

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 217

[Docket No. 240501–0124]

RIN 0648–BL67

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Sunrise Wind Offshore Wind Farm Project Offshore New York

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), as amended, NMFS hereby promulgates regulations to govern the incidental taking of marine mammals incidental to Sunrise Wind, LLC (Sunrise Wind), a 50/50 joint venture between Ørsted North America, Inc. (Ørsted) and Eversource Investment, LLC, construction of the Sunrise Wind Offshore Wind Farm Project (hereafter known as the “Project”) in Federal and State waters offshore New York, specifically within the Bureau of Ocean Energy Management (BOEM) Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) Lease Area OCS–A–0487 (Lease Area) and along one export cable route to sea-to-shore transition points in Shirley, New York (collectively referred to as the “Project Area”), over the course of 5 years (June 21, 2024–June 20, 2029). These regulations, which allow for the issuance of a Letter of Authorization (LOA) for the incidental take of marine mammals during construction-related activities within the Project Area during the effective dates of the regulations, prescribe the permissible methods of taking and other means of effecting the least practicable adverse impact on marine mammal species or stocks and their habitat as well as requirements pertaining to the monitoring and reporting of such taking.

DATES: This rule is effective from June 21, 2024, through June 20, 2029.

FOR FURTHER INFORMATION CONTACT: Jaclyn Daly, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

A copy of Sunrise Wind’s application and supporting documents, received public comments, and the proposed rulemaking as well as a list of the references cited in this document may be obtained online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>. In case of problems accessing these documents, please call the contact listed above (**FOR FURTHER INFORMATION CONTACT**).

Purpose and Need for Regulatory Action

This final rule, as promulgated, provides a framework under the authority of the MMPA (16 U.S.C. 1361 *et seq.*) for NMFS to authorize the take of marine mammals incidental to construction of the Project within the Project Area. NMFS received a request from Sunrise Wind to incidentally take a small number of marine mammals from 16 species of marine mammals, comprising 16 stocks (7 stocks by Level A harassment and Level B harassment; 9 stocks by Level B harassment only), incidental to Sunrise Wind’s 5 years of construction activities. Sunrise Wind did not request authorization for, and NMFS neither anticipates nor allows, take by serious injury or mortality incidental to the specified activities to be authorized under this final rulemaking.

Legal Authority for the Final Action

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made, regulations are promulgated (when applicable), and public notice and an opportunity for public comment are provided.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). If such findings are made, NMFS must prescribe the permissible methods of taking, other means of effecting the least practicable adverse impact on the affected species or stocks

and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to as “mitigation”); and requirements pertaining to the monitoring and reporting of such takings.

As noted above, Sunrise Wind did not request for authorization of, and NMFS neither anticipates nor allows, take by serious injury or mortality incidental to the specified activities to be authorized under this final rulemaking. Relevant definitions of MMPA statutory and regulatory terms are included below:

- *U.S. Citizens*—individual U.S. citizens or any corporation or similar entity if it is organized under the laws of the United States or any governmental unit defined in 16 U.S.C. 1362(13) (50 CFR 216.103);
- *Take*—to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. 1362(13); 50 CFR 216.3);
- *Incidental Harassment, Incidental Taking and Incidental, but not Intentional, Taking*—an accidental taking. This does not mean that the taking is unexpected, but rather it includes those takings that are infrequent, unavoidable, or accidental (50 CFR 216.103);
- *Serious Injury*—any injury that will likely result in mortality (50 CFR 216.3);
- *Level A harassment*—any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (16 U.S.C. 1362(18); 50 CFR 216.3); and
- *Level B harassment*—any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (16 U.S.C. 1362(18); 50 CFR 216.3).

Section 101(a)(5)(A) of the MMPA and the implementing regulations at 50 CFR part 216, subpart I, provide the legal basis for proposing and, if appropriate, issuing regulations and an associated LOA(s). This final rule establishes permissible methods of taking and mitigation, monitoring, and reporting requirements for Sunrise Wind’s construction activities.

Summary of Major Provisions Within the Final Rule

The major provisions of this final rule are:

- Allowing NMFS to authorize, under a LOA, the take of small numbers of

marine mammals by Level A harassment and/or Level B harassment (50 CFR 217.312) incidental to the Project and prohibiting take of such species or stocks in any manner not permitted (50 CFR 217.313) (e.g., mortality or serious injury);

- Establishing a seasonal moratorium for foundation impact pile driving from January 1 through April 30 annually and requirements to avoid, to the maximum extent practicable, foundation impact pile driving in December and to obtain NMFS prior approval to minimize impacts to the North Atlantic right whale (NARW) (*Eubalaena glacialis*);

- Establishing a seasonal moratorium on the detonation of unexploded ordnance or munitions and explosives of concern (UXO/MEC) from December 1 through April 30 annually to minimize impacts to NARW;

- Requirements for UXO/MEC detonations to only occur if all other means of removal are exhausted (i.e., As Low As Reasonably Practical (ALARP) risk mitigation procedure) and conducting UXO/MEC detonations during daylight hours only and limiting detonations to 1 per 24-hour period;

- Conducting both visual and passive acoustic monitoring (PAM) by trained, NMFS-approved Protected Species Observers (PSOs) and PAM operators before, during, and after select in-water construction activities;

- Requiring training for all Project personnel to ensure marine mammal protocols and procedures are understood;

- Establishing clearance and shutdown zones for all in-water construction activities to prevent or reduce the risk of Level A harassment and to minimize the risk of Level B harassment, including a delay or shutdown of foundation impact pile driving and delay to UXO/MEC detonation if a NARW is observed at any distance by PSOs or acoustically detected within certain distances;

- Establishing minimum visibility and PAM monitoring zones during foundation impact pile driving;

- Requiring use of at least two sound attenuation devices during all foundation impact pile driving installation activities and UXO/MEC detonations to reduce noise levels to those modeled assuming a broadband 10 decibel (dB) attenuation;

- Requiring sound field verification (SFV) monitoring during impact pile driving of foundation piles and during UXO/MEC detonations to measure *in situ* noise levels for comparison against the modeled results and ensure noise levels assuming 10 dB attenuation are not exceeded;

- Requiring SFV during the operational phase of the Project;

- Implementing soft-starts during impact pile driving and ramp-up during the use of high-resolution geophysical (HRG) marine site characterization survey equipment;

- Requiring various vessel strike avoidance measures;

- Requiring various measures during fisheries monitoring surveys, such as immediately removing gear from the water if marine mammals are considered at-risk of interacting with gear;

- Requiring regular and situational reporting including, but not limited to, information regarding activities occurring, marine mammal observations and acoustic detections, and sound field verification monitoring results; and

- Requiring monitoring of the NARW sighting networks, Channel 16, and PAM data as well as reporting any sightings to NMFS.

Through adaptive management (50 CFR 217.317(c)(1)) NMFS Office of Protected Resources may modify (e.g., remove, revise, or add to) the existing mitigation, monitoring, or reporting measures summarized above and required by the LOA. NMFS must withdraw or suspend an LOA issued under these regulations after notice and opportunity for public comment if it finds the methods of taking or the mitigation, monitoring, or reporting measures are not being substantially complied with (16 U.S.C. 1371(a)(5)(B); 50 CFR 216.106(e)). Additionally, failure to comply with the requirements of the LOA may result in civil monetary penalties and knowing violations may result in criminal penalties (16 U.S.C. 1375; 50 CFR 216.106(g)).

Fixing America's Surface Transportation Act (FAST-41)

This project is covered under Title 41 of the Fixing America's Surface Transportation Act, or "FAST-41". FAST-41 includes a suite of provisions designed to expedite the environmental review for covered infrastructure projects, including enhanced interagency coordination as well as milestone tracking on the public-facing Permitting Dashboard. FAST-41 also places a 2-year limitations period on any judicial claim that challenges the validity of a Federal agency decision to issue or deny an authorization for a FAST-41 covered project (42 U.S.C. 4370m-6(a)(1)(A)). The Project is listed on the Permitting Dashboard, where milestones and schedules related to the environmental review and permitting for the project can be found: [https://](https://www.permits.performance.gov/permitting-project/sunrise-wind-farm)

www.permits.performance.gov/permitting-project/sunrise-wind-farm.

Summary of Request

On November 10, 2021, Sunrise Wind submitted a request for the promulgation of regulations and issuance of an associated 5-year LOA to take marine mammals incidental to construction activities associated with the Project offshore of New York in the BOEM Lease Area OCS-A-0487. Sunrise Wind's request is for the incidental, but not intentional, taking of a small number of 16 marine mammal species (comprising 16 stocks) by Level B harassment (for all 16 species or stocks) and by Level A harassment (for 7 of the 16 species or stocks). Sunrise Wind did not request authorization for, and NMFS does not expect, take by serious injury or mortality to occur for any marine mammal species or stock incidental to the specified activities.

In response to our questions and comments and following extensive information exchange between Sunrise Wind and NMFS, Sunrise Wind submitted a final revised application on May 9, 2022, which NMFS deemed adequate and complete on May 10, 2022. This final application is available on NMFS' website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

On June 2, 2022, NMFS published a notice of receipt (NOR) of Sunrise Wind's adequate and complete application in the **Federal Register** (87 FR 33470), requesting comments and soliciting information related to Sunrise Wind's request during a 30-day public comment period. During the NOR public comment period, NMFS received comment letters from two environmental non-governmental organizations: Clean Ocean Action and Oceana. NMFS reviewed all submitted material and took the material into consideration during the drafting of the proposed rule. Subsequently, in June 2022, new scientific information was released regarding marine mammal densities (Robert and Halpin, 2022) and, as such, Sunrise Wind submitted a final Updated Density and Take Estimation Memo to NMFS on December 15, 2022 that included updated marine mammal densities and take estimates. This memo is available on our website at <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

On February 10, 2023, NMFS published the proposed rule for the Project in the **Federal Register** (88 FR

8996). In the proposed rule, NMFS synthesized all of the information provided by Sunrise Wind, all best available scientific information and literature relevant to the proposed project, outlined, in detail, proposed mitigation designed to effect the least practicable adverse impacts on marine mammal species and stocks as well as proposed monitoring and reporting measures, and made preliminary negligible impact and small numbers determinations. The public comment period on the proposed rule was open for 30 days from February 10, 2023 through March 13, 2023 on <https://www.regulations.gov>. A summary of public comments received during this 30-day period is described in the Comments and Responses section; full public comments may be viewed on <https://regulations.gov>.

On March 23, 2023, after the proposed rule was published and the public comment period concluded, Sunrise Wind submitted revised take and exposure estimates resulting from a reduction in the number of wind turbine generator (WTG) foundations to be installed (94 to 87; Reduced WTG Foundation report) and then a correction shortly thereafter (Reduced WTG Foundation Corrected tables 50 and 51). Pile size (maximum 7/12 m diameter tapered monopiles and 4-m pin piles for the jacket foundation) and hammer size (maximum 4,000 kJ hammer) did not change, nor did the underlying modeling and take estimate methodologies. A reduction in total WTG foundations results in an overall reduction in take within the Lease Area and, therefore, an overall reduction in take across the 5-year duration of Project activities. Also, in March 2023, Sunrise Wind submitted a revised Temporary Pier Pile Driving at the Sunrise Wind Landfall—Take Assessment and Mitigation Measures Memo. This memo removed the work associated with the plan to install mooring and breasting dolphins near the boat ramp at the Smith Point Marina on the Long Island side of the ICW. As described in the proposed rule, Sunrise Wind did not request and NMFS did not propose to authorize take of marine mammals incidental to temporary pier and breasting and mooring dolphin construction activities, and thus, the estimated take numbers have not changed due to the removal of these activities.

In April 2023, Sunrise Wind submitted a supplementary report that demonstrates its ability to accurately determine the charge weight of UXO/MEC encountered in the field prior to detonation. Because of this report, the

final rule provides Orsted with specific mitigation and monitoring zone sizes based on charge weight bin sizes and no longer requires that the E12 (largest) charge weight mitigation and monitoring zones apply to smaller charge weight sizes, provided that Sunrise Wind is able to confirm the smaller charge weight size before any detonation.

NMFS previously issued four Incidental Harassment Authorizations (IHAs) to Ørsted for the taking of marine mammals incidental to marine site characterization surveys using HRG equipment of the Sunrise Wind's Lease Area (OCS-A 0487) and surrounding Lease Areas (OCS-A 0486, OCS-A 0500) (84 FR 52464, October 2, 2019; 85 FR 63508, October 8, 2020; 87 FR 756, January 6, 2022; and 87 FR 61575, October 12, 2022). In addition, NMFS issued an IHA to South Fork Wind (a subsidiary of Ørsted) to install foundations and conduct HRG surveys for construction of the South Fork Wind Project (87 FR 806; January 6, 2022). To date, Ørsted has complied with all IHA requirements (*e.g.*, mitigation, monitoring, and reporting) and has not exceeded the number of take authorized. Information regarding Ørsted's monitoring results relevant to the Sunrise Wind Project may be found in the Estimated Take section and the final monitoring reports, where available, can be found on NMFS' website: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable>.

On August 1, 2022, NMFS announced proposed changes to the existing NARW vessel speed regulations to further reduce the likelihood of mortalities and serious injuries to endangered right whales from vessel collisions, which are a leading cause of the species' decline and a primary factor in an ongoing Unusual Mortality Event (UME) (87 FR 46921, August 1, 2022). Should a final vessel speed rule be issued and become effective during the effective period of these regulations (or any other MMPA incidental take authorization), the authorization holder will be required to comply with any and all applicable requirements contained within the final rule. Specifically, where measures in any final vessel speed rule are more protective or restrictive than those in this or any other MMPA authorization, authorization holders will be required to comply with the requirements of the vessel speed rule. Alternatively, where measures in this or any other MMPA authorization are more restrictive or protective than those in any final vessel speed rule, the measures in the MMPA

authorization will remain in place. The responsibility to comply with the applicable requirements of any vessel speed rule will become effective immediately upon the effective date of any final vessel speed rule, and when notice is published on the effective date, NMFS will also notify Sunrise Wind if the measures in the speed rule were to supersede any of the measures in the MMPA authorization such that they were no longer required.

On February 22, 2024, Sunrise Wind provided an updated Project schedule that aligns with their December 2023 Construction and Operations Plan submitted to BOEM for approval. Based on this update, Sunrise Wind has requested the regulations and associated LOA be effective from June 21, 2024 through June 20, 2029.

Description of the Specified Activity

Overview

Sunrise Wind has proposed to construct and operate a 924 to 1,034 megawatt (MW) wind energy facility (known as Sunrise Wind Farm (SRWF)) in the Project Area. Sunrise Wind's project would consist of several different types of permanent offshore infrastructure, including 87 WTGs on monopile foundations with a maximum diameter tapering from 7 meters (m) above the waterline to 12 m below the waterline (7/12 m), a single offshore converter substation (OCS-DC) on a jacket foundation (comprised on 4-m pin piles), offshore substation array cables, and substation interconnector cables. Specifically, activities to construct the project include: (1) impact pile driving the WTG and OCS-DC foundations; (2) pneumatic hammering for installation and removal of temporary casing pipes and vibratory pile driving for installation and removal of temporary goal post and sheet piles at the cable landfall site; (3) impact and vibratory pile driving associated with the Smith Point County Park temporary pier; (4) trenching, laying, and burial activities associated with the installation of the export cable route from the OCS-DC to the shore-based converter station and inter-array cables between turbines; (5) site preparation work (*e.g.*, boulder removal); placement of scour protection around foundations; (6) HRG vessel-based site characterization surveys using active acoustic sources with frequencies of less than 180 kHz; (7) detonating up to three UXO/MEC of different charge weights; and (8) several types of fishery and ecological monitoring surveys. Vessels would transit within the Project Area and between ports and the SRWF to

transport crew, supplies, and materials to support pile installation. All offshore cables will connect to onshore export cables, substations, and grid connections, which would be located at Smith Point County Park in Shirley, New York. Marine mammals exposed to elevated noise levels during impact and vibratory pile driving, UXO/MEC detonation, pneumatic hammering, or HRG site characterization surveys may

be taken by Level A harassment and/or Level B harassment, depending on the specified activity. Other activities listed above are not anticipated to result in take either due to the nature of the activities or due to the implementation of monitoring and mitigation measures.

Dates and Duration

Since publication of the proposed rule, Sunrise Wind has provided an

updated Project schedule (table 1) based on the latest version of their Construction and Operations Plan submitted to BOEM for approval. While this is the most recent schedule at time of promulgating this rulemaking, NMFS recognizes the potential for activity schedules to shift such that they may occur during different timeframes.

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Table 1 -- Estimated Activity Schedule to Construct and Operate the Sunrise Wind Project

Project Area	Project Activity	Expected Timing and Duration
Sunrise Wind Farm (SRWF) Construction	WTG Foundation Installation and Scour Protection	Q3-Q4 2024; Q2-Q3 2025; 4-5 months
	OCS-DC Foundation Installation	Q4 2024; 2-3 days (48-72 hours)
	<i>WTG Installation</i>	Q2-Q4 2025; 10 months
	<i>Seafloor preparation Array Cable Installation</i>	Q2-Q3 2024 Q2-Q3 2024; Q2-Q3 2025 7 months
	UXO/MEC detonation	Q2-Q4 any year; up to 3 days
Sunrise Wind Export Corridor (SRWEC) Construction	Cable Landfall Installation (casing pipe and sheetpile installation and removal, HDD)	Q3-Q4 2024; up to 32 days
	<i>Offshore Export Cable Installation Route clearance EC Installation</i>	Q3 2024-Q2 2025 8 months
	HRG Survey	Q3 2024 - Q4 2025 Any time of year
Operations	HRG Survey	Q4 2025-Q3 2029 Any time of year

Note: Italicized activities are not expected to result in take of marine mammals. "Q1, Q2, Q3, and Q4" each refer to a quarter of the year, starting in January and comprising 3 months each. Therefore, Q1 represents January through March, Q2 represents April through June, Q3 represents July through September, and Q4 represents October through December.

Specific Geographic Region

A detailed description of the Specific Geographic Region, identified as the Mid-Atlantic Bight, is provided in the proposed rule (88 FR 8996, February 10, 2023). Since the proposed rule was published, no changes have been made to the Specified Geographic Region. Generally, Sunrise Wind’s specified

activities (*i.e.*, impact pile driving of monopile and jacket foundations; vibratory pile driving (installation and removal) of temporary goal posts and sheet piles; pneumatic hammering of temporary casing pipes; impact and vibratory pile driving associated with the Smith Point County Park temporary pier; placement of scour protection; trenching, laying, and burial activities

associated with the installation of the SRWEC and inter-array cables; HRG site characterization surveys; UXO/MEC detonation; and WTG operation) are concentrated in the Project Area. Vessel transit may originate from ports in New York, Connecticut, Maryland, Massachusetts, New Jersey, Rhode Island, and Virginia.

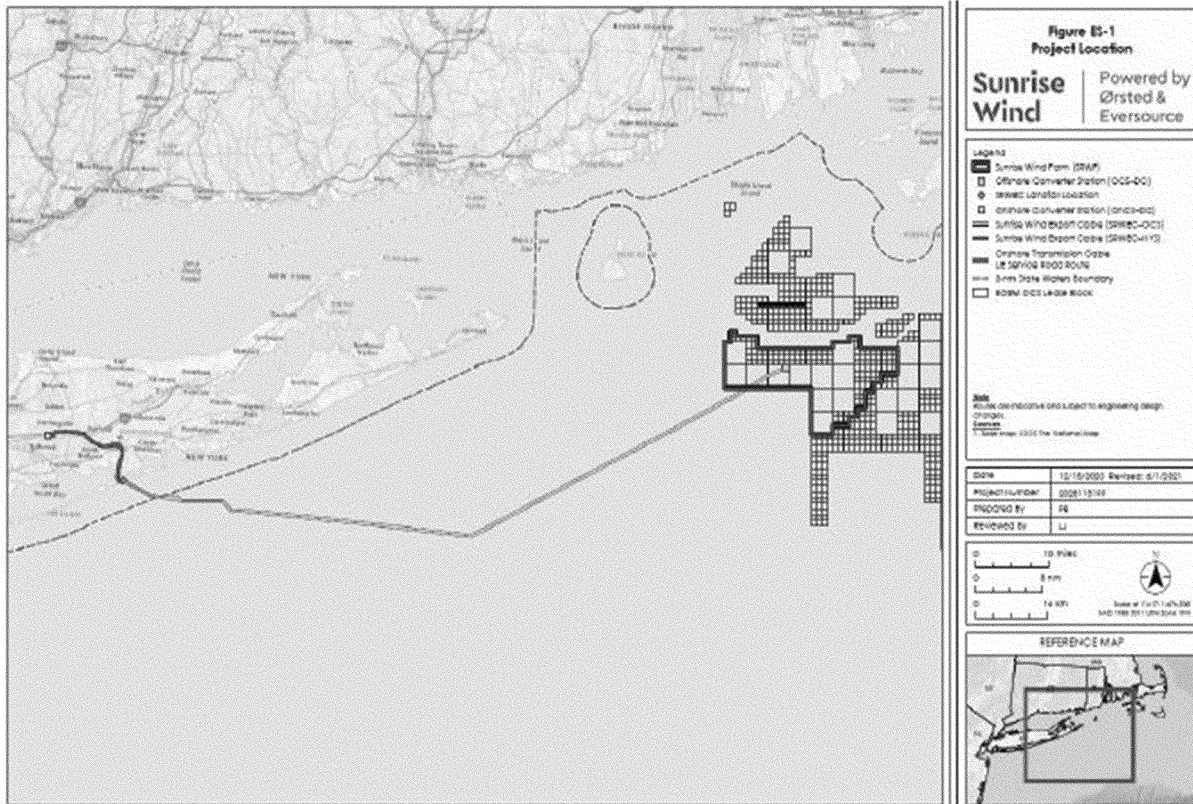


Figure 1. Sunrise Wind Project Location

Comments and Responses

NMFS published a proposed rule in the **Federal Register** on February 10, 2023 and opened a 30-day public comment period (88 FR 8996). The proposed rule described, in detail, Sunrise Wind’s specified activities, the specific geographic region of the specified activities, the marine mammal species that may be affected by those activities, and the anticipated effects on marine mammals. In the proposed rule, NMFS requested that interested persons submit relevant information, suggestions, and comments on Sunrise Wind’s request for the promulgation of regulations and issuance of an associated LOA described therein, our estimated take analyses, the preliminary determinations, and the proposed regulations.

NMFS received 578 comment submissions, including from the Marine Mammal Commission (Commission), several non-governmental organizations, and private citizens, all of which are available for review on www.regulations.gov. Most of these comments were out-of-scope or not applicable to the Project (*e.g.*, general opposition to or support of offshore wind projects; concerns for other species outside NMFS’ jurisdiction such as birds) and are not described herein or discussed further. Moreover, NMFS does not include comments recommended that the final rule include mitigation, monitoring, or reporting measures that were already included in the proposed rule and such measures are carried forward in this final rule, as those comments did not raise significant points for NMFS to consider. Furthermore, if a comment received was

unclear, NMFS does not include it here as it could not determine whether it raised a significant point for NMFS to consider. Non-governmental organizations that submitted comments included: (1) Responsible Offshore Development Alliance (RODA); (2) Oceana, Inc. (Oceana); (3) Natural Resources Defense Council (NRDC); (4) Clean Ocean Action (COA); (5) Seafreeze Limited; (6) Long Island Commercial Fishing Association; (7) Green Ocean; and (8) Allco Renewable Energy Limited. NMFS considered substantive comments in this final rule, including comments related to the estimated take analysis, final determinations, and final mitigation, monitoring, and reporting requirements. A summary of comments is described below, along with NMFS’ responses.

Comment 1: The Commission recommends that, until JASCO Applied

Sciences' (hereafter, "JASCO") model has been validated with *in situ* measurements from the impact installation of monopiles and pin piles along the Atlantic coast, NMFS should re-estimate the various Level A harassment and Level B harassment zones for the final rule using source levels that are at a minimum 3 dB greater than those currently used.

Response: The Commission has expressed concerns about the lack of validation of JASCO's models in previous Commission letters for Ørsted's other wind projects. JASCO has compared their source model predictions to an empirical model prediction by the Institute of Technical and Applied Physics (ITAP). The empirical model is based on a large data set of pile driving sounds measured at 750 m from the source collected during installation of large-diameter piles (up to 8 m) during wind farm installation in the North Sea (Bellmann, 2020). As no noise measurements exist for tapered 7/12-m monopile at this time as these have yet to be installed offshore, the ITAP prediction facilitates a way of validating the source levels of the numerical finite difference (FD) model. The ITAP data are averaged across different scenarios—pile sizes are grouped, which includes different hammers, water depths, depths of penetration, and environmental conditions—and the 95th percentile level is reported, whereas the aim of JASCO's modeling is to estimate the median value. While the ITAP forecast and the FD source predictions were comparable (Küsel *et al.*, 2022), there is variance in the underlying ITAP data and there are parametric choices for the FD model in the different environments, so an exact match is not expected. As part of the comparison, it was found that different, but reasonable, parametric input choices in the FD modeling can result in output differences on the order of the variance in the ITAP data so it was concluded that the FD modeling approach performed as well as can be discernible given the available data. While adding 3 dB to the JASCO predictions at 750 m may bring JASCO's source predictions into line with the finite-element (FE) predictions for the portmanteau combining computation, comparison, and pile (COMPILE) scenario, it is not clear that this would be more accurate. This approach assumes that the FE models are correct, but Lippert *et al.* (2016) also state "a drawback of [the FE] approach is that it simulates the energy loss due to friction in an indirect and rather nonphysical way." The

Commission also suggested that NMFS could have used damped cylindrical spreading model (DCSM; Lippert *et al.*, 2018) and the source levels provided by the time-domain finite difference pile-driving source model (TDFD PDSM); however, for reasons described herein, NMFS has determined JASCO's model results are reliable and achievable.

Measurements taken during the Coastal Virginia Offshore Wind (CVOW) Pilot Project reported the maximum distance to the marine mammal Level B threshold (160 dB re 1 microPascal (1 μ Pa)) from the 7.8-m pile installed with a double big bubble curtain to be 3,891 m (12,765.75 feet (ft)) when using a hammer operating at a maximum of 550 kilojoules (kJ) (WaterProof, 2020). JASCO's model prediction for 7/12-m tapered piles using a 4,000-kJ hammer is 3,833 m (12,575 ft). The Commission states that, based on the CVOW reported sound levels, it is unrealistic that an impact hammer with seven times more energy intensity would result in a smaller harassment zone. NMFS disagrees. Small differences in the propagation environment could account for the ranges being more comparable than expected. The CVOW pilot project is located in Virginia whereas the Sunrise Wind project is located in southern New England.

Also, since the proposed rule was published, NMFS has received sound field verification reports from the South Fork Wind project, which used JASCO's modeling. In all but one case, the measured distances to NMFS' Level B harassment threshold were lower than JASCO's model predicted. The distance to NMFS Level B harassment threshold for the South Fork Wind project was modeled as 4,684 m while *insitu* measurements identified distances, excluding the one aforementioned pile, ranging from 1.84 kilometers (km) to 3.25 km. JASCO's modeling predicts the distances to the Level B harassment threshold during installation of the Sunrise Wind 7/12 m tapered monopiles will be approximately 6 to 6.5 km in summer depending on hammer size, which is approximately double than the loudest pile installed during the South Fork Wind results. NMFS notes that South Fork Wind determined that the one pile generating noise levels above those predicted (the first pile) did so due to a malfunctioning noise attenuation system, which was quickly rectified and deployed appropriately on all future piles.

Since the close of the public comment period, NMFS has also received SFV reports from Vineyard Wind. However, due to the hammer energy assumption in the model versus what was used in

the field (*i.e.*, more hammer energy was used than modeled) and other operational challenges, it is more challenging to compare the Vineyard Wind measured results directly to the modeled results. Further, NMFS acknowledges the uncertainty associated with predicting phenomena such as propagation loss and its potential variability within a region but overall, JASCO's models are supported by recent measured results.

Importantly, in this final rule, should SFV results reveal noise levels are louder than those predicted assuming 10 dB attenuation, NMFS is requiring Sunrise Wind to implement additional measures to reduce sound levels such that they do not exceed those modeled assuming 10 dB. Sunrise Wind is required to conduct either complete or abbreviated SFV monitoring on all foundation piles installed. Based on all these reasons, NMFS is not requiring Sunrise Wind to remodel the harassment zone sizes by adding 3 dB to the source levels and is, instead, carrying forward the modeling results as presented in the proposed rule.

Based on this discussion, and given NMFS' consideration of the best available scientific information including available interim sound field verification (SFV) reports from other offshore wind construction projects in the United States, NMFS disagrees with the suggestions made by the Commission. NMFS has incorporated the best available scientific information into this final rule, using recent measurements as well as estimates obtained through JASCO's modeling.

Comment 2: The Commission and other members of the public recommended NMFS (1) re-estimate and authorize Level A harassment takes based on modeling results for the worst-case scenario rather than presuming an arbitrary 80- or 100-percent reduction for mitigation efficacy and/or a 10-dB sound attenuation for impact pile driving, (2) re-estimate and authorize Level B harassment takes based on more conservative assumptions for the pile-driving scenarios that could occur (including only one monopile or fewer than four pin piles installed per day), (3) re-estimate the various mortality, Level A harassment, and Level B harassment zones and numbers of takes based on 0-dB of sound attenuation for UXO detonations and authorize Level A and B harassment takes, including behavior takes, that could result from UXO detonations, and (4) increase any Level A or B harassment takes to mean group size (including updates that reflect the results of more recent marine mammal surveys in the Rhode Island-

Massachusetts WEA). Another commenter suggested that the numbers of takes, particularly with respect to NARW, rely on mitigation methods that remain unproven.

Response: NMFS disagrees with the Commission that our analysis should carry forward take estimates based on the worst-case scenario that assumes no reduction of impacts results from the mitigation and notes that the Commission did not present any data supporting their recommendation. As described in the proposed rule, this final rule reasonably assumes that the mitigation efforts will be effective at reducing the potential for Level A harassment calculated in the density-based models. The models do not account for mitigation (except with respect to assuming attenuation and seasonal restrictions) and, therefore, it is reasonable to assume the model overestimates Level A harassment. Further, while the scientific literature documents marine mammals are likely to avoid loud noises such as pile driving (e.g., Brandt et al., 2016, Nowack et al., 2004), avoidance was not quantitatively considered in the take estimates. However, NMFS reasonably predicts this natural behavior will further reduce the potential for Level A harassment.

In the proposed rule, NMFS described the best available science, which supports the assumption that at least 10dB attenuation can be reliably achieved using noise attenuation systems such as a double bubble curtain. The Commission did not provide reason for why they believe this was an overestimate nor did they suggest an alternative amount of attenuation NMFS should consider other than zero attenuation. Other commenters expressed similar support stating that bubble curtains are not effective for low-frequency cetaceans. NMFS agrees that attenuation levels vary by frequency band and that bubble curtains attenuate higher frequency sounds more effectively; however, NMFS disagrees that lower frequency bands, which are important to consider when evaluating impacts, are not attenuated at all. The data from Bellmann (2021), shows that for both single and double bubble curtains, more than 10 dB of attenuation was achieved for bands as low as 32 Hz. And while it is true that performance diminishes significantly at lower frequencies (< 32 Hz), those bands also contain significantly less pile driving sound and is 16+ dB outside the most susceptible frequency range for low-frequency cetaceans.

NMFS recognizes that the key to effective mitigation is the ability to

detect marine mammals to trigger such mitigation. Sunrise Wind is required to undertake extensive monitoring to maximize marine mammal detection effectiveness. The reduction to the density-based take estimate appropriately reflects and acknowledges the monitoring efforts, including the placement of 3 PSOs on the pile driving platform and dedicated PSOs vessel(s) and PAM.

NMFS agrees with the Commission that there is potential for behavioral disturbance from a single detonation per day and disagrees that "behavior takes" were omitted and have not been accounted for. However, the behavioral threshold for underwater detonations identified by the Commission (5 dB less than the temporary threshold shift (TTS) threshold) is only applicable to multiple detonations per day. NMFS is not aware of evidence to support the assertion that animals will have behavioral responses that would qualify as take to temporally and spatially isolated explosions at received levels below the TTS threshold. Accordingly, the current take estimate framework allows for the consideration of behavioral disturbance resulting from single explosions specifically if they are exposed above the TTS threshold, as opposed to the 5 dB lower threshold for behavioral disturbance from multiple detonations. We acknowledge in our analysis that individuals exposed above the TTS threshold may also be harassed by direct behavioral disruption and those potential impacts are considered in the negligible impact determination. NMFS agrees with the Commission that the proposed rule did not include some information in Sunrise Wind's application regarding certain foundation construction scenarios. We have added that information to this final rule. The distances to harassment thresholds have not changed from the application and proposed rule and are presented in this final rule. Take estimates did not change as a result of including this additional information.

Comment 3: A commenter claimed that the authorized taking by harassment is not incidental but intentional and that take associated with soft-starts was not considered in the take analysis.

Response: NMFS' implementing regulations define *incidental harassment, incidental taking, and incidental, but not intentional, taking* as an accidental taking. This does not mean that the taking is unexpected, but rather it includes those takings that are infrequent, unavoidable or accidental" (50 CFR 216.103). NMFS disagrees that the take that may be authorized under

this rulemaking is intentional. The commenter is also incorrect that the amount of harassment that would be authorized in a LOA under this final rule does not account for soft-starts. As described in the Estimated Take section, Sunrise Wind requested the maximum number of takes generated from three methods: density-based exposure estimates, group size data, and PSO data, all of which account for soft starts. Based on the nature of the methods, this is most evident in the density-based exposure estimates. The hammer schedules in the application, proposed rule, and this final rule all account for pile driving that would occur during installation, including lower hammer energies. Soft starts are simply impact pile driving at these lower hammer energies. Therefore, the exposure estimates account for pile driving during soft starts. The other two take estimate methods (i.e., group size and PSO data) are based on the number of days of pile driving, which also inherently considers all pile driving associated with foundation installation for those days.

Comment 4: A commenter requested NMFS provide an explanation for the differences in assumptions and corresponding differences in take estimates for the Revolution Wind, LLC (Revolution Wind) and Sunrise Wind projects provided Ørsted is the developer for both projects.

Response: The MMPA indicates that, upon request, NMFS shall issue the requested incidental take authorization if certain findings are made. Applicants propose take estimate modeling methodologies, and NMFS evaluates if the approaches are reasonable and supported. Sunrise Wind, a 50/50 joint venture between Ørsted and Eversource Investment, LLC and Revolution Wind, a subsidiary wholly owned by Ørsted, both submitted applications containing the same acoustic modeling and take estimate approaches for foundation installation, cable landfall construction, HRG surveys, and UXO/MEC detonation activities. Both companies applied JASCO's modeling tools to estimate distances to NMFS harassment isopleths. They also both estimated take from foundation installation assuming that all impact pile driving occurred in the highest and second highest density months in their applications (note that Revolution Wind subsequently assumed all piles would be installed in the highest density month after reducing the number of foundations to be installed). For some species, observational data from PSOs aboard HRG survey vessels or group size data indicated that the density-based take estimates may be

insufficient to account for the number of individuals of a species that may be encountered during the planned activities and, therefore, take from the density-based exposures were adjusted to account for these data. While the methodologies are similar, there are differences in the results of undertaking those methods. The primary differences for take numbers between the two projects are generated from the scope of work (e.g., number of piles, amount of HRG survey work planned, number of UXO/MEC detonations), density estimates, and distances to NMFS harassment isopleths, which are influenced by both source levels and transmission loss rates which are site specific. These three factors strongly influence the take numbers requested and proposed by NMFS to authorize.

Both applicants assumed mitigation measures (e.g., delay or shutdown) would result in fewer Level A harassment takes than estimated from the modeling (no Level A harassment was modeled (or expected) from HRG surveys or vibratory pile driving for both projects). Collectively, there are a multitude of reasons why take numbers, both modeled and ultimately requested, may differ. NMFS evaluates each application independently. The commenter did not provide evidence that any of the methodologies or assumptions were flawed. Specific to Sunrise Wind, NMFS has found that the take authorized under this rule would have a negligible impact on affected marine mammal species and stocks and has prescribed mitigation measures that affect the least practicable adverse impact on marine mammals.

Comment 5: A commenter claimed that NMFS' thresholds are outdated, primarily because scientific literature demonstrates examples where behavioral disturbances have been documented where received levels are lower than 160 dB. Moreover, the commenter suggested that estimating the extent of Level B take from impact driving using the 160dB (impulsive) threshold is flawed because an animal may be exposed to several hours of pile driving per day, which should be considered continuous, and that, although impulsive at the source, the sound from impact driving may be received as a continuous source at a distance. For these reasons, the commenter suggested the proposed rule underestimates the Level B take and "zones of impact"; thus, NMFS' small numbers and negligible impact determination is flawed.

Response: For the reasons described below, NMFS disagrees that the 160-dB threshold for behavioral harassment is

not supported by the best available science and that the small numbers and negligible impact determinations are flawed based on the use of this threshold in the take estimate analysis. The potential for behavioral response to an anthropogenic source can be highly variable and context-specific (Ellison et al., 2012). While NMFS acknowledges the potential for Level B harassment at exposures to received levels below 160 dB rms, it should also be acknowledged that not every animal exposed to received levels above 160 dB rms will respond in ways constituting behavioral harassment. There are a variety of studies indicating that contextual variables play a very important role in response to anthropogenic noise, and the severity of effects are not necessarily linear when compared to a received level (RL). Several studies (e.g., Nowacek et al., 2004 and Kastelein et al., 2012 and 2015) showed there were behavioral responses to sources below the 160 dB threshold but also acknowledged the importance of context in these responses. For example, Nowacek et al. (2004) reported the behavior of five out of six NARW was disrupted at RLs of only 133–148 dB re 1 μ Pa (returning to normal behavior within minutes) when exposed to an alert signal. However, the authors also reported that none of the whales responded to noise from transiting vessels or playbacks of ship noise even though the RLs were at least as loud and contained similar frequencies to those of the alert signal. The authors state that a possible explanation for whales responding to the alert signal and not responding to vessel noise is due to the whales having been habituated to vessel noise while the alert signal was a novel sound. In addition, the authors noted differences between the characteristics of the vessel noise and alert signal, which may also have played a part in the differences in responses to the two noise types. Therefore, it was concluded that the signal itself, as opposed to the RL, was responsible for the response. DeRuiter et al. (2012) also indicate that variability of responses to acoustic stimuli depends not only on the species receiving the sound and the sound source, but also on the social, behavioral, or environmental contexts of exposure. Finally, behavioral responses depend on many contextual factors, including range to source, RL above background noise, novelty of the signal, and differences in behavioral state (Ellison et al., 2012, Gong et al., 2014). Similarly, Kastelein et al. (2015) examined behavioral responses of a harbor porpoise to sonar signals in a

quiet pool but stated behavioral responses of harbor porpoises at sea would vary with context such as social situation, sound propagation, and background noise levels.

NMFS uses 160 dB (rms) as the received sound pressure level for estimating the onset of Level B behavioral harassment for impulsive/intermittent sound sources, and this is currently considered the best available science while acknowledging that the 160 dB_{rms} step-function approach is a simplistic approach. While it may be true because of reverberation that impulsive pile driving strikes may "stretch" as their sound travels through the environment, we do not classify these sounds as continuous, like drilling and vibratory pile driving. NMFS' behavioral harassment thresholds consider instantaneous exposure to noise and are based on a received level. These thresholds do not account for duration of exposure, as our PTS onset thresholds do. Thus, whether an individual was exposed to a few pile driving strikes or exposed for several hours of pile driving, the 160-dB threshold would still apply. While it is correct that in practice it works as a step-function (i.e., animals exposed to received levels above the threshold are considered to be "taken" and those exposed to levels below the threshold are not), it is in fact intended as a sort of mid-point of likely behavioral responses, which are extremely complex depending on many factors including species, noise source, individual experience, and behavioral context. What this means is that, conceptually, the function recognizes that some animals exposed to levels below the threshold will in fact react in ways that appropriately considered take while others that are exposed to levels above the threshold will not. Use of the 160-dB threshold allows for a simplistic quantitative estimate of take while we can qualitatively address the variation in responses across different received levels in our discussion and analysis.

Overall, we reiterate the lack of scientific consensus regarding what criteria might be more appropriate. Defining sound levels that disrupt behavioral patterns is difficult because responses depend on the context in which the animal receives the sound, including an animal's behavioral mode when it hears sounds (e.g., feeding, resting, or migrating), prior experience, and biological factors (e.g., age and sex). Other contextual factors, such as signal characteristics, distance from the source, and signal to noise ratio, may also help determine response to a given received level of sound. Therefore,

levels at which responses occur are not necessarily consistent and can be difficult to predict (Southall et al., 2007; Ellison et al., 2012; Southall et al., 2021). For example, Gomez *et al.* (2016) reported that RL was not an appropriate indicator of behavioral response. Further, the seminal reviews presented by Southall *et al.* (2007), Gomez *et al.* (2016), and Southall *et al.* (2021) did not suggest any specific new criteria due to lack of convergence in the data.

Given that there is currently no concurrence on these complex issues, NMFS followed its practice at the time of submission and review of this application in assessing the likelihood of disruption of behavioral patterns by using the 160 dB threshold. NMFS is currently evaluating available information towards development of updated guidance for assessing the effects of anthropogenic sound on marine mammal behavior. However, undertaking a process to derive defensible exposure-response relationships, as suggested by Tyack and Thomas (2019), is complex. The recent systematic review by Gomez *et al.* (2016) was unable to derive criteria expressing these types of exposure-response relationships based on currently available data.

NMFS acknowledges that there may be methods of assessing likely behavioral responses to acoustic stimuli that better capture the variation and context-dependency of those responses than the simple 160 dB step-function used here. However, there is no agreement on what that method should be or how more complicated methods may be implemented by applicants. NMFS is committed to continuing its work in developing updated guidance with regard to acoustic thresholds but pending additional consideration and process, is reliant upon an established threshold that is reasonably reflective of best available science.

Comment 6: A commenter recommended that NMFS should consider the best available data regarding NARW abundance in the project area, as well as the most comprehensive models for estimating marine mammal take and developing robust mitigation measures.

Response: The MMPA and its implementing regulations require that incidental take regulations be established based on the best available information, which does not always mean the most recent information. NMFS generally considers the information in the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments Report (SAR) (Hayes *et al.*, 2023) to be the best

available information for a particular marine mammal stock because of the MMPA's rigorous SAR procedural requirements, which includes peer review by a statutorily established Scientific Review Group. Since publication of the proposed rule, NMFS has released the draft 2023 Stock Assessment Report indicating the NARW population abundance is estimated as 340 individuals based on sighting data through December 31, 2021 (89 FR 5495, January 29, 2024). NMFS has used the best available scientific information in the analysis of this final rule. This new estimate, which is based on the analysis from Pace *et al.* (2017) and subsequent refinements found in Pace (2021), provides the best available, and in this case most recent, estimate, including improvements to NMFS' right whale abundance model. NMFS notes this estimate aligns with the 2022 NARW Report Card (Pettis *et al.*, 2022) estimate (340) based on sighting data through August 2022 but, as described above, that the SARs are peer reviewed by other scientific review groups prior to being finalized and published and that the Report Card does not undertake this process. Based on this, NMFS has considered all relevant information regarding NARW. The commenters did not cite specific abundance data sources they recommended NMFS used or reasons why the science used in NMFS' assessment is not best available. NMFS has relied on the draft 2023 SAR in this final rule as it reflects the best available scientific information.

NMFS notes that this change in abundance estimate does not change the estimated take of NARW or authorized take numbers, nor affect its ability to make the required findings under the MMPA for Sunrise Wind's construction activities.

While NMFS cannot require applicants to utilize specific models for the purposes of estimating take incidental to offshore wind construction activities, it evaluates the models used to support take estimates to ensure that they are methodologically sound and incorporate the best available science. NMFS does require use of the Roberts *et al.* (2016, 2023) density data and SARs abundance estimates for all species, both of which represent the best available science regarding marine mammal occurrence.

Comment 7: A commenter recommended a prohibition on pile driving, site assessment, and site characterization activities during times of highest risk to NARW by extending the seasonal restriction on impact pile driving to December 1 through April 30,

reflecting highest activity levels of NARW. The commenter further identified that if a near real-time monitoring system and mitigation protocol for NARW and other large whale species is developed and scientifically validated, the system and protocol may be used to dynamically manage the timing of site assessment and characterization activities to ensure those activities are undertaken during times of lowest risk for all relevant large whale species.

Response: NMFS has restricted foundation installation pile driving from January through April, which represent the times of year when NARW are most likely to be in the Project Area. However, NMFS recognizes that the density of whales begins to elevate in December, as suggested by the commenter. Sunrise Wind has agreed to restrict pile driving in December to the maximum extent practicable. In this final rule, Sunrise Wind must not plan and, to the maximum extent practicable, not pile drive in December, and must seek NMFS approval for December pile driving. As described in the proposed rule, in any time of year when foundation installation is occurring, a visual sighting of NARW by foundation installation PSOs or an acoustic detection within a 10-km PAM monitoring zone triggers a delay in pile driving commencement or shutdown. In December, Sunrise Wind is also required to implement larger mitigation zones that reflect the acoustic modeling results using a winter sound speed profile (Table 32). With the application of these enhanced mitigation and monitoring measures in December, impacts to NARW will be further reduced.

NMFS neither anticipates nor authorizes take of NARW by Level A harassment (PTS) from HRG survey activities. While NMFS is authorizing a total of 17 Level B harassment takes of NARW incidental to HRG surveys over the 5-year effective period of this rulemaking, the required mitigation will affect the least practicable adverse impact on the species from this activity. Specifically, the largest modeled Level B harassment zone size for the sparker (141 m) is already much smaller than the required separation, clearance, and shutdown distances for NARW (500 m) and any unidentified large whale must be treated as if it were a NARW, triggering associated mitigation. Any Level B harassment that is not avoided is not expected to impact important feeding or other behaviors that may occur throughout the year in the Project Area in a manner that poses energetic or reproductive risks for any individuals.

The commenter stated that site assessment surveys could injure NARW; however, they did not provide scientific evidence to support this claim. As described in this rule, NMFS does not anticipate nor would authorize injury (*i.e.*, Level A harassment) of NARW incidental to these surveys. Given the anticipated minimal impacts of the HRG surveys, NMFS disagrees that additional mitigation measures, including seasonal restrictions or dynamic management of HRG surveys timing, are warranted.

Comment 8: The Commission recommends that NMFS expand zone sizes for foundation installation and base the various mitigation and monitoring zones, including the minimum visibility zone, on the largest of the Level A harassment zones in Tables 15 and 16 of the **Federal Register** notice.

Response: NMFS has considered each construction scenario in this final rule as recommended by the Commission. This final rule increased the clearance and shutdown mitigation zone sizes for scenarios involving monopiles for marine mammals except for NARW (Table 32). The NARW clearance and shutdown zones remain “any distance” as described in Table 42 of the proposed rule. The final rule more clearly distinguishes between the sequential and concurrent installation scenarios. For example, the proposed rule included large whale (other than NARW) clearance and shutdown zones for all monopiles installed equating to 3,700 m in summer and 4,300 m in winter. In this final rule, the clearance and shutdown zones for sequential monopiling in summer is 4 km in summer and 4,300 m in winter while the monopile concurrent and OCS-DC/monopile concurrent clearance and shutdown zone in summer is 5.3 km in summer and 6.3 km in winter.

NMFS did not increase the minimum visibility zone to the largest Level A harassment distance modeled, as recommended by the Commission, as this may result in unnecessary delays to the project. As described above, models demonstrate that completing a project during a time of year when a species of concern is less likely to be present is an effective means by which to reduce the magnitude of impacts (Southall *et al.*, 2021). In this case, if the largest Level A harassment zones for all marine mammals (or zones within the low frequency cetacean hearing group) is used to establish the minimum visibility zone, this extended zone could unnecessarily delay the project, leading to a prolonged duration or more days over which construction would occur, which could result in greater impacts on

marine mammals. The minimum visibility zone in this final rule equates to the largest ER95% for NARW. The “OCS-DC only” scenario zones remained the same as the proposed rule as these are considered adequately protective.

Comment 9: The Commission recommends that NMFS require Sunrise Wind to deploy a dual sound attenuation system for UXO detonations and prohibit Sunrise Wind from conducting UXO detonations when currents are greater than 2 knots (kn).

Response: In this final rule, NMFS is requiring Sunrise Wind to deploy a dual sound attenuation system (such as a double bubble curtain) to meet the noise levels modeled assuming 10-dB attenuation. As described in the proposed rule and carried forward in this final rule, NMFS is requiring Sunrise Wind to conduct complete SFV on all detonations. Further, we are requiring that the bubble curtain be placed at a distance such that the nozzle hose remains undamaged.

In its letter, the Commission did not provide reasoning or justification for its recommendation for restricting UXO/MEC detonation if current speeds are greater than 2 kn. However, the Commission references its Ocean Wind 1 proposed rule comment letter, which states that Bellmann (2021) indicated that currents greater than 2 kn led to a reduction of sound attenuation that cannot be resolved with additional compressed air or larger distances to the source and that the overall achieved sound reduction of a big bubble curtain depends significantly on the configuration and application of the BBC. The Commission identified that if the configuration and application of the bubble curtain is not optimized, then sound reduction decreases significantly. In this case, Ørsted will have experience deploying bubble curtains in U.S. waters for two offshore wind projects, and NMFS anticipates that the double bubble curtain will be optimized. The Commission did not present evidence that the distances to thresholds assuming 10 dB attenuation could not be achieved in current speeds over 2 knots; therefore, at this time, NMFS is not requiring UXO/MEC detonation be limited to times when current speed is 2 kn (2.3 mph) or less. Sunrise Wind is required to use a dual attenuation device (*e.g.*, double bubble curtain) during the 3 UXO/MEC detonations that may occur and conduct SFV on all detonations. Should SFV determine that the model underestimated impacts, the mitigation zone sizes would be increased, and additional attenuation measures added to ensure impacts are

not greater than those analyzed for the next detonation.

Comment 10: Several commenters requested NMFS add to or modify the vessel strike avoidance mitigation measures contained within the proposed rule. Specific recommendations included limiting all vessels to speeds of 10 kn or less at all times with no exceptions, developing an “Adaptive Plan” as an alternative to the 10 kn speed restriction, requiring Class A AIS, requiring PSOs on all vessels when underway as opposed to a “visual observer” and requiring service vessels to complement observer coverage with additional monitoring technologies (*e.g.*, infrared (IR) detection devices for whales and other protected species, requiring Sunrise Wind to provide a vessel traffic plan, keeping 500 m away from NARW at all times and 100 m for other large whale species, requiring that all vessel personnel are trained in observing and identifying NARW, and requiring each vessel to have a minimum of 4 PSOs following a two-on, two-off rotation, each responsible for scanning no more than 180° of the horizon per pile driving locations). A commenter also claimed that vessel speed restrictions are not fully mandated or enforced for OSW vessels.

Response: NMFS acknowledges that vessel strikes pose a risk to all large whales, including NARW and the proposed rule and this final rule requires a suite of mitigation measures to effect the least practicable adverse impact from vessels on marine mammals. These measures are more restrictive than other industrial, commercial, military, and recreational vessels. All vessel operators must abide by vessel speed regulations (50 CFR 224.105). All transiting vessels, regardless of speed or size, are required to have a trained dedicated visual observer watching for marine mammals. In the event a marine mammal is observed, the vessel must slow to 10 kn or less or if within separation zones (500 m for NARW and 100 m for sperm whales and non-NARW), turn away from and slow engines to neutral. In any Seasonal Management Area (SMA), Dynamic Management Area (DMA), or Slow Zone (the latter two of which are voluntary for other vessels), Sunrise Wind must operate vessels at 10 kn or less. Further, between November 1st and April 30th, all vessels, regardless of size, must operate port to port (specifically from ports in New Jersey, New York, Maryland, Delaware, and Virginia) at 10 kn or less, except for while transiting in Narragansett Bay or Long Island Sound. Sunrise Wind is also required to maintain situational

awareness of marine mammals by monitoring various systems and internal communication. NMFS has determined it is impracticable for all vessels to travel 10 kn or less at all times and is not necessary to achieve the least practicable adverse impact given the mitigation discussed above.

As described above, in many cases, there are no alternatives to the 10 kt or less speed restrictions. However, NMFS has determined that under certain conditions, Sunrise Wind vessels could travel at over 10 kts. A commenter has recommended that this "Adaptive Plan" be allowed only if it is proven to be equally or more effective than a 10 kt speed restriction. NMFS has determined that the monitoring required, including both direct marine mammal monitoring and situational awareness monitoring and reporting, affect the least practicable adverse impact on marine mammals. The commenter did not provide scientific evidence that the circumstances in which Sunrise Wind vessels could travel over 10 kts are not effective at avoiding vessel strikes.

In this final rule, NMFS is requiring that all vessels associated with Sunrise Wind's activities be equipped with a properly installed, operational Automatic Identification System (AIS) device and Sunrise Wind must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources, thus facilitating monitoring of vessel speeds. In addition, NMFS maintains an Enforcement Hotline for members of the public to report violations of vessel speed restrictions. NMFS does not require PSOs to be onboard every transiting vessel as it is impracticable due to potential limited space on the vessels. However, as described in the proposed rule and carried forward in this final rule, Sunrise Wind must have dedicated visual observers onboard all vessels with no other concurrent duties. The dedicated visual observer may be a PSO or a trained crew member.

