation; OU = Other Uses; REC = Recreation and Tourism; ST = Sea Turtle; STF = Sea Turtle and ESA-listed Fish species; VIS = Scenic and Visual Resources; WQ = Water Quality

µPa = micro pascal; ADLS = aircraft detection lighting system; ADS-B = automatic dependent surveillance–broadcast; AMMM = avoidance, minimization, mitigation, and monitoring; AMP = alternative monitoring plan; ARSR-4 = air route surveillance radar; ASLF = ancient submerged landform features; ASR = airport surveillance radar; ASV = autonomous surface vehicles; ATONs = federal aids to navigation; AUV = autonomous underwater vehicle; BBPCMP = Bird and Bat Post-Construction Monitoring Plan; BiOp = biological opinion; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = code of federal regulation; COP = Construction and Operations Plan; CSV = comma-separated values; dB = decibel; DMA = dynamic management area; DoD = Department of Defense; DOI = Department of the Interior; EJ = environmental justice; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FDR = facility design report; FIR = fabrication and installation report; FSC = Finance Section Chief; GARFO = Greater Atlantic Regional Fisheries Office; GHG = greenhouse gas; GPS = global positioning system; HD = high definition; HOV = human-occupied vehicles; HRG = high resolution geophysical; IC = Incident Commander; ICS = Incident Command System; IMPLAN = impact analysis for planning; IMR = injury and mortality reporting; IMT = Incident Management Team; IOOS = integrated ocean observing system; IR = inadvertent returns; ISO = independent system operator; IT = incidental take; JPEG = joint photographic experts group; kHz = kilohertz; km = kilometers; LOA = letter of authorization; LSC = Logistics Section Chief; MEC = munitions and explosives of concern; MMP = marine minerals program; MMPA = Marine Mammal Protection Act; NABat = North American Bat Monitoring Program database; NARW = North Atlantic right whale; NAS = noise attenuation system; NCEI = National Centers for Ecological Information; NEFOP = northeast fisheries observer program; NEFSC = Northeast Fisheries Science Center; NEPA = National Environmental Policy Act; NEXRAD = Next Generation Weather Radar; NJDEP = New Jersey Department of Environmental Protection; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRHP = National Register of Historic Places; nT = nanotesla; NYSDEC = New York State Department of Environmental Conservation; NYSDOS = New York State Department of State; NYSERDA = New York State Energy Research and Development Authority; OCS = outer continental shelf; OPR = office of protected resources; OSC = Operations Section Chief; OSPD = Oil Spill Preparedness Division; OSRO = Oil Spill Removal Organizations; OSRP = Oil Spill Response Plan; OSS = offshore substation; PAM = passive acoustic monitoring; PATON = private aids to navigation; PDC = project design criteria; PDF = portable document format; POWERON = Partnership for an Offshore Wind Energy Regional Observation Network; PSC = Planning Section Chief; PSO = protected species observer; PTS = permanent threshold shift; QA/QC = quality assurance quality control; QI = Qualified Individual; RP = Recommended Practice; ROV = remotely operated vehicle; RSLL = received sound level limit; RVMP = Reduced Visibility Monitoring Plan; RWSC = Regional Wildlife Science Collaborative; SBP = sub-bottom profiler; SFV = sound field verification; SLR = single lens reflex; SLVIA = seascape, landscape, and visual impact assessment; SMA = seasonal management area; SMS = safety management system; SROT = Spill Response Operating Teams; STDN = sea turtle disentanglement network; T&C = terms and conditions; TIFF = tag image file format; TIMS = technical information management systems USACE = United States Army Corp of Engineers; U.S.C. = United States Code; USCG = United States Coast Guard; USFWS = United States Fish and Wildlife Service; UTC = universal time coordinated; UXO = unexploded ordnance; VFH = very high frequency; WCD = worst-case discharge; WTGs = wind turbine generators

Table G-2. Recommended Practices (RP) for Future Analysis

RP ID[1]	RP Name	Description	Applicable Resource Area
AQ-1	Using a substitute insulator gas in the switch gears and transmission systems to the maximum extent possible	The Lessee should evaluate the feasibility of using non-SF_6 switchgear and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. To the maximum extent feasible, the Lessee should use a substitute insulator gas rather than SF6 in the switchgear and transmission systems. If the Lessee determines using non-SF6 switchgear is infeasible then the Lessee should provide written justification of this determination to BOEM. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-2	Cleaner fuels for vessels, equipment, and vehicles engaged in activities on the OCS	The Lessee is encouraged to replace diesel fuel and marine fuel oil with alternative fuels such as natural gas, propane, or hydrogen, to the extent that use of such alternative fuels is feasible and provides emissions reductions. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-3	Electrification of vessels, equipment, and vehicles engaged in activities on the OCS	The Lessee is encouraged to replace combustion engines with zero-emissions technology (fuel cell-electric or battery-electric) if feasible. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-4	Exhaust aftertreatment for vessels engaged in activities on the OCS	The Lessee should evaluate, on a vessel-specific basis, the use of exhaust aftertreatments such as emission control technologies, for example, scrubbers for SO_2 and selective catalytic reduction for NO_X. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-5	Exhaust aftertreatment for older engines in vehicles and equipment engaged in activities on the OCS	The Lessee is encouraged to use diesel particulate filters and diesel oxidation catalysts to retrofit older (USEPA Tiers 1–3) diesel engines if feasible. The Lessee should evaluate the feasibility of this mitigation measure and should provide the evaluation to BOEM for review as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages. Any instances where the Lessee believes there is technical (and/or economic) infeasibility should be supported by a technical feasibility analysis, as appropriate.	Air Quality and GHG Emissions
