United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Mr. Lou Chiarella
Assistant Regional Administrator for Habitat Conservation
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Mr. Chiarella:

This letter is in response to the Essential Fish Habitat (EFH) conservation recommendations provided via letter dated June 7, 2021, regarding the proposed South Fork Wind Farm and South Fork Export Cable Project (Project). The Bureau of Ocean Energy Management (BOEM) is the lead Federal agency for the EFH consultation for the Project, in coordination with the U.S. Army Corps of Engineers (USACE), who would be permitting construction of portions of the project. Your June 2021 letter also provided recommendations under the Fish and Wildlife Coordination Act (FWCA).

Pursuant to Section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, BOEM is required to provide a detailed response to each EFH conservation recommendation within 30 days of receipt. Due to the novel nature of offshore wind projects and timing of approval decisions, the National Marine Fisheries Service (NMFS) clarified to BOEM via email on July 26, 2019, that, by statute, an EFH response letter from BOEM must be received at least 10 days before the Record of Decision (ROD) is issued. BOEM initially contacted NMFS on July 2, 2021 to acknowledge that information. BOEM also indicated that conservation recommendation (CR) #1 was being addressed and that a meeting between NMFS and BOEM staff would be scheduled to discuss BOEM's responses to the remaining CRs. Through subsequent emails, BOEM clarified that a response would be provided to NMFS earlier than 10 days before the ROD, and BOEM stated the hope to work with NMFS to develop a standard timeline for receiving and responding to NMFS's EFH CRs. NMFS provided an additional letter on August 31, 2021, in response to our EFH addendum (see CR #1 below) and included a revision to CR #12 and two additional CRs (#14 and #15).

Below are our responses to the recommendations provided in your June 7, 2021 and August 31, 2021 letters. As described above, BOEM and NMFS staff have discussed these CRs in a meeting, by email, and by phone several times since the NMFS June 7, 2021 letter. BOEM believes the conservative approach to evaluating potential impacts to EFH taken in the EFH assessment, in particular the potential impacts to complex and hard bottom habitats, is to use conservative estimates that properly estimate the potential adverse effects to EFH. Where applicable, BOEM has referenced mitigation measures to be adopted pursuant to the

Endangered Species Act (ESA), as these measures may confer benefits to EFH. Throughout this document the phrase "complex habitat" is defined as: 1) hard bottom substrates (defined as Substrate Class Rock Substrate, and the four Substrate Groups: Gravels, Gravel Mixes, Gravelly, and Shell, according to the Coastal and Marine Ecological Classification Standard modifier, and includes both large-grained and small-grained hard habitats); 2) hard bottom substrates with epifauna or macroalgae cover; and 3) vegetated habitats (e.g. submerged aquatic vegetation and tidal wetlands).

The CRs provided by NMFS in the June 7, 2021, and August 31, 2021, letters are included below with BOEM's responses for each CR.

1. CR #1 recommended that:

> …BOEM update and revise the EFH assessment to clarify the type of turbine scour protection to be used and the extent of boulder relocation required for each turbine location. The EFH assessment should also be updated to reflect new information incorporated into the [Construction and Operations Plan] (COP), including any identified unexploded ordinances (UXOs) and proposed plans for remediation and movement of any UXOs. We also recommend that your updated EFH assessment describe any anticipated impacts from proposed monitoring plans. If the new information affects the basis of our EFH conservation recommendations, or if upon review of the updated EFH assessment we determine that additional recommendations are necessary to avoid, minimize, or offset adverse impacts to EFH, you will be required to reinitiate the EFH consultation. Additionally, BOEM should coordinate with us to develop an EFH assessment template to help standardize the structure and content of future assessments.

BOEM has already partially adopted this CR by having prepared an addendum to the EFH assessment as described below. The recommendation to develop an EFH assessment template is not part of the Project action; therefore, BOEM will not adopt that part of the CR as a result of this consultation. However, BOEM is committed to working with NMFS to develop an EFH assessment template, as discussed below.

<u>EFH Addendum</u>
In response to NMFS's CR #1, BOEM submitted an addendum to the EFH assessment (Addendum) on August 2, 2021. The following information was included in the addendum:

- Errata addressing inconsistencies between the impact area quantities presented in the EFH assessment and those presented in the COP[1]. These discrepancies could be attributed to an inaccurate description of the project design envelope analysis area for benthic habitat impacts as the actual impact area; changes to the project design that were not consistently addressed throughout the document; and inconsistent use of English and metric units and associated rounding errors.