NMFS described in the proposed rule, and is requiring in this final rule, that infrared technologies and PAM hydrophone deployments be available and used before, during, and after pile driving. To ensure marine mammal detection is maximized, and in response to public comments, NMFS is now requiring monitoring for marine mammals before, during, and after foundation installation, and is requiring in this final rule three on-duty PSOs on both platforms such that each PSO is responsible for 120-degree coverage. As proposed, this final rule requires that visual observers must be equipped with alternative monitoring technology (e.g.,

night vision devices, infrared cameras) to monitor clearance and shutdown zones during periods of low visibility (e.g., darkness, rain, fog, etc.).

NMFS disagrees with the commenter that the final rule and LOA must include a "vessel traffic" plan. The commenter did not provide details on what this plan should include. Sunrise Wind provided information pertaining to the types and number of vessels necessary to construct the project. It is also required to submit a Vessel Strike Avoidance Plan, which must include, but is not limited to, more detail on ports used and means by which they would abide by the extensive measures outlined here. While NMFS acknowledges that vessel strikes can result in injury or mortality, the implementation of the required monitoring and mitigation measures would reduce the risk of vessel strike to levels low enough such that it is considered discountable; thus, no vessel strike is expected or would be authorized under this final rule. These measures also ensure the least practicable adverse impact on species or stocks and their habitat.

Comment 11: A commenter recommended strengthening mitigation measures for other endangered species and species experiencing UMEs to minimize take by Level A harassment, indicating the mitigation measures required by the proposed rule to reduce risk to large whales are largely designed for NARW and may not be equally efficacious for other species (e.g., passive acoustics will not be used to trigger mitigation measures for fin whales).

Response: NMFS disagrees that additional or modified mitigation measures are necessary to affect the least practicable adverse impact on marine mammal species or stocks, including those listed under the ESA and experiencing UMEs. This rule allows a limited number of Level A harassment takes to be authorized for two ESA-listed species (i.e., fin whale and sei whale, neither of which are experiencing a UME), two non-ESA listed species experiencing active UMEs (i.e., humpback whales and minke whales) and two non-ESA listed species with non-active UMEs with closure pending (i.e., gray and harbor seals) incidental to foundation impact pile driving (table 15). A very limited number of seals (n=5) may also experience PTS from UXO/MEC detonation (table 23). NMFS notes that these take estimates did not consider mitigation measures other than seasonal restrictions and 10 dB of sound attenuation. Some mitigation measures

in the proposed rule and this final rule are centered around NARW because of the species status and general fitness of individuals. NMFS acknowledges that seasonal closures are based on NARW densities and the maximum density months for other ESA-listed species and stocks experiencing UMEs may occur outside of the seasonal closures (table 12). However, it is neither possible nor practicable to schedule activities around every species' densities because of the significant amount of variation and year-round presence of some species. Other enhanced mitigation for NARW includes delaying or shutting down pile driving should a NARW be observed at any distance by a foundation installation PSO or acoustically detected within the PAM monitoring zone. If clearance and shutdown zones were increased for other ESA-listed species and marine mammal species experiencing UMEs, it would result in longer construction time frames, prolonging the time periods over which marine mammals may be exposed to construction-related stressors, as well as creating impracticable operational scenarios for the applicant. It has been modeled and is logical that projects should be constructed as quickly as possible during times when the potential for a species of concern to be present is lowest (Southall *et al.* 2021). Accordingly, NMFS has determined that the current clearance and shutdown zones, together with other mitigation measures, affect the least practicable adverse impact on marine mammals. Moreover, while some mitigation measures are focused on NARW, NMFS has determined that the take that may be authorized, which includes both Level A and Level B harassment, has a negligible impact on all marine mammal species and stocks and affects the least practicable adverse impact on marine mammal species or stocks.

Regarding PAM detections, NMFS has clarified in this final rule that while the PAM system should be designed to maximize detections of NARW and is not required to have the capability to detect all marine mammals within the 10km PAM monitoring zone, should another marine mammal be detected (e.g., a fin whale, which vocalizes within similar frequencies for which the PAM system would be optimized) within a clearance or shutdown zone via PAM, mitigation must be applied.

Comment 12: Several commenters recommended that the impacts of underwater noise be minimized to the fullest extent feasible (e.g., select and operate subbottom profiling systems at the lowest source levels practicable) and that the best commercially available

technology and methods should be used to minimize sound levels from piledriving coupled with a robust monitoring and reporting program to ensure compliance. A commenter recommended projects should achieve no less than 10 dB (SEL) in combined noise reduction and attenuation, taking as a baseline, projections from prior noise measurements of unmitigated piles from Europe and North America. Another commenter recommended a requirement of the implementation of best commercially available combined (near- and far-field) noise abatement systems capable of a 15 dB reduction (SEL). A commenter also suggested that developers must be required to specify the exact equipment to be used for noise attenuation for proper evaluation of potential impacts.

Response: NMFS, as delegated by the Secretary of Commerce, must promulgate regulations setting forth mitigation measures affecting the least practicable adverse impact on marine mammal species or stocks and their habitat in any issued incidental take authorization (16 U.S.C. 1371(a)(5)(A)(i)(II)). As described in both the proposed rule and this final rule, NMFS has included requirements for sound attenuation methods that successfully (evidenced by required sound field verification measurements) reduce real-world noise levels produced by impact pile driving of foundation installation to, at a minimum, the levels modeled assuming 10 dB attenuation. NMFS clarifies that, because no unattenuated piles may be driven, there is no way to confirm a 10-dB reduction; rather, *in situ* SFV measurements will be conducted to ensure that sound levels are at or below those modeled assuming a 10-dB reduction. At this time, NMFS is not requiring 15 dB attenuation be achieved. While data do demonstrate that this is feasible under some circumstances (e.g., Bellman *et al.*, 2020), the data on the effectiveness of NAS in the Atlantic for similar size piles is scant. Preliminary sound measurements from South Fork Wind indicate that with multiple NAS systems, measured sound levels during impact driving foundation piles using a 4,000 kilojoules (kJ) hammer are below those modeled assuming a 10-dB reduction and suggest, in fact, that two systems may sometimes be necessary to reach the targeted 10-dB reductions. Therefore, while higher than 10 dB attenuation may be technically feasible under some circumstances, more data are needed before assuming a higher level of attenuation is consistently achievable in all environments.

In addition to the SFV requirements in the proposed rule, consistent with the Biological Opinion, NMFS has added to this final rule the requirement that Sunrise Wind must conduct abbreviated SFV monitoring (consisting of a single acoustic recorder placed at an appropriate distance from the pile) on all foundation installations for which the complete SFV monitoring, as required in the proposed rule, is not carried out. NMFS is requiring that these SFV results must be included in the weekly reports. Any indications that distances to the Level A harassment and Level B harassment thresholds for whales are exceeded must be addressed by Sunrise Wind, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles.

Since the proposed rule, Sunrise Wind has identified the noise attenuation systems that will be used during foundation installation (*i.e.*, a double bubble curtain and A dBm resonator). While knowing the exact system is not required to evaluate the potential impacts to marine mammals as NMFS conservatively carries forward the proposed system with the largest potential impact into the estimate take analysis, NMFS believes the commenter's request to specific the noise attenuation system has been satisfied.

Comment 13: A commenter recommended NMFS should expand the NARW PAM and visual clearance zones to 5,000 m from the pile during impact and vibratory pile driving; expand the PAM shutdown zone (exclusion zone) to 2,000 m during vibratory and impact pile driving; expand the clearance zone during HRG to 1,000 m; and have a soft-start/ramp-up whenever a shutdown during HRG occurs.

Response: The foundation installation impact pile driving PAM monitoring zone for NARW is 10 km and any detection within this zone would trigger a delay or shutdown of pile driving. Clearance or shut down for NARW would also occur if a whale is visually detected at any distance by foundation installation PSOs. These requirements are more protective than those recommended by the commenter. While the minimum visibility zone is construction scenario-specific (table 32) but less than the recommended 5,000 m, it is based on the largest modeled Level A harassment ER95% for NARW. Any larger zone could result in delays to the project that could adversely impact marine mammals by extending construction. Further, this is the *minimum* distance that must be visually

cleared, and NMFS anticipates that on many occasions, the ability to detect NARW beyond this zone will be obtainable.

Vibratory pile driving would occur at the cable landfall location to install cofferdam sheet piles and goal posts. The distances to the Level A harassment thresholds from this activity are very small (*i.e.*, less than 200 m for all marine mammal species). While the distance to the Level B harassment threshold is not small (*i.e.*, approximately 9.7 km for all marine mammal species), clearing 5,000 km before beginning vibratory driving is not practical. The commenter did not provide scientific information supporting their recommendation for such a large clearance zone. The commenter also recommended a PAM clearance zone of 2 km during vibratory pile driving; however, PAM is not required during this activity given it is an activity that would be very limited in duration (a maximum of 12 days), produces relatively low noise levels, and is expected to result in a limited number of takes. NMFS has determined that the current clearance zones, along with other mitigation measures, affect the least practicable adverse impact on marine mammal species or stocks and their habitat.

As described in the proposed rule and this final rule for HRG surveys, the required 500-m shutdown zone for NARW exceeds the modeled distance to the largest 160-dB Level B harassment isopleth (141 m during sparker use) by a large margin, minimizing the likelihood that they will be harassed in any manner by this activity. Commenters do not provide additional scientific information for NMFS to consider to support their recommendation to expand the zones to 1,000 m. Given that these surveys are relatively low impact, and that NMFS has prescribed a precautionary NARW clearance and shutdown zone that is larger (500 m) than the largest estimated Level B harassment zone (141 m), NMFS has determined that an increase in the size of the zones to 1,000 m is not necessary to affect the least practicable adverse impact.

Finally, a soft-start to impact pile driving and ramp-up to HRG surveys was included in the proposed rule and is included in this final rule. The rule specifies that if an acoustic source is shut down for a period longer than 30 minutes, then all clearance and ramp-up procedures must be initiated. However, if an acoustic source is shut down for reasons other than mitigation (*e.g.*, mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up only if PSOs have

maintained constant observation and no additional detections of any marine mammal occurred within the respective shutdown zones.

Comment 14: A commenter asserted an independent review of mitigation measures should be required due to limitations associated with visual monitoring and PAM.

Response: The MMPA does not require an independent review of mitigation measures. It does require notice and opportunity for public comment (16 U.S.C. 1371(a)(5)(A)(i)). The public comment period is a means by which the public (*i.e.*, independent reviewers) are able to provide NMFS with mitigation measure recommendations supported by scientific evidence that NMFS takes into consideration when finalizing the rulemaking.

Comment 15: A commenter recommended shutdown should be initiated if weather or other conditions limit the range of observation.

Response: The comment refers to a 500 m shutdown zone for NARW; therefore, NMFS assumes the recommendation is referring to HRG surveys, which are a low impact activity. As described in the proposed rule and this final rule, PSOs are required to monitor the shutdown zone during operations. During periods of low visibility, alternative monitoring technology (*i.e.*, infrared or thermal cameras) must be used to monitor these zones. This final rule clarifies that when the shutdown zones become obscured for brief periods (*i.e.*, no more than 30 minutes) due to inclement weather, survey operations may continue (*i.e.*, no shutdown is required) so long as no marine mammals have been detected. Further, the shutdown requirement is waived for certain genera of small dolphins. As noted above, take of marine mammals from HRG surveys is limited overall, take by Level B harassment only is expected to occur only within a small area in close proximity to the vessel, and no Level A harassment is expected to result from exposure to the surveys even in the absence of mitigation. There is a low likelihood that short periods of obscured visibility might potentially coincide with a marine mammal entering the shutdown zone and a shutdown not occurring. While such an event may result in a higher-level exposure than would occur if the shutdown happened, such an exposure would still not be expected to result in a Level A take and would be brief and not change the number of takes or our evaluation of their likely effects, which are expected to be comparatively minor.

Additionally, the frequent delay and/or cessation of HRG surveys creates operational challenges and impracticalities for applicants. Altogether, the required measures affect the least practicable adverse impact on the affected species.

Comment 16: For HRG survey activities, a commenter questioned why the NARW is given an exclusion zone for ramp up and ramp down procedures equal to 500 meters, while all other baleen whales that hear in the exact same profile, are only given an exclusion zone range from 100–141 m, even though they hear equally as well as the NARW.

Response: While baleen whales have similar hearing capabilities, given the baseline status and condition of NARW, NMFS determined that enhanced mitigation measures are necessary to affect the least practicable adverse impact on the species. The largest Level B harassment zone for HRG acoustic sources is 141 m. Extending clearance zones for other baleen whales from 100 m to 500 m could result in HRG surveys extending over longer time periods. Extending the time over which surveys are conducted could potentially lead to adverse impacts on marine mammals (*e.g.*, Southall *et al.*, 2021). In consideration of the size of the Level B harassment zone and the potential consequences of extending survey time, NMFS has determined that the mitigation measures for HRG surveys effect the least practicable adverse impact on non-NARW baleen whales.

Comment 17: A commenter recommended prohibiting all planned activities on days or periods where reduced visibility conditions occur, as well as at night due to concerns over the ability to monitor the clearance zone and increased risk of vessel strikes in the case that various construction vessels are operating at night. Another commenter recommended if, under rare circumstances pile driving must proceed after dark for safety reasons, a summary of the frequency of these exceptions be publicly available to ensure they are the exception and not the norm for the project.

Response: NMFS acknowledges the limitations inherent in visual detection of marine mammals at night. In order for Sunrise Wind to conduct nighttime pile driving activities, it must submit and NMFS must approve a Nighttime Monitoring Plan that reliably demonstrates the efficacy of its night vision methods. In this final rule, NMFS has clarified that this includes a description of how Sunrise Wind 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 NVDs, spotlights) in detecting marine mammals over the full extent of the required clearance and shutdown zones. All impact pile driving activities must have visual monitoring paired with PAM, increasing the likelihood that NARW and opportunistically, other marine mammals, will be detected. NMFS emphasizes that there are benefits to completing the pile driving activities in a shorter total amount of time, in that some number of marine mammals (*i.e.*, those that might intersect the much larger Level B harassment zone) would be exposed to fewer overall days of pile driving noise and potentially a smaller magnitude or severity of behavioral disturbance as a result given repeated exposures would be minimized. Therefore, NMFS has determined the current mitigation measures affect the least practicable adverse impact on marine mammals and their habitat.

Sunrise Wind is also required to submit a Vessel Strike Avoidance Plan, which NMFS will also review in consideration of the vessel strike avoidance monitoring requirements, including the technology it would use to monitor for marine mammals at night and the effectiveness of that technology. NMFS notes any vessel strike would be unlawful, and Sunrise Wind is required to immediately report the incident to NMFS, cease activities, and work with NMFS to determine the best course of action.

NMFS does not plan to make the weekly or monthly reports publicly available; however, it will make the final reports available, which must summarize all of the information contained in the weekly and monthly reports.

The proposed rule and this final rule do not restrict the timing of HRG survey activities. There is no evidence that mortality or Level A harassment is an outcome of HRG survey noise exposure, the Level B harassment zones are small (*i.e.*, no more than 141 m), and HRG survey PSOs are required to use alternative technology to monitor the mitigation zones at night. Therefore, the mitigation zones are able to be effectively monitored at night. Further, ramp-up may occur at nighttime if appropriate visual monitoring has occurred with no detections of marine mammals in the 30 minutes prior to beginning ramp-up. The commenter did not provide justification for why, with the use of two PSOs and alternative detection technology, the mitigation

zones cannot be effectively monitored. Furthermore, restricting the ability of the applicant to begin operations only during daylight hours could result in the applicant failing to collect the data they have determined is necessary within the specific timeframe and, subsequently, may necessitate the need to conduct additional surveys in the future across additional days. No Level A harassment is expected to result from exposure to HRG equipment, even in the absence of mitigation, given the characteristics of the sources planned for use (supported by the very small estimated Level A harassment zones; *i.e.*, <36.5 m (119.8 ft) for all sources).

Regarding Level B harassment, any potential impacts from HRG survey noise exposure are expected to be limited to short-term, minor (*e.g.*, slight avoidance) behavioral responses. In consideration of the effects of the activity on marine mammals, the fact PSOs would utilize alternative technology at night, the potential unintended consequences of the measures as proposed by the commenters, NMFS has determined that the HRG mitigation measures affect the least practicable adverse impact on marine mammals and their habitat and no additional restrictions are warranted.

Comment 18: The Commission recommends that in the final rule, NMFS should: (1) specify which model-estimated zones (*i.e.*, acoustic ranges, exposure ranges, mitigation zones, monitoring zones) and which metrics (*i.e.*, flat R_{max} , flat $R_{95\%}$) should be compared to the *in situ* measured Level A and B harassment zones; (2) specify which type of *in situ* Level A harassment zone (*i.e.*, acoustic or exposure ranges) should be calculated; (3) require Sunrise Wind to conduct additional *in situ* measurements for monopiles that are not represented by the previous three locations (*i.e.*, substrate composition, water depth) or by the hammer energies and numbers of strikes needed to install a pile in a given day or number of piles installed in a given day; and (4) require Sunrise Wind to deploy a minimum of three hydrophones for SFV during impact pile driving of monopiles and two hydrophones and one pressure transducer for SFV during UXO/MEC detonations. The Commission also recommends that NMFS require Sunrise Wind to determine (1) root-mean-square SPL (SPL_{rms}) and single-strike SEL (SEL_{s-s}) source levels and (2) ranges to (a) mortality, (b) Level A harassment based on slight lung injury, slight gastro-intestinal (GI) injury, and permanent threshold shift (PTS), and (c) Level B harassment based on temporary

threshold shift (TTS) and behavior. The also recommended NMFS require Sunrise Wind to include in the interim SFV reports (1) number of strikes for impact pile driving, (2) the type(s) and location(s) of the sound attenuation systems, (3) SELcum for impact pile driving and UXO detonations, and (4) ranges to (a) Level A harassment (PTS for impact pile driving and UXO detonations) and (b) Level B harassment (TTS for UXO detonations and behavior for impact pile driving and UXO detonations). In the final SFV reports, the Commission recommended Sunrise Wind include (1) the impulse metric (in Pa-sec) for UXO detonations, (2) ranges to Level A harassment (PTS) and Level B harassment (behavior) for impact pile driving, (3) ranges to mortality, Level A harassment (slight lung injury, slight GI injury, and PTS), and Level B harassment (TTS and behavior) for UXO detonations, (4) source levels at 10 m during wind turbine operations, (5) received levels at 50 m, 100 m, and 250 m from the wind turbine during operations, and (6) operational parameters (*i.e.*, direct drive/gearbox information, turbine rotation rate), sea state conditions, and any nearby anthropogenic activities when monitoring operational sound.

Response: NMFS agrees with most of the Commission's recommendations on reporting and have added metrics recommended in this final rule where they were not included or unclear in the proposed rule. The following provides a summary of those recommendations NMFS does not agree with or where NMFS has provided alternative measures. NMFS is not at this time requiring rms source levels as those can be deduced from the SEL levels. NMFS is also not specifying the distances at which operational noise be measured as recommended by the Commission but will assess the proposal by the developer in their SFV plan. In this final rule, NMFS is requiring Sunrise Wind conduct abbreviated SFV on all piles, which is more than is recommended by the Commission. In addition, for complete SFV, NMFS is requiring four recorders (each equipped with two hydrophones) to be used as well as an additional recorder at a 90 degrees (total of 10 hydrophones), which is well above that recommended by the Commission. Sunrise Wind is also required in this final rule to measure pressure during all UXO/MEC detonations with a pressure transducer.

Comment 19: The Commission recommends that NMFS allow for public comment on Sunrise Wind's PAM Plan prior to issuing any final rule; require wind energy applicants to

submit a PAM plan and SFV plans prior to the agency publishing any proposed rule; ensure that any PAM plan include, at a minimum, information on the minimum number, type (*e.g.*, moored, drifting, or towed), location, bandwidth/sampling rate, estimated acoustic detection range, or sensitivity of the hydrophones or the detection software (*e.g.*, PAMGUARD) that would be used; and discuss with Sunrise Wind whether the operator would use vector sensors in addition to hydrophones to enhance detections, particularly of those vocalizations that may be drowned out by the hammer strikes and resulting reverberation.

Response: Due to other concurrent permitting processes and acknowledging the need for flexibility and project-specific implementation, NMFS disagrees these Plans must be submitted prior to promulgating the final rule. The purpose of the Plans is for the developer to provide to NMFS details on how they would satisfy the criteria identified in the rule. These criteria are available for public review and comment. NMFS does not specify the Commission's reporting recommendations; however, it does require a description of all proposed PAM equipment, procedures, and protocols, including evidence that vocalizing NARW will be detected within the clearance and shutdown zones, as well as how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind. Sunrise Wind's responses to these requirements will address the Commission's recommendations.

Comment 20: Commenters recommended that NMFS should expand the visual monitoring (PSO) and acoustic monitoring (PAM) requirements for the project. They recommended that PSO staffing levels should be increased to a minimum of four PSOs on each monitoring platform, with at least two on duty at all times, and be supplemented with drones during periods of darkness or poor visibility. They also recommended PAM should be required during vibratory pile driving, and HRG surveys; have a minimum detection range of 10,000 m during pile driving; and be undertaken from a vessel other than the pile driving vessel or from a stationary unit to avoid the hydrophone being masked by construction related noise. Finally, the commenters recommended that visual and acoustic monitoring should begin 60 minutes prior to vibratory pile driving.

Response: Regarding the number of PSOs, NMFS notes that the proposed rule required a minimum of four PSOs actively observing marine mammals before, during, and after (specific times described below) the installation of monopiles (two on the pile driving platform and two on a secondary PSO vessel). In light of other public comments regarding monitoring, NMFS has increased this requirement to 3 on-duty PSOs per vessel platform for a minimum of six on-duty PSOs monitoring before, during, and after foundation installation impact pile driving.

NMFS has expanded the visual and acoustic monitoring requirements in this final rule and has established a 10 km PAM monitoring zone for NARW (and opportunistically other marine mammals) during foundation impact pile driving and the PAM system be at least 1 km from the pile driving vessel. In this final rule, NMFS has increased the number of on-duty PSOs on the pile driving vessel from two to three. NMFS notes that the proposed rule and this final rule limit the number of consecutive PSO watch hours and, therefore, Sunrise Wind must ensure it has enough PSOs on staff to meet on-duty requirements. NMFS is not requiring drones to be used at this time and the commenters did not provide information supporting the recommendation that they be used when considering the extensive PSO monitoring required.

NMFS is not requiring PAM during HRG surveys and vibratory pile driving and the commenters do not provide additional scientific information for NMFS to consider to support their recommendation to require PAM during these activities. NMFS disagrees that this measure is warranted during HRG surveys because it is not expected to be effective for use in detecting the species of concern given the noise from the vessel because the flow noise, and the cable noise are in the same frequency band and will mask the vast majority of baleen whale calls. Vessels produce low-frequency noise, primarily through propeller cavitation, with main energy in the 5–300 Hz frequency range. Source levels range from about 140 to 195 decibel (dB) re 1 μ Pa (micropascal) at 1 m (NRC, 2003; Hildebrand, 2009), depending on factors such as ship type, load, and speed, and ship hull and propeller design. Studies of vessel noise show that it appears to increase background noise levels in the 71–224 Hz range by 10–13 dB (Hatch *et al.*, 2012; McKenna *et al.*, 2012; Rolland *et al.*, 2012). PAM systems employ hydrophones towed in streamer cables

approximately 500 m behind a vessel. Noise from water flow around the cables and from strumming of the cables themselves is also low frequency and typically masks signals in the same range. Experienced PAM operators (Thode *et al.*, 2017) emphasized that a PAM operation could easily report no acoustic encounters, depending on species present, simply because background noise levels rendered any acoustic detection impossible. The same report stated that a typical eight-element array towed 500 m behind a vessel could be expected to detect delphinids, sperm whales, and beaked whales at the required range but not baleen whales due to expected background noise levels (including seismic noise, vessel noise, and flow noise).

While NMFS agrees that PAM can be an important tool for augmenting detection capabilities in certain circumstances (*e.g.*, foundation installation), its utility in further reducing impacts during HRG survey activities and vibratory pile driving is limited. For HRG surveys, the area expected to be ensonified above the Level B harassment threshold is relatively small (a maximum of 141 m); this reflects the fact that the source level is comparatively low and the intensity of any resulting impacts would be lower level and, further, it means that inasmuch as PAM will only detect a portion of any animals exposed within a zone, the overall probability of PAM detecting an animal in the harassment zone is low (particularly because of flow noise masking vocalizations). Together, these factors support the limited value of PAM for use in reducing take for activities/sources with smaller zones. Additionally, PAM is only capable of detecting animals that are actively vocalizing, while many marine mammal species vocalize infrequently or during certain activities, which means that only a subset of the animals within the range of the PAM would be detected (and potentially have reduced impacts). Further, localization and range detection can be challenging under certain scenarios. For example, odontocetes are fast moving and often travel in large or dispersed groups which makes localization difficult while porpoises and delphinid echolocation clicks are high frequency with limited detection ranges.

The only vibratory pile driving that would occur is during installation and removal of sheet piles at the cofferdam site and pier pile installation at Smith Point County Park, the latter of which is not expected to result in take of marine mammals. Vibratory installation of sheet piles is a relatively quiet pile

installation method when compared to impact pile driving with lower impacts and would occur over a short durations (*i.e.*, approximately one month intermittently). The use of PAM is not typically required during similar coastal construction pile driving projects, as PSOs are sufficient to monitor for marine mammals. This work would also occur in shallow water; therefore, any marine mammals should be reliably detected within 30 minutes prior to pile driving when PSO monitoring would begin as animals would not be diving to depth that require longer dive times. Further, the commenters did not provide scientific evidence suggesting 30 minutes is not an adequate amount of time to detect marine mammals to enact mitigation, where applicable. Therefore, NMFS is not requiring 60 minutes of monitoring prior to beginning cable landfall pile driving as it has determined it affects the least practicable adverse impact.

Given that the effects to marine mammals from the types of HRG surveys and vibratory pile driving authorized are expected to be limited to low-level, behavioral harassment even in the absence of mitigation and the cost and impracticability of implementing a full-time PAM program, NMFS has determined the current requirements for visual monitoring are sufficient to effect the least practicable adverse impact on the affected species or stocks and their habitat during these activities.

Comment 21: A commenter suggested that NMFS should improve data transparency for the reporting measures by requiring that all reports and data be accessible to the public; require immediate reporting of all visual and acoustic detections of NARW and dead/injured/entangled marine mammals, if possible, to the appropriate authority but no later than the end of the protected species observer's shift; and require reporting to NMFS and the public whenever an exemption was taken to implementing a mitigation measure (*e.g.*, shutdown did not occur due to safety concerns).

Response: The commenter's recommendations to report all visual and acoustic detections of NARW and any dead, injured, or entangled marine mammals to NMFS are consistent with the proposed rule and this final rule. NMFS recognizes the potential for intermittent communication issues at sea and these issues may last longer than a maximum PSO shift (*i.e.*, four hours). Therefore, NMFS is requiring these reports be made as soon as possible but no later than 24 hours.

Neither the MMPA nor its implementing regulations require NMFS

to make monitoring reports publicly available. However, it is NMFS long standing practice to make final incidental take authorization monitoring reports available to the public via our website. In both the proposed rule and this final rule, NMFS requires Sunrise Wind to submit annual marine mammal monitoring reports (which include documenting instances where allowable exemptions were taken) and final SFV monitoring reports; the final versions of these reports will be posted on NMFS' website). NMFS also requires weekly and monthly reporting; however, these reports are a means by which to check compliance with the rule. NMFS does not intend to make these publicly available. Further, as NARW sightings are reported by Sunrise Wind, they will be made publicly available on WhaleMap (<https://whalemap.org/whalemap.html>) while acoustic detections of NARW and other large whale species will be available to the public on NOAA's Passive Acoustic Cetacean Map website (<https://www.fisheries.noaa.gov/resource/data/passive-acoustic-cetacean-map>).

Comment 22: A commenter recommended NMFS should set more frequent reporting requirements for NAS and require independent compliance evaluators.

Response: In addition to the SFV reporting included in the proposed rule for complete SFV, this final rule requires Sunrise Wind to conduct abbreviated SFV on all foundation piles for which complete SFV is not conducted with frequent reporting in weekly reports. Frequent SFV reporting will allow NMFS to evaluate Sunrise Wind's compliance with the need to reduce distances to NMFS harassment isopleths to at or below those modeled assuming 10 dB attenuation. NMFS is not requiring independent compliance evaluators. These reports will be reviewed by NMFS staff with specialized expertise.

Comment 23: A commenter asserted the use of PSOs and PAM is not sufficient or effective, particularly for NARW and calves, as well as during UXO detonations and construction of multiple and adjacent projects and requested the final rule detail the effectiveness of PAM for detecting NARW, including mothers and calves, during pile driving and UXO detonation occurring simultaneously with other projects.

Response: The commenter did not provide any scientific evidence that visual monitoring for NARW is not effective and therefore, is not supported. Regarding the assertion that PAM is also not effective, the commenter cited Parks

et al. (2019). As evident from the title of the paper, "Acoustic crypsis in communication by NARW mother-calf pairs on calving grounds", all data collected to support the findings from that paper were from calving grounds off the coasts of Georgia and Florida. Habitat use and age classes are different between calving ground and southern New England, which hosts older animals and those engaged in foraging and socialization, making findings in the referenced paper not applicable to the Sunrise Wind project area. Furthermore, there is ample scientific evidence to support PAM is an effective tool for monitoring for NARW (*e.g.*, Davis *et al.*, 2017, Van Parijs *et al.* (2021)) with recent literature indicating PAM was able to detect NARW in the Massachusetts and Rhode Island Wind Energy Areas monitored, including where the Sunrise Wind's Lease Area is located on, in certain months of the year, a daily basis (Davis *et al.* 2023). Together, visual and PAM approaches are well understood to provide best results when combined together (*e.g.*, Barlow and Taylor, 2005; Clark *et al.*, 2010; Gerrodette *et al.*, 2011). For these reasons, NMFS finds that the suite of visual and acoustic monitoring measures in the proposed rule and carried forward in this final rule are based on the best available scientific information and are effective at detecting NARW.

Comment 24: A commenter requested an increase in the frequency of information review for adaptive management to occur on a quarterly basis, that these quarterly reports be made publicly available, and for NMFS develop a mechanism to undertake these reviews on an ad hoc basis if a serious issue is identified.

Response: Regarding the recommendation that NMFS have a mechanism in place to undertake review and adaptive management on an ad hoc basis if a serious issue is identified, there are no timing restrictions in the adaptive management provisions and therefore, NMFS may undertake review and adaptive management actions at any time under the regulations, as written. Regarding the recommendation to increase the frequency of information review, Sunrise Wind is required to submit weekly, monthly, and annual reports that NMFS will review in a timely manner and may act on pursuant to the adaptive management provisions at any time and, therefore, a separate specific quarterly review is unnecessary.

Comment 25: A commenter recommended that sound source validation reports of field measurements must be evaluated by NOAA Fisheries

prior to additional piles being installed and be made publicly available and that SFV be on the first pile installed and from a random sample of piles throughout the construction period.

Response: NMFS notes that, as proposed, this final rule requires that no unmitigated piles can be installed and that SFV is required for piles to ensure that measured sound levels do not exceed those modeled assuming 10 dB of attenuation. NMFS acknowledges the importance of transparency in the reporting process and plans to make all final annual SFV reports available on our website.

Comment 26: A commenter requested that NMFS: (1) explain whether or not Level B necropsies will be conducted on all animals that may wash ashore during construction activities to examine for auditory injury and/or lung and gastrointestinal injury; (2) how or if those results will be made public and available in a timely manner, if such injury is discovered if or how this would be attributed to any particular project or offshore wind construction activity; and (3) what steps NMFS would take as a result.

Response: The MMPA established the Marine Mammal Health and Stranding Response Program (MMHSRP). It coordinates emergency responses to sick, injured, distressed, or dead seals, sea lions, dolphins, porpoises, and whales. The MMHSRP works with volunteer stranding and entanglement networks as well as local, tribal, state, and Federal Government agencies to coordinate and conduct emergency responses to stranded or entangled marine mammals. The networks respond, when safe and feasible, to document and recover carcasses. It does not and cannot respond to every stranded marine mammal, and it is not responsible for disposing of carcasses. The type of examination conducted varies and depends on availability of resources, location, carcass accessibility, and the decomposition state. A necropsy report, when written, includes data which are compiled over several weeks to months and then analyzed for a possible cause of death determination and findings. National and Regional summaries of stranding statistics are available at: <https://www.fisheries.noaa.gov/resource/publication-database/marine-mammal-health-and-stranding-response-program-reports>. NMFS may modify these regulations and the LOA based on new information it considers the best available science. If this science indicates the takings allowed under these regulations may be having more than a negligible impact, NMFS must

suspend or withdraw the LOA after notice and opportunity for public comment.

Comment 27: Several commenters disagreed with NMFS' negligible impact determination, particularly for NARW. Comments claimed that NMFS did not: (1) consider the imperiled population status of NARWs; (2) evaluate the cumulative effects of all projects (e.g., offshore wind construction and operational noise and site characterization surveys and baseline urbanized background levels of ambient noise which result in stress); (3) meaningfully examine the effects of the loss of communication space on marine mammals and, further, seems to misapprehend the spatial and temporal scope of the effects; (4) consider that any effect to the small number of breeding females can adversely affect fecundity and imperil the species; and (5) consider whether abandonment of habitat that was designated with the express purpose of preventing vessel strikes would push the species further into a vessel traffic corridor, thereby elevating the risk to the species nor evaluated all the risks to NARW by habitat displacements as sublethal take has can a measurable effect due to the small population.

Response: NMFS is required to authorize the requested incidental take if it finds the total incidental take of small numbers of marine mammals by U.S. citizens "while engaging in that (specified) activity" within a specified geographic region during the 5-year period (or less) will have a negligible impact on such species or stock and, where applicable, will not have an unmitigable adverse impact on the availability of such species or stock for subsistence uses (16 U.S.C. 1371(a)(5)(A)). Negligible impact is defined as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effect on annual rates of recruitment or survival" (50 CFR 216.103). Consistent with the preamble of NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are factored into the baseline, which is used in the negligible impact analysis. Here, NMFS has factored into its negligible impact analysis the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (e.g., as reflected in the density/distribution and status of the species, population size and growth rate, and other relevant stressors).

The preamble of NMFS' implementing regulations also addresses cumulative effects from future, unrelated activities. Such effects are not considered in making the negligible impact determination under section 101(a)(5) of the MMPA. NMFS considers: (1) cumulative effects that are reasonably foreseeable when preparing a National Environmental Policy Act (NEPA) analysis; and (2) reasonably foreseeable cumulative effects under section 7 of the ESA for ESA-listed species, as appropriate. Accordingly, NMFS has adopted and reviewed BOEM's EIS and as part of its inter-agency coordination. This EIS addresses cumulative impacts related to the Project and substantially similar activities in similar locations. Cumulative impacts regarding the promulgation of the regulations and issuance of an LOA for construction activities planned by Sunrise Wind, have been adequately addressed in the adopted EIS that supports NMFS' determination that this action has been appropriately analyzed under NEPA. Separately, the cumulative effects of the Project on ESA-listed species, including the NARW, were analyzed under section 7 of the ESA when NMFS engaged in formal inter-agency consultation with NOAA's Greater Atlantic Regional Fisheries Office (GARFO). The Biological Opinion for the Project determined that NMFS' promulgation of the rulemaking and issuance of an LOA for construction activities, individually and cumulatively, are likely to adversely affect, but not jeopardize, listed marine mammals.

NMFS disagrees that its negligible impact determination is flawed or not supported. NMFS fully disclosed the imperiled status of NARW in the Description of Marine Mammals in the Area of Specified Activity section of the proposed rule. The proposed rule, as well as this final rule by reference, fully explains the impacts to NARW is expected to be limited to low-level behavioral harassment (e.g., temporary avoidance or cessation of foraging). The proposed rule also described the potential effects of behavioral disturbance on marine mammal fitness and that, based on the best available science, behavioral disturbance resulting from Sunrise Wind's activities is not expected to impact individual animals' health or have effects on individual animals' survival or reproduction, thus no detrimental impacts at the population level are anticipated. The commenters do not provide scientific evidence that suggests otherwise. Specifically, the commenters

did not provide evidence that any effect to a breeding female would result in reduced fecundity.

Commenters suggested NMFS did not meaningfully evaluate loss of communication space; however, the Effects on Marine Mammals and Their Habitat section in the proposed rule contained an analysis on the impacts of masking both in general and from the specified activities.

NMFS acknowledges that whales may temporarily avoid the area where the specified activities occur. However, NMFS does not anticipate, based on the best available science, that whales will abandon their habitat, as suggested by a commenter, or be displaced in a manner that would result in a higher risk of vessel strike, and the commenter does not provide evidence that either of these effects should be a reasonably anticipated outcome of the specified activity. The primary activity that is anticipated to result in temporary avoidance of the otherwise used habitat is foundation installation impact pile driving. Not only would this activity be limited to times of year when NARW presence is low, pile driving would be intermittent, and pile driving would only occur for a limited time (i.e., approximately 348 hours plus the installation of an OCS-DC in one day) over the course of two years. Together, these factors further reduce the likelihood that this species would be in close enough proximity to the activity to engage in avoidance behavior to the degree it would move into an area of risk (which would be closer to shore) that it could be struck by another vessel.

Comment 28: Commenters questioned the validity of NMFS' small numbers analysis on the basis that the numbers do not account for the cumulative take numbers from previous, ongoing, or potential projects. One commenter also requested NMFS clarify the definition of and thresholds for a small numbers determination.

Response: NMFS has provided a reasoned approach to small numbers, as described in the final rule, "Taking Marine Mammals Incidental to Geophysical Surveys Related to Oil and Gas Activities in the Gulf of Mexico" (86 FR 5322 at 5438, April 19, 2021). Utilizing that approach, NMFS has made the necessary small numbers finding for all affected species and stocks in this case (Small Numbers section of this preamble for more detail). Neither the MMPA nor our implementing regulations require the small numbers analysis to consider take from previous, ongoing, or potential projects.

Comment 29: Commenters suggested that NMFS failed to account for the cumulative (or additive) impacts on marine mammal species in the Sunrise Wind analysis and that NMFS should evaluate the cumulative impacts of ongoing and future OSW projects rather than evaluating projects individually. They provide that NMFS must consider the total number of takes proposed to be authorized across all wind projects and must fully consider the discrete effects of each activity and the cumulative effects of the suite of approved, proposed, and potential activities on marine mammals, including NARWs, and ensure that the cumulative effects are not excessive before issuing a LOA.

Response: Neither the MMPA nor NMFS' implementing regulations call for consideration of the take resulting from other specified activities in the negligible impact analysis. The preamble to NMFS' implementing regulations states, in response to comments, that the impacts from other past and ongoing anthropogenic activities are to be incorporated into the negligible impact analysis via their impacts on the baseline (54 FR 40338, September 29, 1989). Consistent with that direction, NMFS has factored into its negligible impact analysis the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (*e.g.*, as reflected in the density/distribution and status of the species, population size and growth rate, and other relevant stressors). The final rule for the MMPA implementing regulations also addressed public comments regarding cumulative effects from future, unrelated activities (54 FR 40338, September 29, 1989). There, NMFS stated that such effects are not considered in making findings under section 101(a)(5) concerning negligible impact. In this case, this incidental take regulation (ITR), as well as other ITRs currently in effect or proposed within the specified geographic region, are appropriately considered an unrelated activity relative to the others. The ITRs are unrelated in the sense that they are discrete actions under section 101(a)(5)(A) of the MMPA issued to discrete applicants. Section 101(a)(5)(A) of the MMPA requires NMFS to make a determination that the take incidental to a "specified activity" will have a negligible impact on the affected species or stocks of marine mammals.

NMFS' implementing regulations require applicants to include in their request a detailed description of the specified activity or class of activities that can be expected to result in incidental taking of marine mammals

(50 CFR 216.104(a)(1)). Thus, the "specified activity" for which incidental take coverage is being sought under section 101(a)(5)(A) is generally defined and described by the applicant. Here, Sunrise Wind was the applicant for the ITR, and NMFS is responding to the specified activity as described in that application and making the necessary findings on that basis.

Through the response to public comments in the 1989 implementing regulations, NMFS also indicated: (1) that it would consider cumulative effects that are reasonably foreseeable when preparing a National Environmental Policy Act (NEPA) analysis; and (2) that reasonably foreseeable cumulative effects would also be considered under section 7 of the ESA for listed species, as appropriate (54 FR 40338, September 29, 1989). Accordingly, NMFS has adopted an EIS written by BOEM and reviewed by NMFS as part of inter-agency coordination. This EIS addresses cumulative impacts related to Sunrise Wind and substantially similar activities in similar locations. Cumulative impacts regarding the promulgation of the regulations and issuance of a LOA for construction activities, such as those planned by Sunrise Wind, have been adequately addressed under NEPA in the adopted EIS that supports NMFS' MMPA decision. Separately, the cumulative effects of Sunrise Wind on ESA-listed species, including NARW, was analyzed under section 7 of the ESA when NMFS engaged in formal inter-agency consultation with GARFO. The Biological Opinion for Sunrise Wind determined that NMFS' promulgation of the rulemaking and issuance of a LOA for construction activities associated with leasing, individually and cumulatively, are likely to adversely affect, but not jeopardize, listed marine mammals.

Comment 30: Several commenters claimed the request for an ITA should be denied alleging the specified activities kill marine mammals, and some commenters suggested that the ongoing whale UMEs, including the whale deaths occurring in the winter of 2022–2023, are linked with ongoing offshore wind survey work (*i.e.*, HRG surveys). One commenter claimed the burden is on NMFS to prove, with evidence, that there is no association between HRG surveys and whale injuries, including "rectified diffusion" deaths, or otherwise assume that offshore wind activity has contributed to these deaths. A commenter also asserted that the activities covered by the ITR and associated LOA are reasonably likely to result in Level A

take of NARWs that are not covered by the authorization's terms.

Response: Neither the proposed rule nor this final rule allow mortality or serious injury of marine mammals to be authorized. The best available science indicates that the anticipated impacts from the specified activities potentially include avoidance, cessation of foraging or communication, TTS and PTS, stress, masking, *etc.* (as described in the Effects of the Specified Activities on Marine Mammals and their Habitat section in the proposed rule). NMFS emphasizes that there is no evidence that noise resulting from offshore wind development-related specified activities would cause marine mammal strandings and that there is no evidence linking recent large whale mortalities and currently ongoing offshore wind activities. The commenters offer no such evidence or other scientific information to substantiate their claim. This point has been well supported by other agencies, including BOEM and the Marine Mammal Commission (Marine Mammal Commission Newsletter, Spring 2023).

There is an ongoing UME for humpback whales along the Atlantic coast from Maine to Florida, which includes animals stranded since 2016, and NMFS provides further information on the humpback UME in the humpback whale subsection in the Description of Marine Mammals in the Specific Geographic Region section of this final rule.

Partial or full necropsy examinations were conducted on approximately half of the whales that recently stranded along the U.S. east coast. Necropsies were not conducted on other carcasses because they were too decomposed, not brought to land, or stranded on protected lands (*e.g.*, National and State parks) with limited or no access. Of the whales examined (roughly 90), about 40 percent had evidence of human interaction (*i.e.*, ship strike or entanglement). Vessel strikes and entanglement in fishing gear are the greatest human threats to large whales. The remaining 50 necropsied whales either had an undetermined cause of death (due to a limited examination or decomposition of the carcass) or had other causes of death including parasite-caused organ damage and starvation. The best available science indicates that only Level B harassment, or disruption of behavioral patterns (*e.g.*, avoidance), may occur as a result of Sunrise Wind's HRG surveys. NMFS emphasizes that there is no credible scientific evidence available suggesting that mortality and/or serious injury is a potential outcome of the planned survey activity. More

information about interactions between offshore wind energy projects and whales can be found at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-life-distress/frequent-questions-offshore-wind-and-whales>. The proposed rule and this final rule state that no take of NARW by Level A harassment, mortality, or serious injury was requested or proposed for authorization (see the Estimated Take and Negligible Impact Analysis and Determination sections), and they are not expected based on the best available science.

One commenter cited literature as evidence that seismic surveys in the mid to low frequency range can injure, cause decompression sickness (*i.e.*, the bends), and cause rectified diffusion in whales. The Fernandez (2005) paper cited refers to pathology results from necropsies conducted on beaked whales involved in a mass stranding event in the Canary Islands following high intensity military training exercises involving numerous surface warships and several submarines and mid-frequency tactical sonar activities. NMFS acknowledges the effects of these activities described by the commenter are known; however, the activities in that paper are not analogous to HRG surveys that would be conducted by Sunrise Wind to construct the Project, and the information presented by the commenter is not applicable due to many factors (*e.g.*, pile driving is stationary, versus the sound sources cited, and HRG surveys utilize a much lower source level).

Comment 31: Members of the public recommended NMFS consider the impacts of structure presence and operations, including those from operational noise on marine mammals as well as ocean mixing and vibrations on phytoplankton, zooplankton, and the food chain. One commenter suggested that NMFS did not evaluate the long-term operational and maintenance impacts of the project on marine mammals and ignored the best available science demonstrating behavioral impacts to marine mammals from operational turbines; therefore, NMFS' small numbers and negligible impact findings are arbitrary and capricious.

Response: In the proposed rule, NMFS considered the impacts to marine mammals from operational noise and to their habitat, including prey, from the presence of structures and operations based on the best available science. In this final rule, NMFS has supplemented that analysis with new scientific information that has become available regarding these issues since publishing the proposed rule. This new information

does not change our findings. The commenter did not provide scientific evidence that suggests the analysis within the proposed rule was unsupported. NMFS has fully evaluated the potential impacts of both issuing this final rule on marine mammals over the five-year effective period of this rulemaking and the potential impacts from long-term operations via the Biological Opinion. NMFS refers the reader to the Effects of the Specified Activities on Marine Mammals and Their Habitat section and the Negligible Impact Determination section in the proposed and in this final rule for further details.

Comment 32: The Commission recommends that NMFS ensure that all underlying documentation used in the agency's analyses, including PSO reports from previous authorizations, are publicly available on its website prior to publishing any **Federal Register** notice for advance notice of proposed rulemakings or the proposed rules themselves.

Response: Although not required by the MMPA or its implementing regulations, NMFS posts all final reports on our website when approved by NMFS. For reports used in its analysis, NMFS agrees that all underlying documentation should be readily available to the public for review along with the proposed rule. While it anticipates the timing is such that in most cases, NMFS will have a final report posted prior to publishing a proposed rule. In more unusual circumstances, in particular if a report is not due, but some preliminary information is available, it may not be possible to make the report publicly available at the same time as the proposed rule. Therefore, NMFS agrees having underlying documentation to support our analyses available for public review is the goal; however, it recognizes that this may not be practicable in all cases. NMFS does publish a Notice of Receipt as required per NMFS' implementing regulations inviting public input on an adequate and complete application for rulemaking. However, this stage does not include NMFS' analysis or preliminary determinations, and therefore, there is no analysis for which supporting documentation is needed. In general, NMFS aims to post relevant documentation as early as possible.

Comment 33: The Commission understands and supports the Administration's push for wind energy development along the Atlantic coast but is concerned the push is compromising the quality of documents at the sake of adhering to timelines and

milestones. The Commission recommends that NMFS prioritize conducting quality control and general oversight of reviewing the preambles to and the proposed and final rules prior to publication in the **Federal Register**.

Response: NMFS is committed to producing accurate and scientifically-defensible documents that support our management decisions for incidental take authorizations and other actions and will continue to prioritize quality control as appropriate, given available resources.

Comment 34: A commenter requested that NMFS' consideration of LOAs for offshore wind developers be applied equitably across industries and that there be a clear threshold for OSW-related takes regionally and across project phases.

Response: NMFS carefully reviews models and take estimate methodology to authorize a number of takes, by species and manner of take that is a likely outcome of the Project. Sunrise Wind is required to submit frequent reports, which identify the number of takes applied to the Project.

Fishing impacts and NMFS assessment of them generally center on entanglement in fishing gear, which is a very acute, visible, and severe impact (*i.e.*, mortality or serious injury). In contrast, the impacts incidental to the specified activities are primarily acoustic in nature and limited to Level A harassment and Level B harassment, there is no anticipated or authorized serious injury or mortality that the fishing industry could theoretically be held accountable for. Any take resulting from the specified activities would not be associated with take authorizations related to commercial fisheries. Neither the MMPA nor NMFS' implementing regulations require NMFS to analyze impacts to other industries (*e.g.*, fisheries) from issuance of an ITA pursuant to section 101(a)(5)(A) of the MMPA. NMFS notes that the Sunrise Wind Final EIS assesses the impacts of both BOEM's and NMFS' actions (*i.e.*, approving Sunrise Wind's activities and authorizing the associated take of marine mammals, respectively) on the human environment, including to fisheries, and NMFS considered the analysis, as appropriate, in the final decisions under the MMPA. The impacts of commercial fisheries on marine mammals and incidental take for said fishing activities are managed separately from those of non-commercial fishing activities (*e.g.*, offshore wind site characterization surveys) under section 118 of the MMPA.

Comment 35: A commenter expressed concern about how the presence of wind turbines will impact NMFS' ability to conduct low-altitude (*i.e.*, 1,000 m) marine mammal assessment aerial surveys, thus impacting NMFS' ability to continue using current methods to fulfill its mission of precisely and accurately assessing and managing protected species.

Response: NMFS and BOEM have collaborated to establish the "Federal Survey Mitigation Strategy for the Northeast U.S. Region" (Hare *et al.*, 2022). This interagency effort is intended to guide the development and implementation of a program to mitigate impacts of wind energy development on fisheries surveys. For more information on this effort, please see: <https://repository.library.noaa.gov/view/noaa/47925>.

Comment 36: A commenter questioned the consequences and implications of a scenario in which the authorized incidental take levels are exceeded.

Response: In the unlikely scenario that Sunrise Wind exceeds their authorized take levels, any further take would be unauthorized and, therefore, prohibited under the MMPA. Sunrise Wind could request additional incidental take of marine mammals from their specified activities. This would require NMFS to reanalyze its small numbers and negligible impact determinations and may require reinitiation of the BiOp and supplemental NEPA analysis depending on the specific facts.

Comment 37: A commenter recommended that, consistent with the requirement to achieve "the least practicable impact on such species or stock and its habitat," the LOA must include conditions for the survey and construction activities that will first avoid adverse effects on NARW in and around the area and then minimize and mitigate the effects that cannot be avoided.

Response: The MMPA requires that we include measures that will affect the least practicable adverse impact on the affected species and stocks and, in practice, NMFS generally agrees with the approach suggested (*i.e.*, the rule should include conditions for the construction activities that will first avoid adverse effects on NARW in and around the Project Area where practicable and then minimize the effects that cannot be avoided) and has generally considered mitigation in that way. NMFS does not agree that it "must" consider mitigation in this exact manner. NMFS has determined that this final rule meets this requirement to

effect the least practicable adverse impact and described our rationale in the final rule. The commenter does not make any specific recommendations of measures to add to the rulemaking.

Comment 38: A commenter requested that, due to rapid changes for NARW and the need to react quickly to protect the species, NMFS should issue 5-year ITRs but should limit LOAs to 1-year period instead of the proposed 5-year LOA.

Response: While NMFS understands the reasoning behind the commenters' suggestion, it does not think this is necessary because the final rule includes requirements for annual reports (in addition to weekly and monthly requirements) to support frequent evaluation of the activities and monitoring results, and the final rule includes an Adaptive Management provision that allows NMFS to make modifications and adjustments to the measures found in the issued LOA if and when new information that supports necessary modifications becomes available. Because of this, NMFS will issue a single, 5-year LOA and modify it if and when necessary at any point during the effective period of the regulations.

Comment 39: A commenter recommended that NMFS should only issue the ITR and LOA after pending regulatory rules with possible effects to marine mammals are finalized (*e.g.*, BOEM's renewable energy modernization rule, NMFS vessel speed rule); the results of the UME investigations in the area are completed and available; and research and studies on the impacts of offshore wind development on marine mammals are completed as baseline information is lacking. Another commenter recommended no ITRs should be issued until a programmatic analysis of offshore wind is conducted.

Response: The MMPA requires NMFS to evaluate the effects of the specified activities in consideration of the best scientific evidence available and to issue the requested incidental take authorization if it makes the necessary findings (16 U.S.C. 1371(a)(5)(A)(i)). The MMPA does not allow NMFS to delay issuance of the requested authorization on the presumption that new information or new regulations will become available in the future. If new information becomes available in the future, NMFS may modify the mitigation and monitoring measures in an LOA issued under these regulations through the adaptive management provisions. Furthermore, NMFS is required to withdraw or suspend an LOA if, after notice and public comment

unless an emergency exists, it determines the authorized incidental take may be having more than a negligible impact on a species or stock. NMFS has duly considered the best scientific evidence available in its promulgation of the final rule and made the required findings.