AQ-6	Zero-emissions technologies	The Lessee is encouraged to require its contractors to use ports equipped with shore power and zero-emissions material-handling equipment, and construction firms that offer alternative-fueled or zero-emissions equipment and vehicles.	Air Quality and GHG Emissions
AQ-7	Diesel engine emissions standards	The Lessee is encouraged to require contractors using diesel engines that use a combination of combustion and post-combustion controls to meet or exceed applicable marine engine standards. These include the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI for foreign vessels; 40 CFR Part 1039 for Tier 1 and 2 domestic marine diesel engines smaller than 37 kW- Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines; 40 CFR Part 1042 for Tier 1 and 2 domestic marine diesel engines larger than 37 kW- Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels; and 40 CFR Part 1042 for Tier 3, Tier 4 Interim, and Tier 4 Final domestic marine diesel engines- Control of Emissions from New and In-Use Marine Compression-Ignition Engines and Vessels. On-road engines, non-road engines, and aircraft engines will meet or exceed similar standards, where practicable.	Air Quality and GHG Emissions

RP ID[1]	RP Name	Description	Applicable Resource Area
AQ-8	Technical feasibility analysis of air quality RPs	This measure encourages the Lessee to perform and present a technical feasibility analysis for air quality RPs 1 through 5 (AQ-1 – AQ-5), ensuring a comprehensive review of each measure's effectiveness, and readiness for implementation. The technical feasibility analysis should be submitted to BOEM/BSEE as part of a brief memo following finalization of the FDR and FIR, totaling no more than 10 pages.	Air Quality and GHG Emissions
BB-4	Bird and bat monitoring plan framework	The Lessee should develop a framework for a Bird and Bat Post-Construction Monitoring Plan (BB-3) in coordination with BOEM and USFWS. The Lessee is encouraged to include this framework with their initial COP submission or subsequent updated versions.	Bats, Birds
BEN-3	Benthic Survey Guidelines	The Lessee is encouraged to follow the BOEM Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585 (updated June 2019, at: https://www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Renewable-Benthic-Habitat-Guidelines.pdf) with regards to pre-, during- and post-construction benthic monitoring survey plan design.	Benthic
COMFIS-4	Fisheries mitigation	**Static cable design elements** are recommended: • All static cables should be buried to a minimum depth of 3 feet below stable seabed where technically feasible. Technical feasibility constraints include seabed conditions that preclude burial, such as telecommunication cable crossings. Deeper cable burial depths may be required dependent on risks identified in cable route design (see the Carbon Trust's Cable Burial Risk Assessment Methodology at: https://ctprodstorageaccountp.blob.core.windows.net/prod-drupal-files/documents/resource/public/cable-burial-risk-assessment-guidance.pdf). • The Lessee should avoid installation techniques that raise the profile of the seabed, such as the ejection of large, previously buried rocks or boulders onto the surface. The ejection of this material may damage fishing gear. If raising the profile of the seabed is unavoidable, the Lessee should propose measures in the COP to minimize the total area of impact through measures such as removing potential obstructions from areas where bottom-tending fishing gear is actively used or consolidating such obstructions in areas where bottom-tending fishing gear is not actively used. • If needed, cable protection measures should reflect the pre-existing conditions at the site. This mitigation measure ensures that seafloor cable protection does not introduce new obstructions for mobile fishing gear. Thus, the cable protection measures should be trawl-friendly with tapered or sloped edges. If cable protection is necessary in "non-trawlable" habitat, such as rocky habitat, then the Lessee should use materials that mirror the benthic environment. • Where technically and economically feasible, cables should share corridors and minimize the total area disturbed. **Project design** should be planned in coordination with fisheries: • The facility design should seek to maximize existing access to fisheries in balance with other siting constraints by considering: a. Transit within the project area and traditional fishing activities within the project area. b. Consolidation of infrastructure, where practicable, to reduce space-use conflicts. c. Technologies to reduce total project area and meet energy production commitments. • Turbine locations should be sited to avoid areas of commercial fishery production such as known sensitive benthic features and natural and artificial reefs. • Facility planning should use nature-inclusive designs (see Evaluating the Effectiveness of Nature Inclusive Design Materials at: https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf), where applicable, to maximize available habitat for fish. • Installation techniques and time windows should minimize disruption to fishing activities (e.g., simultaneous lay and burial, or conducting activity during the appropriate time of year). To improve **safety** at sea in and around offshore wind facilities, BOEM recommends that the Lessee consider the following measures in its plan submittals: • Charting all facilities and obstructions resulting from construction and operations of an offshore wind energy facility and providing that information to NOAA, USCG, and navigational software companies. • Employing liaisons with experience in the commercial fishing industry to provide safety and communication services during construction. • Monitoring cable burial in real-time and reporting all potential hazard events to USCG as soon as possible throughout the life of the project. • Using digital information technology platforms (e.g., smartphone applications) to bring together survey and construction schedules and locations in addition to standard local notices to mariners via the USCG. • Marking facilities and appurtenances with permanent identification of the project and company. • Providing training opportunities for the commercial fishing industry to simulate safe navigation through a wind facility in various weather conditions and at various speeds. • Monitoring safety threats (e.g., radar disruption, ice shedding, vessel allisions and collisions, security threats, unexploded ordnance/munitions of explosive concern, and impacts on search and rescue efforts) throughout the life of a project. • Consulting with the fishing industry and USCG to identify which structures would be most appropriate for Automatic Identification System (AIS) transponders consistent with BOEM's Lighting and Marking Guidelines (https://www.boem.gov/2021-lighting-and-marking-guidelines). • Considering Lessee-funded radar system upgrades for commercial and for-hire recreational fishing vessels (e.g., solid state Doppler-based marine vessel radar systems; see National Academies of Science Engineering and Medicine 2022).[4]	Commercial and For-Hire Fishing
COMFIS-5	Fisheries Survey Guidelines	The Lessee should follow the BOEM Fisheries Survey Guidelines (Fisheries Guidelines, updated March 27, 2023, at: https://www.boem.gov/sites/default/files/documents/about-boem/Fishery-Survey-Guidelines.pdf) with regards to pre-, during- and post-construction fisheries monitoring survey plan design.	Commercial and For-Hire Fishing; Marine Mammals
COMFIS-7	Fisheries Compensation Fund	The Lessee should consider contracting with a neutral third-party, such as a regional fund administrator, to process claims, manage, and disburse funds, and handle appeals.	Commercial and For-Hire Fishing
CUL-7	Section 106 mitigation fund	Through consultation, BOEM may request that the Lessee financially contributes to a third-party managed compensatory mitigation fund to address visual impacts on aboveground historic properties related to OCS offshore wind activities.	Cultural Resources
EJ-1b	Draft Environmental Justice Communication Plan	The Draft Environmental Justice (EJ) Communications Plan should be created in coordination with EJ populations and identify Lessee plans for communicating with EJ communities or populations (defined for EJ-1a and EJ-3 AMMM measures as "communities with environmental justice concerns" as related to Executive Order 14096 and the revised implementation	Environmental Justice

[4] National Academies of Science Engineering and Medicine. 2022. Wind Turbine Generator Impacts to Marine Vessel Radar. Washington, D.C.: The National Academies Press. https://doi.org/10.17226/26430.

RP ID[1]	RP Name	Description	Applicable Resource Area
		regulations for NEPA (National Environmental Policy Act Implementing Regulations Revisions Phase 2; 89 Federal Register 35554 – 35577 (May 1, 2024)), referred to herein as "EJ populations"). The Lessee should develop a Draft EJ Communications Plan early in the project planning process. The Lessee is encouraged to submit a Draft EJ Communications Plan to BOEM for BOEM's feedback prior to publication of the Draft COP NEPA document. This will allow sufficient time for coordination with EJ populations during the development of an EJ Communications Plan in advance of activities. The Draft EJ Communications Plan should propose a process for how the Lessee plans to communicate during activities described in the COP, including construction, operations, and decommissioning. Because potential impacts on EJ populations are expected to be much lower during operations than during construction or decommissioning, the Draft EJ Communications Plan should reflect different levels of communications, as appropriate, during these different stages. The Lessee may utilize efforts or language developed for any state requirements (e.g., measures identified through state renewable energy procurement processes or as requirements of state permits) to satisfy this Draft EJ Communications Plan partially or wholly. In order to meet the intent of this RP to enhance ongoing Lessee communications with EJ populations, this Draft EJ Communications Plan should be developed in consultation with community leaders and community organizations who work with the identified EJ population(s). Plans should be specifically designed for EJ populations and advance meaningful engagement based on each affected community's unique communication and information needs. EJ populations should be identified by any applicable federal and state-level EJ and related screening tools, or other relevant local information.	