Changes From the Proposed to Final Rule

Since the publication of the proposed rule in the **Federal Register** on February 10, 2023 (88 FR 8996), NMFS has made changes, where appropriate, that are reflected in the preamble text of this final rule and in the final regulatory text. These changes are briefly identified below, with more information included in the indicated sections of the preamble to this final rule.

Changes to Information Provided in the Preamble

The information found in the preamble of the Proposed Rule was based on the best available information at the time of publication. Since publication of the Proposed Rule, new information has become available, which has been incorporated into this final rule as discussed below.

The following changes are reflected in the Description of Marine Mammals in the Area of Specified Activities section of the preamble to this final rule:

Given the release of NMFS' draft 2023 SARs (Hayes *et al.* 2024), NMFS has updated the population estimate used in the proposed rule (Hayes *et al.*, 2022) for the NARW (*Eubalaena glacialis*) from 368 to 340 and the total mortality/serious injury (M/SI) amount from 7.7 to 27.2. This increase is due to the inclusion of undetected M/SI (whereas 7.7 accounted only for detected M/SI).

Given the availability of new information, NMFS has made updates to the UME summaries for NARW, humpback whales, minke whales, and phocid seals (pinnipeds).

The following changes are reflected in the Estimated Take section the preamble to this final rule:

Since the proposed rule was published, Sunrise Wind has reduced the number of foundations to be installed from 94 WTGs to 87 (see Reduced WTG Foundations report). Therefore, the exposure estimates and take numbers from this activity have been slightly reduced to account for this reduction in activity. While the number of authorized takes resulting from foundation installation have decreased, the underlying modeling and methodologies to estimate take have not changed since the proposed rule.

Sunrise Wind submitted adjusted take numbers for Level B harassment associated with HRG surveys as part of the Reduced WTG Foundations report. Due to the reduction on WTGs, the amount of HRG survey tracklines have been reduced. This change to the project results, in some cases, in a reduction of the number of takes that would be authorized under this rule. However, species in which take by Level B harassment for HRG was based on mean group size (*i.e.*, Atlantic spotted dolphin, pilot whales, Risso's dolphin, and sperm whale) were originally calculated by halving the mean group size between years 1 and 2 rather than accounting for the total mean group size for each year of HRG survey activity. This correction to using total mean group size for each year resulted in minor increased take to these species.

The total takes by Level B harassment for blue whale was corrected to 8 from 7 due to a summation error (other tables in the Estimated Take section of the proposed rule included correct take numbers for blue whales and correctly added up to 8 total takes).

The following changes are reflected in the Mitigation, and Monitoring and Reporting section in the preamble to this final rule:

Based, in part, on recommendations received from the public, NMFS has revised the minimum visibility, shutdown, and clearance zone sizes for foundation installation (table 32). To simplify the various schedules, NMFS determined that three installation scenarios warranted different zone sizes assuming 10 dB attenuation: (1) sequential (Schedule 1 and 2); (2) concurrent (Schedule 3 and 4); and (3) OCS-DC only (Schedule 5) (see table 32). In addition, the minimum visibility zone is now based on the Level A harassment zone sizes for NARW under the three different construction scenarios. When Schedules were considered together (*e.g.*, Schedules 1 and 2 comprise the "sequential" scenario), the largest zone of the two schedules considered was used to develop mitigation zone sizes (see table 32). For OCS-DC only (Schedule 5), the clearance and shutdown zone sizes were set as the largest distance for the low frequency cetaceans (*i.e.*, fin whale).

NMFS has increased the PSO and PAM clearance and shutdown zone sizes based on the largest Level A harassment threshold distance for low frequency cetaceans (*i.e.*, fin whale) based on the construction scenario and season. NMFS increased the PAM shutdown zone from 3.7 km (summer) and 4.3 km (winter) for NARW and now requires Sunrise Wind to shutdown

foundation pile driving if a NARW is acoustically detected within the 10 km PAM monitoring zone.

Due to the different zone sizes based on the three construction scenarios, NMFS has included a requirement that Sunrise Wind must select the most conservative (largest) zone sizes each day depending on which construction scenario is planned. If the real-world construction scenario for that day occurs that would have had smaller zone sizes than what was planned at the start of the day, Sunrise Wind may not decrease to the smaller zone sizes for that day (*i.e.*, real-world concurrent installation does not occur though was planned at the start of the day and, instead, only sequential installation occurred; Sunrise Wind must still implement the larger concurrent installation zone sizes).

NMFS has included mitigation and monitoring zones specific to the different UXO/MEC charge weights, rather than a single zone size assuming only the largest charge weight, as Ørsted has provided evidence to NMFS that they can reliably identify UXO/MEC charge weights in the field since publication of the proposed rule.

Recognizing the extensive, frequent, and situational monitoring data and report requirements, NMFS clarified the language describing the annual or biennial review of data to inform adaptive management decisions to indicate that adaptive management decisions may be made at any time, as new information warrants it.

Changes in the Regulatory Text

We have made the following changes to the regulatory text, which are reflected, as appropriate, throughout this final rule and described, as appropriate, in the preamble.

The following change is reflected in § 217.310 (Specified activity and specified geographical region):

For clarity and consistency, we revised two paragraphs in § 217.310 Specified activity and specified geographical region of the regulatory text to fully describe the specified activities and specified geographical region.

The following change is reflected in § 217.312 (Permissible Methods of Taking):

NMFS added pneumatic hammering of casing pipes to the list of permissible methods of taking by Level B harassment as it was inadvertently excluded from the regulatory text but fully described and analyzed in preamble.

The following changes are reflected in § 217.314 (Mitigation requirements) and

the associated Mitigation section of the preamble to this final rule:

For clarity and consistency, NMFS has reorganized and revised, as applicable, the paragraphs in § 217.314 (Mitigation requirements).

Based on a recommendation by a commenter, NMFS added a requirement that all project vessels must utilize AIS.

NMFS corrected the limitation on the number of monopiles that could be installed per day from 3 to 4 per day to accurately reflect the scenarios analyzed by Sunrise Wind in their application and as described in table 16 of the proposed rule.

Given that NARW density in the Project Area increases by an order of magnitude from November to December and based on public comment, NMFS is including a requirement that foundation impact pile driving should be avoided in December and may only occur when unforeseen circumstances would otherwise preclude completion of the foundation installation for the project in a given year, and only with prior approval by NMFS. NMFS has also clarified that when a clearance zone is over 5 km, an aerial platform must be used unless Sunrise Wind determines an aerial platform is not practical and, in such case, an additional vessel must be used.

NMFS updated the vessel strike avoidance measures to now specify that the mitigation measure apply to all Project vessels, and that if a NARW is detected, all vessels, not only crew transfer vessels, must travel at 10 km (11.5 mph) or less. In addition, the regulatory text clarifies that this measure applies only when other speed restrictions are not in place (*e.g.*, no DMA, SMA, or Slow Zone is established). NMFS has also modified a vessel strike measure that had indicated a vessel should slow to 10 kts if it came within an identified separation zone. The measure was changed to indicate that vessels should steer away from slow, and shift engines to neutral if the separation zone is violated. NMFS also clarified the situations under which a safety exemption may be taken from the vessel strike avoidance measures.

For the Smith Point County Park temporary pier, NMFS now includes the required mitigation measures to avoid take by Level A harassment or Level B harassment, as Sunrise Wind has not requested take for these activities. These mitigation and monitoring measures are the same as required of cable landfall. With the addition of these measures, NMFS concurs with Sunrise Wind that take is not expected to occur.

The following changes are reflected in the § 217.315 (Monitoring and reporting

requirements) and the associated Monitoring and Reporting section of the preamble to this final rule:

For clarity and consistency, NMFS has reorganized and revised, as applicable, the paragraphs in § 217.315 (Monitoring and reporting requirements).

NMFS updated the process for obtaining NMFS approval for PSO and PAM Operators and have clarified education, training, and experience necessary to obtain NMFS' approval.

NMFS added a requirement to have at least three PSOs on the pile driving vessel and any dedicated PSO vessel (or equivalent coverage) rather than two PSOs, as was originally described in the proposed rule.

Based on the best available science and a recommendation by the Commission, NMFS added a requirement that increases the time that PAM data must be reviewed prior to all UXO/MEC detonations from 1 to 24 hours (except in emergency cases where the 24-hour delay before the detonation occurred would create risk to human safety).

Based on a recommendation by the Commission, NMFS added a requirement that a double big bubble curtain must be placed at a distance that would avoid damage to the nozzle holes during all UXO/MEC detonations. NMFS also added a requirement that a pressure transducer must be used during all UXO/MEC detonations.

Since publishing the proposed rule, Sunrise Wind has finalized their noise attenuation systems. NMFS modified the NAS requirement stating that Sunrise Wind must use a double bubble curtain with AdBm Helmholtz resonator during monopile installation and, at minimum, a double bubble curtain during jacket foundation pin pile installation.

Consistent with the requirements included in the Sunrise Wind Biological Opinion, NMFS added additional details regarding complete SFV requirements and added a requirement that abbreviated SFV (consisting of a single recorder with a bottom and mid-water column hydrophone) must be conducted on every foundation for

which complete monitoring is not conducted. NMFS also added details regarding SFV reporting requirements. NMFS is now requiring Sunrise Wind to deploy two dedicated PSOs vessels to monitor the clearance and shutdown zones prior to and during impact pile driving installation of monopile foundations. In addition to the three on-duty PSOs on the pile driving platform, three on-duty PSOs must be deployed on each of the dedicated PSO vessels to monitor for marine mammals. Similarly, NMFS is now requiring that Sunrise Wind deploy at least three on-duty PSOs, instead of two on-duty PSOs, on each observation platform for all detonations.

Based on consideration of the Commission recommendation, NMFS has added additional specified reporting requirements for SFV conducted during UXO/MEC detonation and operations and clarified the general SFV reporting metrics to align with the Commission's comments.

Given the new tools that NMFS has made available since publishing the proposed rule, NMFS updated how Sunrise Wind should electronically submit NARW detection (visual and acoustic) reports.

Description of Marine Mammals in the Area of Specified Activities

As noted in the Changes From the Proposed to Final Rule section, since publication of the proposed rule (88 FR 8996, February 10, 2023), updates have been made to the abundance estimate for NARW and the UME summaries of multiple species. These changes are described in detail in the sections below. Otherwise, the Description of Marine Mammals in the Area of Specified Activities section has not changed since the publication of the proposed rule in the **Federal Register** (88 FR 8996, February 10, 2023).

Sections 3 and 4 of Sunrise Wind's application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history of the potentially affected species (Sunrise Wind, 2021). NMFS fully considered all of this information, and refers the reader

to these descriptions in the application. Additional information regarding population trends and threats may be found in NMFS' SARs at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>, and more general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS' website at: <https://www.fisheries.noaa.gov/find-species>.

Table 2 lists all species or stocks for which take is authorized under this final rule and summarizes information related to the species or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. PBR is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population as described in NMFS' SARs (16 U.S.C. 1362(20)). While no mortality is anticipated or allowed to be authorized under this rulemaking, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Atlantic and Gulf of Mexico SARs. All values presented in table 2 are the most recent available data at the time of publication which can be found in NMFS' 2023 draft SARs (Hayes *et al.*, 2024), available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>.

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Table 2 -- Marine Mammal Species that May Occur in the Project Area and be Taken, by Harassment

Common Name	Scientific Name ⁵	Stock	ESA/MMP A status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Total Annual M/SI ³
<i>Order Artiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)</i>						
<i>Family Balaenidae</i>						
North Atlantic right whale	<i>Eubalaena glacialis</i>	Western Atlantic	E, D, Y	340 (0; 337; 2021) ₆	0.7	27.2 ⁶
<i>Family Balaenopteridae (rorquals)</i>						
Blue whale	<i>Balaenoptera musculus</i>	Western North Atlantic	E, D, Y	UNK (UNK; 402; 1980-2008)	0.8	0
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic	E, D, Y	6,802 (0.24; 5,573; 2021)	11	2.05
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine	-, -, Y	1,396 (0; 1,380; 2016)	22	12.15
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	E, D, Y	6,292 (1.02; 3,098; 2021)	6.2	0.6
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian Eastern Coastal	-, -, N	21,968 (0.31; 17,002; 2021)	170	9.4
<i>Superfamily Odontoceti (toothed whales, dolphins, and porpoises)</i>						
<i>Family Physeteridae</i>						
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic	E, D, Y	5,895 (0.29; 4,639; 2021)	9.28	0.2
<i>Family Delphinidae</i>						
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic	-, -, N	93,233 (0.71; 54,443; 2021)	544	28
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic	-, -, N	31,506 (0.28; 25,042; 2021)	250	0
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic Offshore	-, -, N	64,587 (0.24; 52,801; 2021) ⁷	507	28
Long-finned pilot whales	<i>Globicephala melas</i>	Western North Atlantic	-, -, N	39,215 (0.30; 30,627; 2021)	306	5.7
Risso’s dolphin	<i>Grampus griseus</i>	Western North Atlantic	-, -, N	44,067 (0.19; 30,662; 2021)	301	34

Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic	-, -, N	93,100 (0.56; 59,897; 2021)	1,452	414
<i>Family Phocoenidae (porpoises)</i>						
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-, -, N	85,765 (0.53; 56,420; 2021)	649	145
<i>Order Carnivora – Superfamily Pinnipedia</i>						
<i>Family Phocidae (earless seals)</i>						
Gray seal ⁴	<i>Halichoerus grypus</i>	Western North Atlantic	-, -, N	27,911 (0.20; 23,624; 2021)	1,512	4,570
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-, -, N	61,336 (0.08; 57,637; 2018)	1,729	339

1 - ESA status: Endangered (E), Threatened (T) / MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2 - NMFS' marine mammal stock assessment reports can be found online at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. CV is the coefficient of variation; Nmin is the minimum estimate of stock abundance.

3 - These values, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, vessel strike).

4 - NMFS' stock abundance estimate (and associated PBR value) applies to the U.S. population only. Total stock abundance (including animals in Canada) is approximately 394,311. The annual M/SI value given is for the total stock (Hayes et al. 2024).

5 - Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy (<https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/>; Committee on Taxonomy (2023)).

6 - In the proposed rule (87 FR 79072, December 23, 2022), a population estimate of 368 was used which represented the best available science at the time of publication. However, since the publication of the proposed rule, a new estimate (n=340) was released in NMFS' draft 2023 SARs and has been incorporated into this final rule. The current draft SAR includes an estimated population (N best 340) based on sighting history through December 2021 (Hayes et al. 2024). In October 2023, NMFS released a technical report identifying that the NARW population size based on sighting history through 2022 was 356 whales, with a 95 percent credible interval ranging from 346 to 363 (Linden, 2023); Total annual average observed NARW mortality during the period 2017–2021 was 7.1 animals and annual average observed fishery mortality was 4.6 animals. Numbers presented in this table (27.2 total mortality and 17.6 fishery mortality) are 2016–2020 estimated annual means, accounting for undetected mortality and serious injury.

7 - As noted in the draft 2023 SAR (Hayes et al. 2024), abundance estimates may include sightings of the coastal form, although only the offshore stock is anticipated to occur in the project area.

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Of the marine mammal species and/or stocks with geographic ranges that include the western North Atlantic OCS (table 5 in Sunrise Wind ITA application), 23 are not expected to be present or are considered rare or unexpected in the project area based on sighting and distribution data. Therefore, they are not discussed further beyond the explanation provided here. The following species are not expected to occur in the project area due to the location of preferred habitat outside the

project area based on the best scientific information available: Dwarf and pygmy sperm whales (*Kogia sima* and *K. breviceps*), northern bottlenose whale (*hyperoodon ampullatus*), cuvier's beaked whale (*Ziphius cavirostris*), four species of Mesoplodont beaked whales (*Mesoplodon densirostris*, *M. europaeus*, *M. mirus*, and *M. bidens*), killer whale (*Orcinus orca*), false killer whale (*Pseudorca crassidens*), pygmy killer whale (*Feresa attenuate*), short-finned pilot whale (*Globicephalus macrohynchus*), melon-headed whale

(*Peponocephala electra*), Fraser's dolphin (*Lagenodelphis hosei*), white-beaked dolphin (*Lagenorhynchus albirostris*), pantropical spotted dolphin (*Stenella attenuata*), Clymene dolphin (*Stenella clymene*), striped dolphin (*Stenella coeruleoalba*), spinner dolphin (*Stenella longirostris*), rough-toothed dolphin (*Steno bredanensis*), and the northern migratory coastal stock of common bottlenose dolphins (*Tursiops truncatus truncatus*). The following species may occur in the project area but at such low densities that take is not

anticipated: hooded seal (*Cystophora cristata*) and harp seal (*Pagophilus groenlandica*).

There are two pilot whale species, long-finned (*Globicephala melas*) and short-finned (*Globicephala macrorhynchus*), with distributions that overlap in the latitudinal range of the Project Area (Hayes *et al.*, 2003; Roberts *et al.*, 2016). Because it is difficult to differentiate between the two species at sea, sightings, and thus the densities calculated from them, are generally reported together as *Globicephala spp.* (Roberts *et al.*, 2016; Hayes *et al.*, 2023; Hayes *et al.*, 2024). However, based on the best available information, short-finned pilot whales occur in habitats that are both further offshore on the shelf break and further south than the Project Area (Hayes *et al.*, 2020). Therefore, NMFS assumes that any take of pilot whales would be of long-finned pilot whales. Similarly, in the Western North Atlantic, there are two morphologically and genetically distinct common bottlenose morphotypes: the Western North Atlantic Northern Migratory Coastal stock and the Western North Atlantic Offshore stock. The Western North Atlantic Offshore stock is primarily distributed along the outer shelf and slope from Georges Bank to Florida during spring and summer and has been observed in the Gulf of Maine during late summer and fall (Hayes *et al.*, 2020), whereas the Northern Migratory Coastal stock is distributed along the coast between southern Long Island, New York, and Florida (Hayes *et al.*, 2018). Given their distribution, only the offshore stock is likely to occur in the Project Area and is the only stock included in Sunrise Wind's application.

A detailed description of the species likely to be affected by the Project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the proposed rule (88 FR 8996, February 10, 2023). Since that time, a new draft SAR (Hayes *et al.*, 2024) has become available for the NARW. Estimated abundance for the species declined from 368 to 340 and annual M/SI increased from 8.1 to 27.2. This large increase in annual serious injury/mortality is a result of NMFS including undetected annual M/SI in the total annual M/SI. The NARW population remains in decline, as described in the *North Atlantic Right Whale* species section below. NMFS is not aware of any additional changes in the status of the species and stocks listed in table 2; therefore, detailed descriptions are not provided here.

Please refer to the proposed rule for these descriptions (88 FR 8996, February 10, 2023).

Since the publication of the proposed rule, the following updates have occurred to the below species in regard to general information or their active UMEs.

North Atlantic Right Whale

In August 2023, NMFS released its draft 2023 SARs, which updated the population estimate (N_{best}) of NARW from 368 to 340 individuals and the annual M/SI value from 8.1 to 37.2 due to the addition of estimated undetected mortality and serious injury, as described above, which had not been previously included in the SAR. The population estimate is equal to the North Atlantic Right Whale Consortium's 2022 Annual Report Card, which identifies the population estimate as 340 individuals (Pettis *et al.*, 2023). Elevated NARW mortalities have occurred since June 7, 2017, along the U.S. and Canadian coast, with the leading category for the cause of death for this UME determined to be "human interaction," specifically from entanglements or vessel strikes. Since publication of the proposed rule, the number of animals considered part of the UME has increased. As of April 8, 2024, there have been 39 confirmed mortalities (*i.e.*, dead, stranded, or floaters), 1 pending mortality, and 34 seriously injured free-swimming whales for a total of 74 whales. The UME also considers animals with sublethal injury or illness (*i.e.*, "morbidity"; $n=51$) bringing the total number of whales in the UME from 71 to 122. More information about the NARW UME is available online at: <https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events>.

Humpback Whale

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine to Florida. This event was declared a UME in April 2017. Partial or full necropsy examinations have been conducted on approximately half of the 212 known cases (as of January 5, 2024). Of the whales examined (approximately 90), about 40 percent had evidence of human interaction either from vessel strike or entanglement. While a portion of the whales have shown evidence of pre-mortem vessel strike, this finding is not consistent across all whales examined and more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these

efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. More information is available at: <https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events>.

Since December 1, 2022, the number of humpback strandings along the mid-Atlantic coast (from North Carolina to New York) has been elevated. In some cases, the cause of death is not yet known. In others, vessel strike has been deemed the cause of death. As the humpback whale population has grown, they are seen more often in the Mid-Atlantic. These whales may be following their prey (small fish) which were reportedly close to shore in the 2022–2023 winter. Changing distributions of prey impact larger marine species that depend on them and result in changing distribution of whales and other marine life. These prey also attract fish that are targeted by recreational and commercial fishermen, which increases the number of boats and amount of fishing gear in these areas. This nearshore movement increases the potential for anthropogenic interactions, particularly as the increased presence of whales in areas traveled by boats of all sizes increases the risk of vessel strikes.

Minke Whale

Since January 2017, a UME has been declared based on elevated minke whale mortalities detected along the Atlantic coast from Maine through South Carolina. As of January 5, 2024, a total of 164 minke whales have stranded during this UME. Full or partial necropsy examinations were conducted on more than 60 percent of the whales. Preliminary findings have shown evidence of human interactions or infectious disease in several of the whales, but these findings are not consistent across all of the whales examined, so more research is needed. This UME has been declared non-active and is pending closure. More information is available at: <https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events>.

Phocid Seals

Since June 2022, elevated numbers of harbor seal and gray seal mortalities have occurred across the southern and central coast of Maine. This event was declared a UME in July 2022 but has since closed. The UME Investigative Team reviewed necropsy, histopathology, and diagnostic findings.

They determined the UME was attributed to spillover events of the highly pathogenic avian influenza H5N1 virus from infected wild birds to harbor and gray seals. An ongoing HPAI H5N1 global outbreak in domestic and wild birds and wild mammals began in 2021. Live seals showed signs of respiratory and neurological disease including nasal and ocular discharge, coughing, unresponsiveness, and seizures. Eighteen percent of the stranded seals (33 out of 180) were tested for avian influenza via polymerase-chain-reaction. A subset of seals was positive for HPAI H5N1, with preliminary findings confirmed by the United States Department of Agriculture's National Veterinary Services Laboratories. Of the 33 seals tested during the UME period 19 (58 percent) were positive for H5N1 (17 harbor seals; 2 gray seals) and 14 (42 percent) tested negative. Twelve H5N1 positive seals had histopathology conducted and 11 of those seals had lesions (primarily respiratory and/or neurologic) suspected or consistent with

avian influenza infection. Sequencing of the H5N1 virus detected in seals suggests the seals were infected from spillover events from infected wild birds to these seals. While the UME was not occurring in the Project Area, the populations affected by the UME were the same as those potentially affected by the Project. Information on this UME is available online at: <https://www.fisheries.noaa.gov/national/marine-life-distress/active-and-closed-unusual-mortality-events>.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008).

To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in table 3.

Table 3 -- Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, Kogia, river dolphins, cephalorhynchid, Lagenorhynchus cruciger & L. australis)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
* Represents the generalized hearing range for the entire group as a composite (<i>i.e.</i> , all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall <i>et al.</i> , 2007) and PW pinniped (approximation).	

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.*, 2006; Kastelein *et al.*, 2009; Reichmuth and Holt, 2013). For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

NMFS notes that in 2019a, Southall *et al.* recommended new names for hearing groups that are widely recognized. However, this new hearing group classification does not change the weighting functions or acoustic thresholds (*i.e.*, the weighting functions and thresholds in Southall *et al.* (2019a) are identical to NMFS 2018 Revised Technical Guidance). When NMFS updates our Technical Guidance, it will be adopting the updated Southall *et al.* (2019a) hearing group classification.

Potential Effects of Specified Activities to Marine Mammals and Their Habitat

The effects of underwater noise from the Project's specified activities have the potential to result in the harassment of marine mammals in the specified geographic region. The proposed rule included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from the Project's specified activities on marine mammals and their habitat (88 FR 8996, February

10, 2023). While some new literature has been published since publication of the proposed rule (e.g., HDR, Inc., 2023, Holme *et al.*, 2023, Meyer-Gutbrod *et al.*, 2023, Van Parijs *et al.* 2023, Davis *et al.* 2023), there is no new information that NMFS is aware of that changes the analysis in the proposed rule. The information and analysis included in the proposed rule is referenced and used for this final rule and is not repeated here (88 FR 8996, February 10, 2023).

However, some new papers, which NMFS considers part of the best available science, further informed, though not necessarily changed, its analysis and consideration of mitigation and monitoring measures (e.g., Crowe *et al.*, 2023, Davis *et al.* 2023, Holdman *et al.*, 2023, Van Parijs *et al.* 2023, Westwell *et al.*, 2024). Crowe *et al.* (2023) research evaluated the use and importance of real-time data for detecting NARW. The shift in NARW habitat use motivated the integration of additional ways to detect the presence of NARW and passive acoustic detections of right whale vocalizations reported in near real-time became an increasingly important tool to supplement visual sightings. The proposed rule did include real-time and daily awareness measures and sighting communication protocols, and NMFS did evaluate these measures and added details for clarity or updated the reporting mechanisms, such as in the case of sighting an injured NARW.

Davis *et al.* (2023) analyzed NARW individual upcalls from 2 years of acoustic recordings in southern New England which showed that NARW were detected at least one day every week throughout both years, with highest NARW presence from October to April. Within southern New England, on average NARW persisted for 10 days and recurred again within 11 days. An evaluation of the time period over which it is most effective to monitor prior to commencing pile driving activities showed that with 1 h of pre-construction monitoring there was only 4% likelihood of hearing a NARW, compared to 74% at 18 h. Therefore, monitoring for at least 24 h prior to activity will increase the likelihood of detecting an up-calling NARW. Holdamn *et al.* (2023) studied harbor porpoise habitats in the Gulf of Maine (GOM) and Southern New England waters providing baseline data on the occurrence and foraging activity of porpoises from 2020 to 2022. Harbor porpoises were present year-round in the GOM with peak detections in the summer and fall. The observed seasonal pattern of harbor porpoise occurrence in

this study is consistent with prior information on the general distribution of the GOM/Bay of Fundy stock (Wingfield *et al.*, 2017; NMFS, 2021). In line with previously reported distribution patterns, harbor porpoise occurrence in Southern New England was high in fall, winter, and spring, but porpoises were largely absent in the summer. Results from generalized additive models suggest that time of year, hour of day, lunar illumination, and temperature are significant contributors to harbor porpoise presence (detection mainly through echolocation clicks) and/or foraging effort.

Van Parijs *et al.* (2023), provides 2 years of baseline data on cetacean species' presence, vessel activity, and ambient sound levels in the southern New England wind energy area. With eight species/families present in the area for at least 9 months of the year, this area represents an important habitat for cetaceans. Most species showed seasonality, with peak daily presence in winter (harbor porpoise, North Atlantic right, fin, and humpback whales), summer (sperm whales), spring (sei whales), or spring and fall/autumn (minke whales). Delphinids were continuously present and blue whales present only in January. The NARW was present year-round with high presence in October through April. Westell *et al.* (2024) collected baseline data from 2020 to 2022, with six passive acoustic recorders deployed in the vicinity of Nantucket Shoals and Cox's Ledge. Data were analyzed for sperm whale presence, and demographic composition was assessed using interclick intervals. Presence varied by site, season, and year. Sperm whales were detected year-round but the majority (78%) of days with acoustic occurrences were between May and August. Sound propagation tests were conducted at two sites and predicted detection ranges within 20–40 km indicate that sperm whales were likely in proximity to the WEA. These results provide a baseline for ongoing sperm whale presence, especially that of social groups which may be more sensitive to disturbance.

Separately, since issuance of the proposed rule, a non-peer reviewed report on HRG survey noise has also been released (Rand *et al.*, 2023). The measured data presented in Rand *et al.*, (2023) are consistent with our evaluation of sound levels produced by HRG surveys (*i.e.*, received sound levels at the ranges measured) and vessels and do not change our assessments of potential impacts. The analysis of those data in the Rand *et al.* (2023) report, however, includes methodological

issues and therefore does not support all of their conclusions.

Since the publication of the proposed rule, new scientific information has become available that provides additional insight into the sound fields produced by turbine operation (HDR, Inc., 2023; Holme *et al.*, 2023). Recently, Holme *et al.* (2023) stated that Tougaard *et al.* (2020) and Stöber and Thomsen (2021) extrapolated levels for larger turbines and should be interpreted with caution since both studies relied on data from smaller turbines (0.45 to 6.15 MW) collected over a variety of environmental conditions. They demonstrated that the model presented in Tougaard *et al.* (2020) tends to overestimate levels (up to approximately 8 dB) measured to those in the field, especially with measurements closer to the turbine for larger turbines. Holme *et al.* (2023) measured operational noise from larger turbines (6.3 and 8.3 MW) associated with three wind farms in Europe and found no relationship between turbine activity (*i.e.*, power production, which is proportional to the blade's revolutions per minute) and noise level. However, it was noted that this missing relationship may have been masked by the area's relatively high ambient noise sound levels. Sound levels (*i.e.*, root-mean-square (RMS)) of a 6.3 MW direct-drive turbine were measured to be 117.3 dB at a distance of 70 meters. However, measurements from 8.3 MW turbines were inconclusive as turbine noise was deemed to have been largely masked by ambient noise.

In addition, operational turbine measurements from the Coastal Virginia Offshore Wind pilot pile project indicated that noise levels from two, 7.8 m monopiles WTGs were higher when compared to those of the Block Island wind farm, likely due to vibrations associated with the monopiles structure (HDR, Inc., 2023). NMFS notes that this updated information does not change our assessment for impacts of turbine operational sound on marine mammals. As described in the proposed rule, NMFS will require Sunrise Wind to measure operational noise levels, however, is not authorizing take incidental to operational noise from WTGs.

In addition, recently, a National Academy of Sciences, Engineering, and Medicine (NASEM) panel of independent experts concluded that the impacts of offshore wind operations on NARW and their habitat in the Nantucket Shoals region (a key winter foraging habitat tens of kilometers to the east of the Project Area) are uncertain due to the limited data available at this

time and recognized what data is available is largely based on models from the North Sea that have not been validated by observations (National Academy of Sciences, 2023). The report also identifies that major oceanographic changes have occurred to the Nantucket Shoals region over the past 25 years, and it will be difficult to isolate from the much larger variability introduced by natural and other anthropogenic sources (e.g., climate change). This report is specific to the Nantucket Shoals region which is unlikely to be influenced by any long-term operational effects of the Sunrise Wind Project; however, the findings in the report align with those presented in the proposed rule. More recently, NMFS concluded ESA consultation on Federal actions associated with the Project, including NMFS' proposal to issue a 5-year LOA to Sunrise Wind and BOEM's approval of the Construction and Operation Plan (COP) which covers the 30 years of the Project's operation and subsequent decommissioning.

Overall, new scientific information regarding the general anticipated effects of OSW construction and operations on marine mammals and their habitat support the findings in the proposed rule. The information and analysis regarding the potential effects on marine mammals and their habitat was included in the proposed rule and is not repeated here (88 FR 8996, February 10, 2023).

Estimated Take

As noted in the Changes From the Proposed to Final Rule section, NMFS has revised the take estimates for several species based on updated information received from Sunrise Wind and its concurrence with comments received on the proposed rule. While distances to thresholds and estimated take have been updated, the underlying methodologies to calculate these values have not changed. This section provides an estimate of the number of incidental takes that may occur through this rulemaking, which informs both NMFS' small numbers and the negligible impact determination. Authorized takes would be primarily by Level B harassment, as use of the acoustic sources (i.e., impact and vibratory pile driving, pneumatic hammering, site characterization surveys, and UXO/MEC detonations) have the potential to result in disruption of marine mammal behavioral patterns due to exposure to elevated noise levels. Impacts such as masking and TTS can contribute to behavioral disturbances. There is also some potential for auditory injury (Level A harassment) to occur in select marine

mammal species incidental to the specified activities (i.e., impact pile driving, and UXO/MEC detonations). As described below, the larger distances to the PTS thresholds, when considering marine mammal weighting functions, demonstrate this potential. For mid-frequency hearing sensitivities, when thresholds and weighting and the associated PTS zone sizes are considered, the potential for PTS from the noise produced by the project is negligible. The required mitigation and monitoring measures are expected to minimize the severity of the taking to the extent practicable. As described previously, no serious injury or mortality is anticipated or authorized for this project.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment (as well as impulse metric (Pascal-second) pressure and peak sound pressure level thresholds above which marine mammals may incur non-auditory injury from underwater explosive detonations); (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and (4) the number of days of activities. NMFS notes that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (e.g., previous monitoring results or average group size). Below, NMFS describes the factors considered here in more detail and present the authorized take estimates.

Marine Mammal Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals are likely to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment). Thresholds have also been developed to identify the levels above which animals may incur different types of tissue damage (non-acoustic Level A harassment or mortality) from exposure to pressure waves from explosive detonation. A summary of all NMFS' thresholds can be found at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Level B harassment—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source or exposure context (e.g., frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (e.g., other noises in the area) and the receiving animals (e.g., animal hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (e.g., Southall *et al.*, 2007, 2021; Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities, NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above root-mean-squared pressure received levels (RMS SPL) of 120 dB (referenced to re 1 μ Pa) for continuous (e.g., vibratory pile driving, drilling) and above RMS SPL 160 dB re 1 μ Pa for non-explosive impulsive (e.g., seismic airguns) or intermittent (e.g., scientific sonar) sources (table 4). Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by TTS as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (e.g., conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

Level A harassment—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups, based on hearing sensitivity, as a result of exposure to noise from two different types of sources (i.e., impulsive or non-impulsive). As dual metrics, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the two metrics is exceeded (i.e., metric resulting in the

largest isopleth). The Project includes the use of both impulsive and non-impulsive sources.

These thresholds are provided in table 4 below. The references, analysis, and

methodology used in the development of the thresholds are described in NMFS' 2018 Technical Guidance, which may be accessed at:

www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.

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Table 4 -- Onset of Permanent Threshold Shift (PTS) (NMFS, 2018)

Hearing Group	PTS Onset Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	Cell 1 $L_{p,0-pk,flat}$: 219 dB $L_{E,p, LF,24h}$: 183 dB	Cell 2 $L_{E,p, LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	Cell 3 $L_{p,0-pk,flat}$: 230 dB $L_{E,p, MF,24h}$: 185 dB	Cell 4 $L_{E,p, MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	Cell 5 $L_{p,0-pk,flat}$: 202 dB $L_{E,p, HF,24h}$: 155 dB	Cell 6 $L_{E,p, HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	Cell 7 $L_{p,0-pk,flat}$: 218 dB $L_{E,p, PW,24h}$: 185 dB	Cell 8 $L_{E,p, PW,24h}$: 201 dB
<p>* Dual metric thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds are recommended for consideration.</p> <p>Note: Peak sound pressure level ($L_{p,0-pk}$) has a reference value of 1 μPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1 μPa²s. In this Table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO, 2017). The subscript “flat” is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (<i>i.e.</i>, 7 Hz to 160 kHz). The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW pinnipeds) and that the recommended accumulation period is 24 hours. The weighted cumulative sound exposure level thresholds could be exceeded in a multitude of ways (<i>i.e.</i>, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these thresholds will be exceeded.</p>		

Explosive sources—Based on the best available science, NMFS uses the acoustic and pressure thresholds

indicated in tables 5 and 6 to predict the onset of behavioral harassment, TTS, PTS, tissue damage, and mortality

incidental to explosive detonations. Given that Sunrise Wind would be limited to detonating one UXO/MEC per

day, the TTS threshold is used to estimate the potential for Level B (behavioral) harassment (*i.e.*, individuals exposed above the TTS

threshold may also be harassed by behavioral disruption). However, NMFS does not anticipate that any impacts from exposure to UXO/MEC detonation

below the TTS threshold would constitute behavioral harassment).

Table 5 -- PTS Onset, TTS Onset, for Underwater Explosives (NMFS, 2018)

Hearing Group	PTS Impulsive Thresholds (Level A harassment)	TTS Impulsive Thresholds (Level B harassment)	Behavioral Threshold (multiple detonations; Level B harassment) ¹
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{pk,flat}$: 213 dB $L_{E,LF,24h}$: 168 dB	<i>Cell 3</i> $L_{E,LF,24h}$: 163 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 4</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 5</i> $L_{pk,flat}$: 224 dB $L_{E,MF,24h}$: 170 dB	<i>Cell 6</i> $L_{E,MF,24h}$: 165 dB
High-Frequency (HF) Cetaceans	<i>Cell 7</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 8</i> $L_{pk,flat}$: 196 dB $L_{E,HF,24h}$: 140 dB	<i>Cell 9</i> $L_{E,HF,24h}$: 135 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 10</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 11</i> $L_{pk,flat}$: 212 dB $L_{E,PW,24h}$: 170 dB	<i>Cell 12</i> $L_{E,PW,24h}$: 165 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS/TTS onset.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μ Pa, and cumulative sound exposure level (L_E) has a reference value of 1 μ Pa²s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI, 2013). However, ANSI defines peak sound pressure as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the overall marine mammal generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

1 – Given Sunrise Wind would be limited to detonating one UXO/MEC per day, the TTS threshold is used to estimate the potential for Level B (behavioral) harassment (i.e., individuals exposed above the TTS threshold may also be harassed by behavioral disruption but we do not anticipate any impacts from exposure to UXO/MEC detonation below the TTS threshold would constitute behavioral harassment

Additional thresholds for non-auditory injury to lung and gastrointestinal (GI) tracts from the blast shock wave and/or onset of high peak pressures are also relevant (at relatively

close ranges) (table 6). These criteria have been developed by the U.S. Navy (DoN (U.S. Department of the Navy) 2017a) and are based on the mass of the animal and the depth at which it is

present in the water column. Equations predicting the onset of the associated potential effects are included below (table 6).

Table 6 -- Lung and G.I. Tract Injury Thresholds (DoN, 2017)

Hearing Group	Mortality (Severe lung injury)*	Slight Lung Injury*	G.I. Tract Injury
All Marine Mammals	<i>Cell 1</i> Modified Goertner model; Equation 1	<i>Cell 2</i> Modified Goertner model; Equation 2	<i>Cell 3</i> $L_{pk,flat}$: 237 dB
<p>* Lung injury (severe and slight) thresholds are dependent on animal mass (Recommendation: Table C.9 from DoN (2017) based on adult and/or calf/pup mass by species).</p> <p>Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI, 2013). However, ANSI defines peak sound pressure as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the overall marine mammal generalized hearing range.</p> <p style="text-align: center;">Modified Goertner Equations for severe and slight lung injury (pascal-second)</p> <p style="text-align: center;">Equation 1: $103M^{1/3}(1 + D/10.1)^{1/6}$ Pa-s</p> <p style="text-align: center;">Equation 2: $47.5M^{1/3}(1 + D/10.1)^{1/6}$ Pa-s</p> <p style="text-align: center;">M animal (adult and/or calf/pup) mass (kg) (Table C.9 in DoN, 2017)</p> <p style="text-align: center;">D animal depth (meters)</p>			

BILLING CODE 3510-22-C*Marine Mammal Density and Occurrence*

In this section, NMFS provides the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Depending on the species and as described in the take estimation section for each activity, take estimates may be based on the Roberts *et al.* (2023) density estimates, marine mammal monitoring results from HRG surveys, or average group sizes.

Habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory and the Marine-life Data and Analysis Team, based on the best available marine mammal data obtained in a collaboration between Duke University, the Northeast Regional Planning Body, the University of North Carolina Wilmington, the Virginia Aquarium and Marine Science Center, and NOAA (Roberts *et al.*, 2016a, 2016b, 2017, 2018, 2020, 2021a, 2021b, 2023), represent the best available information regarding marine mammal densities in the Project Area. Density data are subdivided into five separate raster data layers for each species: (1) Abundance (density); (2) 95 percent Confidence

Interval of Abundance; (3) 5 percent Confidence Interval of Abundance; (4) Standard Error of Abundance; and (5) Coefficient of Variation of Abundance. The density estimates have not changed since the Proposed Rule.

Below, NMFS describes the observational data from monitoring reports and average group size information, both of which are appropriate to inform take estimates for certain activities or species in lieu of density estimates. As noted above, the density and occurrence information type resulting in the highest take estimate was used, and the explanation and results for each activity are described in the specific activity subsections in the Modeling and Take Estimation section.

For some species and activities, observational data from Protected Species Observers (PSOs) aboard HRG and geotechnical survey vessels indicate that the density-based exposure estimates may be insufficient to account for the number of individuals of a species that may be encountered during the planned activities. PSO data from geophysical and geotechnical surveys conducted in the area surrounding the Sunrise Wind Lease Area and SWEC route from October 2018 through February 2021 (AIS-Inc., 2019; Bennett,

2021; Stevens *et al.*, 2021; Stevens and Mills, 2021) were analyzed to determine the average number of individuals of each species observed per vessel day. For each species, the total number of individuals observed (including the “proportion of unidentified individuals”) was divided by the number of vessel days during which observations were conducted in 2018–2021 HRG surveys (*i.e.*, 407 survey days) to calculate the number of individuals observed per vessel day, as shown in the final columns of tables 7 and 8 as found in the Updated Density and Take Estimation Memo.

For other less-common species, the predicted densities from Roberts and Halpin (2022) are very low and the resulting density-based exposure estimate is less than a single animal or a typical group size for the species. In such cases, the mean group size was considered as an alternative to the density-based or PSO data-based take estimates to account for potential impacts on a group during an activity. Mean group sizes for each species were calculated from recent aerial and/or vessel-based surveys, as shown in table 7. Additional detail regarding the density and occurrence as well as the methodology used to estimate take for

specific activities is included in the activity-specific subsections below.

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Table 7 -- Mean Group Sizes of Species for Which Incidental Take Is Being Requested

Species	Individuals	Sightings	Mean Group Size	Information Source
North Atlantic right whale*	145	60	2.4	Kraus <i>et al.</i> (2016)
Blue whale*	3	3	1.0	Palka <i>et al.</i> (2017)
Fin whale*	155	86	1.8	Kraus <i>et al.</i> (2016)
Humpback whale	160	82	2.0	Kraus <i>et al.</i> (2016)
Minke whale	103	83	1.2	Kraus <i>et al.</i> (2016)
Sei whale*	41	25	1.6	Kraus <i>et al.</i> (2016)
Sperm whale*	208	138	1.5	Palka <i>et al.</i> (2017)
Atlantic spotted dolphin	1,335	46	29.0	Palka <i>et al.</i> (2017)
Atlantic white-sided dolphin	223	8	27.9	Kraus <i>et al.</i> (2016)
Bottlenose dolphin	259	33	7.8	Kraus <i>et al.</i> (2016)
Common dolphin	2,896	83	34.9	Kraus <i>et al.</i> (2016)
Pilot whales	117	14	8.4	Kraus <i>et al.</i> (2016)
Risso's dolphin	1,215	224	5.4	Palka <i>et al.</i> (2017)
Harbor porpoise	121	45	2.7	Kraus <i>et al.</i> (2016)
Seals (harbor and gray)	201	144	1.4	Palka <i>et al.</i> (2017)

* Denotes species listed under the Endangered Species Act.

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The estimated exposure and take tables for each activity present the density-based exposure estimates, PSO-data derived take estimate, and mean group size for each species. The number of takes by Level B harassment Sunrise

Wind requested and NMFS authorizes is based on the largest of these three values. As mentioned previously, the number of takes by Level A harassment authorized is based strictly on density-based exposure modeling results,

rounded up to the nearest whole number or group size, as appropriate.

Modeling and Take Estimation

Sunrise Wind estimated density-based exposures in two separate ways, depending on the activity. For Level A

and Level B harassment from the noise produced by foundation installation, sophisticated sound and animal movement modeling was conducted to account for the movement and behavior of marine mammals and their exposure to the underwater sound fields produced during impact pile driving, as described below. Sunrise Wind also estimated the potential for Level B harassment from foundation installation using a simplified “static” method wherein the take estimates are the product of density, ensonified area above the NMFS defined threshold levels (e.g., unweighted 160 dB SPLrms), and number of days of installation. Take estimates from landfall construction activities, HRG surveys, and UXOs/MECs detonations were also calculated based on the static method (i.e., animal movement modeling was not conducted for these activities). For some species, observational data from PSOs aboard HRG survey vessels or group size indicated that the density-based take estimates may be insufficient to account for the number of individuals of a species that may be encountered during the planned activities; thus, adjustments were made to the density-based estimates. The “static” take estimates are calculated by multiplying the expected densities of marine mammals in the activity area(s) by the area of water likely to be ensonified above the NMFS defined threshold levels (e.g., unweighted 160 dB SPLrms) by the total number of days each month. The number of days per month is dependent upon the construction schedules (see tables 1–5 in the March 2023 Reduced WTG Foundation Scenario Memo). The results of these calculations were then summed to arrive at the total estimated

exposure from WTG and OCS–DC foundation installations. That is, Sunrise Wind assumed all 87 foundations are installed in the months with the highest densities for each species. For foundation installation, the maximum monthly density is multiplied by the total ensonified area (highest between summer or winter) for the first month of construction of WTG monopile installation. The second highest monthly density is multiplied by the total ensonified area (highest between summer or winter) for the second month of WTG monopile installation. Lastly, the maximum monthly density is multiplied by the total ensonified area for OCS–DC installation. These three values are then added together to derive the “static” take estimate value for all foundation installation. Total ensonified area is calculated by multiplying the single pile ensonified area by the total number of piles installed within the first and second month of construction. For example, if 56 WTG monopiles were assumed to be installed during the month with the highest density (e.g., July) and 46 were installed in the month with the second highest density (e.g., August), the resulting equation would be:

Max monthly density [July] × total ensonified area for first month [summer WTG monopile] + 2nd highest monthly density [August] × total ensonified area for the 2nd month [summer WTG monopile] + max monthly density [July] × total ensonified area for first month [summer OCS–DC] = Total “static” take estimate.

In some cases, the exposure estimates from the animal movement modeling methods described above directly informed the take estimates. In other

cases, adjustments were made based on previously collected monitoring data or average group size as described above. In all cases, Sunrise Wind requested, and this final rule allows for, an amount of take to be authorized that is based on the highest amount of exposures estimated from any given method.

Below, NMFS presents the distances to NMFS thresholds and take estimates associated with each activity (e.g., WTG and OCS–DC foundation installation) as a result of exposure modeling or the static method as described above.

WTG and OCS–DC Foundation Installation—Here, for WTG and OCS–DC monopile foundation installation, NMFS provides summarized descriptions of the modeling methodology used to predict sound levels generated from the Project with respect to harassment thresholds and potential exposures using animal movement, the density and/or occurrence information used to support the take estimates for this activity, and the resulting acoustic and exposure ranges, exposures, and authorized takes. Additional modeling details are available in the proposed rule **Federal Register** notice (88 FR 8996, February 10, 2023).

To complete the Project, Sunrise Wind proposed five total pile installation schedules, as construction schedules cannot be fully predicted due to uncontrollable environmental factors (e.g., weather) and installation schedules include variability (e.g., drivability). Table 8 describes the assumptions in each scenario with regard to how piles are installed relative to each other as well as the amount of pile driving time (days) allocated to each month.

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Table 8 -- Sunrise Wind's Five Potential Foundation Installation Schedules

Schedule Analyzed	Installation Details	Foundation Structure	Configuration	1 st Highest Species Density Month		2 nd Highest Species Density Month	
				Days of piling	Total piles	Days of piling	Total piles
Schedule 1	Sequential operations; assumptions for WTG (one vessel installing two monopiles per day) foundations and the OCS-DC foundation.	OCS-DC	Jacket pin pile, 4 per day	2	8	0	0
		WTG	Monopile, 2 per day	28	56	23	46
Schedule 2	Sequential operations; assumptions for WTG (one vessel installing three monopiles per day) foundations and the OCS-DC foundation	OCS-DC	Jacket pin pile, 4 per day	2	8	0	0
		WTG	Monopile, 3 per day	28	84	6	18
Schedule 3	Concurrent operations; proximal assumptions for concurrent piling of WTG (two vessels, each installing two monopiles per day) foundations, and the OCS-DC foundation	OCS-DC	Jacket pin pile, 4 per day	2	8	-	-
		WTG	2 vessels, each 2 per day	25.5	102	-	-
Schedule 4	Concurrent operations; distal assumptions for concurrent piling of WTG (two vessels, each installing two monopiles per day) foundations, and the OCS-DC foundation.	OCS-DC	Jacket pin pile, 4 per day	2	8	-	-
		WTG	2 vessels, each 2 per day	25.5	102	-	-
Schedule 5	Concurrent operations; proximal assumptions for concurrent piling of WTG (one vessel installing two monopiles per day) and the	OCS-DC & WTG	Jacket pin pile, 4 per day + Monopile, 2 per day	2	8 (pin) + 4 (monopile)	0	0

	OCS-DC foundation (one vessel installing four pin piles per day), and remaining WTG foundations	WTG	Monopile, 2 per day	28	60	21	42
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** Note: No specific installation Schedule was carried forward; however, the highest Level A and Level B exposure estimates produced from across all five installation Schedules was selected and summarized as the most conservative for analysis purposes, given uncertainty in the exact construction approach at this stage of the project.
- not applicable*

Sumrise Wind assumed that a maximum of three (if installed

sequentially) or four (if installed concurrently) WTG monopile

foundations and four pin piles related to the jacket foundation for the OCS-DC

may be driven in 24 hours. It is unlikely that this installation rate would be consistently possible throughout the SRWF construction phase, but this schedule was considered to have the greatest potential for Level A harassment (*i.e.*, PTS) and was, therefore, carried forward into the Level A harassment take estimation. Exposure ranges (ER_{0.5percent}) to Level A SEL_{cum} thresholds resulting from animal exposure modeling assuming various consecutive pile installation scenarios and 10 dB of attenuation by a NAS are summarized in table 9. In the event two installation vessels are able to work simultaneously, exposure ranges

(ER_{0.5percent}) to Level A SEL_{cum} thresholds from the three concurrent pile installation scenarios and 10 dB of attenuation by a NAS are summarized in table 10. Comparison of the results in table 9 and table 10 show that the scenario assuming consecutive installation of 2 WTG monopiles per day (which assumes the piles are located close to each other) and concurrent installation of 4 WTG monopiles per day at distant locations yield very similar results. This makes logical sense because the close proximity of the two piles installed at each location in the concurrent scenario is very similar to the 2 piles installed in

the consecutive installation scenario and animals are unlikely to occur in both locations in the concurrent scenarios when they are far apart. Exposure ranges from the “Proximal” concurrent installation scenario (assuming close distances between concurrent pile installations) are slightly greater than from the “Distal” concurrent installation scenario (assuming long distances between concurrent pile installations) reflecting the fact that animals may be exposed to slightly higher cumulative sound levels when concurrent pile installations occur close to each other.

Table 9 -- Exposure ranges (ER95percent) to Level A cumulative sound exposure level (SEL_{cum}) thresholds for marine mammals from sequential installation of two and three 7/12 m WTG monopiles (10,398 strikes each) and four 4-m OCS-DC jacket foundation pin piles (17,088 strikes each) in 1 day during the summer and winter seasons using a IHC S-4000 hammer and assuming 10 dB of broadband noise attenuation

Hearing Group	SEL _{cum} Threshold (dB re 1 μPa ² ·s)	Range (km)					
		WTG Monopile 2-Piles/Day		WTG Monopile 3-Piles/Day		OCS-DC Jacket 4 piles/Day	
		Summer	Winter	Summer	Winter	Summer	Winter
Low-frequency	183						
Fin Whale*		3.91	4.19	3.68	4.24	5.55	6.42
Humpback Whale		3.63	3.8	3.4	3.82	5.13	3.2
Minke Whale		1.98	2.12	1.86	2.02	2.88	6.03
NA Right Whale*		2.66	2.81	2.51	2.9	3.62	4.06
Sei Whale*		2.69	3.09	2.67	3.01	4.22	4.73
Mid-frequency	185	0	0	0	0	0	0
High-frequency	155	0	0	0	0	0.81	0.59
Phocid pinnipeds	185	<0.01	<0.01	0.03	0.03	1.72	1.73

Table 10 -- Exposure ranges (ER95percent) to Level A cumulative sound exposure level (SELcum) thresholds for marine mammals from concurrent installation scenarios including up to four 7/12 m WTG monopiles (10,398 strikes each) per day in close proximity to each other (“Proximal”) and distant from each other (“Distal”) or two 7/12 m WTG monopiles and four 4-m OCS-DC jacket foundation pin piles (17,088 strikes each) in 1 day during the summer and winter seasons using a IHC S-4000 hammer and assuming 10 dB of broadband noise attenuation

Hearing Group	SEL _{cum} Threshold (dB re 1 μPa ² ·s)	Range (km)					
		Proximal WTG Monopiles 4-Piles/Day		Distal WTG Monopiles 4-Piles/Day		2 WTG Monopiles and 4 OCS-DC Jacket	
		Summer	Winter	Summer	Winter	Summer	Winter
Low-frequency	183						
Fin Whale*		4.23	4.83	3.8	3.8	5.25	6.21
Humpback Whale		4.02	4.32	3.66	3.66	4.83	5.68
Minke Whale		2.17	2.37	1.96	1.96	2.71	3.07
NA Right Whale*		2.94	3.31	2.61	2.61	3.49	3.85
Sei Whale*		3.18	3.37	2.74	2.74	3.97	4.65
Mid-frequency	185	0	0	0	0	0	0
High-frequency	155	0	0	0	0	0.61	0.57
Phocid pinnipeds	185	0.22	0.16	0.22	0.22	1.62	1.74

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As described previously, Sunrise Wind also modeled acoustic ranges to NMFS harassment thresholds. Because the Level B harassment threshold is instantaneous, NMFS considers the

acoustic ranges most appropriate to identify areas at which PSOs would determine if a Level B harassment take has occurred, although NMFS notes the differences between the Level B harassment exposure ranges calculated

assuming animal movement modeling and Level B acoustic ranges are negligible. Table 11 presents the acoustic ranges resulting from JASCO’s source and propagation models.

Table 11 -- Acoustic Ranges (R95 percent) in km to the Level B, 160 dB re 1 μPa sound pressure level (SPLrms) threshold for impact pile driving during 7/12 m WTG monopile and OCS-DC jacket foundation pin pile (4 m) installation using an IHC S-4000 hammer and assuming 10 dB of broadband noise attenuation

WTG Monopile Foundation (3,200 kJ)		WTG Monopile Foundation (4,000 kJ)		OCS-DC Jacket Foundation (4,000 kJ)	
Summer	Winter	Summer	Winter	Summer	Winter
6.07	6.5	6.49	6.97	6.47	6.63

Sunrise Wind modeled potential Level A harassment and Level B

harassment density-based exposure estimates for all five foundation

installation schedules: consecutive pile driving (Schedules 1 and 2) and

concurrent pile driving (Schedules 3, 4, and 5). For both WTG monopile and OCS–DC jacket foundation installation, mean monthly densities for all species were calculated by first selecting density data from 5 x 5 km (3.1 x 3.1 mile) grid cells (Roberts *et al.*, 2016; Roberts *et al.*, 2022) both within the Lease Area and out to 10 km (6.2 mi) from the perimeter of the Lease Area. This is a reduction from the 50 km (31 mi) perimeter used in the Adequate & Complete ITR application from May 2022. The relatively large area selected for density estimation encompasses and

extends approximately to the largest estimated exposure acoustic range (ER_{95percent} to the isopleth corresponding to Level B harassment, assuming 10 dB of noise attenuation) for all hearing groups using the unweighted threshold of 160 dB re 1 μPa (rms). Please see figure 11 in Sunrise Wind’s Updated Density and Take Estimation Memo for an example of a density map showing the Roberts *et al.* (2022) density grid cells overlaid on a map of the SRWF. For monopile installation, the exposure calculations assume 30 days of piling would occur in the highest

density month and that the remaining piling days would occur in the second highest density month for each marine mammal species (excluding January–April). Sunrise Wind assumed that the OCS–DC jacket foundation would be installed in the month with the highest density for each species. Due to differences in the seasonal migration and occurrence patterns, the month selected for each species differs. Table 12 identifies the months and density values used in the exposure estimate models for foundation installation.
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Table 12 -- Maximum Average Monthly Marine Mammal Densities during Foundation Pile Installation

Marine Mammal Species	Maximum Monthly (May- December) Density (Individual/km ²)	Maximum Density Month (May- December)	2 nd Highest Monthly Density (May- December) (Individual/km ²)	2 nd Highest Density Month (May- December)
North Atlantic right whale*	0.0018	May	0.0015	December
Blue whale*	N/A	Annual	N/A	Annual
Fin whale*	0.0043	July	0.037	August
Humpback whale	0.0025	May	0.0024	June
Minke whale	0.0180	May	0.0137	June
Sei whale*	0.0017	May	0.0007	November
Sperm whale*	0.0006	August	0.0004	September
Atlantic spotted dolphin	0.0030	October	0.0015	September
Atlantic white-sided dolphin	0.0270	May	0.0234	June
Bottlenose dolphin	0.0162	August	0.0160	July
Common dolphin	0.1816	September	0.1564	October
Pilot whales	0.0018	Annual	0.0018	Annual
Risso’s dolphin	0.0021	December	0.0010	November
Harbor porpoise	0.0529	May	0.0451	December
Seals (Harbor and Gray)	0.1712	May	0.1668	December

* Denotes species listed under the Endangered Species Act.

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For some species, modifications to the densities used were necessary, and these are described here. The estimated monthly density of seals provided in Roberts *et al.* (2022) includes all seal species present in the region as a single guild. To split the resulting “seal” density-based exposure estimate by species (harbor and gray seals), the estimate was multiplied by the proportion of the combined abundance attributable to each species.

Specifically, the SAR N_{best} abundance estimates (Hayes *et al.*, 2021) for the two species (*i.e.*, gray seal = 27,300, harbor seal = 61,336; total = 88,636) were added and divided the total by the estimate for each species to get the proportion of the total for each species (*i.e.*, gray seal = 0.308; harbor seal = 0.692). The total estimated exposure from the pooled seal density provided by Roberts and Halpin (2022) was then multiplied by these proportions to get the species-specific exposure estimates. Monthly densities were unavailable for pilot whales, so the annual mean density was used instead. The blue whale density was considered too low to be carried into exposure estimation so the amount of blue whale take that Sunrise Wind requests (see Estimated Take) is instead based on group size.

The winter acoustic modeling results were used to calculate the ensonified area in cases where the first or second highest monthly density was December (when considering May through December given the seasonal restriction on pile driving). All species expected in the SRWF and SRWEC have the highest and second highest monthly densities occurring in summer months except for the NARW, harbor porpoise, common dolphin, and harbor seal. During foundation installation activities, the NARW, harbor seal, and harbor porpoise densities are highest during May and second highest during the month of

December. Common dolphin densities are highest during the month of September and second highest during December. The resulting take estimate for the two highest months was then summed together with the OCS-DC take estimate to get the total “Static” Level B take for each scenario. These calculations were used for all five scenarios and the highest Level B “Static” exposure estimate from across the five installation scenarios was selected for the final take tables (tables 50 and 51 in the Reduced WTG Foundations report and its correction).

No single schedule resulted in the greatest amount of potential for injury or behavioral harassment. Sunrise Wind identified the following trends when looking across all construction schedules. Schedules 3 and 4 resulted in the highest take estimate due to the fact that the total ensonified area was distributed only into a single month of effort rather than across two months, meaning that all activity would occur within the month with the highest density for each species. This is likely because marine mammals would be exposed to two sources at the same moment and as one event rather than by two separate and distinct construction events. There were no SEL injury exposures at any attenuation level for any construction schedule. Harbor porpoise Level A harassment exposures were consistent regardless of the construction schedule. Schedule 3 tended to result in a reduced amount of take compared to the other construction schedules for phocid pinnipeds. Schedule 5 has similar results to Schedule 1.

As several of these schedules assume nearby concurrent operations, modeling efforts found that, because of the SEL metric used to evaluate PTS and the greater energy accumulated from multiple sources over a larger footprint,

concurrent nearby operations may marginally increase the total number of injurious takes of marine mammals by PTS (Level A harassment) even though the number of days of operations goes down in these situations. Alternately, while the footprint ensonified above the behavioral harassment threshold by two concurrent installations may be larger than that of a single operation, because the behavioral harassment threshold is based on SPL and not accumulated energy, the number of behavioral disruptions of marine mammals (Level B harassment) are reduced when the number of days of pile driving is reduced. The fact that concurrent operations will likely result in the construction activities being completed in a shorter amount of time (fewer days), this is also considered a benefit, and more broadly, in the context of how repeated or longer total duration activities may impact marine mammals and their habitat.

As described above, no single schedule was carried forward specifically for annual take estimates. Sunrise Wind compiled the maximum amount of take modeled for each species from each construction schedule to consider in their take estimates. Moreover, as described above, other factors influenced Sunrise Wind’s take request. However, NMFS notes that final take estimates and the number of takes that NMFS may authorize represent the maximum number of takes that is reasonably likely to occur from any method considered (*e.g.*, exposure modeling, static Level B harassment calculations (*i.e.*, density x ensonified area x days of pile driving), PSO data, or group size). Tables 13 and 14 represent take estimates from all methods for consecutive and concurrent pile driving schedules.

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Table 13 -- Estimated Take by Level A and Level B Harassments from sequential installation of 87, 7/12 m WTG monopile foundations and 1 OCS-DC piled jacket foundation using an IHC-4000 hammer assuming 10 dB of noise attenuation

Marine Mammal Species	Exposure Modeling Take Estimate ^a		Static Level B Take Estimates ^b	PSO Data Take Estimates	Mean Group Size	Highest Take By Level B Harassment
	Level A Harassment	Level B Harassment				
North Atlantic right whale*	6.9	18.4	21.1	1.6	2.4	22
Blue whale*	N/A	N/A	0.1	-	1.0	1
Fin whale*	15.7	33.7	50.5	17.4	1.8	51
Humpback whale*	11.9	23.7	29.7	51.7	2.0	52
Minke whale	103.1	316.5	209.8	6.3	1.2	317
Sei whale*	5.7	15.3	19.5	0.4	1.6	20
Sperm whale*	0.0	6.4	7.1	-	1.5	8
Atlantic spotted dolphin	0.0	7.5	34.2	-	29.0	35
Atlantic white-sided dolphin	0.0	469.7	316.6	5.1	27.9	470
Bottlenose dolphin	0.0	205.3	190.2	56.5	7.8	206
Common dolphin	0.0	4,449.6	2,440.1	1,438.2	34.9	4,450
Pilot whales	0.0	28.8	21.7	-	8.4	29
Risso's dolphin	0.0	26.6	23.9	4.0	5.4	27
Harbor porpoise	3.9	547.3	623.0	1.4	2.7	623
Gray Seal	2.0	382.9	647.8	3.9	1.4	648
Harbor Seal	7.2	1,072.6	1,455.4	5.1	1.4	1,456

* Denotes species listed under the Endangered Species Act.

a - Only 87 WTG foundations would be installed. The values in this table are a result of table 22 in the Reduced WTG Foundations report.

b - "Static" Level B take estimates are from the standard density x area x number of days method, not from exposure modeling.

Table 14 -- Estimated Take by Level A and Level B Harassments from three concurrent installation schedules of 87, 7/12 m WTG monopile foundations and 1 OCS-DC piled jacket foundation using an IHC S-4000 hammer assuming 10 dB of noise attenuation

Species	Proximal WTG Monopiles (4 piles/day)		Distal WTG Monopiles (4 piles/day)		2 WTG Monopiles and 4 OCS-DC Jacket pin piles		Maximum Among All Three Schedules	
	Level A Harassment	Level B Harassment	Level A Harassment	Level B Harassment	Level A Harassment	Level B Harassment	Level A Harassment	Level B Harassment
North Atlantic right whale*	7.3	14.6	7.2	18.8	6.3	17.0	7.3	18.8
Blue whale*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fin whale*	16.3	28.8	16.0	32.0	15.5	30.9	16.3	32.0
Humpback whale*	11.4	19.2	10.4	21.2	11.7	21.7	11.7	21.7
Minke whale	113.1	251.5	103.4	314.2	99.6	289.4	113.1	314.2
Sei whale*	5.8	12.8	5.7	15.0	4.5	12.3	5.8	15.0
Sperm whale*	0.0	5.1	0.0	6.0	0.0	5.5	0.0	6.0
Atlantic spotted dolphin	0.0	15.9	0.0	15.3	0.0	7.3	0.0	15.9
Atlantic white-sided dolphin	0.0	369.9	0.0	464.9	0.0	432.8	0.0	464.9
Bottlenose dolphin	0.0	167.2	0.0	195.8	0.0	199.9	0.0	199.9
Common dolphin	0.0	2,599.5	0.0	4,457.4	0.0	4,289.4	0.0	4,457.4
Pilot whales	0.0	5.1	0.0	6.0	0.0	5.5	0.0	6.0
Risso's dolphin	0.0	20.7	0.0	27.0	0.0	21.2	0.0	27.0

Harbor porpoise	3.9	455.5	3.9	542.4	4.0	527.2	4.0	542.4
Gray Seal	1.6	307.7	1.9	353.5	1.7	372.7	1.9	372.7
Harbor Seal	6.7	927.6	8.1	1,067.0	7.5	1,029.8	8.1	1,067.0

* Denotes species listed under the Endangered Species Act.

a - Only 87 WTG foundations would be installed. The values in this table are a result of table 23 in the Reduced WTG Foundations report.

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Table 15 presents the maximum number of exposures among all five schedules modeled (see Küsel *et al.* 2022 for exposure estimates for each schedule), results from a static approach to calculate Level B harassment take, other available data to consider (*i.e.*, mean group size and PSO data), and importantly, the number of takes Sunrise Wind requested and NMFS may authorize incidental to installing WTG and OCS-DC foundations. NMFS notes that in its application, Sunrise Wind requested take by Level A harassment for humpback whales only. However, the new Roberts and Halpin (2022) density estimates resulted in Level A harassment takes for other marine mammal species' (*i.e.*, fin whale, humpback whale, minke whale, sei whale, harbor porpoise, gray seal, harbor seal) during foundation installation, which led to a reevaluation of how Level A harassment takes were determined during the foundation installation associated with the Sunrise Wind proposed project. As it is possible for some animals to occur within the relevant distances for durations long

enough to result in Level A harassment, additional take was evaluated and requested. However, most species will temporarily avoid the area during the foundation installation activities, and in combination with the mitigation and monitoring measures, the potential for Level A harassment is very low. However, there may be some situations where pile driving cannot be stopped due to safety concerns related to pile instability. To estimate the potential for PTS, Sunrise Wind conservatively estimated that some animals may be undetected at distance but within the Level A harassment exposure ranges. Assuming the greatest risk to not detecting marine mammals is within the outer 500 m of the exposure range (or approximately 20 percent of exposure range area), Sunrise Wind estimates that up to 20 percent of the model-predicted Level A harassment take (except NARW) could occur. Given the extensive visual and acoustic monitoring required for all marine mammals, NMFS believes animals will be reliably detected to the degree that PTS can be avoided; however, at Sunrise Wind's request, this rule would allow for take, by Level A

harassment, to be authorized in the amount of 20 percent of the modeled PTS exposures for each species. However, due to the enhanced mitigation measures for NARW (see Mitigation section), no Level A harassment takes are requested for this species nor is NMFS allowed to authorize any such takes under this rulemaking.

Sunrise Wind assumed that all foundations would be installed in a single year and calculated take based on this schedule. However, the new schedule predicts foundation installation may occur over two years. Regardless, Sunrise Wind's conservative approaches (*e.g.*, assuming all piles would be installed within the two highest density months for each species) indicate the assumption all piles would be installed in one year is reasonable. Further, it is possible the schedule could shift again. It is anticipated that all foundations would be installed in Year 1; therefore, table 15 represents the maximum number of takes that is reasonably expected to occur in any given year from foundation installation.

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Table 15 -- Maximum estimated take by Level A and Level B harassment from installation of 87, 7/12 m WTG monopile foundations and 1 OCS-DC piled jacket foundation using an IHC S-4000 hammer assuming 10 dB of noise attenuation among the 5 modeled installation schedules^a

Species	Exposure Modeling Take Estimate		Static Level B Take Estimates ^b	PSO Data Take Estimates	Mean Group Size	Authorized Level A Harassment	Authorized Level B Harassment
	Level A Harassment	Level B Harassment					
North Atlantic right whale*	7.3	18.8	21.1	1.6	2.4	0	22
Blue whale*	n/a	n/a	0.1	-	1.0	0	1
Fin whale*	16.3	33.7	50.8	17.4	1.8	4	51
Humpback whale*	11.9	23.7	29.8	51.7	2.0	3	52
Minke whale	113.1	316.5	211.5	6.3	1.2	23	317
Sei whale*	5.8	15.3	19.9	0.4	1.6	2	20
Sperm whale*	0.0	6.4	7.2	-	1.5	0	8
Atlantic spotted dolphin	0.0	15.9	34.7	-	29.0	0	35
Atlantic white-sided dolphin	0.0	469.7	318.0	5.1	27.9	0	470
Bottlenose dolphin	0.0	205.3	190.3	56.5	7.8	0	206
Common dolphin	0.0	4,457.4	2,461.2	1,438.2	34.9	0	4,458
Pilot whales	0.0	28.8	21.7	-	8.4	0	29
Risso's dolphin	0.0	27.0	24.4	4.0	5.4	0	28
Harbor porpoise	4.0	547.3	623.4	1.4	2.7	1	624
Gray Seal	2.0	382.9	647.8	3.9	1.4	1	648
Harbor Seal	8.1	1,072.6	1,455.4	5.1	1.4	2	1,456

* Denotes species listed under the Endangered Species Act.

a - Sunrise Wind assumed that some animals may go undetected near the outer perimeter of the largest modeled exposure range (approximately within 500 m). Given the area of the water is represented by a band that is around 500-m wide on the inside of the modeled exposure ranges, it was estimated that this made up approximately 20 to 25 percent of the total area of the exposure range. Because of these reasons, Sunrise Wind evaluated that up to 20 percent of the model predicted Level A harassment take could occur. Level B harassment exposure modeling take estimates are based on the unweighted distances to the 160 dB level. "Static" Level B harassment estimates are from the standard density x area method described in the text, not from exposure modeling.

b - "Static" Level B take estimates are from the standard density x area x number of days method, not from exposure modeling.

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Export Cable Landfall Construction

NMFS previously described Sunrise Wind's acoustic modeling methodologies and identified that Sunrise Wind applied the static method to estimate take (i.e., no exposure modeling was conducted for cable landfall construction work). Here, NMFS presents the results from that modeling. Table 16 identifies the modeled acoustic ranges to the PTS (SEL_{cum}) thresholds from pneumatic

hammering of the casing pipe. Level A harassment (SPL_{pk}) thresholds were not exceeded in the model and, therefore, will not be discussed further. The modeled Level B harassment threshold distance is 920 m (table 16).

Modeled distances to PTS thresholds are larger than distances to the Level B harassment threshold due to the high strike rate of the pneumatic hammer (table 16). However, low-frequency cetaceans are not expected to occur frequently close to this nearshore site and individuals of any species

(including seals) are not expected to remain within the estimated SEL_{cum} threshold distances for the entire 3-hour duration of piling in a day. Furthermore, with the implementation of planned monitoring and mitigation (see Mitigation and Monitoring section), the potential for PTS incidental to pneumatic hammering is not anticipated. Sunrise Wind did not request nor is NMFS authorizing Level A harassment incidental to installation of the casing pipe.

Table 16 -- Acoustic Ranges (R_{95percent}) In Meters To Level A Harassment (PTS) and Level B Harassment Thresholds From Pneumatic Hammering During Casing Pipe Installation For Marine Mammal Functional Hearing Groups, Assuming A Winter Sound Speed Profile

Hearing Group	Level A Harassment SEL _{cum} Thresholds (dB re 1 μPa ² ·s)	Level B Harassment SPL _{rms} Threshold (120 dB re 1 μPa)
Low-frequency cetaceans	3,870	920
Mid-frequency cetaceans	230	
High-frequency cetaceans	3,950	
Phocid pinnipeds	1,290	

Each casing pipe would be supported by six goal posts to allow the borehole exit point to remain clear of mud. Each goal post would be supported by two vertical sheet piles (a total of 12 sheet piles) that would be installed using a vibratory hammer (i.e., an American Piledriving Equipment model 300 or similar), with a potential for up to 10 additional sheet piles being installed to support ongoing construction activities (a total of 22 sheet piles). Sunrise Wind

anticipates installing the 22 sheet piles over 6 days (approximately four piles per day). Each sheet pile would take up to 2 hours to install for a total of 8 hours per day. Removal timelines would be similar (up to six days total), equating to a total of 12 days for both installation and removal.

Similar to the modeling approach for foundation impact pile driving, distances to harassment thresholds are reported as R_{95percent} values. Given the

nature of vibratory pile driving and the very small distances to Level A harassment thresholds (i.e., 0–190 m) (table 17), which accounts for eight hours of vibratory pile driving per day, vibratory driving is not expected to result in Level A harassment. Sunrise Wind did not request, nor is NMFS authorizing, any Level A harassment incidental to installation or removal of sheet piles.

Table 17 -- Acoustic Ranges ($R_{95\text{percent}}$) In Meters To Level A Harassment (PTS) and Level B Harassment Thresholds From Vibratory Pile Driving During Sheet Pile Installation For Marine Mammal Functional Hearing Groups, Assuming A Winter Sound Speed Profile

Hearing Group	Level A Harassment SEL_{cum} Thresholds (dB re 1 $\mu\text{Pa}^2 \cdot \text{s}$)	Level B Harassment SPL_{rms} Threshold (120 dB re 1 μPa)
Low-frequency cetaceans	50	9,740
Mid-frequency cetaceans	-	
High-frequency cetaceans	190	
Phocid pinnipeds	10	

Note: Sunrise Wind estimates no more than eight hours of vibratory pile driving per day for sheet pile installation.

The acoustic ranges to the Level B harassment threshold were used to calculate the ensonified area around the cable landfall construction site. The Ensonified Area is calculated as the following:

$$\text{Ensonified Area} = \pi \times r^2,$$

where r is the linear acoustic range distance from the source to the isopleth to the Level B harassment thresholds.

Based on the duration of both the installation/removal of the sheet piles and the casing pipe, different daily ensonified values are necessary for this calculation for the cable landfall take analysis. For the vibratory pile driving associated with the sheet pile installation and removal, the calculated daily ensonified area was 149 km^2

(57.53 mi^2) or a total ensonified area of 1,788 km^2 (1,111 mi^2). For impact pile driving associated with the casing pipe by the pneumatic hammer, the calculated daily ensonified area was 0.92 km^2 (0.36 mi^2) with a total ensonified area of 10.6 km^2 (6.58 mi^2) to result.

To estimate marine mammal density around the nearshore landfall site, the greatest ensonified area plus a 10-km buffer was then intersected with the density grid cells for each individual species to select all of those grid cells that the buffer intersects (Figure 10 in Sunrise Wind's Updated Density and Take Estimation Memo). Since the timing of landfall construction activities may vary somewhat from the proposed schedule, the highest average monthly

density from January through December for each species was selected and used to estimate exposures from landfall construction (table 18).

For some species where little density information is available (*i.e.*, blue whales, pilot whales), the annual density was used instead. Given overlap with the pinniped density models as the Roberts and Halpin (2022) dataset does not distinguish between species, a collective "pinniped" density was used and then split based on the relative abundance for each species for the estimated take (Roberts *et al.*, 2016). These approaches were the same as described in the WTG and OCS-DC Foundation Installation section.

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Table 18 -- Maximum Average Monthly Marine Mammal Densities Within 10 km of the Landfall Location and the Month in Which Each Maximum Density Occurs

Species	Maximum Monthly Density (Individual/km ²)	Maximum Density Month
North Atlantic right whale*	0.0009	February
Blue whale*	0.000	Annual
Fin whale*	0.0013	January
Humpback whale*	0.0016	December
Minke whale	0.0072	May
Sei whale*	0.0006	December
Sperm Whale*	0.0002	November
Atlantic Spotted Dolphin	0.000	September
Atlantic White-sided Dolphin	0.0040	May
Bottlenose Dolphin	0.0540	July
Common Dolphin	0.0336	November
Pilot Whales	0.0000	Annual
Risso's Dolphin	0.0001	December
Harbor Porpoise	0.0384	January
Seals (Harbor and Gray)	0.3789	June

* Denotes species listed under the Endangered Species Act.

Note: Values are derived from table 26 in the December 2022 Updated Density and Take Estimation Memo.

To calculate exposures, the average marine mammal densities (table 18) were multiplied by the daily ensonified area (149 km²) for installation/removal of sheet piles and for the installation/removal of the casing pipe (0.92 km²). Given that use of the vibratory hammer during sheet pile installation and removal may occur on up to 12 days, the daily estimated take (which is the product of density × ensonified area) was multiplied by 12 to produce the

results shown in table 19. The same approach was undertaken for the use of the pneumatic hammer for the casing pipe with the exception that the 8 total days was used.

To be conservative, Sunrise Wind has requested take by Level B harassment based on the highest exposures predicted by the density-based, PSO based, or average group size-based estimates, and the take to be authorized is indicated in the last column of table

19. As described above, given the small distances to Level A harassment isopleths, Level A harassment incidental to this activity is not anticipated, even absent mitigation, although mitigation measures are required that would further reduce the risk. Therefore, Sunrise Wind is not requesting and NMFS is not authorizing Level A harassment related to cable landfall construction activities.

Table 19 -- Estimated Take by Level B Harassment from Export Cable Landfall Construction

Species	Density-based Take Estimate		Total Density-based Take Estimate	PSO Data Take Estimate	Mean Group Size	Highest Level B Takes
	Sheet Piles	Casing Pipe				
North Atlantic right whale*	1.7	0.0	1.7	0.3	2.4	3
Blue whale*	0.0	0.0	0.0	-	1.0	1
Fin whale	2.3	0.0	2.3	3.1	1.8	4
Humpback whale	2.9	0.0	2.9	9.3	2.0	10
Minke whale	12.8	0.1	12.9	1.1	1.2	13
Sei whale*	1.0	0.0	1.0	0.1	1.6	2
Sperm whale*	0.3	0.0	0.3	-	1.5	2
Atlantic spotted dolphin	0.1	0.0	0.1	-	29.0	29
Atlantic white-sided dolphin	7.2	0.0	7.2	0.9	27.9	28
Bottlenose dolphin	96.6	0.6	97.2	10.2	7.8	98
Common dolphin	60.0	0.4	60.4	258.5	34.9	259
Pilot whales	0.0	0.0	0.0	-	8.4	9
Risso's dolphin	0.2	0.0	0.2	0.7	5.4	6
Harbor porpoise	68.7	0.4	69.1	0.3	2.7	70
Gray Seal	208.7	1.2	209.9	0.7	1.4	210
Harbor Seal	468.9	2.8	471.7	0.9	1.4	472

* Denotes species listed under the Endangered Species Act.

Note: Bolded value is corrected from the proposed rule due to a typographical error.

UXO/MEC Detonation

Sunrise Wind may detonate up to three UXO/MECs within the Project's Lease Area over the 5-year effective period of the final rule. To assess the impacts from UXO/MEC detonations, JASCO conducted acoustic modeling based on previous underwater acoustic assessment work that was performed jointly between NMFS and the United States Navy. JASCO evaluated the effects thresholds for TTS, PTS, non-auditory injury, and mortality based on the following three appropriate metrics: (1) peak sound pressure level; (2) weighted cumulative SEL; and (3) acoustic impulse. Charge weights of 2.3 kg (5.1 pounds (lbs)), 9.1 kg (20.1 lbs), 45.5 kg (100.3 lbs), 227 kg (500 lbs), and 454 kg (1,000.9 lbs) (which is the largest charge the Navy considers for the purposes of its analyses) (see the Description of the Specified Activities section in the proposed rule), were modeled to determine the ranges to mortality, gastrointestinal injury, lung injury, PTS, and TTS thresholds. These charge weights were modeled at four different locations and associated water depths in the Project Area (12 m (Site S1), 20 m (Site S2), 30 m (Site S3), and 45 m (Site S4)). Sites S3 (30 m depth) and S4 (45 m depth) were deemed to be representative of the Sunrise Wind Lease Area where detonations could

occur (see figure 1 in Hannay and Zykov, 2022).

Here, NMFS presents the distances to PTS and TTS thresholds for all UXO/MEC charge weights (tables 20 and 21). In the proposed rule, NMFS only described the distances to thresholds for the largest E12 charge weight. However, Sunrise Wind will be able to identify and mitigate at the relevant distances for each specific charge weight, so NMFS has incorporated the maximum values for each size herein. As described below, in consideration of the distances to the associated thresholds and the implementation of the required mitigation and monitoring measures, Sunrise Wind did not request, and NMFS does not anticipate and is not authorizing, take by mortality or non-auditory injury from any activity. All modeling results, including mortality and non-auditory injury, can be found in the supplementary report for Sunrise Wind's ITA application titled "Underwater Acoustic Modeling of Detonations of Unexploded Ordnance (UXO) for Ørsted Wind Farm Construction, US East Coast" (UXO/MEC acoustic modeling report; Hannay and Zykov, 2022). Information on UXO/MEC detonation risk evaluation and charge weight identification can be found in the supplementary report "Supplementary Unexploded Ordnance (UXO) Information for Ørsted Wind

Farm Construction, US East Coast" (UXO/MEC Charge Weight report), as found on NMFS' website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

JASCO selected the largest distances to the PTS and TTS isopleths modeled for the project area (S3 and S4) to carry forward for take estimation (Hannay and Zykov, 2022). This same approach was used to determine the largest distances to these isopleths for the Lease Area (tables 46 and 48 in ITA application). For all species, the distance to the SEL threshold isopleth exceeded that for the SPL peak isopleth (see section 9 in Hannay and Zykov, 2022). Sunrise Wind has committed to use a noise abatement system capable of 10-dB attenuation (at minimum a double bubble curtain) during all detonations. As a result, the 10 dB mitigated UXO/MEC scenario is the one carried forward into exposure and take estimation here. Additional information can be found in the UXO/MEC modeling report (Hannay and Zykov, 2022)) and the Updated Density and Take Estimation Memo for Sunrise Wind on NMFS' website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

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Table 20 – Maximum SEL-based R_{95%} PTS-Onset Ranges, in Meters, from all Site Modeled During UXO/MEC Detonation by Charge Weight, Assuming 10-dB Sound Attenuation

Marine Mammal Hearing Group	2.3 kg (5.1 lbs)		9.1 kg (20.1 lbs)		45.5 kg (100.3 lbs)		227 kg (500 lbs)		454 kg (1,000.9 lbs)	
	R _{max} ^a	R _{95%} ^b	R _{max}	R _{95%}	R _{max}	R _{95%}	R _{max}	R _{95%}	R _{max}	R _{95%}
LFC	632	552	1,230	982	2,010	1,730	3,370	2,970	4,270	3,780
MFC	<50	<50	79	75	175	156	419	337	535	461
HFC	2,100	1,820	3,020	2,590	4,400	3,900	6,130	5,400	6,960	6,200
PP	192	182	413	357	822	690	1,410	1,220	1,830	1,600

Note: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds

a- Represents the maximum distance in any direction that the threshold was exceeded. This metric is often overly conservative for take estimates because it reflects the influence of coherent constructive interference effects, produced by most propagation loss models, due to model approximations of highly uniform environments. In practice, these coherent effects are almost always disrupted by rough interfaces and ocean inhomogeneities.

b- Represents the radius of a circle that encompasses 95% of the area predicted by the model to exceed the threshold. The circle radius is typically larger than the maximum distances in most directions, but it cuts off “fingers” of ensonification that protrude in a small number of directions. This metric is typically also conservative, but less so than the R_{max} distance.

Table 21 – Maximum SEL-based R_{95%} TTS-Onset Ranges, in Meters, from all Site Modeled During UXO/MEC Detonation by Charge Weight, Assuming 10-dB Sound Attenuation

Marine Mammal Hearing Group	2.3 kg (5.1 lbs)		9.1 kg (20.1 lbs)		45.5 kg (100.3 lbs)		227 kg (500 lbs)		454 kg (1,000.9 lbs)	
	R _{max} ^a	R _{95%} ^b	R _{max}	R _{95%}	R _{max}	R _{95%}	R _{max}	R _{95%}	R _{max}	R _{95%}
LFC	3,140	2,820	5,230	4,680	8,160	7,490	11,700	10,500	13,500	11,900
MFC	535	453	910	773	1,520	1,240	2,400	2,120	2,930	2,550
HFC	6,920	6,160	8,970	8,000	11,300	10,300	14,600	12,900	15,600	14,100
PP	1,730	1,470	2,710	2,350	4,340	3,820	6,640	5,980	7,820	7,020

Note: LFC = low-frequency cetaceans; MFC = mid-frequency cetaceans; HFC = high-frequency cetaceans; PP = phocid pinnipeds

a- Represents the maximum distance in any direction that the threshold was exceeded. This metric is often overly conservative for take estimates because it reflects the influence of coherent constructive interference effects, produced by most propagation loss models, due to model approximations of highly uniform environments. In practice, these coherent effects are almost always disrupted by rough interfaces and ocean inhomogeneities.

b- Represents the radius of a circle that encompasses 95% of the area predicted by the model to exceed the threshold. The circle radius is typically larger than the maximum distances in most directions, but it cuts off “fingers” of ensonification that protrude in a small number of directions. This metric is typically also conservative, but less so than the R_{max} distance.

injury, and onset of mortality can be found in the supplementary report for Sunrise Wind's ITA application titled "UXO/MEC acoustic modeling report (Hannay and Zykov, 2022)," as found on NMFS' website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

NMFS concurs with Sunrise Wind's analysis, and neither expects nor authorizes any non-auditory injury, serious injury, or mortality of marine mammals from UXO/MEC detonation. The modeled distances to the mortality threshold for all UXO/MECs sizes for all animal masses are small enough that they can be effectively monitored (*i.e.*, 5–353 m; see tables 35–38 in Hannay and Zykov, 2022) and these types of impacts avoided, given the robust mitigation and monitoring measures required. The modeled distances to gastrointestinal and lung injuries (*i.e.*, non-auditory injury) thresholds range from 5–648 m (see tables 30–34 in Hannay and Zykov, 2022). Sunrise Wind will be required to conduct extensive monitoring using both PSOs and PAM operators and clear an area of marine mammals prior to detonating any UXO/MEC. Given that Sunrise Wind will be employing multiple platforms to visually monitor marine mammals as well as conducting passive

acoustic monitoring, it is reasonable to conclude that marine mammals will be reliably detected within approximately 660 m of the UXO/MEC being detonated and mortality or non-auditory injury is not likely to occur.

Sunrise Wind did not request, and NMFS is not authorizing, take by mortality or non-auditory injury. For this reason, NMFS is not presenting all modeling results here; however, they can be found in Sunrise Wind's UXO/MEC acoustic modeling report (Hannay and Zykov, 2022).

To estimate the maximum ensonified zones that could result from UXO/MEC detonations, the largest acoustic range ($R_{95\text{percent}}$; assuming 10dB attenuation) to PTS and TTS thresholds of a E12 UXO/MEC charge weight were used as radii to calculate the area of a circle ($\pi \times r^2$; where r is the range to the threshold level) for each marine mammal hearing group. The results represent the largest area potentially ensonified above threshold levels from a single detonation within the SRWEC. The same method was used to calculate the maximum ensonified area from a single detonation in the Lease Area, based on the distances in tables 46 and 47 in the ITA application. Again, acoustic and exposure modeling results are presented here for mitigated (*i.e.*, assuming 10 dB and including seasonal restrictions) detonations of UXO/MECs.

Regarding the marine mammal density and occurrence data used in the take estimates for UXO/MECs, to avoid any *in situ* detonations of UXO/MECs during periods when NARW densities are highest in and near the SWEC corridor and Lease Area, this rule includes a seasonal temporal restriction on detonation of UXO/MECs in Federal waters from December 1 through April 30, annually. Accordingly, for each species, the highest average monthly marine mammal density between May and November from Roberts *et al.*, 2023 was used to conservatively estimate exposures from UXO/MEC detonation for a given species in any given year (*i.e.*, assumed all three UXO/MECs would be detonated in the month with the greatest average monthly density). Furthermore, given that UXO/MECs detonations have the potential to occur anywhere within the Lease Area, a 10 km (6.21 mi) perimeter was applied around the Lease Area. In some cases where monthly densities were unavailable, annual densities were used instead for some species (*i.e.*, blue whales, pilot whale *spp.*). Table 22 provides those densities and the associated months in which the species-specific densities are highest for the Sunrise Wind Lease Area (table 41 in the December 2022 Updated Density and Take Estimation Memo for Sunrise Wind).

Table 22 -- Maximum Average Monthly Marine Mammal Densities (Individuals/km²) Within 10 km of the Sunrise Wind Lease Area from May through November, and the Month in Which the Maximum Density Occurs

Marine Mammal Species	Maximum Average Monthly Density (Individual/km ²)	Maximum Density Month
North Atlantic right whale*	0.0018	May
Blue whale*	0.0000	Annual
Fin whale*	0.0042	July
Humpback whale	0.0025	May
Minke whale	0.0178	May
Sei whale*	0.0017	May
Sperm whale*	0.0006	August
Atlantic spotted dolphin	0.0033	October
Atlantic white-sided dolphin	0.0268	May
Bottlenose dolphin	0.0160	August
Common dolphin	0.1824	September
Pilot whales	0.0018	Annual
Risso's dolphin	0.0020	December
Harbor porpoise	0.0517	May
Seals (Harbor and Gray)	0.1730	May

* Denotes species listed under the Endangered Species Act.

To estimate take incidental to UXO/MEC detonations in Sunrise Wind's Lease Area, the maximum ensouffled areas based on the largest R_{95percent} to Level A harassment (PTS) and Level B harassment (TTS) thresholds (assuming 10 dB attenuation) from a single detonation (assuming the largest UXO/MEC charge weight) in the Lease Area, as shown in tables 20 and 21 and xx, were multiplied by three (the maximum number of UXOs/MECs that are expected to be detonated in the Sunrise Wind Lease Area) and then multiplied by the marine mammal densities shown in table 22, resulting in the take estimates in table 23. As described above, Sunrise Wind based the number of requested takes on the number of exposures estimated assuming 10 dB attenuation using a NAS, and NMFS agrees the distances to thresholds (which are considered in the take

estimate) based on this assumption are reasonable.

The likelihood of marine mammal exposures above the PTS threshold is low, especially considering the instantaneous nature of the acoustic signal and the fact that there will be no more than three. Further, the rule includes required mitigation and monitoring measures intended to avoid the potential for PTS for most marine mammal species and the extent and severity of Level B harassment (see Mitigation and Monitoring and Reporting sections below). However, given the relatively large distances to the high-frequency cetacean Level A harassment (PTS, SEL_{cum}) isopleth applicable to harbor porpoises and the difficulty detecting this species at sea, Sunrise Wind is requesting, and NMFS is authorizing, 19 Level A harassment takes of harbor porpoise from UXO/MEC

detonations. Similarly, seals are difficult to detect at longer ranges, and although the distance to the phocid hearing group SEL PTS threshold is not as large as those for high-frequency cetaceans, it may not be possible to detect all seals within the PTS threshold distances even with the required monitoring measures. Therefore, Sunrise Wind is requesting, and NMFS would authorize under this rule, take by Level A harassment of 2 gray seals and 3 harbor seals incidental to UXO/MEC detonation.

While there would be no more than 3 detonations of UXO/MECs, each of which would be of very short duration (approximately 1 second), UXO/MEC detonations have a higher potential to cause mortality and injury than other Project activities and therefore, have specific mitigation measures designed to prevent mortality and/or injury of marine mammals, including: (1) time of

year/seasonal restrictions; (2) time of day restrictions; (3) use of PSOs to visually observe for NARW; (4) use of PAM to acoustically detect NARW; (5) implementation of clearance zones; (6) use of noise mitigation technology; and

(7) post-detonation monitoring visual and acoustic monitoring by PSOs and PAM operators.

The mitigation measures Sunrise Wind must implement during any UXO/MEC detonations are expected to reduce the likelihood of Level A harassment

(PTS) and, to a degree, Level B harassment, to the extent practicable. However, as described above, there remains potential for Level A harassment (PTS) for multiple species.

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Table 23 -- Estimated Level A Harassment (PTS) and Level B Harassment (TTS, Behavior) Takes Authorized for All Potential UXO/MEC Detonations¹ Assuming 10 dB Noise Attenuation for the Project

Species	Total Level A Density-based Take Estimate	Total Level B Density-based Take Estimate	PSO Data Take Estimate	Mean Group Size	Level A Harassment Take ²	Level B Harassment Take
North Atlantic right whale*	0.2	2.3	0.1	2.4	0	3
Blue whale*	0.0	0.0	-	1.0	0	1
Fin whale*	0.5	5.5	0.6	1.8	0	6
Humpback whale	0.3	3.3	1.7	2.0	0	4
Minke whale	2.2	23.4	0.2	1.2	0	24
Sei whale*	0.2	2.2	0.0	1.6	0	3
Sperm whale*	0.0	0.0	-	1.5	0	2
Atlantic spotted dolphin	0.0	0.2	-	29.0	0	29
Atlantic white-sided dolphin	0.0	1.6	0.2	27.9	0	28
Bottlenose dolphin	0.0	0.9	1.9	7.8	0	8
Common dolphin	0.3	10.6	48.5	34.9	0	49
Pilot whales	0.0	0.1	-	8.4	0	9
Risso's dolphin	0.0	0.1	0.1	5.4	0	6
Harbor porpoise	18.7	91.4	0.0	2.7	19	92
Gray seal	1.1	24.8	0.1	0.4	2	25
Harbor seal	2.5	55.6	0.2	1.0	3	56

* Denotes species listed under the Endangered Species Act.

- 1 - Sunrise Wind only expects up to three UXO/MECs to necessitate high-order removal (detonation) and only expects that these would be found in the Lease Area, not the export cable corridor. These values can be found in table 48 of the December 2022 Updated Density and Take Estimation Memo.
- 2- NMFS' Biological Opinion analyzed and agreed that given the distances to the Level A harassment threshold (less than 4 km), the clearance zone (10 km) and the extensive mitigation measures that will ensure that detonation does not occur if any whales are close enough to the detonation site to be exposed to noise above the Level A harassment threshold, exposure of any ESA-listed whales to noise that could result in PTS is extremely unlikely to occur.

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HRG Surveys

Sunrise Wind's HRG survey activity includes the use of impulsive (*i.e.*,

boomers and sparkers) and non-impulsive (*e.g.*, CHIRP SBPs) sources (table 24).

Table 24 -- Representative HRG Survey Equipment and Operating Frequencies

Equipment Type	Representative Equipment Model	Operating Frequency (kHz)
Sub-bottom Profiler	EdgeTech 216	2 - 16
	EdgeTech 424	4 - 24
	EdgeTech 512	0.7 - 12
	GeoPulse 5430A	2 - 17
	Teledyne Benthos Chirp III – TTV 170	2 - 7
Sparker	Applied Acoustics Dura-spark UHD (400 tip, 500 J)	0.3 - 1.2
Boomer	Applied Acoustics triple plate S-Boom (700-1,000 J)	0.1 - 5

Authorized takes would be by Level B harassment in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to noise from certain HRG acoustic sources. Based primarily on the characteristics of the signals produced by the acoustic sources planned for use, Level A harassment is neither anticipated, even absent mitigation, nor authorized. Therefore, the potential for Level A harassment from HRG surveys is not evaluated further in this document. Sunrise Wind did not request, and NMFS is not authorizing, take by Level A harassment incidental to HRG surveys. Please see Sunrise Wind's application for details of a quantitative exposure analysis (*i.e.*, calculated distances to Level A harassment isopleths and Level A harassment exposures).

Specific to HRG surveys, in order to better consider the narrower and directional beams of the sources, NMFS has developed a tool for determining the sound pressure level (SPL_{rms}) at the 160 dB isopleth for the purposes of estimating the extent of Level B harassment isopleths associated with HRG survey equipment (NMFS, 2020). This methodology incorporates frequency-dependent absorption and some directionality to refine estimated ensonified zones. Sunrise Wind used NMFS' methodology with additional modifications to incorporate a seawater absorption formula and account for

energy emitted outside of the primary beam of the source. For sources that operate with different beamwidths, the maximum beam width was used, and the lowest frequency of the source was used when calculating the frequency-dependent absorption coefficient.

NMFS considers the data provided by Crocker and Fratantonio (2016) to represent the best scientific information available on source levels associated with HRG equipment and, therefore, recommends that source levels provided by Crocker and Fratantonio (2016) be incorporated in the method described above to estimate ranges to the Level A harassment and Level B harassment isopleths. In cases when the source level for a specific type of HRG equipment is not provided in Crocker and Fratantonio (2016), NMFS recommends that either the source levels provided by the manufacturer be used or in instances where source levels provided by the manufacturer are unavailable or unreliable, a proxy from Crocker and Fratantonio (2016) be used instead. Sunrise Wind utilized the following criteria for selecting the appropriate inputs into the NMFS User Spreadsheet Tool (NMFS, 2018):

For equipment that was measured in Crocker and Fratantonio (2016), the reported SL for the most likely operational parameters was selected. For equipment not measured in Crocker and Fratantonio (2016), the best available manufacturer specifications

were selected. Use of manufacturer specifications represent the absolute maximum output of any source and do not adequately represent the operational source. Therefore, they should be considered an overestimate of the sound propagation range for that equipment. For equipment that was not measured in Crocker and Fratantonio (2016) and did not have sufficient manufacturer information, the closest proxy source measured in Crocker and Fratantonio (2016) was used.

The Dura-spark measurements and specifications provided in Crocker and Fratantonio (2016) were used for all sparker systems proposed for the HRG surveys. These included variants of the Dura-spark sparker system and various configurations of the GeoMarine Geo-Source sparker system. The data provided in Crocker and Fratantonio (2016) represent the most applicable data for similar sparker systems with comparable operating methods and settings when manufacturer or other reliable measurements are not available. Crocker and Fratantonio (2016) provide S-Boom measurements using two different power sources (CSP-D700 and CSP-N). The CSP-D700 power source was used in the 700 joules (J) measurements but not in the 1,000 J measurements. The CSP-N source was measured for both 700 J and 1,000 J operations but resulted in a lower source level; therefore, the single maximum source level value was used

for both operational levels of the S-Boom.

Table 25 identifies all the representative survey equipment that operates below 180 kHz (*i.e.*, at frequencies that are audible and have

the potential to disturb marine mammals) that may be used in support of planned survey activities and are likely to be detected by marine mammals given the source level,

frequency, and beamwidth of the equipment. This table also provides all operating parameters used to calculate the distances to threshold for marine mammals.

Table 25 -- Summary of Representative HRG Survey Equipment and Operating Parameters

Equipment Type	Representative Equipment Model	Operating Frequency (kHz)	Source Level SPL rms (dB)	Source Level 0-pk (dB)	Pulse Duration (rms)	Repetition Rate (Hz)	Beamwidth (degrees)	Information Source
Sub-bottom Profiler	EdgeTech 216	2 - 16	195	-	20	6	24	MAN
	EdgeTech 424	4 - 24	176	-	3.4	2	71	CF
	EdgeTech 512	0.7 - 12	179	-	9	8	80	CF
	GeoPulse 5430A	2 - 17	196	-	50	10	55	MAN
	Teledyn Benthos Chirp III - TTV 170	2 - 17	197	-	60	15	100	MAN
Sparker	Applied Acoustics DuraSpark UHD (400 tips, 500 J)	0.3 - 1.2	203	211	1.1	4	Omni	CF
Boomer	Applied Acoustics triple plate S-Boom (700–1,000 J)	0.1 - 5	205	211	0.6	4	80	CF

- = not applicable; CF = Crocker and Fratantonio (2016); MAN = Manufactures Specifications
 Source Levels are given in dB re 1 μPa @ 1m

Results of modeling using the methodology described above indicated that, of the HRG equipment planned for use by Sunrise Wind that has the potential to result in Level B harassment of marine mammals, sound produced by the Applied Acoustics sparkers and Applied Acoustics triple-plate S-Boom would propagate furthest to the Level B

harassment isopleth (141 m; table 26). For the purposes of take estimation, it was conservatively assumed that sparkers and/or boomers would be the dominant acoustic source for all survey days (although, again, this may not always be the case). Thus, the range to the isopleth corresponding to the threshold for Level B harassment for

and the boomer and sparkers (141 m) was used as the basis of take calculations for all marine mammals. This is a conservative approach as the actual sources used on individual survey days or during a portion of a survey day may produce smaller distances to the Level B harassment isopleth.

Table 26 -- Distances to the Level B Harassment Thresholds in Meters for Each HRG Sound Source or Comparable Sound Source Category for Each Marine Mammal Hearing Group

Equipment Type	Representative Model	All (SPL _{rms})
Sub-bottom Profiler	EdgeTech 216	9
	EdgeTech 424	4
	EdgeTech 512	6
	GeoPulse 5430A	21
	Teledyn Benthos Chirp III - TTV 170	48
Sparker	Applied Acoustics Dura-Spark UHD (700 tips, 1,000 J)	34
	Applied Acoustics Dura-Spark UHD (400 tips, 500 J)	141
Boomer	Applied Acoustics triple plate S-Boom (700–1,000 J)	141

To estimate densities for the HRG surveys occurring both within the Lease Area and within the SWEC based on Roberts and Halpin (2022), a 5-km (3.11 mi) perimeter was applied around each

area (see Figures 11 and 12 of the Updated Density and Take Estimation Memo for Sunrise Wind) using GIS (ESRI, 2017). Given that HRG surveys could occur at any point year-round, the

annual average density for each species was calculated using average monthly densities from January through December (table 27).

Table 27 – Annual Average Marine Mammal Densities within 5 km of the Export Cable Corridor (SWEC) and Sunrise Wind Lease Area (SRWF)¹

Marine Mammal Species	SWEC Corridor Annual Average Density (Individual per km ²)	Lease Area Annual Average Density (Individual per km ²)
North Atlantic Right Whale*	0.0004	0.0016
Blue whale*	0.0000	0.0000
Fin Whale*	0.0022	0.0020
Humpback Whale	0.0011	0.0012
Minke Whale	0.0052	0.0051
Sei Whale*	0.0004	0.0005
Sperm Whale*	0.0001	0.0002
Atlantic Spotted Dolphin	0.0006	0.0005
Atlantic White-sided Dolphin	0.0117	0.0144
Bottlenose Dolphin	0.0127	0.0091
Common Dolphin	0.0827	0.0802
Pilot Whales	0.0011	0.0021
Risso's Dolphin	0.0005	0.0005
Harbor Porpoise	0.0297	0.0372
Seals (Harbor and Gray)	0.0910	0.0917

* Denotes species listed under the Endangered Species Act.

1 - Values presented in this table are from the Sunrise Wind Updated Density and Take Estimation Memo (tables 34 and 35), which can be found on NMFS' website.

The maximum range (*i.e.*, 141 m) to the Level B harassment threshold and the estimated trackline distance traveled per day by a given survey vessel (*i.e.*, 70 km) were then used to calculate the daily ensonified area or zone of influence (ZOI) around the survey vessel.

The ZOI is a representation of the maximum extent of the ensonified area around a HRG sound source over a 24-hr period. The ZOI for each piece of equipment operating at or below 180 kHz was calculated per the following formula:

$$ZOI = (Distance/day \times 2r) + \pi \times r^2$$

Where *r* is the linear distance from the source to the harassment isopleth.

The largest daily ZOI (19.8 km² (7.64 mi²)), associated with the proposed use of boomers, was applied to all planned survey days.

At the time of the proposed rule, the Project previously assumed 12,604 km of HRG surveys to occur within the SRWF. Based on the reduced number of WTG foundations, as described in the March 2023 Sunrise Wind ITR Application—Reduced WTG Foundations report, 10,940.3 km of HRG surveys are now expected to occur within the Lease Area (previously 12,604 km). Potential Level B density-based harassment exposures are estimated by multiplying the average annual density of each species within

the survey area by the daily ZOI. That product was then multiplied by the number of planned survey days in each sector during the approximately 2-year construction timeframe (*i.e.*, 156.3 days in the SWEC corridor and 180 days in the Lease Area), and the product was rounded to the nearest whole number. This assumed a total ensonified area of 3,094.9 km² (1,194.95 mi²) in the Lease Area and 3,380 km² (1,305.03 mi²) along the SWEC corridor. Given that the HRG surveys are anticipated to occur over 2 years of construction activities, the total survey effort and associated ensonified areas were split equally across 2 years. These results can be found in table 28.

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Table 28 -- Estimated Take, by Level B Harassment, Incidental to HRG Surveys during the 2-Year Construction Period (with Information Presented for Both Years of Construction Activities)

Species	Year 1 Construction Phase Take by Survey		Year 2 Construction Phase Take by Survey		Total Density-Based Take Estimate	PSO Data Take Estimate	Mean Group Size	Highest Annual Take by Level B Harassment For Year 1	Highest Annual Take by Level B Harassment For Year 2
	SRWF Lease Area	SRWF EC Corridor	SRWF Lease Area	SRWF EC Corridor					
North Atlantic Right Whale*	2.5	0.7	2.5	0.7	3.1	-	2.4	4	4
Blue Whale*	0.0	0.0	0.0	0.0	0.0	-	1.0	1	1
Fin Whale*	3.1	3.7	3.1	3.7	6.8	4.9	1.8	7	7
Humpback Whale	1.8	1.9	1.8	1.9	3.7	12.3	2.0	13	13
Minke Whale	7.8	8.7	7.8	8.7	16.6	4.4	1.2	17	17
Sei Whale*	0.7	0.7	0.7	0.7	1.4	-	1.6	2	2
Sperm Whale*	0.3	0.2	0.3	0.2	0.6	-	1.5	2	2
Atlantic Spotted Dolphin	0.8	1.1	0.8	1.1	1.9	-	29.0	29	29
Atlantic White-sided Dolphin	22.2	19.8	22.2	19.8	42.1	-	27.9	43	43
Bottlenose Dolphin	14.1	21.5	14.1	21.5	35.6	74.8	7.8	75	75
Common Dolphin	124.1	139.8	124.1	139.8	263.9	1,759.4	34.9	1,760	1,760

Pilot Whales	3.2	1.9	3.2	1.9	5.1	-	8.4	9	9
Risso's Dolphin	0.8	0.9	0.8	0.9	1.7	1.7	5.4	6	6
Harbor Porpoise	57.6	50.1	57.6	50.1	107.7	-	2.7	108	108
Gray Seal	43.7	47.4	43.7	47.4	91.1	5.7	1.4	92	92
Harbor Seal	98.2	106.4	98.2	106.4	204.6	8.3	0.0	205	205

* Denotes species listed under the Endangered Species Act.