EJ-2	Environmental Justice Impact Mitigation Plan	An EJ Impact Mitigation Plan (Plan) is recommended if EJ populations would potentially be impacted by onshore construction activities or any activity associated with the COP, including activities of the Lessee's contractor(s). The Lessee is encouraged to submit a Draft Environmental Justice Impact Mitigation Plan during COP review, prior to publication of the Draft COP NEPA document. Submission of a Final Environmental Justice Impact Mitigation Plan is recommended before construction begins. The Environmental Justice Impact Mitigation Plan should be created in coordination with EJ populations, and should describe existing state or local requirements (e.g., noise ordinances; dust abatement requirements) that may reduce impacts in order to avoid any duplication. The plan should also describe scenarios of what actions, including distribution of mitigation resources or other mitigation strategies, the Lessee will take if the Lessee receives notice of an impact occurring. For engagement with EJ populations during development of the Impact Mitigation Plan, BOEM encourages the Lessee to coordinate with other Lessees, per the New York Bight Lease Sale lease stipulation (87 Federal Register 2446, VI, (a)), and to carry out engagement in coordination with the development of the communications plan (EJ-1a). The EJ Impact Mitigation Plan should provide sufficient detail on how impacts can be reported, how eligibility for action will be determined, and how EJ populations will have access to mitigation resources or how other mitigation strategies will be implemented. The Impact Mitigation Plan should include a description of all potential mitigation resources or strategies and the duration for which distribution of resources or strategy implementation will occur based on anticipated activity length and localized impacts. The plan should also outline roles and responsibilities of households and the Lessee, and there should be clear guidelines around principles of equity, transparency, and fairness. The EJ Impact Mitigation Plan should demonstrate that potentially affected EJ populations were coordinated with and had multiple and varied opportunities to provide information about the most effective and equitable strategies for all processes, including reporting of impacts, resource distribution, or implementation of mitigation strategies.	Environmental Justice
MM-2	Real-time PAM monitoring and alert system for baleen whales	A near real-time passive acoustic monitoring (PAM) system for the detection of baleen whales in the NY Bight during offshore wind development activities should be implemented, with an alert system/notice to mariners/construction operators. This could be achieved through the deployment of several ocean gliders or fixed PAM systems in the broader NY Bight area. The equipment could be deployed anywhere there is offshore wind development activities, including in the lease areas, but may be particularly useful between lease areas where the placement of other real-time PAM systems is not already directed, or near transit or cable-laying corridors, or other locations where real-time alerting of marine mammal presence would be beneficial to the offshore wind-related activities occurring in one or more lease areas. Every effort should be made to deploy equipment in advance of any on-water activity, including site characterization work, construction work, etc., to provide situational awareness toward vessel strike risk. Each system should be equipped with reliable PAM technology and marine mammal detection and classification software. Detections will be transmittable to a PAM analyst for verification. The systems will be capable of alerting offshore wind developers that a baleen whale has been detected in the general area of offshore wind development-related activity, through methods such as Whale Alert or an offshore wind-specific notification system. This could also be achieved through partnership with other industries, academia, NGOs, and federal agencies in a regional effort. A plan detailing any proposed localization system and analysis methods should be submitted and discussed with BOEM and other relevant permitting agencies in advance of deployment. This real-time PAM alert system will increase the opportunity to detect marine mammals in the greater NY Bight area, providing the opportunity for increased situational awareness (for vessel strike avoidance) to PSOs and others of marine mammal presence in the area. In addition, raw data or data products associated with real-time PAM should be submitted for archiving at the National Centers for Environmental Information or a similar entity determined by BOEM as soon as practicable after instrument retrieval. The archived data will be integrated into community PAM efforts in the broader region, such as through the Regional Wildlife Science Collaborative, to understand marine mammal distribution/occurrence in the area, which can then be used to inform future predictions of potential impacts to marine mammals.	Marine Mammals
MM-7	Additional vessel-related measures for the North Atlantic right whale	The Lessee should develop and implement the project's schedule to reduce vessel density during the times of year when North Atlantic right whales are most likely to occur in lease areas and along vessel routes. The Lessees should coordinate across different offshore wind development projects to reduce cumulative vessel density within the region to the extent practicable. Time periods of highest risk include but are not limited to during foraging and migration and times when mother-calf pairs, pregnant females, surface active groups (indicative of breeding or social behavior), or aggregations of three or more whales (indicative of feeding or social behavior) are, or are expected to be, present. Time periods should be defined based on the best available scientific information.	Marine Mammals
MM-8	Effectiveness criteria for vessel strike avoidance plans	The Lessee should include in its vessel strike avoidance plans the effectiveness criteria being applied. The joint Regional Wildlife Science Collaborative for Offshore Wind (RWSC) and Marine Technology Society Technology Workshop Series may be a good resource for such effectiveness criteria.	Marine Mammals