Note: This table has been updated since the proposed rule as a result of Sunrise Wind's submission of their March 2023 Sunrise Wind ITR Application-Reduced WTG Foundations report (report table 39). Values that have changed are in **bold**.

As mentioned previously, HRG surveys would also routinely be carried

out during the period of time following construction of Sunrise Wind's Lease

Area and SWEC corridor, which, for the purposes of exposure modeling, Sunrise

Wind assumed to be three years. Generally, Sunrise followed the same approach as described above for HRG surveys occurring during the two years of construction activities with the only modification during the three-year operations years being a difference in the survey effort. During the three years of operations, Sunrise Wind estimates that HRG surveys would cover 2,471.4 km (1,535.66 mi) within the Lease Area and 3,413 km (2,120.74 mi) along the SWEC corridor annually. Maintaining that 70 km (43.5 mi) are surveyed per day, this amounts to 35.3 days of survey

activity in the Lease Area and 48.8 days of survey activity along the SWEC corridor each year (an annual ensonified area of 699.1 km²; 269.9 mi²). The amount of HRG survey work was reduced from the proposed rule given the number of foundations has been reduced. Over the three years of operations that would occur during the five-year period covered by this rulemaking, the total ensonified area in the SRWF would be 2,097.4 km² (809.8 mi²).

Density-based take estimates were derived by multiplying the daily ZOI by

the annual average densities and separately by the number of survey days planned for the SWEC and Sunrise Wind Lease Area. Using the same approach described above, Sunrise Wind estimated a conservative amount of annual take by Level B harassment based on the highest exposures predicted by the density-based, PSO based, or average group size-based estimates. The highest predicted exposure value was multiplied by three to yield the amount of take Sunrise Wind requested and that is to be authorized, as shown in table 29 below.

Table 29 -- Estimate Take, by Level B Harassment, Incidental to HRG Surveys during the 3-Year Operations Period

Species	Annual Operations Phase Take by Survey Area		Annual Total Density-Based Take Estimate	Annual PSO Data Take Estimate	Mean Group Size	Highest Annual Level B Take	Total Level B Take Over 3 Years of HRG Surveys
	SRWF	SWEC Corridor					
North Atlantic Right Whale*	1.1	0.4	1.5	-	2.4	3	9
Blue Whale*	0.0	0.0	0.0	-	1.0	1	3
Fin Whale*	1.4	2.1	3.5	2.5	1.8	4	12
Humpback Whale	0.8	1.1	1.9	6.3	2.0	7	21
Minke Whale	3.5	5.0	8.5	2.3	1.2	9	27
Sei Whale*	0.3	0.4	0.7	-	1.6	2	6
Sperm Whale*	0.1	0.1	0.3	-	1.5	2	6
Atlantic Spotted Dolphin	0.4	0.6	1.0	-	29.0	29	87
Atlantic White-sided Dolphin	10.1	11.3	21.4	-	27.9	28	84
Bottlenose Dolphin	6.4	12.3	18.7	38.5	7.8	39	117
Common Dolphin	56.1	79.9	136.0	904.8	34.9	905	2,715
Pilot Whales	1.4	1.1	2.5	-	8.4	9	27
Risso's Dolphin	0.4	0.5	0.9	0.9	5.4	6	18
Harbor Porpoise	26.0	28.6	54.6	-	2.7	55	165
Gray Seal	19.7	27.1	46.8	2.7	1.4	47	141
Harbor Seal	44.4	60.8	105.2	4.3	1.4	106	318

* Denotes species listed under the Endangered Species Act.

Note: This table has been updated since the proposed rule as a result of Sunrise Wind's submission of their March 2023 Sunrise Wind ITR Application- Reduced WTG Foundations report (report table 40). Values that have changed are in **bold**.

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Total Authorized Take Across All Activities
 The number of Level A harassment and Level B harassment takes NMFS allows to be authorized under this rulemaking incidental to all project activities combined during the impact pile driving of monopile and OCS-DC

foundations; pneumatic hammering casing pipe; vibratory pile driving for sheet pile and goal post installation and removal; HRG surveys; and potential UXO/MEC detonations are provided by year in table 30. NMFS also presents the 5-year total number of takes for each species in table 31. Table 31 additionally depicts the number of takes relative to each stock assuming that each individual is taken only once, which specifically informs the small numbers determination.

Table 30 shows the annual take for authorization, given that specific activities are expected to occur within specific years. Sunrise Wind is currently planning for all construction activities related to permanent structures (*i.e.*, WTG foundations, OCS–DC foundation installation, cable landfall structures) to occur within the first year of the project. As a conservative assumption, the Year 1 take includes the installation of all WTGs and OCS–DC foundations, cable landfall construction, one year of HRG surveys, and up to three high-order

detonations of UXOs/MECs. All activities are expected to be completed in 2029, equating to the 5 years of activities as described in this preamble.

To inform the negligible impact analysis, NMFS assesses the greatest number of takes of marine mammals allowable within any given year (which, in the case of this rule, is based on the predicted Year 1 for all species), as well as the total allowable take across all five years of the rule.

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Table 30 -- Level A Harassment and Level B Harassment Takes for All Activities to be Conducted During the Construction and Development of the Sunrise Wind Project Over 5 Years. Year 1 Represents the Maximum Number of Takes Allowed in any Given Year

Species	NMFS Stock Abundance	Year 1 (Max Annual)			Year 2			Year 3			Year 4			Year 5		
		Level A harassment	Level B harassment	Percent of Stock ^a	Level A harassment	Level B harassment	Percent of Stock	Level A harassment	Level B harassment	Percent of Stock	Level A harassment	Level B harassment	Percent of Stock	Level A harassment	Level B harassment	Percent of Stock
North Atlantic Right whale* ^c	340	0	32	9.41	0	4	1.18	0	3	0.88	0	3	0.88	0	3	0.88
Blue whale*	402 ^b	0	4	1.00	0	1	0.25	0	1	0.25	0	1	0.25	0	1	0.25
Fin whale*	6,802	4	68	1.06	0	7	0.10	0	4	0.06	0	4	0.06	0	4	0.06
Humpback whale	1,396	3	79	5.87	0	13	0.93	0	7	0.50	0	7	0.50	0	7	0.50
Sei whale*	6,292	2	27	0.46	0	2	0.03	0	2	0.03	0	2	0.03	0	2	0.03
Minke whale	21,968	23	371	1.79	0	17	0.08	0	9	0.04	0	9	0.04	0	9	0.04
Sperm whale*	5,895	0	14	0.24	0	2	0.03	0	2	0.03	0	2	0.03	0	2	0.03
Atlantic white-sided dolphin	93,233	0	569	0.61	0	43	0.05	0	28	0.03	0	28	0.03	0	28	0.03
Atlantic spotted dolphin	31,506	0	122	0.39	0	29	0.09	0	29	0.09	0	29	0.09	0	29	0.09

Common bottlenose dolphin	62,851	0	387	0.62	0	75	0.12	0	39	0.06	0	39	0.06	0	39	0.06
Long-finned pilot whales	39,215	0	56	0.14	0	9	0.02	0	9	0.02	0	9	0.02	0	9	0.02
Risso's dolphin	44,067	0	46	0.10	0	6	0.01	0	6	0.01	0	6	0.01	0	6	0.01
Common dolphin	93,100	0	6,526	7.01	0	1,760	1.89	0	905	0.97	0	905	0.97	0	905	0.97
Harbor porpoise	85,765	20	894	1.07	0	108	0.13	0	55	0.06	0	55	0.06	0	55	0.06
Gray seal	27,911	3	975	3.50	0	92	0.33	0	47	0.17	0	47	0.17	0	47	0.17
Harbor Seal	61,336	5	2,189	3.58	0	205	0.33	0	106	0.17	0	106	0.17	0	106	0.17

* Denotes species listed under the Endangered Species Act.

a – The percent of stock impacted is the annual sum of the Level A harassment and Level B harassment divided by the stock abundance estimate then multiplied by 100. The best available stock abundance estimates are derived from the NMFS Stock Assessment Reports (Hayes *et al.*, 2024). Year 1 has the maximum expected annual take authorized.

b- The minimum blue whale population is estimated at 402 (Hayes *et al.*, 2024), although the exact value is not known. NMFS is utilizing this value for our small numbers determination.

c- NMFS notes that the 2022 North Atlantic Right Whale Annual Report Card (Pettis *et al.*, 2023; n=340) is the same as the draft 2023 SAR (Hayes *et al.*, 2024). While NMFS acknowledges the estimate found on the North Atlantic Right Whale Consortium's website (<https://www.narwc.org/report-cards.html>) matches, we have used the value presented in the draft 2023 SARs as the best available science for this final action (88 FR 5495, January 29, 2024, <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports>; nmin=340).

Table 31 -- Total 5-Year Takes of Marine Mammals (by Level A Harassment and Level B Harassment) for All Activities to be Conducted During the Construction and Development of the Project

Species	Level A harassment	Level B harassment	Total Combined
North Atlantic Right whale*	0	45	45
Blue whale*	0	8	8
Fin whale*	4	87	91
Humpback whale	3	113	116
Sei whale*	2	35	37
Minke whale	23	415	438
Sperm whale*	0	22	22
Atlantic White-sided dolphin	0	696	696
Atlantic Spotted dolphin	0	238	238
Bottlenose dolphin	0	579	579
Pilot whales	0	92	92
Risso's dolphin	0	70	70
Common dolphin	0	11,001	11,001
Harbor porpoise	20	1,167	1,187
Gray seal	3	1,208	1,211
Harbor seal	5	2,712	2,717

* Denotes species listed under the Endangered Species Act.

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In making the negligible impact determination, NMFS assesses both the maximum annual total number of takes (Level A harassment and Level B harassment) of each marine mammal species or stocks in any one year, which in the case of this rule is in Year 1, and the total taking of each marine mammal species or stock allowed during the five-year effective period of the rule. NMFS recognizes that certain activities could shift within the 5-year effective period of the rule. However, the rule allows for that flexibility, and the takes are not expected to exceed those shown in table 30 in any one year.

Mitigation

As noted in the Changes From the Proposed to Final Rule section, NMFS

has added several new mitigation requirements and clarified a few others. Specifically, as described in greater detail below, NMFS has increased the updated clearance zones (table 32), designated the PAM clearance zone and PAM shutdown zones for NARW as “Any Distance” clarified that if species other than NARW are able to be detected within the 10km PAM monitoring zone, they should be (e.g., use humpback detectors as well as NARW detectors). Additionally, NMFS has clarified that the shutdown and clearance zones in table 32 apply to both visual and auditory detection, and these changes are described in detail in the sections below. Other than the changes described, the required mitigation measures remain the same as

those described in the proposed rule. NMFS has also re-organized and simplified this section of the preamble to avoid full duplication of the specific requirements that are fully described in the regulatory text.

In order to promulgate a rulemaking under section 101(a)(5)(A) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable adverse impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS' regulations require applicants for

incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature (*e.g.*, likelihood, scope, range) of the potential adverse impact being mitigated. It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (*i.e.*, probability of implementation as planned); and,

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

The mitigation strategies described below are consistent with those required and successfully implemented under previous incidental take authorizations issued in association with in-water construction activities (*e.g.*, soft-start, establishing shutdown zones). NMFS has also specifically considered information gathered from the marine mammal and acoustic monitoring, including SFVs, conducted pursuant to those authorizations. Additional measures have also been incorporated to account for the fact that the construction activities would occur offshore. Modeling was performed to estimate harassment zones, which were used to inform mitigation measures for the project's activities to minimize Level A harassment and Level B harassment to the extent practicable, while providing estimates of the areas within which harassment might occur.

Generally speaking, the mitigation measures considered and required here fall into three categories: temporal (seasonal and daily) work restrictions, real-time measures (shutdown,

clearance, and vessel strike avoidance), and noise attenuation/reduction measures. Seasonal work restrictions are designed to avoid or minimize operations when marine mammals are concentrated or engaged in behaviors that make them more susceptible or make impacts more likely, in order to reduce both the number and severity of potential takes and are effective in reducing both chronic (longer-term) and acute effects. Real-time measures, such as implementation of shutdown and clearance zones, as well as vessel strike avoidance measures, are intended to reduce the probability or severity of harassment by taking steps in real time once a higher-risk scenario is identified (*e.g.*, once animals are detected within an impact zone). Noise attenuation measures, such as bubble curtains, are intended to reduce the noise at the source, which reduces both acute impacts, as well as the contribution to aggregate and cumulative noise that may result in longer-term chronic impacts.

Below, NMFS briefly describes the required training, coordination, and vessel strike avoidance measures that apply to all specified activities and then in the following subsections and the measures that apply specifically to foundation installation, nearshore installation, and removal activities for cable laying, HRG surveys, and UXO/MEC detonation. Details on specific requirements can be found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking.

Training and Coordination

NMFS requires all Project employees and contractors conducting activities on the water, including, but not limited to, all vessel captains and crew are trained in marine mammal detection and identification, communication protocols, and all required measures to minimize impacts on marine mammals and support Sunrise Wind's compliance with the LOA, if issued. Additionally, all relevant personnel and the marine mammal species monitoring team(s) are required to participate in joint, onboard briefings prior to the beginning of project activities. The briefing must be repeated whenever new relevant personnel (*e.g.*, new PSOs, construction contractors, relevant crew) join the project before work commences. During this training, Sunrise Wind is required to instruct all project personnel regarding the authority of the marine mammal monitoring team(s). For example, the HRG acoustic equipment operator, pile driving personnel, *etc.*, is required to immediately comply with any call for a delay or shut down by the

Lead PSO. Any disagreement between the Lead PSO and the project personnel must only be discussed after delay or shutdown has occurred. In particular, all vessel operators and vessel crew must be trained in marine mammal detection and vessel strike avoidance measures to ensure marine mammals are not struck by any project or project-related vessel.

Prior to the start of in-water construction activities, vessel operators and crews would receive training about marine mammals and other protected species known or with the potential to occur in the Project Area, making observations in all weather conditions, and vessel strike avoidance measures. In addition, training would include information and resources available regarding applicable Federal laws and regulations for protected species. Sunrise Wind will provide documentation of training to NMFS.

North Atlantic Right Whale Awareness Monitoring

Sunrise Wind must use available sources of information on NARW presence, including daily monitoring of the Right Whale Sightings Advisory System, monitoring of U.S. Coast Guard very high frequency (VHF) Channel 16 throughout each day to receive notifications of any sightings, and information associated with any regulatory management actions (*e.g.*, establishment of a zone identifying the need to reduce vessel speeds). Maintaining daily awareness and coordination affords increased protection of NARW by understanding NARW presence in the area through ongoing visual and passive acoustic monitoring efforts and opportunities (outside of Sunrise Wind's efforts), and allows for planning of construction activities, when practicable, to minimize potential impacts on NARW.

Vessel Strike Avoidance Measures

This final rule contains numerous vessel strike avoidance measures that reduce the risk that a vessel and marine mammal could collide. While the likelihood of a vessel strike is generally low, such strikes are one of the most common ways that marine mammals are seriously injured or killed by human activities. Therefore, enhanced mitigation and monitoring measures are required to avoid vessel strikes to the extent practicable. While many of these measures are proactive intending to avoid the heavy use of vessels during times when marine mammals of particular concern may be in the area, several are reactive and occur when Project personnel sight a marine

mammal. The mitigation requirements are described generally here and in detail in § 217.314(b) of the regulation text at the end of this final rule. Sunrise Wind must comply with the following vessel strike avoidance measures unless it's unsafe to do so.

While a vessel is underway, Sunrise Wind is required to monitor for and maintain a minimum separation distance from marine mammals and operate vessels in a manner that reduces the potential for vessel strike. Regardless of the vessel's size, all vessel operators, crews, and dedicated visual observers (*i.e.*, PSO or trained crew member) must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course (as appropriate) to avoid striking any marine mammal. The dedicated visual observer, equipped with suitable monitoring technology (*e.g.*, binoculars, night vision devices), must be located at an appropriate vantage point for ensuring vessels are maintaining required vessel separation distances from marine mammals (*e.g.*, 500 m from NARW).

All project vessels, regardless of size, must maintain the following minimum separation zones: 500 m from NARW; 100 m from sperm whales and non-NARW baleen whales; and 50 m from all delphinid cetaceans and pinnipeds (an exception is made for those species that approach the vessel (*i.e.*, bow-riding dolphins)). If any of these species are sighted within their respective minimum separation zone, the underway vessel must shift its engine to neutral and the engines must not be engaged until the animal(s) have been observed to be outside of the vessel's path and beyond the respective minimum separation zone. If a NARW is observed at any distance by any project personnel or acoustically detected, project vessels must reduce speeds to 10 kn. Additionally, in the event that any project-related vessel, regardless of size, observes any large whale (other than a NARW) within 500 m of an underway vessel, the vessel is required to shift engines into neutral. The vessel shall remain in neutral until the NARW has moved beyond 500 m and the 10 kn speed restriction will remain in effect as outlined in § 217.314(b) in the regulatory text below.

All of the Project-related vessels are required to comply with the measures within this rulemaking for operating vessels around NARW and other marine mammals, as well as existing NMFS vessel speed and approach regulations for NARW and the measures within this rulemaking for operating vessels around NARW and other marine mammals.

When NMFS vessel speed restrictions are not in effect and a vessel is traveling at greater than 10 kn, in addition to the required dedicated visual observer, Sunrise Wind is required to monitor the crew transfer vessel transit corridor (*i.e.*, the path crew transfer vessels take from port to any work area) in real-time with PAM prior to and during transits. To maintain awareness of NARW presence, vessel operators, crew members, and the marine mammal monitoring team would monitor U.S. Coast Guard VHF Channel 16, WhaleAlert, the Right Whale Sighting Advisory System (RWSAS), and the PAM system. Any marine mammal observed by Project personnel must be immediately communicated to any on-duty PSOs, PAM operator(s), and all vessel captains. Any NARW or large whale observation or acoustic detection by PSOs or PAM operators must be conveyed to all vessel captains. All vessels would be equipped with an AIS and Sunrise Wind must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources prior to initiating in-water activities. Sunrise Wind must submit a NMFS-approved Marine Mammal Vessel Strike Avoidance Plan at least 180 days prior to commencement of vessel use.

Compliance with these measures will reduce the likelihood of vessel strike to the extent practicable. These measures increase awareness of marine mammals in the vicinity of project vessels and require project vessels to reduce speed when marine mammals are detected by PSOs, PAM, and/or through another source (*e.g.*, RWSAS) and maintain separation distances when marine mammals are encountered. While visual monitoring is useful, reducing vessel speed is one of the most effective, feasible options available to reduce the likelihood of, and effects from, a vessel strike. Numerous studies have indicated that slowing the speed of vessels reduces the risk of lethal vessel collisions, particularly in areas where right whales are abundant and vessel traffic is common and otherwise traveling at high speeds (Vanderlaan and Taggart, 2007; Conn and Silber, 2013; Van der Hoop *et al.*, 2014; Martin *et al.*, 2015; Crum *et al.*, 2019).

Seasonal and Daily Restrictions

Temporal and spatial restrictions in places where marine mammals are concentrated, engaged in biologically important behaviors, and/or present in sensitive life stages are effective measures for reducing the magnitude and severity of human impacts. The restrictions required here are built around NARW protection. Based upon

the best scientific information available (Roberts *et al.*, 2023), the highest densities of NARW in the specified geographic region are expected during the months of January through April with an increase in density starting in December and continuing through May. However, NARW may be present in the specified geographic region throughout the year.

NMFS is requiring seasonal work restrictions to minimize the risk of noise exposure to NARW incidental to certain specified activities to the extent practicable. These seasonal work restrictions are expected to greatly reduce the number of takes of NARW. These seasonal restrictions also afford protection to other marine mammals that are known to use the Project Area with greater frequency during winter months, including other baleen whales.

As described previously, no foundation impact pile driving activities may occur January 1 through April 30. A new measure included in this final rule requires that Sunrise Wind avoid pile driving to the maximum extent practicable in December (*i.e.*, it must not be planned but may have to occur in the case of unforeseen circumstances) and, it may only occur if necessary to complete the project within any given year with prior approval by NMFS. Sunrise Wind must notify NMFS in writing by September 1 of that year that circumstances are expected to necessitate pile driving in December. NMFS is not requiring any seasonal restrictions for cable landfall work due to the relatively short duration of work, nearshore location, and low associated impacts to marine mammals. However, all cable landfall work must be conducted during daylight hours when marine mammals can be visually detected. Similarly, there are no time of year restrictions for the temporary pier or Smith Point County Park pile driving activities, but the work must be conducted during daylight hours when the entire Level B harassment zones are visible to ensure no take of marine mammals from the activities.

There is no specific time of year that UXOs/MECs would be detonated as detonations would be considered on a case-by-case basis. However, Sunrise Wind will be restricted from detonating UXO/MECs November 1 through April 30 to reduce impacts to NARW during peak migratory periods. NMFS is not adding seasonal restrictions to HRG surveys; however, Sunrise Wind would only perform a predetermined amount of 24-hour survey days within specific years, as previously described.

NMFS is also requiring temporal and spatial restrictions for some other

specified activities. Within a day, Sunrise Wind would be limited to installing no more than four monopile foundations. Sunrise Wind had requested to initiate pile driving during nighttime when detection of marine mammals is visually challenging. Since the publication of the proposed rule, Sunrise Wind has continued conversations with NMFS and BOEM regarding field trials it has been performing to prove the efficacy of their nighttime monitoring methods and systems. These field trials have provided information and evidence that their systems are capable of detecting marine mammals, particularly large whales, at distances necessary to ensure that the required mitigation measures are effective. NMFS is requiring Sunrise Wind to submit and obtain approval on a Nighttime Pile Driving Plan before any piling may be initiated at night. NMFS also continues to encourage Sunrise Wind to further investigate and test advanced technology detection systems. Any and all vibratory pile driving associated with sheet piles and goal posts installation and removal would only occur during daylight hours. Any UXO/MEC detonations will also be limited to daylight hours only. Lastly, given the very small Level B harassment zone associated with HRG survey activities and no anticipated or authorized Level A harassment, NMFS is not requiring any daily restrictions for HRG surveys.

More information on activity-specific seasonal and daily restrictions can be found in the regulatory text at the end of this rulemaking.

Noise Abatement Systems

Sunrise Wind is required to employ noise abatement systems (NAS), also known as noise attenuation systems, during all foundation installation (*i.e.*, impact pile driving) and UXO/MEC detonation activities to reduce the sound pressure levels that are transmitted through the water in an effort to reduce ranges to acoustic thresholds and minimize, to the extent practicable, any acoustic impacts resulting from these activities. Sunrise Wind proposed, and is required to use, a double big bubble curtain and Adbm Helmholtz resonator, as well as the adjustment of operational protocols to minimize noise levels. For UXO/MEC detonation, a double big bubble curtain must be used and the hoses must be placed at distances to avoid damage to the bubble curtain during detonation. Should the research and development phase of newer systems demonstrate effectiveness, as part of adaptive management, Sunrise Wind may submit

data on the effectiveness of these systems and request approval from NMFS to use them during foundation installation and UXO/MEC detonation activities.

Two categories of NAS exist: primary and secondary. A primary NAS would be used to reduce the level of noise produced by foundation installation activities at the source, typically through adjustments on to the equipment (*e.g.*, hammer strike parameters). Primary NAS are still evolving and will be considered for use during mitigation efforts when the NAS has been demonstrated as effective in commercial projects. However, as primary NAS are not fully effective at eliminating noise, a secondary NAS would be employed. The secondary NAS is a device or group of devices that would reduce noise as it was transmitted through the water away from the pile, typically through a physical barrier that would reflect or absorb sound waves and, therefore, reduce the distance the higher energy sound propagates through the water column. Together, these systems must reduce noise levels to those not exceeding modeled ranges to Level A harassment and Level B harassment isopleths corresponding to those modeled assuming 10-dB sound attenuation, pending results of SFV (see *Sound Field Verification* section below and Part 217—Regulations Governing The Taking And Importing Of Marine Mammals).

Noise abatement systems, such as bubble curtains, are used to decrease the sound levels radiated from a source. Bubbles create a local impedance change that acts as a barrier to sound transmission. The size of the bubbles determines their effective frequency band, with larger bubbles needed for lower frequencies. There are a variety of bubble curtain systems, confined or unconfined bubbles, and some with encapsulated bubbles or panels. Attenuation levels also vary by type of system, frequency band, and location. Small bubble curtains have been measured to reduce sound levels, but effective attenuation is highly dependent on depth of water, current, and configuration and operation of the curtain (Austin *et al.*, 2016; Koschinski and Lüdemann, 2013). Bubble curtains vary in terms of the sizes of the bubbles and those with larger bubbles tend to perform a bit better and more reliably, particularly when deployed with two separate rings (Bellmann, 2014; Koschinski and Lüdemann, 2013; Nehls *et al.*, 2016). Encapsulated bubble systems (*i.e.*, Hydro Sound Dampers (HSDs)), can be effective within their

targeted frequency ranges (*e.g.*, 100–800 Hz), and when used in conjunction with a bubble curtain appear to create the greatest attenuation. The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices.

The literature presents a wide array of observed attenuation results for bubble curtains. The variability in attenuation levels is the result of variation in design as well as differences in site conditions and difficulty in properly installing and operating in-water attenuation devices. Dähne *et al.* (2017) found that single bubble curtains that reduce sound levels by 7 to 10 dB reduced the overall sound level by approximately 12 dB when combined as a double bubble curtain for 6-m steel monopiles in the North Sea. During installation of monopiles (consisting of approximately 8-m in diameter) for more than 150 WTGs in comparable water depths (≤ 25 m) and conditions in Europe indicate that attenuation of 10 dB is readily achieved (Bellmann, 2019; Bellmann *et al.*, 2020) using single BBCs for noise attenuation. When a double big bubble curtain is used (noting a single bubble curtain is not allowed), Sunrise Wind is required to maintain numerous operational performance standards. These standards are defined in the regulatory text at the end of this rulemaking, and include, but are not limited to, construction contractors' requirement to train personnel in the proper balancing of airflow to the bubble ring and Sunrise Wind mandatory submission of a performance test and maintenance reports to NMFS. Corrections to the attenuation device to meet regulatory requirements must occur prior to use during foundation installation activities and UXO/MEC detonation. In addition, a full maintenance check (*e.g.*, manually clearing holes) must occur prior to each pile being installed or any UXO/MEC detonated.

Sunrise Wind is required to submit an SFV plan to NMFS for approval at least 180 days prior to installing foundations or detonating UXO/MECs. It is also required to submit interim and final SFV data results to NMFS and make corrections to the noise attenuation systems in the case that any SFV measurements demonstrate noise levels are above those modeled assuming 10 dB. These frequent and immediate reports allow NMFS to better understand the sound fields to which marine mammals are being exposed and require immediate corrective action

should they be misaligned with anticipated noise levels within our analysis.

Noise abatement devices are not required during HRG surveys, cofferdam (sheet pile) installation and removal, and goal post (pipe pile) installation and removal. Regarding cofferdam sheet pile and goal post pipe pile installation and removal, NAS is not practicable to implement due to the physical nature of linear sheet piles and angled pipe piles, and is of low risk for impacts to marine mammals due to the short work duration and lower noise levels produced during the activities. Regarding HRG surveys, NAS cannot practicably be employed around a moving survey ship, but Sunrise Wind is required to make efforts to minimize source levels by using the lowest energy settings on equipment that has the potential to result in harassment of marine mammals (e.g., sparkers, boomers) and turn off equipment when not actively surveying. Overall, minimizing the amount and duration of noise in the ocean from any of the project's activities through use of all means necessary and practicable will effect the least practicable adverse impact on marine mammals.

Clearance and Shutdown Zones

NMFS requires the establishment of both clearance and, where technically feasible, shutdown zones during project activities that have the potential to result in harassment of marine mammals. The purpose of "clearance" of a particular zone is to minimize potential instances of auditory injury and more severe behavioral disturbances by delaying the commencement of an activity if marine mammals are near the activity. The purpose of a shutdown is to prevent a specific acute impact, such as auditory injury or severe behavioral disturbance of sensitive species, by halting the activity.

All relevant clearance and shutdown zones during project activities would be monitored by NMFS-approved PSOs and/or PAM operators (as described in the regulatory text at the end of this rulemaking). At least one PAM operator must review data from at least 24 hours prior to foundation installation or any UXO/MEC detonations (based on new information in Davis et al. (2023) and must actively monitor hydrophones for 60 minutes prior to commencement of these activities. Any sighting or acoustic detection of a NARW triggers a delay to commencing pile driving and shutdown.

Prior to the start of certain specified activities (i.e., foundation installation, casing pipe, goal post, and sheet pile install and removal, HRG surveys, UXO/MEC detonations), Sunrise Wind must ensure designated areas (i.e., clearance zones (tables 32–36)) are clear of marine mammals prior to commencing activities to minimize the potential for, and degree of, harassment. For foundation installation and UXO/MEC detonation, PSOs must visually monitor clearance zones for marine mammals for a minimum of 60 minutes, where the zone must be confirmed free of marine mammals at least 30 minutes directly prior to commencing these activities. Clearance zones represent the largest Level A harassment zone for each species group, rounded up for PSO clarity, and are based upon the longest range to threshold for the construction scenario (i.e., sequential or concurrent).

For monopile foundation installation, the minimum visibility zone would extend 2,700 to 3,500 m from the pile during summer months, depending on construction scenario, and 3,000 to 4,000 m during December, depending on construction scenario (table 32). For OCS–DC foundation installation, the minimum visibility zone would extend 3,700 m from the pile during summer months and 4,100 m during December (table 32). These values correspond to the modeled maximum $ER_{95\%}$ distances to the Level A harassment threshold for low-frequency cetaceans, assuming 10 dB of attenuation.

For cofferdam and goal post pile driving and HRG surveys, monitoring must be conducted for 30 minutes prior to initiating activities and the clearance zones must be free of marine mammals during that time.

For any other in-water construction heavy machinery activities (e.g., trenching, cable laying, etc.), if a marine mammal is on a path towards or comes within 10 m (32.8 ft) of equipment, Sunrise Wind is required to cease operations until the marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment.

Once an activity begins, any marine mammal entering their respective shutdown zone would trigger the activity to cease. In the case of pile driving, the shutdown requirement may be waived if it is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals or the lead engineer determines there is pile refusal

or pile instability. Because UXO/MEC detonations are instantaneous, no shutdown is possible; therefore, there are clearance zones but no shutdown zones for UXO/MEC detonations (table 34). In situations when shutdown is called for during impact pile driving but Sunrise Wind determines shutdown is not practicable due to aforementioned emergency reasons, reduced hammer energy must be implemented when the lead engineer determines it is practicable. Specifically, pile refusal or pile instability could result in not being able to shut down pile driving immediately. Pile refusal occurs when the pile driving sensors indicate the pile is approaching refusal, and a shutdown would lead to a stuck pile which then poses an imminent risk of injury or loss of life to an individual, or risk of damage to a vessel that creates risk for individuals. Pile instability occurs when the pile is unstable and unable to stay standing if the piling vessel were to "let go." During these periods of instability, the lead engineer may determine a shutdown is not feasible because the shutdown combined with impending weather conditions may require the piling vessel to "let go" which then poses an imminent risk of injury or loss of life to an individual, or risk of damage to a vessel that creates risk for individuals. Sunrise Wind must document and report to NMFS all cases where the emergency exemption is taken.

After shutdown, impact pile driving may be reinitiated once all clearance zones are clear of marine mammals for the minimum species-specific periods, or, if required to maintain pile stability, at which time the lowest hammer energy must be used to maintain stability. If pile driving has been shut down due to the presence of a NARW, pile driving must not restart until the NARW has neither been visually nor acoustically detected for 30 minutes. Upon re-starting pile driving, soft-start protocols must be followed if pile driving has ceased for 30 minutes or longer.

The clearance and shutdown zone sizes vary by species groups. Sunrise Wind is allowed to request modification to these zone sizes pending results of sound field verification (see regulatory text at the end of this rulemaking). Any changes to zone size would be part of adaptive management and would require NMFS' approval.

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Table 32 – Minimum Visibility, Clearance, Shutdown Zones During Impact Pile Driving of Foundation Installation

Zone ⁷	Species	Monopile (sequential, 2 or 3 piles per day, km) ¹		Concurrent (all foundation types, km) ²		OCS-DC only (km) ³	
		Summer	Winter	Summer	Winter	Summer	Winter
Minimum Visibility Zone (km) ⁴	All marine mammals	2.7	3.0	3.5	4.0	3.7	4.1
Visual and Acoustic Clearance Zone (km) ⁵	North Atlantic right whale	Any distance visual detection by foundation installation PSOs, any acoustic detection within PAM monitoring zone (10 km)					
	Other large whales	4.0	4.3	5.3	6.3	5.6	6.5
	Delphinids	0.2	0.2	0.2	0.2	0.2	0.2
	Harbor Porpoise	0.2	0.2	0.7	0.6	0.9	0.6
	Pinnipeds	0.1	0.1	1.7	1.8	1.8	1.8
Visual and Acoustic Shutdown Zone (km) ⁵	North Atlantic right whale	Any distance visual detection by foundation installation PSOs, any acoustic detection within PAM monitoring zone (10 km)					
	Other large whales	4.0	4.3	5.3	6.3	5.6	6.5
	Delphinids	0.2	0.2	0.2	0.2	0.2	0.2
	Harbor Porpoise	0.2	0.2	0.7	0.6	0.9	0.6
	Pinnipeds	0.1	0.1	1.7	1.8	1.8	1.8

- 1- Level A ER95% exposure ranges for two sequential monopile schedules; 2 piles per day (Schedule 1) and 3 piles per day (Schedule 2) in summer and winter. The schedule resulting in the larger distances was used here.
- 2-Level A harassment ER95% exposure ranges for proximal installation of monopiles (one vessel installing two monopiles per day) and the OCS-DC foundation (one vessel installing four pin piles per day) (Scenario 5).
- 3-Level A harassment ER95% exposure ranges considering installing up to four pin piles per day for the OCS-DC jacket foundation.
- 4- The minimum visibility zone represents the largest ER95% distance for NARWs modeled under the different construction scenarios. PSOs must be able to visually detect marine mammals within the minimum visibility zone.
- 5- The clearance and shutdown zones for “other large whales” represent the largest Level A harassment threshold (ER95%) for all large whales. If the clearance and shutdown zone distances are smaller than the distance at which the outer bubble curtain ring is deployed, clearance and shutdown must occur before an animal breaches the bubble curtain. The PAM system must be able to detect NARWs out to 10 km; however, any opportunistic detection of other species within their respective clearance and shutdown zones would also trigger mitigative action (*i.e.*, it is not required that the PAM system detect all marine mammals to 10 km).
- 6- Sunrise Wind must select the most conservative (largest) zone sizes each day depending on which construction scenario is planned. If the real-world construction scenario for that day occurs that would have had smaller zone sizes than what was planned at the start of the day, Sunrise Wind may not decrease to the smaller zone sizes for that day. These zone sizes may be adjusted based on SFV.

Table 33 – Clearance and Shutdown Zones During Vibratory Pile Driving of Sheet Piles and/or Pneumatic Hammering of Casing Pipe Piles For Cofferdams and Goal Posts^a

Installation	Hearing Groups	Clearance Zone ^b (m)	Shutdown Zone ^c (m)
Sheet Piles	Low-frequency cetaceans	200	50
	Mid-frequency cetaceans	200	50
	High-frequency cetaceans	200	200
	Phocid Pinnipeds	200	10
Casing Pipe	Low-frequency cetaceans	500	500
	Mid-frequency cetaceans	100	100
	High-frequency cetaceans	500	500
	Phocid Pinnipeds	100	100

a – Although Sunrise Wind is also building temporary goal posts in some locations to aid their nearshore installation work, they have committed to using the same zones previously proposed for temporary cofferdams as they are considered more conservative and protective.

b – The clearance zones for large whales, porpoises, and seals are based upon the maximum Level A harassment zone for temporary cofferdams (table 17) and rounded up for PSO clarity.

c – The shutdown zones for large whales (including NARWs) and porpoises are based upon the maximum Level A harassment zone for each group and rounded up for PSO clarity. Shutdown zones for other dolphins and pilot whales were set using precautionary distances.

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In the proposed rule, NMFS presented zone sizes based solely on the largest charge weight due to uncertainty on how accurately these charge weights

could be identified in the water. Since the proposed rule, Sunrise Wind has reliably demonstrated that it can identify charge weights in the field to allow for charge weight-specific mitigative zones. Because of this, Sunrise Wind is required to implement the As Low as Reasonably Practicable (ALARP) process, as described in the UXO/MEC Charge Weight Memo. This process requires Sunrise Wind to undertake “lift-and-shift” (*i.e.*, physical removal) and then lead up to *in situ* disposal, as necessary, which could include low-order (deflagration) to high-order (detonation) methods of removal. Another approach involves the cutting of the UXO/MEC to extract any explosive components. Implementing the ALARP approach would minimize potential impacts to marine mammals as UXOs/MECs would only be detonated

as a last resort. Sunrise Wind will follow a Risk Management Framework designed to align with the ALARP principle which includes historical research/hazard profiling, communication with all relevant State and Federal Agencies, and the standards within their removal plan (see the UXO/MEC Charge Weight Memo). Sunrise Wind has demonstrated it will be able to identify charge weights in the field. Furthermore, NMFS believes that this approach will ensure the least practicable adverse impact on marine mammals by mitigating the potential for TTS for each charge weight. The UXO/MEC Charge Weight Memo is found on NMFS’ website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

Following this charge weight-specific approach, Sunrise Wind is required to clear the relevant zones as described in table 34. These zones are based on, but are not equal to, the greatest TTS threshold distances for each charge weight at any modeled site. NMFS notes that harbor porpoises and seals are difficult to detect at great distances but, due to the UXO/MEC detonation time of year restrictions, their abundance is likely to be relatively low. These zone sizes may be adjusted based on SFV and confirmation of the UXO/MEC or donor charge sizes after approval by NMFS.

No minimum visibility zone is required for UXO/MEC detonation as the entire visual clearance zone must be clear given the potential for lung and gastrointestinal tract injury.

Table 34 – Clearance, Level A Harassment, and Level B Harassment Zones During UXO/MEC Detonations, by Charge Weight and Assuming 10 dB of Sound Attenuation

UXO/MEC Charge Weights		Low-frequency cetaceans	Mid-frequency cetaceans	High-frequency cetaceans	Phocid Pinnipeds
E4 (2.3 kg)	Level A harassment (m)	552	50	1,820	182
	Level B harassment (m)	2,82	453	6,160	1,470
	Clearance Zone (m) ^{a, b}	2,500	500	2,500	1,000
E6 (9.1 kg)	Level A harassment (m)	982	75	2,590	357
	Level B harassment (m)	4,680	773	8,000	2,350
	Clearance Zone (m) ^{a, b}	4,000	600	4,000	1,500
E8 (45.5 kg)	Level A harassment (m)	1,730	156	3,900	690
	Level B harassment (m)	7,490	1,240	10,300	3,820
	Clearance Zone (m) ^{a, b}	6,000	1,000	6,000	3,000
E10 (227 kg)	Level A harassment (m)	2,970	337	5,400	1,220
	Level B harassment (m)	10,500	2,120	12,900	5,980
	Clearance Zone (m) ^{a, b}	9,000	1,500	9,000	4,000
E12 (454 kg)	Level A harassment (m)	3,780	461	6,200	1,600
	Level B harassment (m)	11,900	2,550	14,100	7,020
	Clearance Zone (m) ^{a, b}	10,000	2,000	10,000	5,000

a – The clearance zones presented here for the Level B harassment thresholds were derived based on an approximate proportion of the size of the Level B harassment isopleth.

b – Some of the zones have been rounded for PSO clarity.

For HRG surveys, the Level B harassment zone and mitigation zone

sizes remain the same as that included in the proposed rule (table 35).

Table 35 – Level B Harassment Threshold Ranges and Mitigation Zones During HRG Surveys

Species	Level B Harassment Zone Boomer/Sparker (m)	Level B Harassment Zone CHIRPs (m)	Clearance Zone (m)	Shutdown Zone (m)
North Atlantic right whale	141	48	500	500
Other low-frequency cetaceans (non-North Atlantic right whale species)			100	100
Mid-frequency cetaceans	141	48	100	100 ^a
High-frequency cetaceans	141	48	100	100 ^b
Phocid Pinnipeds	141	48	100	100

a – An exception is noted for bow-riding delphinids of the following genera: *Delphinus*, *Stenella*, *Lagenorhynchus*, and *Tursiops*.

Soft-Start/Ramp-Up

The use of a soft-start or ramp-up procedure is believed to provide additional protection to marine mammals by warning them or providing them with a chance to leave the area prior to the hammer or HRG equipment operating at full capacity. Soft-start typically involves initiating hammer operation at a reduced energy level (relative to full operating capacity) followed by a waiting period. Sunrise Wind must utilize a soft-start protocol for all impact pile driving. For foundation installation, NMFS notes that it is difficult to specify a reduction in energy for any given hammer because of variation across drivers and installation conditions. The final methodology will be developed by Sunrise Wind considering final design details including site-specific soil properties and other considerations. HRG survey operators are also required to ramp-up sources when the acoustic sources are used unless the equipment operates on a binary on/off switch. Given the instantaneous nature of UXO/MEC detonations, no ramp-up/soft-start protocol is possible; therefore, it is not required.

Soft-start and ramp-up will be required at the beginning of each day's

activity and at any time following a cessation of activity of 30 minutes or longer. Prior to soft-start or ramp-up beginning, the operator must receive confirmation from the PSO that the clearance zone is clear of any marine mammals.

Should Sunrise Wind use an ASV for HRG survey operations, the ASV must be within 800 m (2,625 ft) of the primary vessel while conducting survey operations. Two PSOs would be stationed aboard the mother vessel at the best vantage points to monitor the clearance and shutdown zones around the ASV. A dual thermal/high definition camera would be installed on the mother vessel, facing forward and angled in a direction to provide a field of view ahead of the vessel and around the ASV. PSOs would monitor the real-time camera output on hand-held tablets. A monitor would also be installed on the bridge, displaying the real-time image from the thermal/HD camera installed on the ASV itself, providing an additional forward field of view from the ASV. Night-vision goggles with thermal clip-ons, and a hand-held spotlight would be used to monitor the ASV during survey operations during periods of reduced visibility (e.g., darkness, rain, fog).

Fishery Monitoring Surveys

While the likelihood of Sunrise Wind's fishery monitoring surveys impacting marine mammals is minimal, NMFS requires Sunrise Wind to adhere to gear and vessel mitigation measures to reduce potential impacts to the extent practicable. In addition, all crew undertaking the fishery monitoring survey activities are required to receive protected species identification training prior to activities occurring and attend the aforementioned onboarding training. The specific requirements that NMFS has set for the fishery monitoring surveys can be found in the regulatory text at the end of this rulemaking.

Smith Point County Park Temporary Pier Construction

To avoid take of marine mammals, Sunrise Wind would delay or shutdown pile driving if a marine mammal is observed entering or within the Level B harassment zones identified in table 36 (i.e., the Level B harassment zone equates to the clearance and shutdown zones). At least one PSO must be on duty 30 minutes prior to, during and 30 minutes after pile driving to implement this mitigation.

Table 36 - Clearance and Shutdown Zones for Temporary Pier at Smith Point County Park

	Vibratory Pile Driving	Impact Pile Driving
Temporary Pier	800 m (extending to opposite shoreline of Intracoastal Waterway)	300 m

Note- Clearance and shutdown zones extend the entire Level B harassment area to avoid take (see the Sunrise Wind Temporary Pier Memo, dated March 2023, as described in the proposed rule)

Based on an evaluation of the mitigation measures, as well as other measures considered by NMFS, NMFS has determined that these measures will provide the means of affecting the least practicable adverse impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

As noted in the Changes From the Proposed to Final Rule section, NMFS has added, modified, and clarified a number of monitoring and reporting measures since the proposed rule. These changes are described in detail in the sections below and, otherwise, the marine mammal monitoring and reporting requirements have not changed since the proposed rule.

In order to promulgate a rulemaking for an activity, section 101(a)(5)(A) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the Project Area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

1. Occurrence of marine mammal species or stocks in the area in which take is anticipated (e.g., presence, abundance, distribution, density);

2. Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute, or chronic), through better understanding of: (1) action or environment (e.g., source characterization, propagation, ambient noise); (2) affected species (e.g., life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (e.g., age, calving or feeding areas);

3. Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;

4. How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;

5. Effects on marine mammal habitat (e.g., marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and/or

6. Mitigation and monitoring effectiveness.

Separately, monitoring is also regularly used to support mitigation implementation, which is referred to as mitigation monitoring, and monitoring plans typically include measures that both support mitigation implementation and increase our understanding of the impacts of the activity on marine mammals.

During the planned activities, visual monitoring by NMFS-approved PSOs would be conducted before, during, and after all impact pile driving, vibratory pile driving, pneumatic hammering, UXO/MEC detonations, and HRG surveys. PAM would also be conducted during impact pile driving and UXO/MEC detonations. Visual observations and acoustic detections would be used to support the activity-specific

mitigation measures (e.g., clearance zones). To increase understanding of the impacts of the activity on marine mammals, PSOs must record all incidents of marine mammal occurrence at any distance from the piling locations, near the HRG acoustic sources, and during UXO/MEC detonations. PSOs would document all behaviors and behavioral changes, in concert with distance from an acoustic source. Further, SFV during foundation installation and UXO/MEC detonation is required to ensure compliance and that the potential impacts are within the bounds of that analyzed. The required monitoring, including PSO and PAM Operator qualifications, is described below, beginning with PSO measures that are applicable to all the aforementioned activities and PAM (for specific activities).

Protected Species Observer and PAM Operator Requirements

Sunrise Wind is required to employ NMFS-approved PSOs and PAM operators. PSOs are trained professionals who are tasked with visually monitoring for marine mammals during pile driving, UXO/MEC detonation, and HRG surveys. The primary purpose of a PSO is to carry out the monitoring, collect data, and, when appropriate, call for the implementation of mitigation measures. In addition to visual observations, NMFS requires Sunrise Wind to conduct PAM by PAM operators during impact pile driving, UXO/MEC detonations, and vessel transit.

The inclusion of PAM, which would be conducted by NMFS-approved PAM operators, following a standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind, combined with visual data collection, is a valuable way to provide the most accurate record of species presence as possible and, together, these two monitoring methods

are well understood to provide best results when combined together (*e.g.*, Barlow and Taylor, 2005; Clark *et al.*, 2010; Gerrodette *et al.*, 2011; Van Parijs *et al.*, 2021). Acoustic monitoring (in addition to visual monitoring) increases the likelihood of detecting marine mammals within the shutdown and clearance zones of project activities, which, when applied in combination with required shutdowns, helps to further reduce the risk of marine mammals being exposed to sound levels that could otherwise result in acoustic injury or more intense behavioral harassment. The exact configuration and number of PAM systems depends on the size of the zone(s) being monitored, the amount of noise expected in the area, and the characteristics of the signals being monitored.

NMFS does not formally administer any PSO or PAM operator training program or endorse specific providers but will approve PSOs and PAM operators that have successfully completed courses that meet the curriculum and trainer requirements referenced below and further specified in the regulatory text at the end of this rulemaking.

NMFS will provide PSO and PAM operator approvals in the context of the need to ensure that PSOs and PAM operators have the necessary training and/or experience to carry out their duties competently. In order for PSOs and PAM operators to be approved, NMFS must review and approve PSO and PAM operator resumes indicating successful completion of an acceptable training course. PSOs and PAM operators must have previous experience observing marine mammals and must have the ability to work with all required and relevant software and equipment. NMFS may approve PSOs and PAM operators as conditional or unconditional. A conditional approval may be given to one who is trained but has not yet attained the requisite experience. An unconditional approval is given to one who is trained and has attained the necessary experience. The specific requirements for conditional and unconditional approval can be found in the regulatory text at the end of this rulemaking.

Conditionally-approved PSOs and PAM operators would be paired with an unconditional-approved PSO (or PAM operator, as appropriate) to ensure that the quality of marine mammal observations and data recording is kept consistent. Additionally, activities requiring PSO and/or PAM operator monitoring must have a lead on duty. The visual PSO field team, in conjunction with the PAM team (*i.e.*,

marine mammal monitoring team), would have a lead member (designated as the “Lead PSO” or “Lead PAM operator”) who would be required to meet the unconditional approval standard.

Although PSOs and PAM operators must be approved by NMFS, third-party observer providers and/or companies seeking PSO and PAM operator staffing should expect that those having satisfactorily completed acceptable training and with the requisite experience (if required) will be quickly approved. Sunrise Wind is required to request PSO and PAM operator approvals 60 days prior to those personnel commencing work. An initial list of previously approved PSO and PAM operators must be submitted by Sunrise Wind at least 30 days prior to the start of the Project. Should Sunrise Wind require additional PSOs or PAM operators throughout the Project, Sunrise Wind must submit a subsequent list of pre-approved PSOs and PAM operators to NMFS at least 15 days prior to planned use of that PSO or PAM operator. A PSO may be trained and/or experienced as both a PSO and PAM operator and may perform either duty, pursuant to scheduling requirements (and vice versa).

A minimum number of PSOs would be required to actively observe for the presence of marine mammals during certain project activities with, generally speaking, more PSOs required as the mitigation zone sizes increase. A minimum number of PAM operators would be required to actively monitor for the presence of marine mammals during foundation installation and UXO/MEC detonation. The types of equipment required (*e.g.*, big eyes on the pile driving vessel) are also designed to increase marine mammal detection capabilities. In summary, at least three PSOs and one PAM operator per acoustic data stream (equivalent to the number of acoustic buoys) must be on-duty and actively monitoring per platform during foundation installation and any UXO/MEC detonation event; at least two PSOs must be on duty during cable landfall construction vibratory pile installation and removal and pneumatic hammering; at least one PSO must be on-duty during HRG surveys conducted during daylight hours; and at least two PSOs must be on-duty during HRG surveys conducted during nighttime.

In addition to monitoring duties, PSOs and PAM operators are responsible for data collection. The data collected by PSO and PAM operators and subsequent analysis provide the necessary information to inform an

estimate of the amount of take that occurred during the project, better understand the impacts of the project on marine mammals, address the effectiveness of monitoring and mitigation measures, and to adaptively manage activities and mitigation in the future. Data reported includes information on marine mammal sightings, activity occurring at time of sighting, monitoring conditions, and if mitigative actions were taken. Specific data collection requirements are contained within the regulations at the end of this rulemaking.

Sunrise Wind is required to submit a Pile Driving and UXO/MEC Marine Mammal Monitoring Plan and a PAM Plan to NMFS 180 days in advance of foundation installation activities. The Plan must include details regarding PSO and PAM monitoring protocols and equipment proposed for use. More specifically, the PAM Plan must include a description of all proposed PAM equipment, address how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind as described in *NOAA and BOEM Minimum Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs* (Van Parijs *et al.*, 2021). NMFS must approve the plan prior to foundation installation activities or UXO/MEC detonation commencing. Specific details on NMFS’ PSO or PAM operator qualifications and requirements can be found in Part 217—Regulations Governing The Taking And Importing Of Marine Mammals at the end of this rulemaking. Additional information can be found in Sunrise Wind’s Protected Species Mitigation and Monitoring Plan (PSMMP) on NMFS’ website at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-sunrise-wind-llc-construction-and-operation-sunrise-wind>.

Sound Field Verification

Sunrise Wind must conduct SFV measurements during all UXO/MEC detonations and all foundation installation. At minimum, the first three monopile foundations and all pin piles for the OCS–DC must be monitored with complete SFV. SFV measurements must continue until at least three consecutive piles demonstrate distances to thresholds are at or below those modeled (assuming 10 dB of attenuation). Subsequent complete SFV measurements are also required should larger piles be installed or additional piles be driven that are anticipated to

produce longer distances to harassment isopleths than those previously measured (e.g., higher hammer energy, greater number of strikes, etc.). The required reporting metrics associated with complete SFV can be found in the regulatory text at the end of this rule.

The requirements are extensive to ensure monitoring is conducted appropriately and the reporting frequency is such that Sunrise Wind is required to make adjustments quickly (e.g., ensure bubble curtain hose maintenance, check bubble curtain air pressure supply, add additional sound attenuation, etc.) to ensure marine mammals are not experiencing noise levels above those considered in this analysis. For recommended SFV protocols for impact pile driving, please consult ISO 18406 *Underwater acoustics—Measurement of radiated underwater sound from percussive pile driving* (2017). Sunrise Wind must conduct abbreviated SFV on all piles for which complete SFV is not conducted. The reporting requirements and frequency of reporting can be found in the regulatory text below. Sunrise Wind must also conduct SFV during operations to better understand the sound fields and potential impacts on marine mammals associated with turbine operations.

As described in the proposed rule, in addition to the aforementioned monitoring requirements, Sunrise Wind plans to conduct a long-term ecological monitoring project using bottom-mounted passive acoustic monitoring equipment during the effective period of this rule to better understand the long-term distribution of marine mammals in the project area with a focus on detecting NARW. This long-term study will contribute to the understanding of the potential impacts of the project and inform any potential adaptive management strategies. NMFS is not requiring this study as part of monitoring requirements.

Reporting

Prior to any construction activities occurring, Sunrise Wind will provide a report to NMFS Office of Protected Resources that demonstrates that all required training for Sunrise Wind personnel, which includes the vessel crews, vessel captains, PSOs, and PAM operators, have completed all required trainings.

NMFS will require standardized and frequent reporting from Sunrise Wind during the life of the regulations and LOA. All data collected relating to the Project will be recorded using industry-standard software (e.g., Mysticetus or a similar software) installed on field

laptops and/or tablets. Sunrise Wind is required to submit weekly, monthly, annual, situational, and final reports. The specifics of what NMFS requires to be reported can be found in the regulatory text at the end of this final rule.

Weekly Report—During foundation installation activities, Sunrise Wind will be required to compile and submit weekly marine mammal monitoring reports for foundation installation pile driving to NMFS Office of Protected Resources that document the daily start and stop of all pile-driving activities, the start and stop of associated observation periods by PSOs, details on the deployment of PSOs, a record of all detections of marine mammals (acoustic and visual), any mitigation actions (or if mitigation actions could not be taken, provide reasons why), and details on the noise abatement system(s) (e.g., system type, distance deployed from the pile, bubble rate, etc.), and abbreviated SFV results. Weekly reports will be due on Wednesday for the previous week (Sunday to Saturday). The weekly reports are also required to identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is complete, weekly reports will no longer be required. If UXO/MEC detonation occurs, all relevant information should be included in the weekly report.

Monthly Report—Sunrise Wind is required to compile and submit monthly reports to NMFS Office of Protected Resources that include a summary of all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel, and route), number of piles installed, all detections of marine mammals, and any mitigative actions taken. Monthly reports will be due on the 15th of the month for the previous month. The monthly report would also identify which turbines become operational and when (a map must be provided). Once all foundation pile installation is complete, monthly reports would no longer be required.

Annual Reporting—Sunrise Wind is required to submit an annual marine mammal monitoring (both PSO and PAM) report to NMFS Office of Protected Resources by March 31, annually, describing, in detail, all of the information required in the monitoring section above for the previous calendar year. A final annual report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report.

Final Reporting—Sunrise Wind must submit its draft 5-year report(s) to NMFS Office of Protected Resources. The

report must contain, but is not limited to, a description of activities conducted (including GIS files where relevant), and all visual and acoustic monitoring, including SFV and monitoring effectiveness, conducted under the LOA within 90 calendar days of the completion of activities occurring under the LOA. A final 5-year report must be prepared and submitted within 60 calendar days following receipt of any NMFS comments on the draft report.

Situational Reporting—Specific situations encountered during the development of the Project require immediate reporting. For instance, if a NARW is observed at any time by PSOs or project personnel, the sighting must be immediately (if not feasible, as soon as possible, and no longer than 24 hours after the sighting) reported to NMFS. If a NARW is acoustically detected at any time via a project-related PAM system, the detection must be reported as soon as possible and no longer than 24 hours after the detection to NMFS via the 24-hour NARW Detection Template at: <https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>. Calling the hotline is not necessary when reporting PAM detections via the template.

If a sighting of a stranded, entangled, injured, or dead marine mammal occurs, the sighting will be reported to NMFS Office of Protected Resources, the NMFS Greater Atlantic Stranding Coordinator for the New England/Mid-Atlantic area (866-755-6622), and the U.S. Coast Guard, within 24 hours. If the injury or death was caused by a project activity, Sunrise Wind must immediately cease all activities until NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. Sunrise Wind may not resume their activities until notified by NMFS Office of Protected Resources.

In the event of a vessel strike of a marine mammal by any vessel associated with the Project, Sunrise Wind must immediately report the strike incident. If the strike occurs in the Greater Atlantic Region (Maine to Virginia), Sunrise Wind must call the NMFS Greater Atlantic Stranding Hotline. Separately, Sunrise Wind must also and immediately report the incident to NMFS Office of Protected Resources and GARFO. Sunrise Wind must immediately cease all on-water activities until NMFS Office of

Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA. NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. Sunrise Wind may not resume their activities until notified by NMFS.

In the event of any lost gear associated with the fishery surveys, Sunrise Wind must report to the GARFO as soon as possible or within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.

The specifics of what NMFS Office of Protected Resources requires to be reported is listed at the end of this rulemaking in the regulatory text.

Sound Field Verification—Sunrise Wind is required to submit interim SFV reports after each foundation installation and UXO/MEC detonation monitored as soon as possible, but within 48 hours. A final SFV report for all monopile foundation installation and UXO/MEC detonations would be required within 90 days following completion of acoustic monitoring.

Adaptive Management

The regulations governing the take of marine mammals incidental to Sunrise Wind's construction activities contain an adaptive management component. Our understanding of the effects of offshore wind construction activities (e.g., acoustic and explosive stressors) on marine mammals continues to evolve, which makes the inclusion of an adaptive management component both valuable and necessary within the context of 5-year regulations.

The monitoring and reporting requirements in this final rule will provide NMFS with information that helps us to better understand the impacts of the project's activities on marine mammals and informs our consideration of whether any changes to mitigation and monitoring are appropriate. The use of adaptive management allows NMFS to consider new information and modify mitigation, monitoring, or reporting requirements, as appropriate, with input from Sunrise Wind regarding practicability, if such modifications will have a reasonable likelihood of more effectively accomplishing the goals of the measures.

The following are some of the possible sources of new information to

be considered through the adaptive management process: (1) results from monitoring reports, including the weekly, monthly, situational, and annual reports required; (2) results from research on marine mammals, noise impacts, or other related topics; and (3) any information that reveals that marine mammals may have been taken in a manner, extent, or number not authorized by these regulations or subsequent LOA. Adaptive management decisions may be made at any time, as new information warrants it. NMFS may consult with Sunrise Wind regarding the practicability of the modifications.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" by mortality, serious injury, Level A harassment, and Level B harassment, NMFS considers other factors, such as the likely nature of any behavioral responses (e.g., intensity, duration), the context of any such responses (e.g., critical reproductive time or location, migration), effects on habitat, and the likely effectiveness of mitigation. NMFS also assesses the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS' implementing regulations (54 FR 40338, September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (e.g., as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

In the Estimated Take section of this preamble, NMFS discusses the estimated maximum number of takes by Level A harassment and Level B harassment that could occur incidental to Sunrise Wind's specified activities based on the methods described. The impact that any given take would have is dependent on many case-specific

factors that need to be considered in the negligible impact analysis (e.g., the context of behavioral exposures such as duration or intensity of a disturbance, the health of impacted animals, the status of a species that incurs fitness-level impacts to individuals, *etc.*). In this final rule, NMFS evaluates the likely impacts of the enumerated harassment takes that are authorized in the context of the specific circumstances surrounding these predicted takes. NMFS also collectively evaluates this information, as well as other more tax-specific information and mitigation measure effectiveness, in group-specific discussions that support our negligible impact conclusions for each stock. As described above, no serious injury or mortality is expected or authorized for any species or stock.

The Description of the Specified Activities section of this preamble describes Sunrise Wind's specified activities that may result in take of marine mammals and an estimated schedule for conducting those activities. On February 22, 2024, Sunrise Wind provided NMFS an updated construction schedule, which shifts foundation pile installation from one year to two years. However, schedules may shift for a variety of reasons (e.g., weather or supply delays). The total number of takes would not exceed the maximum annual total in any given year or the 5-year totals as indicated in tables 30 and 31, respectively.

NMFS bases its analysis and negligible impact determination on the maximum number of takes that could occur annually and across the 5-year effective period of these regulations, as well as extensive qualitative consideration of other contextual factors that influence the severity and nature of impacts have on the affected individuals and the number and context of individuals affected. As stated before, the number of takes, both maximum annual and 5-year total, alone are only a part of the analysis.

To avoid repetition, NMFS provides some general analysis in this Negligible Impact Analysis and Determination section that applies to all the species listed in table 2, given that some of the anticipated effects of Sunrise Wind's construction activities on marine mammals are expected to be relatively similar in nature. Then, it is subdivided into more detailed discussions for mysticetes, odontocetes, and pinnipeds which have broad life-history traits that support an overarching discussion of some factors considered within the analysis for those groups (e.g., habitat-use patterns, high-level differences in feeding strategies).

Lastly, NMFS provides a negligible impact determination for each species or stock, providing species or stock-specific information or analysis, where appropriate (e.g., for NARW, given their population status). Organizing our analysis by grouping species or stocks that share common traits or that would respond similarly to effects of Sunrise Wind's activities, and then providing species- or stock-specific information allows NMFS to avoid duplication while ensuring that we have analyzed the effects of the specified activities on each affected species or stock. It is important to note that in the group or species sections, the majority of the impacts are associated with WTG foundation and OCS-DC foundation installation, which may occur over two years per Sunrise Wind's updated schedule (2024 through 2025) (with maximum annual take assuming all foundation piles are installed in a single year). The take in the other years is expected to be notably less.

As described previously, no serious injury or mortality is anticipated or would be authorized in any LOA issued under this rule. Non-auditory injury (e.g., lung injury or gastrointestinal injury from UXO/MEC detonation) is also not anticipated and would not be authorized in any LOA issued under this rule. Any Level A harassment authorized would be in the form of auditory injury (i.e., PTS).

The number of takes by harassment Sunrise Wind has requested and NMFS may authorize in a LOA is based on exposure models that consider the outputs of acoustic source and propagation models. Several conservative parameters and assumptions are ingrained into the models, such as assuming forcing functions that consider direct contact with piles (i.e., no cushion allowances), and no consideration to the benefits of mitigation measures, other than 10 dB sound attenuation and seasonal restrictions, or an avoidance response. The number of takes requested and may be authorized in a LOA also reflects careful consideration of other data (e.g., group size data, PSO data). For all species, the number of takes authorized represents the maximum amount of Level A harassment and Level B harassment reasonably expected to occur.

Behavioral Disturbance

In general, NMFS anticipates that impacts on an individual that has been harassed are likely to be more intense when exposed to higher received levels and for a longer duration (though this is not a strictly linear relationship for

behavioral effects across species, individuals, or circumstances) and less severe impacts result when exposed to lower received levels and for a brief duration. However, there is also growing evidence of the importance of contextual factors such as distance from a source in predicting marine mammal behavioral response to sound—i.e., sounds of a similar level emanating from a more distant source have been shown to be less likely to evoke a response of equal magnitude (DeRuiter and Doukara, 2012; Falcone *et al.*, 2017). As described in the Potential Effects to Marine Mammals and their Habitat section of the proposed rule, the intensity and duration of any impact resulting from exposure to Sunrise Wind's activities is dependent upon a number of contextual factors including, but not limited to, sound source frequencies, whether the sound source is stationary or moving towards the animal, hearing ranges of marine mammals, behavioral state at time of exposure, status of individual exposed (e.g., reproductive status, age class, health) and an individual's experience with similar sound sources. Southall *et al.* (2021), Ellison *et al.* (2012) and Moore and Barlow (2013), among others, emphasize the importance of context (e.g., behavioral state of the animals, distance from the sound source) in evaluating behavioral responses of marine mammals to acoustic sources. Harassment of marine mammals may result in behavioral modifications (e.g., avoidance, temporary cessation of foraging or communicating, changes in respiration or group dynamics, masking) or may result in auditory impacts such as hearing loss. In addition, some of the lower-level physiological stress responses (e.g., change in respiration, change in heart rate), as described in the proposed rule, would likely co-occur with the behavioral modifications, although these physiological responses are more difficult to detect and fewer data exist relating these responses to specific received levels of sound. Takes by Level B harassment, then, may have a stress-related physiological component as well. However, NMFS would not expect Sunrise Wind's activities to produce conditions of long-term and continuous exposure to noise leading to long-term physiological stress responses in marine mammals that could affect reproduction or survival.

In the range of exposures that might result in Level B harassment (which by nature of the way it is modeled/counted, occurs within 1 day), the less severe end might include exposure to comparatively lower levels of a sound,

at a greater distance from the animal, for a few or several minutes. A less severe exposure of this nature could result in a behavioral response such as avoiding a small area that an animal would otherwise have chosen to move through or feed in for some amount of time or breaking off one or a few feeding bouts. More severe effects could occur if an animal receives comparatively higher levels at very close distances, is exposed continuously to one source for a longer time or is exposed intermittently throughout the day. Such exposure might result in an animal having a more severe avoidance response and leaving a larger area for an extended duration, potentially, for example, losing feeding opportunities for a day or more. Such severe behavioral effects are expected to occur infrequently due to extensive mitigation and monitoring measures included in this rule.

Many species perform vital functions, such as feeding, resting, traveling, and socializing on a diel cycle (i.e., 24-hour cycle). Behavioral reactions to noise exposure, when taking place in a biologically important context, such as disruption of critical life functions, displacement, or avoidance of important habitat, are more likely to be significant if they last more than 1 day or recur on subsequent days (Southall *et al.*, 2007) due to diel and lunar patterns in diving and foraging behaviors observed in many cetaceans (Baird *et al.*, 2008; Barlow *et al.*, 2020; Henderson *et al.*, 2016; Schorr *et al.*, 2014). It is important to note the water depth in the Project Area is shallow (ranging from 5.7 to 67 m (18.7 to 219.8 ft) in the SRWEC and 35 to 62 m (115–203 ft) in the Lease Area) and deep diving species, such as sperm whales, are not expected to be engaging in deep foraging dives when exposed to noise above NMFS harassment thresholds during the specified activities. Therefore, NMFS does not anticipate impacts to deep foraging behavior to be impacted by the specified activities.

It is important to identify that the estimated number of takes for each stock does not necessarily equate to the number of individual marine mammals expected to be harassed (which may be lower, depending on the circumstances), but rather to the instances of take (e.g., exposures above the Level B harassment thresholds) that may occur. These instances may represent either brief exposures of seconds for UXO/MEC detonations, seconds to minutes for HRG surveys, or, in some cases, longer durations of exposure within (but not exceeding) a day (e.g., pile driving). Some members of a species or stock may experience one exposure (i.e., be taken

on one day) as they move through an area, while other individuals may experience recurring instances of take over multiple days throughout the year, in which case the number of individuals taken is smaller than the total estimated take for that species or stock. In short, for species that are more likely to be migrating through the area and/or for which only a comparatively smaller number of takes are predicted (*e.g.*, some of the mysticetes), it is more likely that each take represents a different individual. However, for non-migrating species and/or species with a larger number of estimated take, NMFS expects that the total estimated takes represent exposures of a smaller number of individuals of which some would be taken across multiple days.

For Sunrise Wind, impact pile driving of foundation piles is most likely to result in a higher magnitude and severity of behavioral disturbance than other activities (*i.e.*, vibratory pile driving, pneumatic hammering, UXO/MEC detonations, and HRG surveys). Impact pile driving, in general, and especially in the case of foundation installation, produces higher source levels than the other aforementioned activities. HRG survey equipment also produces much higher frequencies than pile driving, resulting in minimal sound propagation. While UXO/MEC detonations may have higher source levels than other activities, the number of UXO/MEC detonations is limited (three over five years) and they produce instantaneous noise levels (*i.e.*, a total of approximately three seconds of blast noise and pressure would occur) as compared to multiple hours of pile driving or HRG surveys in a given day.

While foundation installation impact driving is anticipated to be most impactful due to high source levels and multiple hour duration in a day, pile driving would not be occurring all day every day. In total, up to 348 hours (87 WTG foundations x 4 hours) of monopile foundation installation impact pile driving may occur within the 5-year effective duration of this final rule while an OCS-DC jacket foundation (comprised of pin piles that produce lower noise levels) would also be installed in a day. As described in the construction schedule scenarios, there may be cases where the WTG foundations are installed concurrently, further reducing the overall amount of time over which impact pile driving noise is being transmitted into marine mammal habitat. Impacts will be minimized through implementation of mitigation measures, including use of a sound attenuation system, soft-starts, and the implementation of clearance

and shutdown zones that either delay or suspend, respectively, pile driving when marine mammals are detected at specified distances. Further, given sufficient notice through the use of soft-start, marine mammals are expected to move away from a pile driving sound source prior to becoming exposed to very loud noise levels. The requirement to couple visual monitoring (using multiple PSOs) and PAM before and during all foundation installation and UXO/MEC detonations will increase the overall capability to detect marine mammals compared to one method alone. Measures such as the requirement to apply sound attenuation devices and implement clearance zones also apply to UXO/MEC detonation(s), which also have the potential to elicit more severe behavioral reactions in the unlikely event that an animal is relatively close to the explosion in the instant that it occurs; hence, severity of behavioral responses are expected to be lower than would be the case without mitigation.

Occasional, milder behavioral reactions are unlikely to cause long-term consequences for individual animals or populations. Even if some smaller subset of the takes are in the form of a longer (several hours or a day) and more severe response, impacts to individual fitness are not anticipated if the taking is not expected to be repeated over numerous or sequential days. Also, the effect of disturbance is strongly influenced by whether it overlaps with biologically important habitats when individuals are present—avoiding biologically important habitats will reduce the likelihood of more significant behavioral impacts (*e.g.*, reduced or lost foraging) (Keen *et al.*, 2021). Nearly all studies and experts agree that infrequent exposures of a single day or less are unlikely to impact an individual's overall energy budget (Farmer *et al.*, 2018; Harris *et al.*, 2017; King *et al.*, 2015; National Academy of Science, 2017; New *et al.*, 2014; Southall *et al.*, 2007; Villegas-Amtmann *et al.*, 2015). *Temporary Threshold Shift (TTS)*

TTS is one form of Level B harassment that marine mammals may incur through exposure to Sunrise Wind's activities and, as described earlier, the takes by Level B harassment may represent takes in the form of direct behavioral disturbance, TTS, or both. As discussed in the Potential Effects of Specified Activities on Marine Mammals and their Habitat section of the proposed rule, in general, TTS can last from a few minutes to days, be of varying degree, and occur across different frequency bandwidths, all of which determine the severity of the

impacts on the affected individual, which can range from minor to more severe. Impact and vibratory pile driving and UXO/MEC detonations are broadband noise sources but generate sounds in the lower frequency ranges (with most of the energy below 1–2 kHz, but with a small amount of energy ranging up to 20 kHz); therefore, in general and all else being equal, NMFS anticipates the potential for TTS is higher in low-frequency cetaceans (*i.e.*, mysticetes) than other marine mammal hearing groups and is more likely to occur in frequency bands in which they communicate. Additionally, though the frequency range of TTS that marine mammals might sustain would overlap with some of the frequency ranges of their vocalizations, the frequency range of TTS from Sunrise Wind's pile driving and UXO/MEC detonation activities would not typically span the entire frequency range of one vocalization type, much less span all types of vocalizations, and entire hearing range for any particular species, or the other critical auditory cues for any given species. The required mitigation measures further reduce the potential for TTS.

Generally, both the degree of TTS and the duration of TTS would be greater if the marine mammal is exposed to a higher level of energy (which would occur when the peak dB level is higher or the duration is longer). The threshold for the onset of TTS was discussed previously (see the Estimated Take section of this preamble). However, source level alone is not a predictor of TTS. An animal would have to approach closer to the source or remain in the vicinity of the sound source appreciably longer to increase the received SEL, which would be difficult considering the required mitigation and the nominal speed of the receiving animal relative to the stationary sources such as impact pile driving. The recovery time of TTS is also important when considering the potential impacts from TTS. In TTS laboratory studies (as discussed in the Potential Effects of the Specified Activities on Marine Mammals and their Habitat section of the proposed rule), some using exposures of almost an hour in duration or up to 217 SEL, almost all individuals recovered within 1 day or less, but often in minutes. While the pile-driving activities last for hours a day, it is unlikely that most marine mammals would stay in the close vicinity of the source long enough to incur more severe TTS. UXO/MEC detonations also have the potential to result in TTS. However, given the duration of exposure is

extremely short (milliseconds), the degree of TTS (*i.e.*, the amount of dB shift) is expected to be small and TTS duration is expected to be short (minutes to hours).

Overall, given the small number of times that any individual might incur TTS, the low degree of TTS and the short anticipated duration, and that any TTS is not anticipated to overlap the entirety of a critical hearing range, it is unlikely that TTS (of the nature expected to result from the project's activities) would result in behavioral changes or other impacts that would impact any individual's (of any hearing sensitivity) reproduction or survival.

Permanent Threshold Shift (PTS)

NMFS is authorizing a very small number of takes by PTS to some marine mammal individuals. The numbers of authorized annual takes by Level A harassment are relatively low for all marine mammal stocks and species (tables 30 and 31). The only activities incidental to which NMFS anticipates PTS may occur is from exposure to impact pile driving and up to three UXO/MEC detonations, which produce sounds that are both impulsive and primarily concentrated in the lower frequency ranges (below 1 kHz) (David, 2006; Krumpel *et al.*, 2021). PTS would consist of minor degradation of hearing capabilities occurring predominantly at frequencies one-half to one octave above the frequency of the energy produced by pile driving or instantaneous UXO/MEC detonation (*i.e.*, the low-frequency region below 2 kHz) (Cody and Johnstone, 1981; McFadden, 1986; Finneran, 2015), not severe hearing impairment. If hearing impairment occurs from either impact pile driving or UXO/MEC detonation, it is most likely that the affected animal would lose a few decibels in its hearing sensitivity, which in most cases is not likely to meaningfully affect its ability to forage and communicate with conspecifics.

Sunrise Wind estimates three UXOs/MECs may be detonated and the exposure analysis conservatively assumes that all of the UXOs/MECs found would consist of the largest charge weight of UXO/MEC (E12; 454 kg). However, it is highly unlikely that all charges would be the maximum size; thus, the number of takes by Level A harassment that may occur incidental to the detonation of the UXOs/MECs is likely less than what is estimated here.

There are no PTS data on cetaceans and only one recorded instance of PTS being induced in older harbor seals (Reichmuth *et al.*, 2019). However, available TTS data (of mid-frequency

hearing specialists exposed to mid- or high-frequency sounds (Southall *et al.*, 2007; NMFS, 2018; Southall *et al.*, 2019) suggest that most threshold shifts occur in the frequency range of the source up to one octave higher than the source. NMFS anticipates a similar result for PTS. Further, no more than a small degree of PTS is expected to be associated with any of the incurred Level A harassment, given it is unlikely that animals would stay in the close vicinity of pile driving for a duration long enough to produce more than a small degree of PTS and given sufficient notice through use of soft-start prior to implementation of full hammer energy during impact pile driving, marine mammals are expected to move away from a sound source that is disturbing prior to it resulting in severe PTS. Given UXO/MEC detonation is instantaneous, the potential for PTS is not a function of duration. NMFS recognizes the distances to PTS thresholds may be large for certain species (*e.g.*, over 4 km based on the largest charge weights; table 20); however, there would be multiple vessels equipped with at minimum 3 PSOs each as well as PAM requirements to observe and acoustically detect marine mammals. A marine mammal within the PTS zone would trigger a delay to detonation; thereby minimizing potential for PTS for all marine mammal species.

Auditory Masking or Communication Impairment

The ultimate potential impacts of masking on an individual are similar to those discussed for TTS (*e.g.*, decreased ability to communicate, forage effectively, or detect predators), but an important difference is that masking only occurs during the time of the signal, as opposed to TTS, which continues beyond the duration of the signal. Also, though, masking can result from the sum of exposure to multiple signals, none of which might individually cause TTS. Fundamentally, masking is referred to as a chronic effect because one of the key potential harmful components of masking is its duration—the fact that an animal would have reduced ability to hear or interpret critical cues becomes much more likely to cause a problem the longer it is occurring. Inherent in the concept of masking is the fact that the potential for the effect is only present during the times that the animal and the source are in close enough proximity for the effect to occur (and further, this time period would need to coincide with a time that the animal was utilizing sounds at the masked frequency).

As the analysis has indicated, for this project NMFS expects that impact pile driving foundations have the greatest potential to mask marine mammal signals, and this pile driving may occur for several, albeit intermittent, hours per day, for multiple days per year. Masking is fundamentally more of a concern at lower frequencies (which are pile-driving dominant frequencies), because low frequency signals propagate significantly further than higher frequencies and because they are more likely to overlap both the narrower low frequency calls of mysticetes, as well as many non-communication cues related to fish and invertebrate prey, and geologic sounds that inform navigation. However, the area in which masking would occur for all marine mammal species and stocks (*e.g.*, predominantly in the vicinity of the foundation pile being driven) is small relative to the extent of habitat used by each species and stock. In summary, the nature of Sunrise Wind's activities, paired with habitat use patterns by marine mammals, does not support the likelihood that the level of masking that could occur would have the potential to affect reproductive success or survival.

Impacts on Habitat and Prey

Construction activities and UXO/MEC detonation may result in fish and invertebrate mortality or injury very close to the source, and all Sunrise Wind's activities may cause some fish to leave the area of disturbance. It is anticipated that any mortality or injury would be limited to a very small subset of available prey and the implementation of mitigation measures such as the use of a noise attenuation system during impact pile driving and UXO/MEC detonation would further limit the degree of impact. Behavioral changes in prey in response to construction activities could temporarily impact marine mammals' foraging opportunities in a limited portion of the foraging range but, because of the relatively small area of the habitat that may be affected at any given time (*e.g.*, around a pile being driven), the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Cable presence is not anticipated to impact marine mammal habitat as these would be buried, and any electromagnetic fields emanating from the cables are not anticipated to result in consequences that would impact marine mammals prey to the extent they would be unavailable for consumption.

The presence and operations of wind turbines within the Lease Area could

have longer-term impacts on marine mammal habitat, as the project would result in the persistence of the structures within marine mammal habitat for more than 30 years. For piscivorous marine mammal species, the presence of structures could result in a beneficial reef effect which may lead to increases in the availability of prey. However, turbine presence and operation are, in general, likely to result in certain oceanographic effects in the marine environment and may alter aggregations and distribution of marine mammal zooplankton prey through changing the strength of tidal currents and associated fronts, changes in stratification, primary production, the degree of mixing, and stratification in the water column (Chen *et al.*, 2021; Johnson *et al.*, 2021; Christiansen *et al.*, 2022; Dorrell *et al.*, 2022). In the recently released BOEM and NOAA Fisheries North Atlantic Right Whale Strategy, the agencies identify the conceptual pathway by which changes to ocean circulation could potentially lead to fitness reduction of NARW, who primarily forage on copepods (see Figure 2). As described in the proposed rule, there is uncertainty regarding the intensity (or magnitude) and spatial extent of turbine operation impacts on marine mammals habitat, including planktonic prey. Recently, a National Academy of Sciences, Engineering, and Medicine panel of independent experts concluded that the impacts of offshore wind operations on NARW and their habitat in the Nantucket Shoals region (a key winter foraging habitat tens of kilometers to the east of the Project Area), is uncertain due to the limited data available at this time, and recognized what data is available is largely based on models from the North Sea that have not been validated by observations (National Academy of Sciences, 2023). The report also identifies that major oceanographic changes have occurred to the Nantucket Shoals region over the past 25 years and it will be difficult to isolate from the much larger variability introduced by natural and other anthropogenic sources (including climate change).

The Project would consist of no more than 88 foundations (87 WTGs and 1 OCS-DC) in the Lease Area (which includes foraging habitat for NARW but is not located near more productive foraging habitat around Nantucket Shoals), which will gradually become operational during construction in batches with all turbines online after construction is complete. The Sunrise Wind Biological Opinion provided a comprehensive evaluation of the best

available science and, based on those data, presented an assessment on the impacts related to presence and operation of the Project over the life of the project on, among other species, marine mammals and their prey (NMFS, 2023). Overall, the Biological Opinion concluded that the Project is not anticipated to adversely impact availability of free-swimming marine mammal prey (*e.g.*, fish) but is anticipated to result in localized effects to the distribution and aggregation of the planktonic prey. However, these impacts are not likely to translate to any overall reduction in the amount of prey in the Project Area. Because changes in the biomass of zooplankton are not anticipated, any higher trophic level impacts are also not anticipated. The Biological Opinion also concluded that effects to listed marine mammal species from the entrainment of ichthyoplankton at the OCS-DC will be so small that they cannot be meaningfully measured, evaluated, or detected and are therefore, insignificant and any impacts, if they occur, from the thermal plume resulting from water discharge would be insignificant.

The ESA-listed marine mammal species in the Biological Opinion include species that forage on a range on prey species (*e.g.*, copepods, fish, invertebrates) and, therefore, the findings in the Biological Opinion also inform our understanding of the anticipated impacts on non-listed marine mammals such as small whales, dolphins, porpoises, and seals. Further, the Biological Opinion assesses the impacts to habitat over the life of the Project; wherein this final rule is effective for only 5 years and turbine operations would occur for only a portion of that time (2–3 years). Overall, in consideration of the Sunrise Wind Lease Area location and the assessment within the Biological Opinion, NMFS does not anticipate that impacts to marine mammal habitat, including prey, would result in meaningful impacts on marine mammals.

Mitigation To Reduce Impacts on All Species

This proposed rulemaking includes a variety of mitigation measures designed to minimize, to the extent practicable, impacts on all marine mammals, with a focus on NARW (the latter is described in more detail below). For impact pile driving of foundation piles and UXO/MEC detonations, ten overarching mitigation and monitoring measures are required, which are intended to reduce both the number and intensity of marine mammal takes: (1) seasonal/time of day work restrictions; (2) use of multiple

PSOs to visually observe for marine mammals (with any detection within specifically designated zones that would trigger a delay or shutdown); (3) use of PAM to acoustically detect marine mammals, with a focus on detecting baleen whales (with any detection within designated zones triggering delay or shutdown); (4) implementation of clearance zones; (5) implementation of shutdown zones; (6) use of soft-starts; (7) use of noise attenuation technology; (8) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Sunrise Wind personnel must be reported to PSOs; (9) sound field verification monitoring; and (10) Vessel Strike Avoidance measures to reduce the risk of a collision with a marine mammal and vessel. For casing pipes, sheet piles and goal post installation and removal, NMFS is requiring five overarching mitigation measures: (1) seasonal/time of day work restrictions; (2) use of multiple PSOs to visually observe for marine mammals (with any detection with specifically designated zones that would trigger a delay or shutdown); (3) implementation of clearance zones; (4) implementation of shutdown zones; and (5) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Sunrise Wind personnel must be reported to PSOs. Lastly, for HRG surveys, NMFS is requiring six measures: (1) measures specifically for Vessel Strike Avoidance; (2) specific requirements during daytime and nighttime HRG surveys; (3) implementation of clearance zones; (4) implementation of shutdown zones; (5) use of ramp-up of acoustic sources; and (6) maintaining situational awareness of marine mammal presence through the requirement that any marine mammal sighting(s) by Sunrise Wind personnel must be reported to PSOs.

The Mitigation section discusses the manner in which the required mitigation measures reduce the magnitude and/or severity of takes of marine mammals. Seasonal restrictions on select activities avoid impacts from the activities. For activities with large harassment isopleths, Sunrise Wind is required to reduce the noise levels generated to the lowest levels practicable and is required to ensure that they do not exceed a noise footprint above that which was modeled, assuming a 10-dB attenuation. Use of a soft-start during impact pile driving will allow animals to move away from (*i.e.*, avoid) the sound source prior to applying higher hammer energy levels

needed to install the pile and Sunrise Wind will not use a hammer energy greater than necessary to install piles. Similarly, ramp-up during HRG surveys would allow animals to move away and avoid the acoustic sources before they reach their maximum energy level. For all activities (with some exception for UXO/MEC detonations, which would not have a shutdown zone), clearance zone and shutdown zone implementation, which are required when marine mammals are within given distances associated with certain impact thresholds for all activities, will reduce the magnitude and severity of marine mammal take. Additionally, the use of multiple PSOs (for WTG and OCS-DC foundation installation, temporary casing pipes, sheet piles, and goal post installation and removal, UXO/MEC detonations, HRG surveys), PAM operators (for impact foundation installation and UXO/MEC detonations), and maintaining awareness of marine mammal sightings reported in the region (for WTG and OCS-DC foundation installation, temporary casing pipes, sheet piles, and goal post installation and removal, UXO/MEC detonations, HRG surveys) will aid in detecting marine mammals that would trigger the implementation of the mitigation measures. The reporting requirements including SFV reporting (for foundation installation, foundation operation, and UXO/MEC detonations), will assist NMFS in identifying if impacts beyond those analyzed in this final rule are occurring, potentially leading to the need to enact adaptive management measures in addition to or in place of the mitigation measures.

Mysticetes

Six mysticete species (comprising six stocks) of cetaceans (NARW, blue whale, humpback whale, fin whale, sei whale, and minke whale) may be taken by harassment. These species, to varying extents, utilize the specified geographic region, including the Project Area, for the purposes of migration, foraging, and socializing. Mysticetes are in the low-frequency hearing group.

Behavioral data on mysticete reactions to pile driving noise are scant. Kraus *et al.* (2019) predicted that the three main impacts of offshore wind farms on marine mammals would consist of displacement, behavioral disruptions, and stress. Broadly, NMFS can look to studies that have focused on other noise sources such as seismic surveys and military training exercises, which suggest that exposure to loud signals can result in avoidance of the sound source (or displacement if the activity continues for a longer duration

in a place where individuals would otherwise have been staying, which is less likely for mysticetes in this area), disruption of foraging activities (if they are occurring in the area), local masking around the source, associated stress responses, and impacts to prey, as well as TTS or PTS in some cases.

Mysticetes encountered in the Project Area are expected to be migrating through and/or engaged in foraging behavior. The extent to which an animal engages in these behaviors in the area is species-specific and varies seasonally. Many mysticetes are expected to predominantly be migrating through the Project Area towards or from primary feeding habitats (*e.g.*, Cape Cod Bay, Great South Channel, and Gulf of St. Lawrence). While NMFS has acknowledged above that mortality, hearing impairment, or displacement of mysticete prey species may result locally from impact pile driving and UXO/MEC detonations, given the very short duration of and broad availability of prey species in the area and the availability of alternative suitable foraging habitat for the mysticete species most likely to be affected, any impacts on mysticete foraging are expected to be minor. Whales temporarily displaced from the Project Area are expected to have sufficient remaining feeding habitat available to them, and would not be prevented from feeding in other areas within the biologically important feeding habitats, including to the east near Nantucket Shoals. In addition, any displacement of whales or interruption of foraging bouts would be expected to be relatively temporary in nature.

The potential for repeated exposures is dependent upon the residency time of whales with migratory animals unlikely to be exposed on repeated occasions and animals remaining in the area to be more likely exposed repeatedly. For mysticetes, where relatively low numbers of species-specific take by Level B harassment are predicted (compared to the abundance of each mysticete species or stock; see table 30) and movement patterns suggest that individuals would not necessarily linger in a particular area for multiple days, each predicted take likely represents an exposure of a different individual, with perhaps a subset of takes for a few species potentially representing a few repeated of a limited number of individuals across multiple days. In other words, the behavioral disturbance to any individual mysticete would, therefore, be expected to mostly likely occur within a single day within a year, or potentially across a few days, and is not expected to impact reproduction or

survival. In general, the duration of exposures would not be continuous throughout any given day, and pile driving would not occur on all consecutive days within a given year due to weather delays or any number of logistical constraints Sunrise Wind has identified. Species-specific analysis regarding potential for repeated exposures and impacts is provided below.

Humpback whales, minke whales, fin whales, and sei whales are the mysticete species for which PTS is anticipated and authorized. As described previously, PTS for mysticetes from some project activities may overlap frequencies used for communication, navigation, or detecting prey. However, given the nature and duration of the activity, the mitigation measures, and likely avoidance behavior, any PTS is expected to be of a small degree, would be limited to frequencies where pile driving noise is concentrated (*i.e.*, only a small subset of their expected hearing range) and would not be expected to impact reproductive success or survival.

North Atlantic Right Whale

NARW are listed as endangered under the ESA and the western Atlantic stock is considered depleted and strategic under the MMPA. As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule, NARW are threatened by a low population abundance, higher than average mortality rates, and lower than average reproductive rates. Recent studies have reported individuals showing high stress levels (*e.g.*, Corkeron *et al.*, 2017) and poor health, which has further implications on reproductive success and calf survival (Christiansen *et al.*, 2020; Stewart *et al.*, 2021; Stewart *et al.*, 2022). As described below, a UME has been designated for NARW. Given this, the status of the NARW population is of heightened concern and, therefore, merits additional analysis and consideration. No Level A harassment, serious injury, or mortality is anticipated or authorized for this species.

For NARW, this rule authorizes up to 45 takes by Level B harassment over the 5-year period, with a maximum annual allowable take of 32 (equating to approximately 9.41 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers expected in the years following foundation installation (*e.g.*, years when only HRG surveys would be occurring). Less than half of all takes (*i.e.*, 22) that would be authorized under this rule would be incidental to foundation installation impact pile

driving, the activity for which NMFS anticipates would result in the most intense behavioral responses. A similar number of takes (*i.e.*, 17) would be incidental to HRG surveys, an activity for which the severity of any behavioral harassment is expected to be very low. The remaining takes would occur incidental to three instantaneous UXO/MEC detonations (*i.e.*, 3 takes) and cable landfall construction (*i.e.*, 3 takes).

Southern New England, including the Project Area, is part of a known migratory corridor for NARW and may be a stopover site for migrating NARW moving to or from southeastern calving grounds and northern foraging grounds. However, NARW range outside of the Project Area for their main feeding, breeding, and calving activities. Additional qualitative observations in southern New England include animals feeding and socializing (Quintana-Rizzo *et al.*, 2021). NARW are primarily concentrated in the northeastern and southeastern sections of the Massachusetts Wind Energy Area (MA WEA) (*i.e.*, east of the Project Area) during the summer (June–August) and winter (December–February) while distribution likely shifts to the west, closer to the Project Area, into the Rhode Island/Massachusetts Wind Energy Area (RI/MA WEA) in the spring (March–May) (Quintana-Rizzo *et al.*, 2021). Approximately 23 percent of the NARW population is present in southern New England from December through May, and the mean residence time has tripled to an average of 13 days during these months (Quintana-Rizzo *et al.*, 2021).

In general, NARW in the Project Area are expected to be engaging in migratory, feeding, and/or social behavior. Migrating whales would typically be moving through the Project Area, rather than lingering for extended periods of time (thereby limiting the potential for repeat exposures); however, foraging whales may remain in the Project Area, with an average residence time of 13 days between December and May (Quintana-Rizzo *et al.*, 2021). It is important to note that the activities that would occur from December through April that may impact NARW using the habitat for foraging or migration would be primarily HRG surveys, of which impacts are expected to be minor given the rapid transmission loss resulting in the small (*i.e.*, less than 150 m) Level B harassment zone. Across all years, if an individual were to be exposed during a subsequent year, the impact of that exposure is likely independent of the previous exposure given the duration between exposures.

As described in the Description of Marine Mammals in the Geographic Area section of the proposed rule, NARW are presently experiencing an ongoing UME (beginning in June 2017). Preliminary findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of NARW. Given the current status of the NARW, the loss of even one individual could significantly impact the population. No mortality, serious injury, or injury of NARW as a result of the Project is expected or may be authorized under this rule. Any disturbance to NARW due to the Project's activities is expected to result in temporary avoidance of the immediate area of construction. As no injury, serious injury, or mortality is expected or authorized and Level B harassment of NARW will be reduced to the level of least practicable adverse impact through use of mitigation measures, the authorized number of takes of NARW would not exacerbate or compound the effects of the ongoing UME.

As described in the general *Mysticetes* section above, foundation installation is likely to result in the highest number of annual takes and is of greatest concern given loud source levels. Sunrise Wind anticipates installing multiple foundations per day; therefore, the number of days with active pile driving is likely to be fewer than 87 (*i.e.*, the number of turbines). This activity is currently scheduled to occur over the course of 2 years, though this rule conservatively assumes all foundation installation would occur in one year; thus, the maximum annual take amount considered in the analysis is the highest number based on all foundations being installed in a single year. Foundation installation would also only occur during times when, based on the best available scientific data, NARW are less frequently encountered and less likely to be engaged in critical foraging behavior (although NMFS recognizes NARW may be present and forage year-round in the Project Area). The potential types, severity, and magnitude of impacts are also anticipated to mirror that described in the general *Mysticetes* section above, including avoidance (the most likely outcome), changes in foraging or vocalization behavior, masking, a small amount of TTS, and temporary physiological impacts (*e.g.*, change in respiration, change in heart rate). Importantly, the effects of the activities are expected to be sufficiently low-level and localized to specific areas as to not meaningfully impact important behaviors such as migration and

foraging for NARW. These takes are expected to result in temporary behavioral disturbance, such as slight displacement (but not abandonment) of migratory habitat or temporary cessation of feeding. Further, given many of these exposures are generally expected to occur to different individual right whales migrating through (*i.e.*, many individuals would not be impacted on more than one day in a year), with some subset potentially being exposed on no more than a few days within the year, they are unlikely to result in energetic consequences that could affect reproduction or survival of any individuals.

Overall, NMFS expects that any behavioral harassment of NARW incidental to the specified activities would not result in changes to their migration patterns or foraging success, as only temporary avoidance of an area during construction is expected to occur. As described previously, NARW migrate, forage, or socialize in the Project Area but are not expected to remain in this habitat for extensive durations relative to core foraging habitats to the east, south of Nantucket and Martha's Vineyard, Cape Cod Bay, or the Great South Channel (Quintana-Rizzo *et al.*, 2021). Any temporarily displaced animals would be able to return to or continue to travel through the Project Area and subsequently utilize this habitat once activities have ceased.

Although acoustic masking may occur in the vicinity of the foundation installation activities, based on the acoustic characteristics of noise associated with pile driving (*e.g.*, frequency spectra, short duration of exposure) and construction surveys (*e.g.*, intermittent signals), NMFS expects masking effects to be minimal during impact pile driving. pneumatic hammering and, for HRG surveys, would not appreciably occur given the directionality of the signals for the HRG survey equipment planned for use and the brief period for when an individual mammal would likely be exposed. Masking is expected to be of low consequence and intermittent within a day and confined to the months in which NARW are at lower densities and primarily moving through the area, the anticipated mitigation effectiveness, and likely avoidance behaviors. TTS is another potential form of Level B harassment that could result in brief periods of slightly reduced hearing sensitivity affecting behavioral patterns by making it more difficult to hear or interpret acoustic cues within the frequency range (and slightly above) of sound produced during impact pile

driving; however, any TTS would likely be of low amount, limited duration, and limited to frequencies where most construction noise is centered (below 2 kHz). NMFS expects that right whale hearing sensitivity would return to pre-exposure levels shortly after migrating through the area or moving away from the sound source.

As described in the Potential Effects to Marine Mammals and Their Habitat section of the proposed rule, the distance of the receiver to the source influences the severity of response with greater distances typically eliciting less severe responses. NMFS recognizes that NARW migrating could be pregnant females (in the fall) and cows with older calves (in the spring), and that these animals may slightly alter their migration course in response to any foundation pile driving; however, NMFS anticipates that course diversion would be of small magnitude. Hence, while some avoidance of the pile-driving activities may occur, NMFS anticipates that any avoidance behavior of migratory NARW would be similar to that of gray whales (Tyack *et al.*, 1983), on the order of hundreds of meters up to 1 to 2 km. This diversion from a migratory path otherwise uninterrupted by the project's activities is not expected to result in meaningful energetic costs that would impact annual rates of recruitment of survival. NMFS expects that NARW would be able to avoid areas during periods of active noise production while not being forced out of this portion of their habitat.

NARW presence in the Project Area is year-round. However, abundance during summer months is lower compared to the winter months with spring and fall serving as "shoulder seasons" wherein abundance waxes (fall) or wanes (spring). Given this year-round habitat usage, in recognition that where and when whales may actually occur during project activities is unknown, as it depends on the annual migratory behaviors, NMFS is requiring a suite of mitigation measures designed to reduce impacts to NARW to the maximum extent practicable. These mitigation measures (*e.g.*, seasonal/daily work restrictions, vessel separation distances, reduced vessel speed) would not only avoid the likelihood of vessel strikes but also would minimize the severity of behavioral disruptions by minimizing impacts (*e.g.*, through sound reduction using attenuation systems and reduced temporal overlap of project activities and NARW). This would further ensure that the number of takes by Level B harassment that are estimated to occur are not expected to affect reproductive success or survivorship by detrimental

impacts to energy intake or cow/calf interactions during migratory transit. However, even in consideration of recent habitat-use and distribution shifts, Sunrise Wind would still be installing foundations when the presence of NARW is expected to be lower.

As described in the Description of Marine Mammals in the Area of Specified Activities section in the preamble of this rule, Sunrise Wind would be constructed within the NARW migratory corridor BIA, which represents areas and months within which a substantial portion of a species or population is known to migrate. The Lease Area is relatively small compared with the migratory BIA area (approximately 351 km² for OCS-A-0487 versus the size of the full NARW migratory BIA, 269,448 km²) and the BIA extends far to the east of the Lease Area (to approximately the shelf edge) where impacts from the Project would not occur. Overall, NARW migration is not expected to be impacted by the planned activities. Although NARW forage to some degree in the Project Area, there are no known breeding or calving areas within the Project Area. Prey species are mobile (*e.g.*, calanoid copepods can initiate rapid and directed escape responses) and are broadly distributed throughout the Project Area. Therefore, any impacts to prey that may occur are also unlikely to impact marine mammals.

The most significant measure to minimize impacts to individual NARW is the seasonal moratorium on all foundation installation activities from January 1 through April 30 and the limitation on these activities in December (*e.g.*, only work with approval from NMFS) when NARW abundance in the Project Area is expected to be highest. NMFS also expects this measure to greatly reduce the potential for mother-calf pairs to be exposed to impact pile driving noise above the Level B harassment threshold during their annual spring migration through the Project Area from calving grounds to primary foraging grounds (*e.g.*, Cape Cod Bay). UXO/MEC detonations are also restricted from December 1 through April 30, annually. NMFS expects that the severity of any take of NARW would be reduced due to the mitigation measures that would ensure that any exposures above the Level B harassment threshold would result in only short-term effects to individuals exposed.

Pile driving and UXO/MEC detonations may only begin in the absence of NARW (based on visual and passive acoustic monitoring). If pile driving or UXO/MEC detonations have

commenced, NMFS anticipates NARW would avoid the area, utilizing nearby waters to carry on pre-exposure behaviors. However, foundation installation activities must be shut down if a NARW is sighted at any distance or acoustically detected within the PAM monitoring zone, unless a shutdown is not feasible due to risk of injury or loss of life. Shutdown may occur anywhere if NARW are seen within or beyond the Level B harassment zone, further minimizing the duration and intensity of exposure. NMFS anticipates that if NARW go undetected and they are exposed to foundation installation or UXO/MEC detonation noise, it is unlikely a NARW would approach the sound source locations to the degree that they would purposely expose themselves to very high noise levels. This is because typical observed whale behavior demonstrates likely avoidance of harassing levels of sound where possible (Richardson *et al.*, 1985). These measures are designed to avoid PTS and also reduce the severity of Level B harassment, including the potential for TTS. While some TTS could occur, given the mitigation measures (*e.g.*, delay pile driving upon a sighting or acoustic detection and shutting down upon a sighting or acoustic detection), the potential for TTS to occur is low.

The clearance and shutdown measures are most effective when detection efficiency is maximized, as the measures are triggered by a sighting or acoustic detection. To maximize detection efficiency during foundation installation, and in consideration of the offshore location of the activities and relatively large mitigation zones, NMFS requires the combination of PAM and visual observers. NMFS is requiring communication protocols with other project vessels and other heightened awareness efforts (*e.g.*, daily monitoring of NARW sighting databases) such that as a NARW approaches the source (and thereby could be exposed to higher noise energy levels), PSO detection efficacy would increase, the whale would be detected, and a delay to commencing foundation installation or shutdown (if feasible) would occur. In addition, the implementation of a soft-start for impact pile driving would provide an opportunity for whales to move away from the source if they are undetected, reducing received levels. The UXO/MEC detonations mitigation measures described above would further reduce the potential to be exposed to high received levels. Clearance and shutdown zones, monitored via PSOs, are also required for cable landfall and

temporary pier activities. Given the nearshore/inshore location of these activities, the smaller mitigation zones, and that the severity of impacts is relatively low, PSOs are able to effectively monitor for marine mammals and PAM is not required.

For HRG surveys, the maximum distance to the Level B harassment threshold is 141 m. The estimated take by Level B harassment associated with HRG surveys is to account for any potential exposures of NARW to active acoustic sources should there be a delay shutting it down (if called for). However, the authorized Level B harassment takes do not account for mitigation and monitoring, and because of the short maximum distance to the Level B harassment threshold, the requirement that vessels maintain a distance of 500 m from any NARW, the fact whales are unlikely to remain in close proximity to an HRG survey vessel for any length of time, and that the acoustic source would be shut down if a NARW is observed within 500 m of the source, any exposure to noise levels above the harassment threshold (if any) would be very brief. To further minimize exposures, ramp-up of sub-bottom profilers must be delayed during the clearance period if PSOs detect a NARW within 500 m of the acoustic source. With implementation of the mitigation requirements, take by Level A harassment is not anticipated and therefore, not authorized. Potential impacts associated with Level B harassment would include low-level, temporary behavioral modifications, most likely in the form of avoidance behavior. Given the high level of precautions taken to minimize both the number and intensity of Level B harassment on NARW, it is unlikely that the anticipated low-level exposures would lead to reduced reproductive success or survival.

As described above, no serious injury or mortality, or Level A harassment of NARW is anticipated or allowed to be authorized under this rule. Extensive NARW-specific mitigation measures (beyond the robust suite required for all species) are expected to further minimize the number and severity of takes by Level B harassment. Given the documented habitat use within the Project Area, many of the individuals predicted to be taken (including no more than 45 instances of take, by Level B harassment) over the course of the 5-year rule (with an annual maximum of no more than 32) would be impacted on only 1 or 2 days in a year, although it is possible that repeated exposures beyond this may occur should NARW briefly use the Project Area as a

'stopover' site and stay or swim in and out of the areas with pile driving for more than day. Further, any impacts to NARW are expected to be in the form of lower-level behavioral disturbance.

Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, we have determined that the take (by Level B harassment) anticipated and allowed to be authorized under this rule will have a negligible impact on the NARW.

Blue Whale

The blue whale is listed as endangered under the ESA, and the Western North Atlantic stock is considered depleted and strategic under the MMPA. There are no known areas of specific biological importance in or around the Project Area, and there is no ongoing UME. The actual abundance of the stock is likely significantly greater than what is reflected in the SAR because the most recent population estimates are primarily based on surveys conducted in U.S. waters and the stock's range extends well beyond the U.S. exclusive economic zone (EEZ). No serious injury or mortality is anticipated or authorized for this species.

The rule authorizes up to eight takes, by Level B harassment, over the 5-year period. The maximum annual allowable take by Level B harassment is 4, which equates to approximately 1.00 percent of the stock abundance if each take were considered to be of a different individual. Based on the migratory nature of blue whales, and the fact that there are neither feeding nor reproductive areas documented in or near the Project Area, and in consideration of the very low number of predicted annual takes, it is unlikely that the predicted instances of takes would represent repeat takes of any individual. In other words, each take likely represents one whale exposed on one day within a year.

With respect to the severity of those individual takes by Level B harassment, NMFS would anticipate impacts to be limited to low-level, temporary behavioral responses with avoidance and potential masking impacts in the vicinity of the turbine installation to be the most likely type of response. Any potential TTS would be concentrated at half or one octave above the frequency band of pile driving noise (most sound is below 2 kHz) which does not include

the full predicted hearing range of blue whales. Any hearing ability temporarily impaired from TTS is anticipated to return to pre-exposure conditions within a relatively short time period after the exposures cease. Any avoidance of the Project Area due to the activities would be expected to be temporary.

Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by Level B harassment anticipated and authorized will have a negligible impact on the western North Atlantic stock of blue whales.

Fin Whale

The fin whale is listed as endangered under the ESA, and the western North Atlantic stock is considered both depleted and strategic under the MMPA. No UME has been designated for this species or stock. No serious injury or mortality is anticipated or authorized for this species.

The rule authorizes up to 91 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, is 4 and 68, respectively (combined, this annual take (n=72) equates to approximately 1.06 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). Given the project overlaps a small portion of a fin whale feeding BIA (2,933 km²) in the months the project will occur (March-October) and that southern New England is generally considered a feeding area, it is likely that some subset of the individual whales exposed could be taken several times annually.