MUL-5	Low noise best practices	For onshore and offshore project activities and across all phases of construction and operations, operators should use equipment, technology, and best practices that produce the least amount of noise practicable to avoid and minimize noise impacts on the environment. See the following as examples: low noise foundations (MUL-6), vessel noise reduction guidelines (MUL-7), and the received sound level limit (MUL-22).	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Land Use and Coastal Infrastructure; Marine Mammals; Recreation and Tourism; Sea Turtles

<table>
<tr><th>RP ID[1]</th><th>RP Name</th><th>Description</th><th>Applicable Resource Area</th></tr>
<tr><td>MUL-6</td><td>Low noise foundations</td><td>BOEM encourages the use of low noise practices in foundation installation. The use of non-pile-driving foundation types (e.g., suction buckets, gravity-based foundations, etc.) should be considered first. If not practicable, then the use of the best available quieting technology should be applied to reach the received sound level limit (MUL-22). (See Appendix J for discussion on non-pile-driving foundations and noise abatement.) In addition, through the COP or a separate report, the Lessee should submit to BOEM (on behalf of BOEM, BSEE, NMFS and USACE) justification for why the use of non-pile-driving foundations is not possible.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-7</td><td>Vessel noise reduction guidelines</td><td>To the extent reasonable and practicable, BOEM encourages the Lessee to follow the most current International Maritime Organization’s (IMO) Guidelines for the reduction of underwater radiated noise, including propulsion noise, machinery noise, and noise from dynamic positioning systems of any vessel associated with the project. BOEM encourages the Lessee to use quieter ships wherever possible, especially for new vessel builds, and contribute to the Experience Building Phase as outlined by the IMO endorsed Action Plan developed by the Sub-Committee on Ship Design and Construction for underwater noise reduction.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-10b</td><td>Avoid spawning and developmental habitat of sturgeon during data collection and site survey activities</td><td>No geotechnical or bottom-disturbing activities should take place during the spawning/rearing season within freshwater reaches of rivers where Atlantic or shortnose sturgeon spawning occurs. Any survey plan that includes geotechnical or other benthic sampling activities in freshwater reaches (salinity 0-0.5 ppt) of such rivers will identify a time of year restriction that will avoid such activities during the time of year when Atlantic sturgeon spawning and rearing of early life stages occurs in that river. Time of year restrictions include the following:
<table>
<tr><td>River</td><td>No Work Window</td><td>Area Affected</td></tr>
<tr><td>Hudson</td><td>April–July</td><td>Upstream of Newburgh, NY – Beacon Bridge/Rt 84</td></tr>
<tr><td>Delaware</td><td>April–July</td><td>Upstream of the Delaware Memorial Bridge</td></tr>
</table></td><td>Finfish, Invertebrates, and EFH; Benthic</td></tr>
<tr><td>MUL-10c</td><td>Minimize vessel interactions with listed species during use of a moon pool</td><td>During times of year when sea turtles are known to occur in the survey area and if there is an intention to utilize a moon pool for the required activities, the following RPs should be followed:
Closure of the Hull Door:
Should the moon pool have a hull door that can be closed, then prior to and following closure, the moon pool must be monitored continuously by a dedicated crew observer with no other tasks to ensure that no individual protected species is present in the moon pool area. If visibility is not clear to the hull door from above (e.g., turbidity or low light), 30 minutes of monitoring is required prior to hull door closure.
If a protected species is observed in the moon pool prior to closure of the hull door, the hull door must not be closed, to the extent practicable. If the observed animal leaves the moon pool, the operator may commence closure. If the observed animal remains in the moon pool, contact BSEE prior to closure of the hull doors according to reporting requirements (see Reporting of Observations of Protected Species within an Enclosed Moon Pool below).
Reporting of Observations of Protected Species within an Enclosed Moon Pool:
If a protected species is observed within an enclosed moon pool and does not demonstrate any signs of distress or injury or an inability to leave the moon pool of its own volition, RPs described in this section should be followed (only in cases where they do not jeopardize human safety). Although this particular situation may not require immediate assistance and reporting, a protected species could potentially become disoriented with their surroundings and may not be able to leave the enclosed moon pool of their own volition. In order for operations requiring use of a moon pool to continue, the following reporting RPs should be followed:
Within 24 hours of any observation, and daily after that for as long as an individual protected species remains within a moon pool (i.e., in cases where an ESA listed species has entered a moon pool but entrapment or injury has not been observed), the following information should be reported to BSEE (protectedspecies@bsee.gov). For an initial report, all information described above should be included.
For subsequent daily reports:
Describe the animal’s status to include external body condition (e.g., note any injuries or noticeable features), behaviors (e.g., floating at surface, chasing fish, diving, lethargic, etc.), and movement (e.g., has the animal left the moon pool and returned on multiple occasions?);
Description of current moon pool activities, if the animal is in the moon pool (e.g., drilling, preparation for demobilization, etc.);
Description of planned activities in the immediate future related to vessel movement or deployment of equipment;
Any additional photographs or video footage of the animal, if possible;
Guidance received and followed from NMFS liaison or stranding hotline that was contacted for assistance;
Whether activities in the moon pool were halted or changed upon observation of the animal; and
Whether the animal remains in the moon pool at the time of the report, or if not, the time/date the animal was last observed.
BOEM does not advocate the lowering of crew members into the moon pool to free protected species and NMFS should be contacted if protected species are encountered in the moon pool.</td><td>Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-12</td><td>Ecological design elements</td><td>The Lessee is encouraged to incorporate ecological design elements into the project design where practicable. For example, nature-inclusive design products are an alternative to traditional concrete that enhance or encourage the growth of flora or fauna when placed in a marine environment and could result in reduced GHG emissions compared to conventional concrete. Other examples include artificial reefs or using nature-based scour protection such as oyster beds.</td><td>Air Quality and GHG Emissions; Benthic; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-14b</td><td>MEC Avoidance Best Practices</td><td>If MEC avoidance is not possible, submitted UXO/MEC avoidance plans should follow, when finalized, the US Committee on the Marine Transportation System general guidance addressing MEC at: https://www.cmts.gov/Portals/75/Documents/page_offshore_energy/DOT-OST-2023-0117-0001_attachment_1.pdf</td><td>Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles</td></tr>
<tr><td>MUL-18</td><td>Shared transmission corridor</td><td>Lessees should coordinate transmission infrastructure among projects. Where practicable, transmission infrastructure should use shared intra- and interregional connections, have requirements for meshed infrastructure, apply parallel routing with existing and proposed linear infrastructure (including export cables and other existing infrastructure such as power</td><td>Benthic; Coastal Habitat and Fauna; Commercial and For-Hire Fishing;</td></tr>
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RP ID[1]	RP Name	Description	Applicable Resource Area
		and telecommunication cables, pipelines), and have a limited combined footprint to minimize impacts and maximize potential capacity. Where possible, Lessees should incorporate cable siting principles and routing measures for export cables and associated substations developed from the Atlantic Offshore Wind Transmission Study and the BOEM/DOE transmission planning effort, the NYSERDA's Offshore Wind Cable Corridor Constraints Assessment,[5] associated NYS Public Service Commission orders, and the results of other state and ISO/RTO transmission planning processes, to maximize the utility of Points of Interconnection (POIs). Lessees considering landfall in New Jersey should also comply with the results of the state agreement approach (SAA)[6] and any other future procurements resulting from similar initiatives.	Cultural Resources; Finfish, Invertebrates, and EFH; Marine Mammals; Navigation and Vessel Traffic; Sea Turtles; Wetlands
MUL-21	Use of new and emerging technology [7]	In addition to employing best available safest technology, the Lessee is encouraged to adopt new and emerging technologies to avoid or minimize potential impacts in both offshore and nearshore environments, where practicable. Examples include the use of jet plows, closed loop cooling systems, trenchless technology, gravity-based structures or foundation designs that do not rely on pile driving, and protected species detection technologies including MERLIN radar systems, thermal imaging cameras, acoustic devices, and the integrations of these data streams for real-time monitoring. In addition, the Lessee should explore opportunities to upgrade/retrofit equipment to the best available technology if it becomes available during project operations.	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles, Water Quality
MUL-23	Adjust project design to reduce impacts	The Lessee should review and refer to the Information Guidelines for Renewable Energy Construction and Operations Plan Best Management Practices (Attachment A, https://www.boem.gov/sites/default/files/documents/about-boem/COP%20Guidelines_Technical_Corrections.pdf) during project planning to avoid or reduce potential impacts on important environmental resources, including sensitive habitats. Additional, project design considerations include: • Using cable installation methods, such as horizontal directional drilling, that avoid and minimize adverse impacts on sensitive habitats and difficult-to-replace resources; • Avoiding routing export cables through estuaries and embayments to reduce impacts on numerous sensitive habitats and difficult-to-replace resources as well as many sensitive life stages of various species; • Ensuring all mooring systems and ancillary equipment are contained inside the approved lease area to reduce impacts on fishing, navigation, and other uses; • Using outputs from marine mammal vessel strike models to inform project design; • Considering all potential WTG positions to allow for flexibility in project design due to identification of sensitive habitats or cultural properties through the environmental review process; and • Using micrositing as a tool for identifying and avoiding sensitive habitats.	Bats; Benthic; Birds; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Wetlands; Sea Turtles
MUL-25	Consistent turbine layout, markings, and lighting	The Lessee should employ consistent turbine grid layouts, spacing, markings, and lighting among lease areas to minimize navigational hazards and facilitate other ocean uses such as fishing and recreational activities. BOEM recommends the lessee have one of the two lines of orientation in the grided layout be spaced at least 1 nautical mile (1.9 kilometers) apart to support navigation safety and Search and Rescue (SAR). This recommended spacing is based on the USCG's 2020 Massachusetts and Rhode Island Port Access Route Study (https://www.navcen.uscg.gov/sites/default/files/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf). The spacing would also preserve structure-free areas to facilitate seabird passage and fishing operations. Also, per lease stipulations if applicable, adjacent lease areas that do not adopt the same layout must have an additional setback from shared borders. In accordance with BOEM lighting and marking guidelines, and USCG and FAA lighting and marking requirements, the Lessee must ensure that all structures are properly marked and lighted.	Bats; Birds; Commercial and For-Hire Fishing; Navigation and Vessel Traffic