Level B harassment is expected to be in the form of behavioral disturbance, primarily resulting in avoidance of the Project Area where foundation installation is occurring and some low-level TTS and masking that may limit the detection of acoustic cues for relatively brief periods of time. Any potential PTS would be minor (limited to a few dB) and any TTS would be of short duration and concentrated at half or one octave above the frequency band of pile driving noise (most sound is below 2 kHz) which does not include

the full predicted hearing range of fin whales.

Fin whales are present in the waters off of New England year-round and are one of the most frequently observed large whales and cetaceans in continental shelf waters, principally from Cape Hatteras, North Carolina in the Mid-Atlantic northward to Nova Scotia, Canada (Sergeant, 1977; Sutcliffe and Brodie, 1977; CETAP, 1982; Hain *et al.*, 1992; Geo-Marine, 2010; BOEM 2012; Edwards *et al.*, 2015; Hayes *et al.*, 2022). In the Project Area, fin whales densities are highest in the winter and summer months (Roberts *et al.*, 2023) though detections do occur in spring and fall (Watkins *et al.*, 1987; Clark and Gagnon, 2002; Geo-Marine, 2010; Morano *et al.*, 2012). However, fin whales feed more extensively in waters in the Great South Channel north to the Gulf of Maine into the Gulf of St. Lawrence, areas north and east of the Project Area (Hayes *et al.*, 2024).

As described in the proposed rule, the Project Area overlaps approximately 12 percent of a small fin whale feeding BIA (2,933 km²) east of Montauk Point, New York (Figure 2.3 in LaBrecque *et al.*, 2015) that is active from March to October. Foundation installations and UXO/MEC detonations have seasonal work restrictions (*i.e.*, spatial and temporal) such that the temporal overlap between the specified activities and the active BIA timeframe would exclude the months of March and April. A separate larger year-round feeding BIA (18,015 km²) located to the east in the southern Gulf of Maine does not overlap with the Project Area and would thus not be impacted by project activities. NMFS anticipates that if foraging is occurring in the Project Area and foraging whales are exposed to noise levels of sufficient strength, they would avoid the Project Area and move into the remaining area of the feeding BIA that would be unaffected to continue foraging without substantial energy expenditure or, depending on the time of year, travel to the larger year-round feeding BIA.

Given the documented habitat use within the area, some of the individuals taken would likely be exposed on multiple days. However, low level impacts are generally expected from any fin whale exposure. Given the magnitude and severity of the impacts discussed above (including no more than 91 takes over the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 4 and 68, respectively), and in consideration of the required mitigation and other information presented, Sunrise Wind's

activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on the western North Atlantic stock of fin whales.

Humpback Whale

The West Indies Distinct Population Segments (DPS) of humpback whales is not listed as threatened or endangered under the ESA but the Gulf of Maine stock, which includes individuals from the West Indies DPS, is considered strategic under the MMPA. However, as described in the Description of Marine Mammals in the Area of Specified Activities section of the preamble to this final rule, humpback whales along the Atlantic Coast have been experiencing an active UME as elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately 40 percent had evidence of human interaction (vessel strike or entanglement). The UME does not yet provide cause for concern regarding population-level impacts and take from vessel strike and entanglement is not authorized. Despite the UME, the relevant population of humpback whales (*i.e.*, the West Indies breeding population, or DPS of which the Gulf of Maine stock is a part) remains stable at approximately 12,000 individuals.

The rule authorizes up to 116 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, is 3 and 79, respectively (combined, this maximum annual take (n = 82) equates to approximately 5.87 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.*, years when only HRG surveys would be occurring). Given that feeding is considered the principal activity of humpback whales in southern New England waters, it is likely that some subset of the individual whales exposed could be taken several times annually.

Among the activities analyzed, impact pile driving is likely to result in the highest number of Level A harassment annual take (n = 3) of humpback whales. The maximum number of authorized annual take by Level B harassment is highest for impact pile driving (n = 79; WTG plus OCS-DC foundations).

In the western North Atlantic, humpback whales feed during spring,

summer, and fall over a geographic range encompassing the eastern coast of the U.S. Feeding is generally considered to be focused in areas north of the Project Area, including in a feeding BIA in the Gulf of Maine/Stellwagen Bank/Great South Channel, but has been documented off the coast of southern New England and as far south as Virginia (Swingle *et al.*, 2006). Foraging animals tend to remain in the area for extended durations to capitalize on the food sources.

Assuming humpback whales who are feeding in waters within or surrounding the Project Area behave similarly, we expect that the predicted instances of disturbance could consist of some individuals that may be exposed on multiple days if they are utilizing the area as foraging habitat. Also similar to other baleen whales, if migrating, such individuals would likely be exposed to noise levels from the project above the harassment thresholds only once during migration through the Project Area.

For all the reasons described in the *Mysticetes* section above, NMFS anticipates any potential PTS and TTS would be concentrated at half or one octave above the frequency band of pile driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of baleen whales. If TTS is incurred, hearing sensitivity would likely return to pre-exposure levels relatively shortly after exposure ends. Any masking or physiological responses would also be of low magnitude and severity for reasons described above.

Given the magnitude and severity of the impacts discussed above (including no more than 116 takes over the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 3 and 79 respectively), and in consideration of the required mitigation measures and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on the Gulf of Maine stock of humpback whales.

Minke Whale

Minke whales are not listed under the ESA, and the Canadian East Coast stock is neither considered depleted nor strategic under the MMPA. There are no known areas of specific biological importance in or adjacent to the Project Area. As described in the Description of

Marine Mammals in the Area of Specified Activities section of this preamble, a UME has been designated for this species but is pending closure. No serious injury or mortality is anticipated or authorized for this species.

The rule authorizes up to 23 takes by Level A harassment and 415 takes by Level B harassment over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment is 23 and 371, respectively (combined, this annual take ($n = 394$) equates to approximately 1.79 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). As described in the Description of Marine Mammals in the Area of Specified Activities section, minke whales inhabit coastal waters during much of the year and are common offshore the U.S. Eastern Seaboard with a strong seasonal component in the continental shelf and in deeper, off-shelf waters (CETAP, 1982; Hayes *et al.*, 2022; Hayes *et al.*, 2024). Spring through fall are times of relatively widespread and common acoustic occurrence on the continental shelf. From September through April, minke whales are frequently detected in deep-ocean waters throughout most of the western North Atlantic (Clark and Gagnon, 2002; Risch *et al.*, 2014; Hayes *et al.*, 2024). Because minke whales are migratory and their known feeding areas are north and east of the Project Area, including a feeding BIA in the southwestern Gulf of Maine and George's Bank, they would be more likely to be transiting through (with each take representing a separate individual), though it is possible that some subset of the individual whales exposed could be taken up to a few times annually.

As previously detailed in the Description of Marine Mammals in the Area of Specified Activities section, there is a UME for minke whales along the Atlantic coast, from Maine through South Carolina, with the highest number of deaths in Massachusetts, Maine, and New York. Preliminary findings in several of the whales have shown evidence of human interactions or infectious diseases. However, NMFS notes that the population abundance is greater than 21,000, and the take by harassment authorized through this action is not expected to exacerbate the UME. NMFS anticipates that the impacts of this harassment to follow those described in the general *Mysticetes* section above. Any potential PTS would

be minor (*i.e.*, limited to a few dB) and any TTS would be of short duration and concentrated at half or one octave above the frequency band of pile driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of minke whales. Level B harassment would be temporary, with primary impacts being temporary displacement of the Project Area but not abandonment of any migratory or foraging behavior.

Given the magnitude and severity of the impacts discussed above (e.g., no more than 438 takes of the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 23 and 371, respectively), and in consideration of the required mitigation and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on the Canadian Eastern Coastal stock of minke whales.

Sei Whale

Sei whales are listed as endangered under the ESA, and the Nova Scotia stock is considered both depleted and strategic under the MMPA. There are no known areas of specific biological importance in or adjacent to the Project Area, and no UME has been designated for this species or stock. No serious injury or mortality is anticipated or authorized for this species. The rule authorizes up to 37 takes by harassment over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, are 2 and 27, respectively (combined, this annual take ($n = 29$) equates to approximately 0.46 percent of the stock abundance if each take were considered to be of a different individual). As described in the Description of Marine Mammals in the Area of Specified Activities section of this preamble, most of the sei whale distribution is concentrated in Canadian waters and seasonally in northerly U.S. waters, although they are uncommonly observed in the waters off of New York. Because sei whales are migratory and their known feeding areas are east and north of the Project Area (e.g., there is a feeding BIA in the Gulf of Maine), they would be more likely to be moving through and, considering this and the very low number of total takes, it is unlikely that any individual would be exposed more than once within a given year.

With respect to the severity of those individual takes by Level B harassment, NMFS anticipate impacts to be limited to low-level, temporary behavioral responses with avoidance and potential masking impacts in the vicinity of the WTG installation to be the most likely type of response. Any potential PTS and TTS would likely be concentrated at half or one octave above the frequency band of pile driving noise (most sound is below 2 kHz) which does not include the full predicted hearing range of sei whales. Moreover, any TTS would be of a small degree. Any avoidance of the Project Area due to the Project's activities would be expected to be temporary.

Given the magnitude and severity of the impacts discussed above (including no more than 37 takes of the course of the 5-year rule, and a maximum annual allowable take by Level A harassment and Level B harassment, of 2 and 27, respectively), and in consideration of the required mitigation and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on the Nova Scotia stock of sei whales.

Odontocetes

In this section, NMFS includes information here that applies to all of the odontocete species and stocks addressed below. Odontocetes include dolphins, porpoises, and all other whales possessing teeth and NMFS further divides them into the following subsections: sperm whales, dolphins and small whales, and harbor porpoise. These sub-sections include more specific information, as well as conclusions for each stock represented.

The authorized takes of odontocetes are incidental to Sunrise Wind's specified activities. No serious injury or mortality is anticipated or authorized. NMFS anticipates that, given ranges of individuals (*i.e.*, that some individuals remain within a small area for some period of time) and non-migratory nature of some odontocetes in general (especially as compared to mysticetes), a larger subset of these takes are more likely to represent multiple exposures of some number of individuals than is the case for mysticetes, though some takes may also represent one-time exposures to an individual. Foundation installation is likely to disturb odontocetes to the greatest extent compared to UXO/MEC detonations and

HRG surveys. While NMFS expects animals to avoid the area during foundation installation and UXO/MEC detonations, their habitat range is extensive compared to the area ensonified during these activities. In addition, as described above, UXO/MEC detonations are instantaneous; therefore, any disturbance would be very limited in time.

As described earlier, Level B harassment may include direct disruptions in behavioral patterns (e.g., avoidance, changes in vocalizations (from masking) or foraging), as well as those associated with stress responses or TTS. Odontocetes are highly mobile species, and similar to mysticetes, NMFS expects any avoidance behavior to be limited to the area near the sound source. While masking could occur during foundation installation, it would only occur in the vicinity of and during the duration of the activity and would not generally occur in a frequency range that overlaps most odontocete communication or any echolocation signals. The mitigation measures (e.g., use of sound attenuation systems, implementation of clearance and shutdown zones) would also minimize received levels such that the severity of any behavioral response would be expected to be less than exposure to unmitigated noise exposure.

Any masking or TTS effects are anticipated to be of low severity. First, while the frequency range of pile driving, the most impactful planned activity in terms of response severity, falls within a portion of the frequency range of most odontocete vocalizations, odontocete vocalizations span a much wider range than the low frequency construction activities planned for the project. Also, as described above, recent studies suggest odontocetes have a mechanism to self-mitigate the impacts of noise exposure (i.e., reduce hearing sensitivity), which could potentially reduce TTS impacts. Any masking or TTS is anticipated to be limited and would typically only interfere with communication within a portion of an odontocete's range and as discussed earlier, the effects would only be expected to be of a short duration and for TTS, a relatively small degree.

Furthermore, odontocete echolocation occurs predominantly at frequencies significantly higher than low frequency construction activities. Therefore, there is little likelihood that threshold shift would interfere with feeding behaviors. For HRG surveys, the sources operate at higher frequencies than foundation installation activities and UXO/MEC detonations. However, sounds from these sources attenuate very quickly in

the water column, as described above. Therefore, any potential for PTS and TTS and masking is very limited. Further, odontocetes (e.g., common dolphins, spotted dolphins, bottlenose dolphins) have demonstrated an affinity to bow-ride actively surveying HRG surveys. Therefore, the severity of any harassment, if it does occur, is anticipated to be minimal based on the lack of avoidance previously demonstrated by these species.

The waters off the coast of New York are used by several odontocete species. However, none except the sperm whale are listed under the ESA and there are no known habitats of particular importance. In general, odontocete habitat ranges are far-reaching along the Atlantic coast of the U.S. and the waters off of New England, including the Project Area, do not contain any particularly unique odontocete habitat features.

Sperm Whales

Sperm whales are listed as endangered under the ESA, and the North Atlantic stock is considered both depleted and strategic under the MMPA. The North Atlantic stock spans the East Coast out into oceanic waters well beyond the U.S. EEZ. Although listed as endangered, the primary threat faced by the sperm whale across its range (i.e., commercial whaling) has been eliminated. Current potential threats to the species globally include vessel strikes, entanglement in fishing gear, anthropogenic noise, exposure to contaminants, climate change, and marine debris. There is no currently reported trend for the stock and although the species is listed as endangered under the ESA, there are no current related issues or events associated with the status of the stock that cause particular concern (e.g., no UMEs). There are no known areas of biological importance (e.g., critical habitat or BIAs) in or near the Project Area. No mortality or serious injury is anticipated or authorized for this species. The rule authorizes up to 22 takes by Level B harassment over the 5-year period. The maximum annual allowable take by Level B harassment is 14, which equates to approximately 0.24 percent of the stock abundance, if each take were considered to be of a different individual, with lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). Given sperm whale's preference for deeper waters, especially for feeding, it is unlikely that individuals will remain in the Project Area for multiple days, and therefore, the estimated takes likely

represent exposures of different individuals on 1 day each annually.

If sperm whales are present in the Project Area during any Project activities, they will likely be only transient visitors and not engaging in any significant behaviors. Further, the potential for TTS is low for reasons described in the general *Odontocete* section, but if it does occur, any hearing shift would be small and of a short duration. Because whales are not expected to be foraging in the Project Area, any TTS is not expected to interfere with foraging behavior.

Given the magnitude and severity of the impacts discussed above (including no more than 22 takes by Level B harassment over the course of the 5-year rule, a maximum annual allowable take of 14, and in consideration of the required mitigation and other information presented, Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by Level B harassment anticipated and authorized will have a negligible impact on the North Atlantic stock of sperm whales.

Dolphins and Small Whales (including delphinids)—The six species and stocks included in this group (which are indicated in table 2 in the *Delphinidae* family) are not listed under the ESA, nor are they listed as depleted or strategic under the MMPA. There are no known areas of specific biological importance in or around the Project Area. As described above for any of these species and no UMEs have been designated for any of these species. No serious injury or mortality is anticipated or authorized for these species.

The six delphinid species (constituting six stocks) with takes authorized for the Project are Atlantic white-sided dolphin, Atlantic spotted dolphin, bottlenose dolphin, long-finned pilot whale, Risso's dolphin, and common dolphin. The rule would allow for the total authorization of 70 to 11,001 takes (depending on species) by Level B harassment, over the 5-year period. The maximum annual allowable take for these species by Level B harassment, would range from 46 (Risso's dolphin) to 6,526 (common dolphin). Overall, this annual take equates to approximately 0.10 (Risso's dolphin) to 7.01 (common dolphin) percent of the stock abundance (if each take were considered to be of a different individual, which is not likely the case) depending on the species, with far lower numbers than that expected in the years without foundation installation

(e.g., years when only HRG surveys would be occurring).

The number of takes, likely movement patterns of the affected species, and the intensity of any Level B harassment, combined with the availability of alternate nearby foraging habitat suggests that the likely impacts would not impact the reproduction or survival of any individuals. While delphinids may be taken on several occasions, none of these species are known to have small home ranges within the Project Area or known to be particularly sensitive to anthropogenic noise. Some TTS can occur, but it would be limited to the frequency ranges of the activity and any loss of hearing sensitivity is anticipated to return to pre-exposure conditions shortly after the animals move away from the source or the source ceases.

Across these species, the maximum number of incidental takes, by Level B harassment (no Level A harassment is anticipated or authorized), authorized in any one year ranges between 46 (Risso's dolphin) to 6,526 (common dolphin). The number of takes authorized in the Year 2 through Year 5 of the rule is notably less and the 5-year total number of take (by Level B harassment) authorized ranges between 70 (Risso's dolphin) and 11,001 (common dolphin). Further, though the estimated numbers of take are comparatively higher than the numbers for mysticetes, NMFS notes that for all species they are relatively low relative to the population abundance.

For the common dolphin, given both the comparatively higher number of takes and the higher number of takes relative to the stock abundance, as well as the residential tendencies of this species, while some of the takes likely represent exposures of different individuals on 1 or 2 days a year, it is likely that some subset of the individuals exposed could be taken several times annually. As described above for odontocetes broadly, given the comparatively higher number of estimated takes for some species and the behavioral patterns of odontocetes, NMFS anticipates that a fair number of these instances of take in a day represent multiple exposures of a smaller number of individuals, meaning the actual number of individuals taken is lower. Although some amount of repeated exposure to some individuals is likely given the duration of activity planned for the specified activities, the intensity of any Level B harassment combined with the availability of alternate nearby foraging habitat suggests that the likely impacts would not impact the reproduction or survival of any individuals.

Overall, the populations of all delphinid and small whale species and stocks for which NMFS authorizes take are stable (no declining population trends). None of these stocks are experiencing existing UMEs. No mortality, serious injury, or Level A harassment is anticipated or authorized for any of these species. Given the magnitude and severity of the impacts discussed above and in consideration of the required mitigation and other information presented, as well as the status of these stocks, the specified activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on all of the following species and stocks: Atlantic white-sided dolphins, Atlantic spotted dolphins, bottlenose dolphins, long-finned pilot whales, Risso's dolphins, and common dolphins.

Harbor Porpoises—Harbor porpoises are not listed as threatened or endangered under the ESA, and the Gulf of Maine/Bay of Fundy stock is neither considered depleted or strategic under the MMPA. The stock is found predominantly in northern U.S. coastal waters (less than 150 m depth) and up into Canada's Bay of Fundy (between New Brunswick and Nova Scotia). Although the population trend is not known, there are no current related issues or events associated with the status of the stock that cause particular concern (e.g., no UMEs). No mortality or non-auditory injury are anticipated or authorized for this stock.

The rule authorizes up to 1,187 takes, by harassment only, over the 5-year period. The maximum annual allowable take by Level A harassment and Level B harassment, would be 20 and 894, respectively (combined, this annual take ($n = 914$) equates to approximately 1.07 percent of the stock abundance, if each take were considered to be of a different individual), with lower numbers than that expected in the years without foundation installation (e.g., years when only HRG surveys would be occurring). Given the number of takes, while many of the takes likely represent exposures of different individuals on 1 day a year, some subset of the individuals exposed could be taken up to a few times annually.

Regarding the severity of takes by Level A harassment and Level B harassment, because harbor porpoises are particularly sensitive to noise, it is likely that a fair number of the responses could be of a moderate

nature, particularly to pile driving, UXO/MEC detonations, and pneumatic hammering. In response to pile driving, harbor porpoises are likely to avoid the area during construction, as previously demonstrated in Tougaard *et al.* (2009) in Denmark, in Dahne *et al.* (2013) in Germany, and in Vallejo *et al.* (2017) in the United Kingdom, although a study by Graham *et al.* (2019) may indicate that the avoidance distance could decrease over time. However, foundation installation is scheduled to occur off the coast of New York and given alternative foraging areas, any avoidance of the area by individuals is not likely to impact the reproduction or survival of any individuals. Regarding UXO/MEC detonations and pneumatic hammering, any TTS or behavioral response would be brief and of low severity given only 1 UXO/MEC would be detonated on any given day and only up to 3 UXO/MECs could be detonated under these regulations and the brevity of pneumatic hammering required for installation and removal of both casing pipes, as previously described in the proposed rule.

With respect to PTS and TTS, the effects on an individual are likely relatively low, given the frequency bands of pile driving (most energy below 2 kHz) compared to harbor porpoise hearing (150 Hz to 160 kHz peaking around 40 kHz). Specifically, TTS is unlikely to impact hearing ability in their more sensitive hearing ranges or the frequencies in which they communicate and echolocate. NMFS expects that any PTS that may occur to be within the very low end of their hearing range where harbor porpoises are not particularly sensitive, and any PTS would be of small magnitude. As such, any PTS would not interfere with key foraging or reproductive strategies necessary for reproduction or survival.

As discussed in Hayes *et al.* (2022), harbor porpoises are seasonally distributed. During fall (October through November) and spring (April through June), harbor porpoises are widely dispersed from New Jersey to Maine with lower densities farther north and south. During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, and lower densities are found in waters off New York to New Brunswick, Canada. In non-summer months they have been seen from the coastline to deep waters (>1800 m; Westgate *et al.*, 1998), although the majority are found over the continental shelf. While harbor porpoises are likely to avoid the area during any of the project's construction activities, as demonstrated during

European wind farm construction, the time of year in which most work would occur is when harbor porpoises are not in highest abundance, and any work that does occur would not result in the species' abandonment of the waters off of New York.

Given the magnitude and severity of the impacts discussed above, and in consideration of the required mitigation and other information presented, the specified activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on the Gulf of Maine/ Bay of Fundy stock of harbor porpoises.

Phocids (Harbor Seals and Gray Seals)

The harbor seal and gray seal are not listed under the ESA, and neither the western North Atlantic stock of gray seal nor the western North Atlantic stock of harbor seal are considered depleted or strategic under the MMPA. There are no known areas of specific biological importance in or around the Project Area. As described in the Description of Marine Mammals in the Area of Specified Activities section of this preamble, a UME has been designated for harbor seals and gray seals and is described further below. No serious injury or mortality is anticipated or authorized for this species.

For the two seal species, the rule authorizes up to between 1,211 (gray seals) and 2,717 (harbor seals) takes, by harassment only, over the 5-year period. The maximum annual allowable take for each species by Level A harassment and Level B harassment, would range from 5 to 2,189 (harbor seals), and 3 to 975 (gray seals), respectively (combined, this annual take ($n = 2,194$ and 978) equates to approximately 3.50 to 3.58 percent of the stock abundance, if each take were considered to be of a different individual), with far lower numbers than that expected in the years without foundation installation (*e.g.*, years when only HRG surveys would be occurring). Though gray seals and harbor seals are considered migratory and no specific feeding areas have been defined for the area, the higher number of takes relative to the stock abundance suggests that while some of the takes likely represent exposures of different individuals on one day a year, it is likely that some subset of the individuals exposed could be taken several times annually.

Harbor and gray seals occur in southern New England waters most often from December through April. Seals are more likely to be close to shore

(*e.g.*, closer to the edge of the area encompassed above NMFS' harassment threshold), such that exposure to foundation installation would be expected to be at comparatively lower levels. Seals are known to haulout in New York. However, neither Sunrise Wind nor NMFS expect in-air sounds produced to cause take of hauled out pinnipeds at distances greater than several hundred meters. NMFS does not expect any harassment to occur and has not authorized any take from in-air impacts on hauled out seals.

As described in the Potential Effects to Marine Mammals and Their Habitat section in the proposed rule, construction of wind farms in Europe resulted in pinnipeds temporarily avoiding construction areas but returning within short time frames after construction was complete (Carroll *et al.*, 2010; Hamre *et al.*, 2011; Hastie *et al.*, 2015; Russell *et al.*, 2016; Brasseur *et al.*, 2010). Effects on pinnipeds that are taken by Level B harassment in the Project Area would likely be limited to avoidance of the area and reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals would simply move away from the sound source and be temporarily displaced from those areas (Lucke *et al.*, 2006; Edren *et al.*, 2010; Skeate *et al.*, 2012; Russell *et al.*, 2016). Given the low anticipated magnitude of impacts from any given exposure (*e.g.*, temporary avoidance), even repeated Level B harassment across a few days of some small subset of individuals, which could occur, is unlikely to result in impacts on the reproduction or survival of any individuals. Moreover, pinnipeds would benefit from the mitigation measures described in § 217.315 of the regulations below.

As described above, noise from pile driving is mainly low frequency, and while any PTS and TTS that does occur would fall within the lower end of pinniped hearing ranges (50 Hz to 86 kHz), PTS and TTS would not occur at frequencies around 5 kHz where pinniped hearing is most susceptible to noise-induced hearing loss (Kastelein *et al.*, 2018). In summary, any PTS and TTS would be of small degree and not occur across the entire, or even most sensitive, hearing range. Hence, any impacts from PTS and TTS are likely to be of low severity and not interfere with behaviors critical to reproduction or survival. Given the magnitude and severity of the impacts of the Sunrise Project discussed above, and in consideration of the required mitigation and other information presented,

Sunrise Wind's activities are not expected to result in impacts on the reproduction or survival of any individuals, much less affect annual rates of recruitment or survival. For these reasons, NMFS has determined that the take by harassment anticipated and authorized will have a negligible impact on harbor and gray seals.

Negligible Impact Determination

No mortality or serious injury is anticipated to occur or authorized. As described in the analysis above, the impacts resulting from the Project's activities cannot be reasonably expected to, and are not reasonably likely to, adversely affect any of the species or stocks through effects on annual rates of recruitment or survival. Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the required mitigation and monitoring measures, NMFS finds that the marine mammal take from all of the specified activities combined will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the maximum number of individuals estimated to be taken in a year to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is less than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

NMFS is authorizing incidental take by Level A harassment and/or Level B harassment of 16 species of marine mammals (with 16 managed stocks). The maximum number of instances of takes by combined Level A harassment and Level B harassment possible within any 1 year relative to the best available population abundance is less than one-third for all species and stocks potentially impacted. For 8 stocks, 1 percent or less of the stock abundance is authorized to be annually taken by

harassment; for the other 8 stocks, less than 10 percent of the stock abundance is authorized to be annually taken by harassment. Specific to the NARW, the maximum number of annual takes, which is by Level B harassment as no Level A harassment is anticipated or authorized, is 32, or 9.41 percent of the stock abundance, assuming that each instance of take represents a different individual. Please see table 30 for information relating to this small numbers analysis.

Based on the analysis contained herein of the activities (including the required mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals would be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Classification

Endangered Species Act (ESA)

Section 7(a)(2) of the ESA of 1973 (16 U.S.C. 1531 *et seq.*) requires that each Federal agency ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the promulgation of rulemakings, NMFS consults internally whenever it proposes to authorize take for endangered or threatened species, in this case with the NOAA GARFO.

There are five marine mammal species under NMFS jurisdiction that are listed as endangered or threatened under the ESA that may be taken (by harassment) incidental to construction of the project: NARW, sei whale, fin whale, blue whale, and sperm whale. The Permit and Conservation Division requested initiation of section 7 consultation on April 11, 2023 with GARFO on the issuance of the Sunrise Wind regulations and the associated 5-year LOA under section 101(a)(5)(A) of the MMPA.

NMFS issued a Biological Opinion on September 28, 2023, concluding that the promulgation of the rule and issuance of

LOAs thereunder is not likely to jeopardize the continued existence of threatened and endangered species under NMFS' jurisdiction and is not likely to result in the destruction or adverse modification of designated or proposed critical habitat. The Biological Opinion is available at: <https://repository.library.noaa.gov/view/noaa/55726>.

Sunrise Wind is required to abide by the promulgated regulations, as well as the reasonable and prudent measures and terms and conditions of the Biological Opinion and Incidental Take Statement, as issued by NMFS.

National Environmental Policy Act (NEPA)

To comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order 216-6A, NMFS must evaluate the proposed action (*i.e.*, promulgation of regulation) and alternatives with respect to potential impacts on the human environment. NMFS participated as a cooperating agency on the BOEM final Environmental Impact Statement (FEIS) for the Sunrise Wind project, which was finalized on December 16, 2023 (88 FR 86927) and is available at: <https://www.boem.gov/renewable-energy/state-activities/sunrise-wind>. In accordance with 40 CFR 1506.3, NMFS independently reviewed and evaluated the 2023 Sunrise Wind FEIS and determined that it is adequate and sufficient to meet our responsibilities under NEPA for the promulgation of this rule and issuance of the associated LOA. NMFS, therefore, has adopted the 2023 Sunrise Wind FEIS through a joint Record of Decision (ROD) with BOEM. The joint ROD for adoption of the 2023 Sunrise Wind FEIS and promulgation of this final rule and subsequent issuance of a LOA can be found at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>.

Executive Order 12866

The Office of Management and Budget has determined that this rule is not significant for purposes of Executive Order 12866.

Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.*), the Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration during the proposed rule stage that this action would not have a significant economic impact on a substantial number of small

entities. The factual basis for the certification was published in the proposed rule and is not repeated here. No comments were received regarding this certification. As a result, a regulatory flexibility analysis was not required and none was prepared.

Paperwork Reduction Act

Notwithstanding any other provision of law, no person is required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid Office of Management and Budget (OMB) control number. These requirements have been approved by OMB under control number 0648-0151 and include applications for regulations, subsequent LOA, and reports. Send comments regarding any aspect of this data collection, including suggestions for reducing the burden, to NMFS.

Coastal Zone Management Act (CZMA)

The Coastal Zone Management Act requires that any applicant for a required Federal license or permit to conduct an activity, within the coastal zone or within the geographic location descriptions (*i.e.*, areas outside the coastal zone in which an activity would have reasonably foreseeable coastal effects), affecting any land or water use or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. NMFS determined that Sunrise Wind's application for an incidental take regulations is an unlisted activity, and thus is not subject to Federal consistency requirements in the absence of the receipt and prior approval of an unlisted activity review request from the state by the Director of NOAA's Office for Coastal Management. Pursuant to 15 CFR 930.54, NMFS published notice of receipt of Sunrise Wind's application in the **Federal Register** on June 2, 2022 (87 FR 33470) and published notice of the proposed rule on February 10, 2023 (88 FR 8996). The States of New York, Rhode Island, and Massachusetts did not request approval from the Director of NOAA's Office for Coastal Management to review Sunrise Wind's application as an unlisted activity, and the time period for making such request has expired. Therefore, NMFS has determined the incidental take authorization is not subject to Federal consistency review.

List of Subjects in 50 CFR Part 217

Administrative practice and procedure, Endangered and threatened species, Fish, Fisheries, Marine mammals, Penalties, Reporting and recordkeeping requirements, Wildlife.

Dated: May 2, 2024.

Samuel D. Rauch III,

Deputy Assistant Administrator for Regulatory Programs, National Marine Fisheries Service.

For reasons set forth in the preamble, NMFS amends 50 CFR part 217 as follows:

PART 217—REGULATIONS GOVERNING THE TAKING AND IMPORTING OF MARINE MAMMALS

■ 1. The authority citation for part 217 continues to read as follows:

Authority: 16 U.S.C. 1361 *et seq.*, unless otherwise noted.

■ 2. Add subpart FF, consisting of §§ 217.310 through 217.319, to read as follows:

Subpart FF—Taking Marine Mammals Incidental to the Sunrise Wind Offshore Wind Farm Project Offshore Rhode Island

Sec.

- 217.310 Specified activity and specified geographical region.
- 217.311 Effective dates.
- 217.312 Permissible methods of taking.
- 217.313 Prohibitions.
- 217.314 Mitigation requirements.
- 217.315 Monitoring and reporting requirements.
- 217.316 Letter of Authorization.
- 217.317 Modifications of Letter of Authorization.
- 217.318–217.319 [Reserved]

Subpart AF—Taking Marine Mammals Incidental to the Sunrise Wind Offshore Wind Farm Project Offshore New York

§ 217.310 Specified activity and specified geographical region.

(a) Regulations in this subpart apply only to activities associated with the Sunrise Wind Offshore Wind Farm Project by Sunrise Wind, LLC (Sunrise Wind) and those persons Sunrise Wind authorizes or funds to conduct activities on its behalf in the area outlined in paragraph (b) of this section. Requirements imposed on Sunrise Wind must be implemented by those persons it authorizes or funds to conduct activities on its behalf.

(b) The specified geographical region is the Mid-Atlantic Bight, which extends between Cape Hatteras, North Carolina, and Martha’s Vineyard, Massachusetts, extending westward into the Atlantic to the 100-m isobath, and includes, but is not limited to, the Bureau of Ocean Energy Management (BOEM) Lease Area Outer Continental Shelf (OCS)–A–0487 Commercial Lease of Submerged Lands for Renewable Energy Development, one export cable route, and one sea-to-shore transition point at Smith Point County Park in Shirley, New York.

(c) The specified activities are impact pile driving wind turbine generator (WTG) and offshore converter substation (OCS–DC) foundations; pneumatic hammering for installation and removal of temporary casing pipes; vibratory pile driving for installation and removal of temporary goal post and sheet piles; impact and vibratory pile driving associated with the Smith Point County Park temporary pier, high-resolution geophysical (HRG) site characterization surveys; detonation of unexploded ordnances (UXOs) or munitions and

explosives of concern (MECs); fisheries and benthic monitoring surveys; placement of scour protection; trenching, laying, and burial activities associated with the installation of the export cable from the OCS–DC to shore based converter stations and inter-array cables between WTG foundations; vessel transit within the specified geographical region to transport crew, supplies, and materials; and WTG operations.

§ 217.311 Effective dates.

Regulations in this subpart are effective from June 21, 2024, through June 20, 2029.

§ 217.312 Permissible methods of taking.

Under a LOA issued pursuant to §§ 216.106 and 217.316, Sunrise Wind and those persons it authorizes or funds to conduct activities on its behalf, may incidentally, but not intentionally, take marine mammals within the specified geographic area in the following ways, provided Sunrise Wind is in compliance with all terms, conditions, and requirements of the regulations in this subpart and the appropriate LOA.

(a) By Level B harassment associated with the acoustic disturbance of marine mammals by impact pile driving WTG and OCS–DC foundations; pneumatic hammering of casing pipes; vibratory pile driving of goal posts and sheet piles; UXOs/MEC detonations, and HRG site characterization surveys.

(b) By Level A harassment associated with impact pile driving WTG and OCS–DC foundations and UXO/MEC detonations.

(c) The incidental take of marine mammals by the activities listed in paragraphs (a) and (b) of this section is limited to the following species and stocks:

TABLE 1 TO PARAGRAPH (c)

Marine mammal species	Scientific name	Stock
Blue whale	<i>Balaenoptera musculus</i>	Western North Atlantic.
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic.
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia.
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian East Stock.
North Atlantic right whale	<i>Eubalaena glacialis</i>	Western North Atlantic.
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine.
Sperm whale	<i>Physeter macrocephalus</i>	North Atlantic.
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic.
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic.
Bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic Offshore.
Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic.
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy.
Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic.
Risso’s dolphin	<i>Grampus griseus</i>	Western North Atlantic.
Gray seal	<i>Halichoerus grypus</i>	Western North Atlantic.
Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic.

§ 217.313 Prohibitions.

Except for the takings described in § 217.312 and authorized by a LOA issued under § 217.316 or § 217.317, it is unlawful for any person to do any of the following in connection with the activities described in this subpart.

(a) Violate or fail to comply with the terms, conditions, and requirements of this subpart or a LOA issued under §§ 217.316 and 217.317.

(b) Take any marine mammal not specified in § 217.312(c).

(c) Take any marine mammal specified in § 217.312(c) in any manner other than specified in § 217.312(a) and (b).

(d) Take any marine mammal, as specified in § 217.312(c), after NMFS determines such taking results in more than a negligible impact on the species or stocks of such marine mammals.

§ 217.314 Mitigation requirements.

When conducting the specified activities identified in §§ 217.310(c) and 217.312, Sunrise Wind must implement the following mitigation measures contained in this section and any LOA issued under § 217.316 or § 217.317. These mitigation measures include, but are not limited to:

(a) *General conditions.* Sunrise Wind must comply with the following general measures:

(1) A copy of any issued LOA must be in the possession of Sunrise Wind and its designees, all vessel operators, visual protected species observers (PSOs), passive acoustic monitoring (PAM) operators, pile driver operators, and any other relevant designees operating under the authority of the issued LOA;

(2) Sunrise Wind must conduct training for construction supervisors, construction crews, and the PSO and PAM team prior to the start of all construction activities and when new personnel join the work in order to explain responsibilities, communication procedures, marine mammal monitoring and reporting protocols, and operational procedures. A description of the training program must be provided to NMFS at least 60 days prior to the initial training before in-water activities begin. Confirmation of all required training must be documented on a training course log sheet and reported to NMFS Office of Protected Resources prior to initiating project activities;

(3) PSOs and PAM operators have the authority to call for a delay or shutdown to an activity and Sunrise Wind must instruct all personnel regarding the authority of the PSOs and PAM operators. If a shutdown of an activity is called for by a PSO or PAM operator, Sunrise Wind must take the required

mitigative action unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability. Any disagreements between the PSO, PAM operator, and the activity operator regarding delays or shutdowns must only be discussed after the mitigative action has occurred;

(4) Sunrise Wind and PSOs are required to use available sources of information on North Atlantic right whale presence to aid in monitoring efforts. These include daily monitoring of the Right Whale Sighting Advisory System, consulting of the WhaleAlert app, and monitoring of the Coast Guard's VHF Channel 16 to receive notifications of marine mammal sightings and information associated with any Dynamic Management Areas (DMA) and Slow Zones;

(5) Any marine mammal observation by project personnel must be immediately communicated to any on-duty PSOs and PAM operator(s). Any large whale observation or acoustic detection must be conveyed to all vessel captains;

(6) If an individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant clearance zone prior to beginning a specified activity, the activity must be delayed. If an activity is ongoing and an individual from a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized take number has been met, is observed entering or within the relevant shutdown zone, the activity must be shut down (*i.e.*, cease) immediately, unless shutdown would result in imminent risk of injury or loss of life to an individual, pile refusal, or pile instability. The activity must not commence or resume until the animal(s) has been confirmed to have left the clearance or shutdown zones and is on a path away from the applicable zone or after 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species;

(7) In the event that a large whale is sighted or acoustically detected that cannot be confirmed as a non-North Atlantic right whale, it must be treated as if it were a North Atlantic right whale for purposes of mitigation;

(8) For in-water construction heavy machinery activities listed in section 1(a)(1), if a marine mammal is detected within, or about to enter, 10 meters (m) (32.8 feet (ft)) of equipment, Sunrise Wind must cease operations until the

marine mammal has moved more than 10 m on a path away from the activity to avoid direct interaction with equipment;

(9) All vessels must be equipped with a properly installed, operational Automatic Identification System (AIS) device and Sunrise Wind must report all Maritime Mobile Service Identify (MMSI) numbers to NMFS Office of Protected Resources;

(10) By accepting a LOA, Sunrise Wind consents to on-site observation and inspections by Federal agency personnel (including NOAA personnel) during activities described in this subpart, for the purposes of evaluating the implementation and effectiveness of measures contained within this subpart and the LOA; and

(11) It is prohibited to assault, harm, harass (including sexually harass), oppose, impede, intimidate, impair, or in any way influence or interfere with a PSO, PAM operator, or vessel crew member acting as an observer, or attempt the same. This prohibition includes, but is not limited to, any action that interferes with an observer's responsibilities, or that creates an intimidating, hostile, or offensive environment. Personnel may report any violations to the NMFS Office of Law Enforcement.

(b) *Vessel strike avoidance measures.* Sunrise Wind must comply with the following vessel strike avoidance measures while in the specific geographic region, unless a deviation is necessary to maintain safe maneuvering speed and justified because the vessel is in an area where oceanographic, hydrographic, and/or meteorological conditions severely restrict the maneuverability of the vessel; an emergency situation presents a threat to the health, safety, life of a person; or when a vessel is actively engaged in emergency rescue or response duties, including vessel-in-distress or environmental crisis response. An emergency is defined as a serious event that occurs without warning and requires immediate action to avert, control, or remedy harm.

(1) Prior to the start of the Project's activities involving vessels, all vessel personnel must receive a protected species training that covers, at a minimum, identification of marine mammals that have the potential to occur in the specified geographical region; detection and observation methods in both good weather conditions (*i.e.*, clear visibility, low winds, low sea states) and bad weather conditions (*i.e.*, fog, high winds, high sea states, with glare); sighting communication protocols; all vessel

strike avoidance mitigation requirements; and information and resources available to the project personnel regarding the applicability of Federal laws and regulations for protected species. This training must be repeated for any new vessel personnel who join the project;

(2) Confirmation of the vessel personnel's training and understanding of the LOA requirements must be documented on a training course log sheet and reported to NMFS within 30 days of completion of training;

(3) All vessel operators and dedicated visual observers must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course to avoid striking any marine mammal;

(4) All transiting vessels, operating at any speed must have a dedicated visual observer on duty at all times to monitor for marine mammals within a 180° direction of the forward path of the vessel (90° port to 90° starboard) located at an appropriate vantage point for ensuring vessels are maintaining appropriate separation distances. Dedicated visual observers may be PSOs or crew members, but crew members responsible for these duties must be provided sufficient training by Sunrise Wind to distinguish marine mammals from other phenomena and must be able to identify a marine mammal as a North Atlantic right whale, other large whale (defined in this context as sperm whales or baleen whales other than North Atlantic right whales), or other marine mammals. Dedicated visual observers must be equipped with alternative monitoring technology (*e.g.*, night vision devices, infrared cameras) for periods of low visibility (*e.g.*, darkness, rain, fog, *etc.*). The dedicated visual observer must not have any other duties while observing and must receive prior training on protected species detection and identification, vessel strike avoidance procedures, how and when to communicate with the vessel captain, and reporting requirements in this subpart;

(5) All vessel operators and dedicated visual observers must continuously monitor US Coast Guard VHF Channel 16 at the onset of transiting through the duration of transit. At the onset of transiting and at least once every 4 hours, vessel operators and/or trained crew member(s) must monitor the project's Situational Awareness System, (if applicable), WhaleAlert, and relevant NOAA information systems such as the Right Whale Sighting Advisory System (RWSAS) for the presence of North Atlantic right whales;

(6) All vessel operators must abide by vessel speed regulations (50 CFR 224.105). Nothing in this subpart exempts vessels from any other applicable marine mammal speed or approach regulations;

(7) In the event that a DMA or Slow Zone is established that overlaps with an area where a project-associated vessel is operating, that vessel, regardless of size, must transit that area at 10 kn or less;

(8) Between November 1st and April 30th, all vessels, regardless of size, must operate port to port (specifically from ports in New Jersey, New York, Maryland, Delaware, and Virginia) at 10 kn or less, except for vessels while transiting in Narragansett Bay or Long Island Sound;

(9) All vessels, regardless of size, must immediately reduce speed to 10 kn or less when any large whale, (other than a North Atlantic right whale), mother/calf pairs, or large assemblages of non-delphinid cetaceans are observed within 500 m (0.31 mi) of a transiting vessel;

(10) All vessel operators must immediately reduce speed to 10 kn (11.5 mph) or less for at least 24 hours when a North Atlantic right whale is sighted, at any distance, by any project-related personnel or acoustically detected by any project-related PAM system. Each subsequent observation or acoustic detection shall trigger an additional 24-hour period. If a vessel is traveling at speed greater than 10 kn (11.5 mph) (*i.e.*, no speed restrictions are enacted) in the transit corridor (defined as from a port to the Lease Area or return), in addition to the required dedicated visual observer, Sunrise Wind must monitor the transit corridor in real-time with PAM prior to and during transits. If a North Atlantic right whale is detected via visual observation or PAM within or approaching the transit corridor, all vessels in the transit corridor must travel at 10 kn (11.5 mph) or less for 24 hours following the detection. Each subsequent detection shall trigger a 24-hour reset. A slowdown in the transit corridor expires when there has been no further North Atlantic right whale visual or acoustic detection in the transit corridor in the past 24 hours; All vessels must maintain a minimum separation distance of 500 m from North Atlantic right whales. If underway, all vessels must steer a course away from any sighted North Atlantic right whale at 10 kn (11.5 mph) or less such that the 500-m minimum separation distance requirement is not violated. If a North Atlantic right whale is sighted within 500 m of an underway vessel, that vessel must turn away from the whale(s), reduce speed and shift the

engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m;

(11) All vessels must maintain a minimum separation distance of 100 m (328 ft) from sperm whales and non-North Atlantic right whale baleen whales. If one of these species is sighted within 100 m of an underway vessel, the vessel must turn away from the whale(s), reduce speed, and shift the engine(s) to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 100 m;

(12) All vessels must maintain a minimum separation distance of 50 m (164 ft) from all delphinid cetaceans and pinnipeds with an exception made for those that approach the vessel (*e.g.*, bow-riding dolphins). If a delphinid cetacean or pinniped is sighted within 50 m of a transiting vessel, that vessel must turn away from the animal(s), reduce speed, and shift the engine to neutral, with an exception made for those that approach the vessel (*e.g.*, bow-riding dolphins). Engines must not be engaged until the animal(s) has moved outside of the vessel's path and beyond 50 m;

(13) All vessels underway must not divert or alter course to approach any marine mammal;

(14) Prior to transit, vessel operators must check for information regarding the establishment of Seasonal and Dynamic Management Areas, Slow Zones, and any information regarding North Atlantic right whale sighting locations; and

(15) Sunrise Wind must submit a Marine Mammal Vessel Strike Avoidance Plan 180 days prior to the planned start of vessel activity that provides details on all relevant mitigation and monitoring measures for marine mammals, vessel speeds and transit protocols from all planned ports, vessel-based observer protocols for transiting vessels, communication and reporting plans, and proposed alternative monitoring equipment in varying weather conditions, darkness, sea states, and in consideration of the use of artificial lighting. If Sunrise Wind plans to implement PAM in any transit corridor to allow vessel transit above 10 kn the plan must describe how PAM, in combination with visual observations, will be conducted. If a plan is not submitted and approved by NMFS prior to vessel operations, all project vessels must travel at speeds of 10 kn (11.5 mph) or less. Sunrise Wind must comply with any approved Marine Mammal Vessel Strike Avoidance Plan.

(c) *Wind turbine generator (WTG) and offshore converter substation (OCS-DC) foundation installation.* The requirements in paragraphs (c)(1) through (27) of this section apply to impact pile driving activities associated with the installation of WTG and OCS-DC foundations:

(1) Foundation impact pile driving activities must not occur January 1 through April 30, annually. Foundation impact pile driving must not be planned in December; however, it may only occur if necessary to complete the Project within a given year with prior approval by NMFS. Sunrise Wind must notify NMFS in writing by September 1 of that year that pile driving cannot be avoided, and circumstances are expected to necessitate pile driving in December;

(2) No more than four monopiles may be installed per day;

(3) Monopiles must be no larger than a tapered 7/12 m monopile design. The minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. Hammer energies must not exceed 4,000 kilojoules (kJ);

(4) Sunrise Wind must not initiate pile driving earlier than 1 hour after civil sunrise or later than 1.5 hours prior to civil sunset, unless Sunrise Wind submits, and NMFS approves, a Nighttime Pile Driving Plan, that demonstrates the efficacy of their night vision devices to effectively monitor the mitigation zones. Sunrise Wind must submit this Plan or Plans (if separate Daytime Reduced Visibility and Nighttime Monitoring Plans are prepared) to NMFS Office of Protected Resources at least 180 calendar days before impact pile driving is planned to begin. This Plan(s) must include, but is not limited to, a complete description of how Sunrise Wind 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 NVDs, spotlights) in detecting marine mammals over the full extent of the required clearance and shutdown zones, including demonstration that the full extent of the minimum visibility zones can be effectively and reliably monitored. The Plan must identify the efficacy of the technology at detecting marine mammals in the clearance and shutdown zones under all the various conditions anticipated during construction, including varying weather conditions, sea states, and in consideration of the use of artificial lighting. If the plan does not include a

full description of the proposed technology, monitoring methodology, and data demonstrating to NMFS Office of Protected Resources's satisfaction that marine mammals can reliably and effectively be detected within the clearance and shutdown zones for monopiles before and during impact pile driving, nighttime pile driving (unless a pile was initiated 1.5 hours prior to civil sunset) may not occur. Additionally, this Plan must contain a thorough description of how Sunrise Wind 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;

(5) Sunrise Wind must utilize a soft-start protocol at the beginning of foundation installation for each impact pile driving event and at any time following a cessation of impact pile driving of 30 minutes or longer;

(6) Sunrise Wind must deploy, at minimum, a double bubble curtain and AdBm during all monopile foundation pile driving and, at minimum, a double bubble curtain during all jacket foundation pile driving; (i) The double bubble curtain must distribute air bubbles using an air flow rate of at least $0.5 \text{ m}^3/(\text{min} \cdot \text{m})$. The double bubble curtain must surround 100 percent of the piling perimeter throughout the full depth of the water column. In the unforeseen event of a single compressor malfunction, the offshore personnel operating the bubble curtain(s) must make appropriate adjustments to the air supply and operating pressure such that the maximum possible sound attenuation performance of the bubble curtain(s) is achieved.

(ii) The lowest bubble ring must be in contact with the seafloor for the full circumference of the ring, and the weights attached to the bottom ring must ensure 100-percent seafloor contact.

(iii) No parts of the ring or other objects may prevent full seafloor contact with a bubble curtain ring.

(iv) Sunrise Wind must inspect and carry out appropriate maintenance on the noise attenuation system prior to every pile driving event and prepare and submit a Noise Attenuation System (NAS) inspection/performance report. For piles for which complete SFV is carried out, this report must be submitted as soon as it is available, but no later than when the interim SFV report is submitted for the respective pile. Performance reports for all subsequent piles must be submitted with the weekly pile driving reports. All

reports must be submitted by email to pr.itp.monitoringreports@noaa.gov. For any noise mitigation device in addition to the bubble curtain, Sunrise Wind must inspect and carry out appropriate maintenance on the system and ensure the system is functioning properly prior to every pile driving event.

(7) Sunrise Wind must utilize PSO(s). Each pile driving platform, including a minimum of a secondary, PSO-dedicated vessel, must have at least three on-duty PSOs;

(8) Concurrent with visual monitoring, Sunrise Wind must utilize at least one PAM operator who must be actively monitoring for marine mammals one hour before, during and 30 minutes after impact pile driving with PAM. PAM operators must immediately communicate all detections of marine mammals to the Lead PSO, including any determination regarding species identification, distance, and bearing and the degree of confidence in the determination;

(9) Sunrise Wind must utilize NMFS-approved PAM systems. The PAM system components (i.e., acoustic buoys) must not be placed closer than 1 km (0.6 mi) to the pile being driven so that the activities do not mask the PAM system. Sunrise Wind must demonstrate and prove the detection range of the system they plan to deploy while considering potential masking from concurrent pile-driving and vessel noise. The PAM system must be able to detect a vocalization of North Atlantic right whales up to 10 km (6.2 mi);

(10) Sunrise Wind must submit a Passive Acoustic Monitoring Plan (PAM Plan) to NMFS Office of Protected Resources for review and approval at least 180 days prior to the planned start of foundation installation activities and abide by the Plan if approved. The PAM Plan must include, but is not limited to, a description of all proposed PAM equipment; the calibration data; bandwidth capability; and sensitivity of hydrophones address how the proposed passive acoustic monitoring must follow standardized measurement, processing methods, reporting metrics, and metadata standards for offshore wind. The Plan must describe all proposed PAM equipment, procedures, and protocols including proof that vocalizing North Atlantic right whales will be detected within the clearance and shutdown zones, including, deployment locations, procedures, detection review methodology, and protocols; hydrophone detection ranges with and without foundation installation activities and data supporting those ranges; communication time between call and

detection, and data transmission rates between PAM Operator and PSOs on the pile driving vessel; where PAM Operators will be stationed relative to hydrophones and PSOs on pile driving vessel calling for delay/shutdowns; and a full description of all proposed software, call detectors, and filters. The Plan must also include a description of Sunrise Wind's evaluation of the planned acoustic detection software using the PAM Atlantic baleen whale annotated data set available at National Centers for Environmental Information (NCEI) and provide evaluation/performance metrics (*e.g.*, false negatives/positives);

(11) Sunrise Wind must establish clearance and shutdown zones, which must be measured using the radial distance around the pile being driven. PSOs must visually monitor clearance zones for marine mammals for a minimum of 60 minutes prior to commencing pile driving. 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, at all times during pile driving, and for 30 minutes after pile driving. All clearance zones must be confirmed to be free of marine mammals for 30 minutes immediately prior to the beginning of soft-start procedures. If a marine mammal is detected within or about to enter the applicable clearance zones, during this 30-minute time period, impact pile driving, including soft-start, must be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings. The specific time periods are 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species;

(12) For North Atlantic right whales, any visual observation by a PSO at any distance or acoustic detection within the 10 km PAM Monitoring Zone must trigger a delay to the commencement of pile driving;

(13) PSOs must be able to visually clear (*i.e.*, confirm no marine mammals are present), at minimum, the minimum visibility zone. The entire minimum visibility zone must be visible (*i.e.*, not obscured by dark, rain, fog, *etc.*) for a full 30 minutes immediately prior to commencing impact pile driving;

(14) If a marine mammal is detected (visually or acoustically) entering or within the respective shutdown after pile driving has begun, the PSO or PAM operator must call for a shutdown of pile driving and Sunrise Wind must stop pile driving immediately, unless shutdown is not practicable due to

imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the lead engineer determines there is risk of pile refusal or pile instability. If pile driving is not shut down due to one of these situations, Sunrise Wind must reduce hammer energy to the lowest level practicable;

(15) If pile driving has been shut down due to the presence of a marine mammal other than a North Atlantic right whale, pile driving must not restart until either the marine mammal(s) has voluntarily left the specific clearance zones and has been visually or acoustically confirmed beyond that clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 30 minutes for all baleen whale species and sperm whales and 15 minutes for all other species. In cases where these criteria are not met, pile driving may restart only if necessary to maintain pile stability at which time Sunrise Wind must use the lowest hammer energy practicable to maintain stability.