MUL-26	Coordination for regional monitoring and surveys	Lessees are encouraged to: • Coordinate monitoring and survey efforts across lease areas in the NY Bight to standardize approaches, understand potential impacts to resources at a regional scale, and maximize efficiencies in monitoring and survey efforts; • Develop monitoring and survey plans that meet regional data requirements and standards, such as ROSA Offshore Wind Project Monitoring Framework and Guidelines (https://www.rosascience.org/wp-content/uploads/2022/09/ROSA-Offshore-Wind-Project-Montioring-Framework-and-Guidelines.pdf), the Regional Wildlife Science Collaborative's Science Plan (https://rwsc.org/science-plan/), and the NMFS/BOEM Federal Survey Mitigation Implementation Strategy; and • Make results from monitoring publicly available, for example through PNNL's offshore wind metadata tool (https://tethys.pnnl.gov/offshore-wind-metadata).	Benthic; Birds; Bats; Coastal Habitat and Fauna; Commercial and For-Hire Fishing; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles
MUL-27	Minimize sediment disturbance	The Lessee should employ methods to minimize sediment disturbance, including, but not limited to, the use of midline buoys to prevent cable sweep, not side casting materials, and removal and reuse of dredged material for backfill or other beneficial use where practicable.	Benthic; Finfish, Invertebrates, and EFH; Water Quality; Sea Turtles
MUL-28	Inadvertent Returns (IR) Plan and drilling fluids	The Lessee should coordinate with applicable agencies to develop an Inadvertent Returns (IR) Plan to address prevention, control, and clean-up of potential IR, which is the unintended release of drilling fluids to the surface during drilling operations. To the extent practicable, use biodegradable drilling solution, and recirculate and recycle drilling fluids used during HDD construction to minimize required water use. Avoid discharging drilling fluids onto the seabed.	Benthic; Finfish, Invertebrates, and EFH; Water Quality
MUL-39	Electrical shielding on underwater cables	The Lessee should use standard underwater cable design that mitigates the intensity of electromagnetic fields (EMF) at the seafloor. EMF will be further refined as part of the design or cable burial risk assessment.	Benthic; Finfish, Invertebrates, and EFH; Marine Mammals; Sea Turtles
NAV-4	Marine Vessel Radar	Where possible, the Lessee should adhere to the recommendations for mitigation to marine radar interference from the National Academy of Science: *Wind Turbine Generator Impacts to Marine Vessel Radar* (2022).	Navigation and Vessel Traffic
OU-8	Marine minerals resource area avoidance	The Lessee should ensure that bottom-disturbing activities avoid, to the maximum extent practicable, nearshore borrow areas and OCS sediment resources. Any activity that lasts more than 180 days and is located within 500 lateral meters of any marine minerals resource areas or limits the long-term use of the resource is considered bottom disturbing. The Lessee should use its geophysical and geological information collected in/along proposed corridors to demonstrate and verify the existence of sand resource or dearth of sand resource and estimate (via range) the possible implication of cable crossing on volume access. The Lessee is responsible for responding to any request from BOEM Marine Minerals Program (MMP),	Other Uses

[5] For a list of specific cable siting principles, refer to Section 4.1 in the Offshore Wind Cable Corridor Constraints Assessment at: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Programs/Offshore-Wind/2306-Offshore-Wind-Cable-Corridor-Constraints-Assessment--completeacc.pdf.
[6] https://www.nj.gov/bpu/pdf/boardorders/2022/20221026/8A%20ORDER%20State%20Agreement%20Approach.pdf.
[7] Appendix B, *Supplemental Information and Additional Figures and Tables*, Section B.9 describes examples of new and emerging technologies that the Lessee could research and consider for adoption as part of MUL-21.

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		USACE, and state resource agencies (e.g., NJDEP, NYSDEC, NYSDOS) in writing and to show good faith efforts to avoid sand resources to the maximum extent practicable or explain why another alternative is not technically or economically feasible.	
STF-1	Monitoring on strategically placed WTGs	The Lessee is encouraged to incorporate technologies for detecting tagged sea turtles and highly migratory fish in its project to monitor the effect of increases in habitat use and residency around WTG foundations. The Lessee is encouraged to share monitoring results and propose new or additional mitigation measures and/or monitoring methods if appropriate.	Finfish, Invertebrates, and EFH; Sea Turtles
VIS-1	Onshore transmission tower visual contrast mitigation	The Lessee should select a transmission tower type that has the least amount of visual contrast within the surrounding setting and the extended landscape within view of which the transmission line is routed in order to avoid undue and unnecessary visual impact. Monopoles typically have less visual contrast within built environments, whereas lattice towers typically have less visual contrast in more natural settings. The Lessee should color-treat the transmission tower darker grays (chemically treated galvanized finishes) to reduce visual contrast or powder-coat the tower with Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore transmission tower visual contrast mitigation. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov.	Scenic and Visual Resources
VIS-2	Onshore substation visual contrast mitigation	The Lessee should color treat all substation facilities the same color, and color-treat them to minimize visual contrast with the surrounding setting, and the extended landscape within view. The default color choice for substations should be Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray does not minimize the visual contrast in order to avoid undue and unnecessary visual impact. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore substation visual contrast mitigation. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov.	Scenic and Visual Resources
VIS-3	Onshore overhead transmission conductors visual contrast mitigation	The Lessee should use non-specular conductors for overhead transmission powerlines to avoid glare commonly associated with untreated conductors to avoid undue and unnecessary visual impact. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore overhead transmission conductors visual contrast mitigation.	Scenic and Visual Resources
VIS-4	Onshore overhead transmission line insulator visual contrast mitigation	The Lessee should use polymer insulators to minimize glare commonly associated with glass insulators. The Lessee should use polymer insulators that are a color that minimizes visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. The default color choice for polymer insulators substations should be Bureau of Land Management Environmental Color Covert Green or Shadow Gray, or Sudan Brown, or a BOEM-approved equivalent submitted by the Lessee for settings where Covert Green or Shadow Gray or Sudan Brown do not minimize the visual contrast. Bureau of Land Management color samples may be acquired by email to blm_oc_pmds@blm.gov. The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore overhead transmission line insulator visual contrast mitigation.	Scenic and Visual Resources
VIS-5	Onshore facility security fencing visual contrast mitigation	The Lessee should ensure galvanized and other types of security fencing are treated to eliminate glare and color-treated to minimize visual contrast with the surrounding setting and the extended landscape that is within view to avoid undue and unnecessary visual impact. Methods include vinyl-coating, powder-coating, and oxidizing treatments. Colors should be dark brown, dark grays, or dark brown (oxidizing treatments only). The Lessee should prepare photo simulations of proposed onshore facilities with and without onshore facility security fencing visual contrast mitigation.	Scenic and Visual Resources
VIS-6	Offshore and Onshore facility lighting	In order to avoid undue and unnecessary visual impact, the Lessee should ensure artificial light at night needed for nighttime operations and security at offshore and onshore facilities such as wind turbine generators, operational and maintenance facilities, offshore and onshore substations and booster stations, and others follows the night lighting principles to avoid light pollution and the artificial lighting BMPs outlined in National Park Service Sustainable Lighting Best Principles (https://www.nps.gov/subjects/nightskies/sustainable-outdoor-lighting.htm) and the Bureau of Land Management Technical Note 457 available at https://www.blm.gov/sites/default/files/docs/2023-05/IB2023-038_att1.pdf. The Lessee should prepare photo simulations of proposed facilities with and without offshore and onshore facility lighting mitigation.	Scenic and Visual Resources; Birds
VIS-8	Scenic and Visual Resources Mitigation Analysis	The Lessee should prepare a methodology for using and integrating BOEM's 2021 SLVIA guidance into the COP SLVIA, and submit to BOEM for review and comment before initiating the impact assessment. The COP SLVIA should also include onshore facilities associated with the offshore wind energy project. Onshore facilities should incorporate visual RPs 1 through 6 (VIS-1 – VIS-6). The SLVIA should include photo simulations, time-lapse video simulations, and/or other forms of visualization technology showing the existing condition, proposed changes to the offshore and onshore visual environment, and effectiveness of mitigation measures, if not included as a part of the proposed action.	Scenic and Visual Resources
REC-1	Nearshore construction timing restriction	The Lessee should prioritize scheduling of nearshore construction activities for outside the summer tourist season, which is generally between Memorial Day and Labor Day.	Land Use and Coastal Infrastructure, Recreation and Tourism

[1] RP measure identification numbers start with a prefix corresponding to the resource or resources for which they were designed to mitigate and are defined as follows: AQ = air quality; BB = Birds and Bats; BEN = Benthic Resources; BIR = Birds; COMFIS = Commercial and For-Hire Recreational Fishing; CUL = Cultural Resources ; EJ = Environmental Justice; MM = Marine Mammal; MMST = Marine Mammals and Sea Turtles; MUL = Multiple; NAV = Navigation; OU = Other Uses; REC = Recreation and Tourism; ST = Sea Turtle; STF = Sea Turtle and ESA-listed Fish species; VIS = Scenic and Visual Resources; WQ = Water Quality

AIS = automatic identification system; AMMM = avoidance, minimization, mitigation, and monitoring; BMPs = best management practices; BOEM = Bureau of Ocean Energy Management; BSEE = Bureau of Safety and Environmental Enforcement; CFR = code of federal regulation; COP = Construction and Operations Plan; DOE = Department of Energy; EMF = electromagnetic field; ESA = Endangered Species Act; FAA = Federal Aviation Administration; FDR = facility design report; FIR = fabrication and installation report; GHG = greenhouse gas; HDD = horizontal directional drilling; IMO = international maritime organization; IMPLAN = impact analysis for planning; IR = inadvertent returns; ISO = independent system operator; kW= kilowatt; MARPOL = The International Convention on the Prevention of Pollution from Ships; MEC = munitions and explosives of concern; NEPA = National Environmental Policy Act; NGOs = non-governmental organization; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NO_X = nitrogen oxides; NRHP = National Register of Historic Places; nT = nanotesla; NYS = New York State; NYSERDA = New York State Energy Research and Development Authority; OCS = outer continental shelf; PAM = passive acoustic monitoring; PNNL = Pacific Northwest National Laboratory; POI = point of interconnection; PSO = protected species observer; RP = Recommended Practice; ROSA = Responsible Offshore Science Alliance; RTO = regional transmission organization; RWSC = Regional Wildlife Science Collaborative; SAA = state agreement approach; SAR = search and rescue; SF_6 = sulfur hexafluoride; SO_2 = sulfur dioxide; USCG = United States Coast Guard; USEPA = United States Environmental Protection Agency; USFWS = United States Fish and Wildlife Service; UXO = unexploded ordnance; WTGs = wind turbine generators