(16) Sunrise Wind must submit a Foundation Installation Pile Driving Marine Mammal Monitoring Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation pile driving and abide by the Plan if approved. Sunrise Wind must obtain both NMFS Office of Protected Resources and NMFS Greater Atlantic Regional Fisheries Office Protected Resources Division's concurrence with this Plan prior to the start of any pile driving. 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 include a description of all monitoring equipment and PAM operator and PSO protocols (including number and location of PSOs and PAM operators) for all foundation pile driving and an informal guide to aid personnel in identifying species if they are observed in the vicinity of the project area;

(17) Sunrise Wind must perform complete sound field verification (SFV) measurements during installation of, at minimum, the first three monopile WTC foundations and all OCS-DC foundation pin piles;

(18) Complete SFV measurements must continue until at least three consecutive piles demonstrate noise levels are at or below those modeled,

assuming 10 decibels (dB) of attenuation. Subsequent complete SFV measurements are also required should larger piles be installed or if additional monopiles are driven that may produce louder sound fields than those previously measured (*e.g.*, from higher hammer energy, greater number of strikes, harder substrate composition, deeper water *etc.*);

(i) Complete SFV measurements must be made at a minimum of four distances from the pile(s) being driven, along a single transect, in the direction of lowest transmission loss (*i.e.*, projected lowest transmission loss coefficient), including, but not limited to, 750 m (2,460 ft) and three additional ranges, including, at least, the modeled Level B harassment isopleth assuming 10-dB attenuation. At least one additional measurement at an azimuth 90 degrees from the array at 750 m must be made;

(ii) At each measurement distance, there must be a near bottom and mid-water column hydrophone (measurement system); and

(iii) Sunrise Wind must submit complete SFV interim reports within 48 hours after each foundation is measured and before an additional foundation is installed. If any of the interim SFV reports submitted indicate that distances to the Level A harassment and Level B harassment thresholds exceed those modeled assuming 10-dB attenuation, then Sunrise Wind must implement additional measures on all subsequent foundations to ensure the measured Level A and Level B harassment isopleths do not exceed those modeled for foundation installation, assuming 10-dB attenuation. Sunrise Wind must also increase clearance and shutdown zone sizes to those identified by NMFS until SFV measurements on at least three additional foundations demonstrate acoustic distances to harassment thresholds meet or are less than those modeled assuming 10-dB of attenuation. For every 1,500 m that a marine mammal clearance or shutdown zone is expanded, additional PSOs must be deployed from additional platforms/vessels to ensure adequate and complete monitoring of the expanded shutdown and/or clearance zone with each observer responsible for maintaining watch in no more than 120° and of an area with a radius no greater than 1,500 m. Sunrise Wind must optimize the sound attenuation systems (*e.g.*, ensure hose maintenance, pressure testing, *etc.*) to, at least, meet noise levels modeled, assuming 10-dB attenuation, within three piles or else foundation installation activities must cease until NMFS and Sunrise Wind can evaluate

the situation and ensure future piles will not exceed noise levels modeled assuming 10-dB attenuation;

(19) Sunrise Wind also must conduct abbreviated SFV, using at least one acoustic recorder (consisting of a bottom and mid-water column hydrophone) for every foundation for which complete SFV monitoring is not conducted. Abbreviated SFV reports must be included in weekly reports. Any indications that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals may be exceeded based on this abbreviated monitoring must be addressed by Sunrise Wind in the weekly report, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles. Sunrise Wind must meet with NMFS within two business days of Sunrise Wind's submission of a report that includes an exceedance to discuss if any additional action is necessary;

(20) The SFV measurement systems must have a sensitivity appropriate for the expected sound levels from pile driving received at the nominal ranges throughout the installation of the pile. The frequency range of SFV measurement systems must cover the range of at least 20 hertz (Hz) to 20 kilohertz (kHz). The SFV measurement systems must be designed to have omnidirectional sensitivity so that the broadband received level of all pile driving exceeds the system noise floor by at least 10-dB. The dynamic range of the SFV measurement system must be sufficient such that at each location, and the signals avoid poor signal-to-noise ratios for low amplitude signals and avoid clipping, nonlinearity, and saturation for high amplitude signals;

(21) All hydrophones used in SFV measurements systems are required to have undergone a full system, traceable laboratory calibration conforming to International Electrotechnical Commission (IEC) 60565, or an equivalent standard procedure, from a factory or accredited source to ensure the hydrophone receives accurate sound levels, at a date not to exceed 2 years before deployment. Additional *in situ* calibration checks using a pistonphone are required to be performed before and after each hydrophone deployment. If the measurement system employs filters via hardware or software (*e.g.*, high-pass, low-pass, *etc.*), which is not already accounted for by the calibration, the filter performance (*i.e.*, the filter's frequency response) must be known, reported, and the data corrected before analysis;

(22) Sunrise Wind must be prepared with additional equipment (*e.g.*, hydrophones, recording devices, hydrophone calibrators, cables, batteries), which exceeds the amount of equipment necessary to perform the measurements, such that technical issues can be mitigated before measurement;

(23) If any of the SFV measurements from any pile indicate that the distance to any isopleth of concern is greater than those modeled assuming 10-dB attenuation before the next pile is installed Sunrise Wind must implement the following measures as applicable: identify and propose for review and concurrence: additional, modified, and/or alternative noise attenuation measures or operational changes that present a reasonable likelihood of reducing sound levels to the modeled distances; provide a written explanation to NMFS Office of Protected Resources supporting that determination and requesting concurrence to proceed; and, following NMFS Office of Protected Resources's concurrence, deploy those additional measures on any subsequent piles that are installed (*e.g.*, if threshold distances are exceeded on pile 1 then additional measures must be deployed before installing pile 2);

(24) If acoustic measurements indicate that ranges to isopleths corresponding to the Level A harassment and Level B harassment thresholds are less than the ranges predicted by modeling (assuming 10-dB attenuation), Sunrise Wind may request to NMFS Office of Protected Resources a modification of the mitigation zones for non-North Atlantic right whale species;

(25) Sunrise Wind must conduct SFV measurements upon commencement of turbine operations to estimate turbine operational source levels and transmission loss rates, in accordance with a NMFS-approved Foundation Installation Pile Driving SFV Plan;

(26) Sunrise Wind must submit a SFV Plan to NMFS Office of Protected Resources for review and approval at least 180 days prior to planned start of foundation installation activities and abide by the Plan if approved. At minimum, the SFV Plan must describe how Sunrise Wind would ensure that the first three monopile foundation installation sites selected for SFV measurements are representative of the rest of the monopile installation sites such that future pile installation events are anticipated to produce similar sound levels to those piles measured. In the case that these sites/scenarios are not determined to be representative of all other pile installation sites, Sunrise Wind must include information in the

SFV Plan on how additional sites/scenarios would be selected for SFV measurements. This SFV Plan must also include methodology for collecting, analyzing, and preparing SFV measurement data for submission to NMFS Office of Protected Resources and describe how the effectiveness of the sound attenuation methodology would be evaluated based on the results. Pile driving may not occur until NMFS approves the SFV Plan for this activity; and

(27) If a subsequent monopile installation location is selected that was not represented by previous three locations (*i.e.*, substrate composition, water depth), complete SFV must be conducted.

(d) *Cable landfall construction.*

Sunrise Wind must comply with the following measures during cable landfall construction activities:

(1) Sunrise Wind must conduct vibratory pile driving and pneumatic hammering during daylight hours only;

(2) Sunrise Wind must have a minimum of two PSOs on active duty 30 minutes before, during, and 30 minutes after any installation and removal of the temporary sheet piles, casing pipes and goal posts. These PSOs must always be located at the best vantage point(s) on the vibratory pile driving, pneumatic hammering, or secondary platform in the immediate vicinity of the vibratory pile driving or pneumatic hammering platform in order to ensure that appropriate visual coverage is available for the entire visual clearance zone and as much of the Level B harassment zone, as possible;

(3) Sunrise Wind must establish clearance and shutdown zones. If a marine mammal(s) is observed entering or is observed within the clearance zones, before vibratory pile driving or pneumatic hammering has begun, the activity must not commence until the animal(s) has exited the zone at its own volition or a specific amount of time has elapsed since the last sighting. The specific time periods are 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species;

(4) If a marine mammal is observed entering or within the respective shutdown zone after pile driving has begun, the PSO must call for a shutdown of pile driving and Sunrise Wind must stop pile driving immediately, unless shutdown is not practicable due to imminent risk of injury or loss of life to an individual or risk of damage to a vessel that creates risk of injury or loss of life for individuals, or the lead engineer determines there is risk of pile refusal

or pile instability. If pile driving is not shut down due to one of these situations, Sunrise Wind must reduce hammer energy to the lowest level practicable;

(5) Pile driving must not restart until either the marine mammal(s) has voluntarily left and have been visually confirmed beyond the clearance zone, or, when specific time periods have elapsed with no further sightings or acoustic detections have occurred. The specific time periods are 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species; and

(6) Sunrise Wind must employ a soft-start for all impact pile driving of goal posts. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets.

(e) *UXO/MEC detonation.* Sunrise wind must comply with the measures related to UXO/MEC detonation in paragraphs (e)(1) through (12) of this section:

(1) Sunrise Wind may only detonate a maximum of three UXO/MECs, of varying sizes;

(2) Sunrise Wind must not detonate UXOs/MECs from December 1 through April 30, annually;

(3) Sunrise Wind must only detonate UXO/MECs during daylight hours (1 hour after civil sunrise through 1.5 hours prior to civil sunset);

(4) Upon encountering a UXO/MEC of concern, Sunrise Wind may only resort to high-order removal (*i.e.*, detonation) if all other means of removal are impracticable;

(5) Sunrise Wind must utilize a dual noise abatement system (*e.g.*, double bubble curtain) around all UXO/MEC detonations and operate that system in a manner that achieves the maximum noise attenuation levels practicable. If a double bubble curtain is used, it must be placed at a distance such that the nozzle hose remains undamaged;

(6) A pressure transducer must be used to monitor pressure levels during all UXO/MEC detonations;

(7) Sunrise Wind must use at least 3 visual PSOs on each PSO platform and one PAM operator to monitor for marine mammals in the clearance zones prior to detonation. If the clearance zone is larger than 2 km (based on charge weight), Sunrise Wind must deploy a secondary PSO vessel. If the clearance is larger than 5 km (based on charge weight), an aerial platform must be used unless Sunrise Wind determines an aerial platform is not practical and, in such case, an additional vessel must be used;

(8) Sunrise Wind must establish and implement clearance zones for UXO/MEC detonation using both visual and acoustic monitoring. Clearance zones must be fully visible for at least 60 minutes and all marine mammal(s) must be confirmed to be outside of the clearance zone for at least 30 minutes prior to detonation. PAM must also be conducted for at least 60 minutes prior to detonation and the zone must be acoustically cleared during this time;

(9) If a marine mammal is observed entering or within the clearance zone prior to detonation, the activity must be delayed. Detonation may only commence if all marine mammals have been confirmed to have voluntarily left the clearance zones and been visually confirmed to be beyond the clearance zone, or when 60 minutes have elapsed without any redetections for whales (including the North Atlantic right whale) or 15 minutes have elapsed without any redetections of delphinids, harbor porpoises, or seals;

(10) During each UXO/MEC detonation, Sunrise Wind must conduct SFV, in accordance with a NMFS-approved UXO/MEC SFV Plan, at a minimum of three locations, with two water depths at each location, from each detonation in a direction toward deeper water to empirically determine source levels (peak and cumulative sound exposure level), the ranges to the isopleths corresponding to the Level A harassment and Level B harassment thresholds, and estimated transmission loss coefficient(s);

(11) If SFV measurements on any of the detonations indicate that the ranges to Level A harassment and Level B harassment thresholds are larger than those modeled, assuming 10-dB attenuation, Sunrise Wind must modify the clearance zones, with approval from NMFS, and apply additional noise attenuation measures (*e.g.*, improve efficiency of bubble curtain(s)) before the next detonation event of similar size; and

(12) Sunrise Wind must prepare and submit a UXO/MEC Marine Mammal Monitoring Plan to NMFS for review and approval at least 180 days before the start of any UXO/MEC detonations. The plan must include final project design and all information related to visual and PAM PSO monitoring protocols for UXO/MEC detonations.

(f) *HRG surveys.* The following requirements apply to HRG surveys operating sub-bottom profilers (SBPs) (*i.e.*, boomers, sparkers, and Compressed High Intensity Radiated Pulse (CHIRPS)) (hereinafter referred to as "acoustic sources"):

(1) Sunrise Wind must abide by the relevant Project Design Criteria (PDCs 4, 5, and 7) of the programmatic consultation completed by NMFS' Greater Atlantic Regional Fisheries Office on June 29, 2021 (revised September 2021), pursuant to section 7 of the Endangered Species Act (ESA) or otherwise updated. To the extent that any relevant Best Management Practices (BMPs) described in these PDCs are more stringent than the requirements herein, those BMPs supersede these requirements;

(2) Acoustic sources must be deactivated when not acquiring data or preparing to acquire data except as necessary for testing. Acoustic sources must be used at the lowest practicable source level to meet the survey objective;

(3) Sunrise Wind must use at least one PSO during daylight operations and two PSOs during nighttime operations, per vessel;

(4) PSOs must begin visually monitoring 30 minutes prior to the initiation of the specified acoustic source (including ramp-up, if applicable), through 30 minutes after the use of the specified acoustic source has ceased;

(5) Prior to starting the survey and after receiving confirmation from the PSOs that the clearance zone is clear of any marine mammals, Sunrise Wind is required to ramp-up acoustic sources to half power for 5 minutes prior to commencing full power, unless the equipment operates on a binary on/off switch (in which case ramp-up is not required). Any ramp-up of acoustic sources may only commence when visual clearance zones are fully visible (*e.g.*, not obscured by darkness, rain, fog, *etc.*) and clear of marine mammals, as determined by the Lead PSO, for at least 30 minutes immediately prior to the initiation of survey activities using a specified acoustic source. Ramp-ups must be scheduled so as to minimize the time spent with the source activated;

(6) Prior to a ramp-up procedure starting, the acoustic source operator must notify the Lead PSO of the planned start of ramp-up. The notification time must not be less than 60 minutes prior to the planned ramp-up or activation in order to allow the PSO(s) time to monitor the clearance zone(s) for 30 minutes prior to the initiation of ramp-up or activation (pre-start clearance). During this 30-minute pre-start clearance period, the entire applicable clearance zones must be visible;

(7) A PSO conducting pre-start clearance observations must be notified again immediately prior to reinitiating

ramp-up procedures and the operator must receive confirmation from the PSO to proceed;

(8) If a marine mammal is observed within a clearance zone during the 30 minute clearance period, ramp-up or acoustic surveys may not begin until the animal(s) has been observed voluntarily exiting its respective clearance zone or until a specific time period has elapsed with no further sighting. The specific time periods are 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species;

(9) In any case when the clearance process has begun in conditions with good visibility, including via the use of night vision/reduced visibility condition equipment (infrared (IR)/thermal camera), and the Lead PSO has determined that the clearance zones are clear of marine mammals, survey operations may commence (*i.e.*, no delay is required) despite periods of inclement weather and/or loss of daylight. Ramp-up may occur at times of poor visibility, including nighttime, if appropriate visual monitoring has occurred with no detections of marine mammals in the 30 minutes prior to beginning ramp-up;

(10) Once the survey has commenced, Sunrise Wind must shut down acoustic sources if a marine mammal enters a respective shutdown zone. In cases when the shutdown zones become obscured for brief periods (less than 30 minutes) due to inclement weather, survey operations would be allowed to continue (*i.e.*, no shutdown is required) so long as no marine mammals have been detected. The shutdown requirement does not apply to small delphinids of the following genera: *Delphinus*, *Stenella*, *Lagenorhynchus*, and *Tursiops*. If there is uncertainty regarding the identification of a marine mammal species (*i.e.*, whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown. Shutdown is required if a delphinid that belongs to a genus other than those specified in this paragraph of this section is detected in the shutdown zone. If there is uncertainty regarding the identification of a marine mammal species (*e.g.*, whether the observed marine mammal belongs to one of the delphinid genera for which shutdown is waived), the PSOs must use their best professional judgment in making the decision to call for a shutdown;

(11) If an acoustic source has been shut down due to the presence of a marine mammal, the use of an acoustic source may not commence or resume

until the animal(s) has been confirmed to have left the Level B harassment zone or until a full 30 minutes for all baleen whale species and sperm whales, and 15 minutes for all other species have elapsed with no further sighting. If an acoustic source is shut down for reasons other than mitigation (*e.g.*, mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up only if PSOs have maintained constant observation and no additional detections of any marine mammal occurred within the respective shutdown zones. If an acoustic source is shut down for a period longer than 30 minutes, then all clearance and ramp-up procedures must be initiated;

(12) If multiple HRG vessels are operating concurrently, any observations of marine mammals must be communicated to PSOs on all nearby survey vessels; and

(13) Should an autonomous survey vehicle (ASV) be used during HRG surveys, the ASV must remain with 800 m (2,635 ft) of the primary vessel while conducting survey operations; two PSOs must be stationed on the mother vessel at the best vantage points to monitor the clearance and shutdown zones around the ASV; at least one PSO must monitor the output of a thermal high-definition camera installed on the mother vessel to monitor the field-of-view around the ASV using a hand-held tablet, and during periods of reduced visibility (*e.g.*, darkness, rain, or fog), PSOs must use night-vision goggles with thermal clip-ons and a hand-held spotlight to monitor the clearance and shutdown zones around the ASV.

(g) *Fisheries monitoring surveys.* The requirements in paragraphs (g)(1) through (12) of this section apply to fishery monitoring surveys:

(1) Marine mammal monitoring must be conducted by the captain and/or a member of the scientific crew before (within 1 nautical mile (nmi) (1.85 km) and 15 minutes prior to deploying gear), during, and after haul back;

(2) Survey gear must be deployed as soon as possible once the vessel arrives on station. Gear must not be deployed if there is a risk of interaction with marine mammals. Gear may be deployed after 15 minutes of no marine mammal sightings within 1 nautical mile (nmi; 1,852 m) of the sampling station;

(3) Sunrise Wind must implement the following "move-on" rule. If marine mammals are sighted within 1 nm (nmi (1.2 mi)) of the planned location in the 15 minutes before gear deployment, then Sunrise Wind must move the vessel away from the marine mammal to a different section of the sampling area.

If, after moving on, marine mammals are still visible from the vessel, Sunrise Wind and its cooperating institutions, contracted vessels, or commercially hired captains must move again or to skip the station;

(4) All captains and crew conducting fishery surveys will be trained in marine mammal detection and identification;

(5) If a marine mammal is at risk of interacting with deployed gear, all gear must be immediately removed from the water. If marine mammals are sighted before the gear is fully removed from the water, the vessel must slow its speed and maneuver the vessel away from the animals to minimize potential interactions with the observed animal;

(6) Sunrise Wind must maintain visual marine mammal monitoring effort during the entire period of time that gear is in the water (*i.e.*, throughout gear deployment, fishing, and retrieval);

(7) Trawl tows must be limited to a maximum of 20 minute trawl-time;

(8) All gear must be emptied as close to the deck/sorting area and as quickly as possible after retrieval in order to avoid injury to animals that may be caught in the gear;

(9) All fisheries monitoring gear must be fully cleaned and repaired (if damaged) before each use/deployment;

(10) All in-water survey gear, including buoys, must be properly labeled with the scientific permit number or identification as Sunrise Wind's research gear. All labels and markings on the gear, buoys, and buoy lines must also be compliant with the applicable regulations, and all buoy markings must comply with instructions received by the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division. Any lost gear associated with the fishery surveys must be reported to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division within 24 hours;

(11) All survey gear must be removed from the water whenever not in active survey use (*i.e.*, no wet storage); and

(12) All reasonable efforts, that do not compromise human safety, must be undertaken to recover gear.

(h) *Temporary pier construction.* The following requirements apply to impact and vibratory pile driving during temporary pier construction at Smith Point County Park:

(1) Sunrise Wind must delay or shutdown pile driving if a marine mammal is observed entering or within the Level B harassment zones; and

(2) At least one PSO must be on duty monitoring for marine mammals 30 minutes prior to, during and 30 minutes after pile driving.

§ 217.315 Monitoring and reporting requirements.

Sunrise Wind must implement the following monitoring and reporting requirements when conducting the specified activities (see § 217.310(c)): (a) Protected species observer (PSO) and passive acoustic monitoring (PAM) operator qualifications: Sunrise Wind must implement the following measures applicable to PSOs and PAM operators:

(1) Sunrise Wind must use independent, NMFS-approved PSOs and PAM operators, meaning that the PSOs and PAM operators must be employed by a third-party observer provider, must have no tasks other than to conduct observational effort, collect data, and communicate with and instruct relevant personnel with regard to the presence of protected species and mitigation requirements;

(2) All PSOs and PAM operators must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics. The educational requirements may be waived if the PSO or PAM operator has acquired the relevant skills through a suitable amount of alternate experience. Requests for such a waiver must be submitted to NMFS Office of Protected Resources and must include written justification containing alternative experience. Alternate experience that may be considered includes, but is not limited to, previous work experience conducting academic, commercial, or government-sponsored marine mammal visual and/or acoustic surveys; or previous work experience as a PSO/PAM operator;

(3) PSOs must have visual acuity in both eyes (with correction of vision being permissible) sufficient enough to discern moving targets on the water's surface with the ability to estimate the target size and distance (binocular use is allowable); ability to conduct field observations and collect data according to the assigned protocols; sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations; writing skills sufficient to document observations, including but not limited to, the number and species of marine mammals observed, the dates and times of when in-water construction activities were conducted, the dates and time when in-water construction activities were suspended to avoid potential incidental take of marine mammals from construction noise within a defined shutdown zone, and marine mammal

behavior; and the ability to communicate orally, by radio, or in-person, with project personnel to provide real-time information on marine mammals observed in the area;

(4) All PSOs must be trained in northwestern Atlantic Ocean marine mammal identification and behaviors and must be able to conduct field observations and collect data according to assigned protocols. Additionally, PSOs must have the ability to work with all required and relevant software and equipment necessary during observations described in paragraphs (b)(2) and (3) of this section;

(5) All PSOs and PAM operators must successfully complete a relevant training course within the last 5 years and obtain a certificate of course completion;

(6) PSOs and PAM operators are responsible for obtaining NMFS' approval. NMFS may approve PSOs as conditional or unconditional. A conditionally approved PSO may be one who has completed training in the last 5 years but has not yet attained the requisite field experience. An unconditionally approved PSO is one who has completed training within the last 5 years and attained the necessary experience (*i.e.*, demonstrate experience with monitoring for marine mammals at clearance and shutdown zone sizes similar to those produced during the respective activity). A conditionally approved PSO must be paired with an unconditionally approved PSO;

(7) PSOs for cable landfall and temporary pier construction (*i.e.*, vibratory and impact pile installation and removal; pneumatic hammering) and HRG surveys may be unconditionally or conditionally approved. PSOs and PAM operators for foundation installation and UXO detonation must be unconditionally approved;

(8) At least one on-duty PSO for each activity (*e.g.*, foundation installation, cable landfall and temporary pier construction, and HRG surveys) must be designated as the Lead PSO. The Lead PSO must meet the minimum requirements described in paragraphs (a)(2) through (5) of this section, have a minimum of ninety days of at-sea experience working in the Northwest Atlantic Ocean and have no more than eighteen months elapsed since the conclusion of their last at-sea experience;

(9) Sunrise Wind must submit NMFS previously approved PSOs and PAM operators to NMFS Office of Protected Resources for review and confirmation of their approval for specific roles at least 30 days prior to commencement of

the activities requiring PSOs/PAM operators or 15 days prior to when new PSOs/PAM operators are required after activities have commenced;

(10) For prospective PSOs and PAM operators not previously approved, or for PSOs and PAM operators whose approval is not current, Sunrise Wind must submit resumes for approval at least 60 days prior to PSO and PAM operator use. Resumes must include information related to relevant education, experience, and training, including dates, duration, location, and description of prior PSO or PAM operator experience. Resumes must be accompanied by relevant documentation of successful completion of necessary training;

(11) To be approved as a PAM operator, the person must meet the following qualifications: the PAM operator must demonstrate that they have prior experience with real-time acoustic detection systems and/or have completed specialized training for operating PAM systems, including experience with relevant Project acoustic software and equipment. They must also demonstrate experience detecting and identifying Atlantic Ocean marine mammals sounds, including North Atlantic right whale sounds, humpback whale sounds and deconflicting them from similar North Atlantic right whale sounds and other co-occurring species' sounds in the area. The PAM operator must be able to review and classify acoustic detections in real-time (prioritizing North Atlantic right whales and noting detection of other cetaceans) during the real-time monitoring periods and must be able to distinguish between whether a marine mammal or other species sound is detected, possibly detected, not detected. Where localization of sounds or deriving bearings and distance are possible, the PAM operators must demonstrate experience in using this technique. PAM operators must have the qualifications and relevant experience/training to safely deploy and retrieve equipment and program the software, as necessary and test software and hardware functionality prior to operation; and

(12) PSOs may work as PAM operators and vice versa, pending NMFS-approval; however, they may only perform one role at any one time and must not exceed work time restrictions, which must be tallied cumulatively.

(b) *General PSO and PAM operator requirements.* The following measures apply to PSOs and PAM operators and must be implemented by Sunrise Wind:

(1) All PSOs must be located at the best vantage point(s) on any platform, as determined by the Lead PSO, in order to collectively obtain 360-degree visual coverage of the entire clearance and shutdown zones around the activity area, and as much of the Level B harassment zone as possible. PAM operators may be located on a vessel or remotely on-shore, but must have the appropriate equipment (*i.e.*, computer station equipped with a data collection software system and acoustic data analysis software) available wherever they are stationed, and data or data products must be streamed in real-time or in near real-time to allow PAM operators to provide assistance to on-duty visual PSOs;

(2) PSOs must use high magnification (25x) binoculars, standard handheld (7x) binoculars, and the naked eye to search continuously for marine mammals. During foundation installation, at least two PSOs on the pile driving-dedicated PSO vessel must be equipped with functional Big Eye binoculars (*e.g.*, 25 x 150; 2.7 view angle; individual ocular focus; height control). These must be pedestal mounted on the deck at the best vantage point that provides for optimal sea surface observation and PSO safety. PAM operators must use a NMFS-approved PAM system to conduct monitoring;

(3) During periods of low visibility (*e.g.*, darkness, rain, fog, poor weather conditions, *etc.*), PSOs must use alternative technology (*e.g.*, infrared or thermal cameras) to monitor the mitigation zones;

(4) PSOs and PAM operators must not exceed 4 consecutive watch hours on duty at any time, must have a 2-hour (minimum) break between watches, and must not exceed a combined watch schedule of more than 12 hours in a 24-hour period;

(5) For UXO/MEC detonation areas larger than 2 km, Sunrise Wind must use a secondary PSO vessel to monitor for marine mammals. For any additional vessels determined to be necessary, three PSOs must be used and located at the appropriate vantage point on the vessel. These additional PSOs would maintain watch during the same time period as the PSOs on the primary monitoring vessel. For detonation areas larger than 5 km, Sunrise Wind must use an aircraft or additional PSO vessels in addition to the primary monitoring vessel to monitor for marine mammals. If an aircraft is used, two PSOs must be used and located at the appropriate vantage point on the aircraft. These additional PSOs would maintain watch

during the same time period as the PSOs on the primary monitoring vessel;

(6) During foundation installation and UXO/MEC detonation, Sunrise Wind must conduct PAM for at least 24 hours immediately prior to pile driving activities. The PAM operator must review all detections from the previous 24-hour period immediately prior to pile driving;

(7) During cable landfall construction, at least two PSOs must be on active duty 30 minutes prior to, during, and 30 minutes after all pile driving activities; and

(8) Sunrise Wind must ensure that visual PSOs conduct, as rotation schedules allow, observations for comparison of sighting rates and behavior with and without use of the specified acoustic sources. Off-effort PSO monitoring must be reflected in the PSO monitoring reports.

(c) *Reporting.* Sunrise Wind must comply with the reporting measures in paragraphs (c)(1) through (20) of this section:

(1) Prior to initiation of project activities, Sunrise Wind must demonstrate in a report submitted to NMFS Office of Protected Resources (*pr.itp.monitoringreports@noaa.gov*) that all required training for Sunrise Wind personnel, including the vessel crews, vessel captains, PSOs, and PAM operators has been completed;

(2) Sunrise Wind must use a standardized reporting system. All data collected related to the Project must be recorded using industry-standard software that is installed on field laptops and/or tablets. Unless stated otherwise, all reports must be submitted to NMFS Office of Protected Resources (*PR.ITP.MonitoringReports@noaa.gov*), dates must be in MM/DD/YYYY format, and location information must be provided in Decimal Degrees and with the coordinate system information (*e.g.*, NAD83, WGS84, *etc.*);

(3) For all visual monitoring efforts and marine mammal sightings, the following information must be collected and reported to NMFS Office of Protected Resources: the date and time that monitored activity begins or ends; the construction activities occurring during each observation period; the watch status (*i.e.*, sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform); the PSO who sighted the animal; the time of sighting; the weather parameters (*e.g.*, wind speed, percent cloud cover, visibility); the water conditions (*e.g.*, Beaufort sea state, tide state, water depth); all marine mammal sightings, regardless of distance from the construction activity; species (or lowest possible taxonomic

level possible); the pace of the animal(s); the estimated number of animals (minimum/maximum/high/low/best); the estimated number of animals by cohort (*e.g.*, adults, yearlings, juveniles, calves, group composition, *etc.*); the description (*i.e.*, as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics); the description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling) and observed changes in behavior, including an assessment of behavioral responses thought to have resulted from the specific activity; the animal's closest distance and bearing from the pile being driven or specified HRG equipment and estimated time entered or spent within the Level A harassment and/or Level B harassment zone(s); the activity at time of sighting (*e.g.*, pile driving, construction surveys), use of any noise attenuation device(s), and specific phase of activity (*e.g.*, ramp-up of HRG equipment, HRG acoustic source on/off, soft-start for pile driving, active pile driving, *etc.*); the marine mammal occurrence in Level A harassment or Level B harassment zones; the description of any mitigation-related action implemented, or mitigation-related actions called for but not implemented, in response to the sighting (*e.g.*, delay, shutdown, *etc.*) and time and location of the action; other human activity in the area, and; other applicable information, as required in any LOA issued under section 5 herein;

(4) If a marine mammal is acoustically detected during PAM monitoring, the following information must be recorded and reported to NMFS: species identification (if possible); call type and number of calls (if known); temporal aspects of vocalization (date, time, duration, *etc.*; date times in ISO 8601 format); confidence of detection (detected, or possibly detected); comparison with any concurrent visual sightings; location and/or directionality of call (if determined) relative to acoustic recorder or construction activities; location of recorder and construction activities at time of call and site name; name and version of detection or sound analysis software used, with protocol reference; minimum and maximum frequencies viewed/monitored/used in detection (in Hz); name of PAM operator(s) on duty; bottom depth and depth of recording unit (in meters); recorder (model & manufacturer) and platform type (*i.e.*, bottom-mounted, electric glider, *etc.*),

and instrument ID of the hydrophone and recording platform (if applicable); time zone for sound files and recorded date/times in data and metadata (in relation to Universal Coordinated Time (UTC); *i.e.*, Eastern Standard Time (EST) time zone is UTC-5); duration of recordings (start/end dates and times; in International Organization for Standardization (ISO) 8601 format, yyyy-mm-ddTHH:MM:SS.sssZ); deployment/retrieval dates and times (in ISO 8601 format); recording schedule (must be continuous); hydrophone and recorder sensitivity (in dB *re. 1* microPascal (μ Pa)); calibration curve for each recorder; bandwidth/sampling rate (in Hz); sample bit-rate of recordings; and detection range of equipment for relevant frequency bands (in meters);

(5) Full marine mammal acoustic detection data, metadata, and location of recorders (or GPS tracks, if applicable) from all real-time hydrophones used for monitoring during construction must be submitted within 90 calendar days following completion of activities requiring PAM for mitigation via the International Organization for Standardization (ISO) standard metadata forms available on the NMFS Passive Acoustic Reporting System website (<https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>). Submit the completed data templates to nmfs.nec.pacmdata@noaa.gov. The full acoustic recordings from real-time systems must also be sent to the National Centers for Environmental Information (NCEI) for archiving within 90 days following completion of activities requiring PAM for mitigation. Submission details can be found at: <https://www.ncei.noaa.gov/products/passive-acoustic-data>;

(6) Sunrise Wind must compile and submit weekly reports during foundation installation to NMFS Office of Protected Resources that document SFV results, the daily start and stop of all pile driving HRG survey, or UXO/MEC detonation activities associated with the Project; the start and stop of associated observation periods by PSOs, details on the deployment of PSOs, a record of all detections of marine mammals (acoustic and visual); any mitigation actions (or if mitigation actions could not be taken, provide reasons why), and details on the noise attenuation system(s) used and its performance. Weekly reports are due on Wednesday for the previous week (Sunday-Saturday) and must include the information required under this section. The weekly report must identify

which turbines become operational and when (a map must be provided);

(7) Sunrise Wind must compile and submit monthly reports to NMFS Office of Protected Resources during foundation installation (PR.ITP.monitoringreports@noaa.gov) that include a summary of all information in the weekly reports, including project activities carried out in the previous month, vessel transits (number, type of vessel, MMIS number, and route), number of piles installed, number of UXO/MEC detonations, all detections of marine mammals, and any mitigative action taken. Monthly reports are due on the 15th of the month for the previous month. The monthly report must also identify which turbines become operational and when (a map must be provided). Full PAM detection data and metadata must also be submitted monthly on the 15th of every month for the previous month via the webform on the NMFS North Atlantic Right Whale Passive Acoustic Reporting System website at <https://www.fisheries.noaa.gov/resource/document/passive-acoustic-reporting-system-templates>.

(8) Sunrise Wind must submit draft annual marine mammal monitoring report to NMFS (PR.ITP.monitoringreports@noaa.gov) no later than March 31, annually. Sunrise Wind must submit a draft annual SFV report to NMFS (PR.ITP.monitoringreports@noaa.gov) no later than 90 days after SFV is completed for the year. The annual marine mammal monitoring report must detail the following: the total number of marine mammals of each species/stock detected and how many were within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity type; marine mammal detections and behavioral observations before, during, and after each activity; what mitigation measures were implemented (*i.e.*, number of shutdowns or clearance zone delays, *etc.*) or, if no mitigative actions was taken, why not; operational details (*i.e.*, days and duration of impact and vibratory pile driving, days, days and amount of HRG survey effort, *etc.*); any PAM systems used; the results, effectiveness, and which noise attenuation systems were used during relevant activities (*i.e.*, foundation pile driving); summarized information related to situational reporting; and any other important information relevant to the Project, including additional information that may be identified through the adaptive management process. The annual SFV report must

summarize all reporting during complete and abbreviated monitoring for the construction year. The final annual reports must be prepared and submitted within 30 calendar days following the receipt of any comments from NMFS on the draft report;

(9) Sunrise Wind must submit its draft final 5-year report to NMFS (PR.ITP.monitoringreports@noaa.gov) on all visual and acoustic monitoring, including SFV, conducted within 90 calendar days of the completion of the specified activities. A 5-year report must be prepared and submitted within 30 calendar days following receipt of any NMFS Office of Protected Resources comments on the draft report. The draft and final 5-year report must include, but is not limited to: the total number (annually and across all five years) of marine mammals of each species/stock detected and how many were detected within the designated Level A harassment and Level B harassment zone(s) with comparison to authorized take of marine mammals for the associated activity; a summary table(s) indicating the amount of each activity type (*e.g.*, pile installation, HRG) completed in each of the five years and total; GIS shapefile(s) of the final location of all piles, cable routes, and other permanent structures including an indication of what year installed and began operating; GIS shapefile of all North Atlantic right whale sightings, including dates and group sizes; a five-year summary and evaluation of all SFV data collected; a five-year summary and evaluation of all PAM and SFV data collected; a five-year summary and evaluation of marine mammal behavioral observations; a five-year summary and evaluation of mitigation and monitoring implementation and effectiveness; and a list of recommendations to inform environmental compliance assessments for future offshore wind actions.

(10) For those foundations requiring complete SFV measurements, Sunrise Wind must provide the initial results of the SFV measurements to NMFS Office of Protected Resources in an interim report after each foundation installation event as soon as they are available and prior to any subsequent foundation installation, but no later than 48 hours after each completed foundation installation event. The report must include hammer energies/schedule used during pile driving or UXO/MEC weight (including donor charge weight), the model-estimated acoustic ranges ($R_{05\%}$) to compare with the real-world source field measurements, estimated source levels at 1 m and/or 10 m, peak sound pressure level (SPL_{pk}) and median,

mean, maximum, and minimum root-mean-square sound pressure level that contains 90 percent of the acoustic energy (SPL_{rms}) and sound exposure level (SEL, in single strike for pile driving (SEL_{s-s}) and SELcum) for each hydrophone, including at least the maximum, arithmetic mean, minimum, median (L50) and L5 (95 percent exceedance) statistics for each metric; estimated marine mammal Level A harassment and Level B harassment acoustic isopleths, calculated using the maximum-over-depth L5 (95 percent exceedance level, maximum of both hydrophones) of the associated sound metric; comparison of modeled results assuming 10-dB attenuation against the measured marine mammal Level A harassment and Level B harassment acoustic isopleths; estimated transmission loss coefficients; pile identifier name, location of the pile and each hydrophone array in latitude/longitude; depths of each hydrophone; one-third-octave band single strike SEL spectra; if filtering is applied, full filter characteristics must be reported; and hydrophone specifications including the type, model, and sensitivity. Sunrise Wind must also report any immediate observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices. If any *in situ* calibration checks for hydrophones reveal a calibration drift greater than 0.75 dB, pistonphone calibration checks are inconclusive, or calibration checks are otherwise not effectively performed, Sunrise Wind must indicate full details of the calibration procedure, results, and any associated issues in the 48-hour interim reports;

(11) All abbreviated SFV results must be included in the weekly reports. The report must include estimated source levels at 1 m or 10 m and the measured SELcum noise levels at distance. Any indications that distances to the identified Level A harassment and Level B harassment thresholds for marine mammals were exceeded must be addressed by Sunrise Wind, including an explanation of factors that contributed to the exceedance and corrective actions that were taken to avoid exceedance on subsequent piles;

(12) The final results of all SFV measurements from each foundation installation must be submitted as soon as possible, but no later than 90 days following completion of all annual SFV measurements. The final reports must include all details included in the

interim report and descriptions of any notable occurrences, explanations for results that were not anticipated, or actions taken during foundation installation. The final report must also include at least the maximum, mean, minimum, median (L50) and L5 (95 percent exceedance) statistics for each metric; the SEL and SPL power spectral density and/or one-third octave band levels (usually calculated as decidecade band levels) at the receiver locations should be reported; range of transmission loss coefficients; the local environmental conditions, such as wind speed, transmission loss data collected on-site (or the sound velocity profile); baseline pre- and post-activity ambient sound levels (broadband and/or within frequencies of concern); a description of depth and sediment type, as documented in the Construction and Operation Plan (COP), at the recording and foundation installation locations; the extents of the measured Level A harassment and Level B harassment zone(s); hammer energies required for pile installation and the number of strikes per pile; the hydrophone equipment and methods (*i.e.*, recording device, bandwidth/sampling rate; distance from the pile where recordings were made; the depth of recording device(s)); a description of the SFV measurement hardware and software, including software version used, calibration data, bandwidth capability and sensitivity of hydrophone(s), any filters used in hardware or software, any limitations with the equipment, and other relevant information; the spatial configuration of the noise attenuation device(s) relative to the pile; a description of the noise abatement system and operational parameters (*e.g.*, bubble flow rate, distance deployed from the pile, *etc.*), and any action taken to adjust the noise abatement system. A discussion which includes any observations which are suspected to have a significant impact on the results including but not limited to: observed noise mitigation system issues, obstructions along the measurement transect, and technical issues with hydrophones or recording devices. Sunrise Wind must submit a revised report within 30 days following receipt of NMFS' comments on the draft final report;

(13) Sunrise Wind must submit SFV results from UXO/MEC detonation monitoring in a report prior to detonating a subsequent UXO/MEC or within the relevant weekly report, whichever comes first. The report must include, at minimum, the size of UXO/MEC detonated and doner charge

weight, why detonation was necessary, current speeds, SELcum, a description of the noise abatement system and operational parameters (*e.g.*, bubble flow rate, distance deployed from the detonation, *etc.*) and any action taken to adjust the noise abatement system, modeled and SFV-based estimated ranges to all relevant NMFS explosive thresholds (including those from pressure transducer measurements);

(14) If at any time during the project Sunrise Wind becomes aware of any issue or issues which may to any reasonable subject-matter expert, including the persons performing the measurements and analysis call into question the validity of any measured Level A harassment or Level B harassment isopleths to a significant degree, which were previously transmitted or communicated to NMFS Office of Protected Resources, Sunrise Wind must inform NMFS Office of Protected Resources within 1 business day of becoming aware of this issue or before the next pile is driven, whichever comes first;

(15) Performance reports for each bubble curtain deployed must include water depth (m), current speed (m/s) and direction (degrees), wind speed (m/s) and direction (degrees), Beaufort sea state, bubble curtain deployment/retrieval date and time (UTC), bubble curtain hose length (m), bubble curtain radius (distance from pile) (m), diameter of holes and hole spacing (metric units), air supply hose length (m), compressor type (including rated Cubic Feet per Minute (CFM) and model number), number of operational compressors, performance data from each compressor (including Revolutions Per Minute (RPM), pressure, start and stop times [UTC]), free air delivery (m^3/min), total hose air volume ($m^3/(min\ m)$), schematic of GPS waypoints during hose laying, maintenance procedures performed and results (pressure tests, inspections, flushing, re-drilling, and any other hose or system maintenance) before and after installation and start and stop times of those tests (UTC), and the length of time the bubble curtain was on the seafloor prior to the associated foundation installation, and confirmation that the bubble curtain was in full contact with the seafloor throughout the use. Additionally, the report must include any important observations regarding performance (before, during, and after pile installation), such as any observed weak areas of low pressure, corrective measures conducted to ensure the system is working sufficiently. The report may also include any relevant video and/or photographs of the bubble

curtain(s) operating during all pile driving;

(16) Sunrise Wind must provide NMFS Office of Protected Resources with notification of planned UXO/MEC detonation as soon as possible but at least 48 hours prior to the planned detonation unless this 48-hour notification would create delays to the detonation that would result in imminent risk of human life or safety. This notification must include the coordinates of the planned detonation, the estimated charge size, and any other information available on the characteristics of the UXO/MEC.

(17) Sunrise Wind must submit situational reports if specific circumstances occur, including but not limited to the following:

(i) All instances wherein an exemption is taken must be reported to the NMFS Office of Protected Resources within 24 hours.

(ii) If a North Atlantic right whale is sighted with no visible injuries or entanglement by PSOs or project personnel, Sunrise Wind must immediately report the sighting to NMFS; if immediate reporting is not possible, the report must be submitted as soon as possible but no later than 24 hours after the initial sighting. All North Atlantic right whale acoustic detections within a 24-hour period should be collated into one spreadsheet and reported to NMFS as soon as possible but no later than 24 hours. To report sightings and acoustic detections, download and complete the *Real-Time North Atlantic Right Whale Reporting Template* spreadsheet found at: <https://www.fisheries.noaa.gov/resource/document/template-datasheet-real-time-north-atlantic-right-whale-acoustic-and-visual>. Save the spreadsheet as a .csv file and email it to NMFS NEFSC-PSD (ne.rw.survey@noaa.gov), NMFS GARFO-PRD (nmfs.gar.incidental-take@noaa.gov), and NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov). If the sighting is in the Southeast (North Carolina through Florida), report via the template and to the Southeast Hotline 877-WHALE-HELP (877-942-5343) with the observation information provided below (PAM detections are not reported to the Hotline). If unable to report a sighting through the spreadsheet within 24 hours, call the relevant regional hotline (Greater Atlantic Region [Maine through Virginia] Hotline 866-755-6622; Southeast Hotline 877-WHALE-HELP) with the observation information provided below (PAM detections are not reported to the Hotline). The visual sighting report must, at minimum,

include the following information: the time (note time format), date (MM/DD/YYYY), location (latitude/longitude in decimal degrees; coordinate system used) of the observation, number of whales, animal description/certainty of observation (follow up with photos/video if taken), reporter's contact information, and lease area number/project name, PSO/personnel name who made the observation, and PSO provider company (if applicable) (PAM detections are not reported to the Hotline). If unable to report via the template or the regional hotline, enter the sighting via the WhaleAlert app (<http://www.whalealert.org/>). If this is not possible, report the sighting to the U.S. Coast Guard via channel 16. The report to the Coast Guard must include the same information as would be reported to the Hotline. PAM detections are not reported to WhaleAlert or the U.S. Coast Guard;

(iii) If a non-NARW large whale is observed, report the sighting via WhaleAlert app (<https://www.whalealert.org/>) as soon as possible but within 24 hours;

(18) In the event that personnel involved in the Project discover a stranded, entangled, injured, or dead marine mammal, the Sunrise Wind must immediately report the observation to NMFS. If in the Greater Atlantic Region (Maine through Virginia), call the NMFS Greater Atlantic Stranding Hotline (866-755-6622), and if in the Southeast Region (North Carolina through Florida) call the NMFS Southeast Stranding Hotline (877-WHALE-HELP (877-942-5343)). Separately, the LOA Holder must report, within 24 hours, the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and, if in the Greater Atlantic Region to the NMFS Greater Atlantic Regional Fisheries Office (GARFO; nmfs.gar.incidental-take@noaa.gov) or if in the Southeast Region, to the NMFS Southeast Regional Office (SERO; secmammalreports@noaa.gov). Note, the stranding hotline may request the report be sent to the local stranding network response team. The report must include contact information (e.g., name, phone number, etc.); time, date, and location (i.e., specify coordinate system) 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); photographs or video footage of the animal(s) (if available); and general circumstances under which the animal was discovered;

(19) In the event of a suspected or confirmed vessel strike of a marine mammal by any vessel associated with the Project or other means by which Project activities caused a non-auditory injury or death of a marine mammal, Sunrise Wind must immediately report the incident to NMFS. If in the Greater Atlantic Region (Maine through Virginia), call the NMFS Greater Atlantic Stranding Hotline (866-755-6622), and if in the Southeast Region (North Carolina through Florida) call the NMFS Southeast Stranding Hotline (877-WHALE-HELP (877-942-5343)). Separately, the Sunrise Wind must immediately report the incident to NMFS Office of Protected Resources (PR.ITP.MonitoringReports@noaa.gov) and, if in the Greater Atlantic Region to the NMFS Greater Atlantic Regional Fisheries Office (GARFO; nmfs.gar.incidental-take@noaa.gov) or if in the Southeast Region, to the NMFS Southeast Regional Office (SERO; secmammalreports@noaa.gov). The report must include time, date, and location (i.e., specify coordinate system) of the incident; species identification (if known) or description of the animal(s) involved (i.e., identifiable features including animal color, presence of dorsal fin, body shape and size, etc.); vessel strike reporter information (name, affiliation, email for person completing the report); vessel strike witness (if different than reporter) information (e.g., name, affiliation, phone number, platform for person witnessing the event, etc.); vessel name and/or MMSI number; vessel size and motor configuration (inboard, outboard, jet propulsion); vessel's speed leading up to and during the incident; vessel's course/heading and what operations were being conducted (if applicable); part of vessel that struck marine mammal (if known); vessel damage notes; status of all sound sources in use at the time of the strike; if the marine mammal was seen before the strike event; description of behavior of the marine mammal before the strike event (if seen) and behavior immediately following the strike; description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike; environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, visibility, etc.) immediately preceding the strike; estimated (or actual, if known) size and length of marine mammal that was struck; if available, description of the presence and behavior of any other marine mammals immediately preceding the

strike; other animal-specific details if known (*e.g.*, length, sex, age class); behavior or estimated fate of the marine mammal post-strike (*e.g.*, dead, injured but alive, injured and moving, external visible wounds (linear wounds, propellor wounds, non-cutting blunt-force trauma wounds), blood or tissue observed in the water, status unknown, disappeared); to the extent practicable, any photographs or video footage of the marine mammal(s); and, any additional notes the witness may have from the interaction. For any numerical values provided (*i.e.*, location, animal length, vessel length, *etc.*), please provide if values are actual or estimated. The Sunrise Wind must immediately cease activities until the NMFS Office of Protected Resources is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the LOA(s). NMFS Office of Protected Resources may impose additional measures to minimize the likelihood of further prohibited take and ensure MMPA compliance. Sunrise Wind may not resume their activities until notified by NMFS Office of Protected Resources; and

(20) Sunrise Wind must report any lost gear associated with the fishery surveys to the NOAA Greater Atlantic Regional Fisheries Office Protected Resources Division (nmfs.gar.incidentaltake@noaa.gov) as soon as possible or within 24 hours of the documented time of missing or lost gear. This report must include information on any markings on the gear and any efforts undertaken or planned to recover the gear.

§ 217.316 Letter of Authorization.

(a) To incidentally take marine mammals pursuant to these regulations, Sunrise Wind must apply for and obtain an LOA; (b) An LOA, unless suspended or revoked, may be effective for a period of time not to exceed the effective period of this subpart;

(c) If an LOA expires prior to the expiration date of these regulations, Sunrise Wind may apply for and obtain a renewal of the LOA; and

(d) In the event of projected changes to the activity or to mitigation and

monitoring measures required by an LOA, Sunrise Wind must apply for and obtain a modification of the LOA as described in § 217.317.

(e) The LOA must set forth:

(1) Permissible methods of incidental taking;

(2) Means of effecting the least practicable adverse impact (*i.e.*, mitigation) on the species, its habitat, and on the availability of the species for subsistence uses; and

(3) Requirements for monitoring and reporting.

(f) Issuance of the LOA must be based on a determination that the level of taking must be consistent with the findings made for the total taking allowable under this subpart. (g) Notice of issuance or denial of an LOA must be published in the **Federal Register** within 30 days of a determination.

§ 217.317 Modifications of Letter of Authorization.

(a) A LOA issued under §§ 216.106 and 217.316 of this section for the activities identified in § 217.310(c) shall be modified upon request by Sunrise Wind, provided that:

(1) The specified activity and mitigation, monitoring, and reporting measures, as well as the anticipated impacts, are the same as those described and analyzed for this subpart (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section); and

(2) NMFS determines that the mitigation, monitoring, or reporting measures required by the previous LOA under this subpart were implemented.

(b) For a LOA modification request by the applicant that includes changes to the activity or the mitigation, monitoring, or reporting measures (excluding changes made pursuant to the adaptive management provision in paragraph (c)(1) of this section), the LOA shall be modified, provided that:

(1) NMFS determines that the changes to the activity or the mitigation, monitoring, or reporting do not change the findings made for the regulations in this subpart and do not result in more than a minor change in the total estimated number of takes (or distribution by species or years); and

(2) NMFS may publish a notice of proposed modified LOA in the **Federal Register**, including the associated analysis of the change, and solicit public comment before issuing the LOA.

(c) A LOA issued under § 216.106 of this chapter and § 217.316 for the activities identified in § 217.310(c) may be modified by NMFS under the circumstances in paragraphs (c)(1) and (2) of this section:

(1) Through adaptive management, NMFS may modify (including remove, revise, or add to) the existing mitigation, monitoring, or reporting measures after consulting with Sunrise Wind regarding the practicability of the modifications, if doing so creates a reasonable likelihood of more effectively accomplishing the goals of the mitigation and monitoring measures set forth in this subpart.

(i) Possible sources of data that could contribute to the decision to modify the mitigation, monitoring, or reporting measures in an LOA include, but are not limited to:

(A) Results from Sunrise Wind's monitoring;

(B) Results from other marine mammals and/or sound research or studies; and

(C) Any information that reveals marine mammals may have been taken in a manner, extent, or number not authorized by this subpart or subsequent LOA.

(ii) If, through adaptive management, the modifications to the mitigation, monitoring, or reporting measures are substantial, NMFS shall publish a notice of proposed LOA in the **Federal Register** and solicit public comment; and

(2) If NMFS determines that an emergency exists that poses a significant risk to the well-being of the species or stocks of marine mammals specified in the LOA issued pursuant to § 216.106 of this chapter and § 217.316, a LOA may be modified without prior notice or opportunity for public comment. Notice would be published in the **Federal Register** within 30 days of the action.

§§ 217.318—217.319 [Reserved]

[FR Doc. 2024-09902 Filed 5-21-24; 8:45 am]

BILLING CODE 3510-22-P