[1] South Fork Wind, LLC. 2021. South Fork Wind Farm Construction and Operations Plan, Volume I (May 2021). 630 p. www.boem.gov/south-fork.

- Analyses of potential impacts to EFH by:
    - The munitions and explosives of concern or unexploded ordinance (MEC/UXO) contingency plan, in the event that MEC/UXO are discovered in the project construction footprint;
    - A proposed change to the installation of the South Fork Export Cable at the sea-to-shore transition; and
    - Proposed Project monitoring plans, including passive acoustic monitoring in the Protected Species Mitigation and Monitoring Plan[2]; fisheries and benthic surveys in the Fisheries Research and Monitoring Plan[3]; and acoustic telemetry and fisheries surveys in the New York State Fisheries Study Work Plan[4];
- Additional information regarding the design specifications for foundation scour protection and the extent of boulder relocation required for each turbine location.

BOEM determined that the additional information and analyses presented in the Addendum would not lead to a change in the conclusions of the original effects analysis or modify any effect determination presented in the April 6, 2021 EFH assessment.

EFH Assessment Template

BOEM supports the development of an EFH assessment template to standardize the structure and content of future EFH assessments for U.S. offshore wind projects. BOEM is currently working with NMFS with support from the Department of Transportation's Volpe Center to develop an EFH assessment template for future offshore wind projects. The target date for completion of the template is Winter 2021/2022.

2. CR #2 stated:

> Based on the available habitat delineations and data, we [NMFS] have determined that the proposed turbine locations [wind turbine generator] (WTG) 1, WTG 5, WTG 15, WTG 16A, and WTG 17A would result in substantial adverse impacts to complex habitats. BOEM should remove these turbine locations from the proposed project and prohibit development at these locations.

[2] South Fork Wind, LLC. 2021. Protected Species Mitigation and Monitoring Plan. Appendix P3 of the South Fork Wind Construction and Operation Plan. 58 p. www.boem.gov/south-fork.
[3] South Fork Wind, LLC and Inspire Environmental. 2020. South Fork Wind Fisheries Research and Monitoring Plan. 123 p. www.boem.gov/renewable-energy/state-activities/south-fork.
[4] South Fork Wind, LLC. 2021. New York State: Fisheries Study Work Plan. April 2021. 39 p. www.boem.gov/renewable-energy/state-activities/south-fork.

If the COP is approved, BOEM intends to adopt Habitat Minimization Alternative Layout B (FEIS Figure 2.1.3-2b), which would exclude a total of five turbines (WTG 5, WTG 6, WTG 9, WTG 16A, WTG 17A). Removal of three of these turbines (WTG 5, WTG 16A and WTG 17A) is consistent with CR #2 (Habitat Minimization Alternative Layout A, FEIS Figure 2.1.3-2a). Therefore, BOEM will partially adopt CR #2 by excluding WTG 5, WTG 16A and WTG 17A. However, South Fork Wind (SFW) raised technical and engineering concerns with the feasibility of removing WTG 1 and WTG 15 and the removal and realignment of the associated inter-array cables. BOEM included information regarding SFW's technical and engineering concerns in the SFW FEIS (Section 2.1.3). SFW submitted additional documentation regarding these concerns to BOEM. BOEM shared this information with NMFS on September 28, 2021. BOEM has weighed the technical and economic burdens associated with fully adopting Alternative Layout A and concurs with SFW's analysis that WTG 6 and WTG 9 should be removed, and WTG 1 and WTG 15 should be retained.

SFW must submit a survey plan to BOEM and NMFS and conduct pre-construction surveys at WTG 1 and WTG 15 to further characterize complex habitat at these two locations. If complex habitats will be permanently disturbed at WTG 1 and WTG 15, these WTGs must be included in the plan submittal detailed in CR #5 below. The plan must be reviewed by NMFS and BOEM, and all comments must be addressed to BOEM's satisfaction prior to implementation of the plan.

As stated in the EIS, both scenarios under the Habitat Minimization Alternative are comparable in their protection of complex and potentially complex habitat, with Habitat Minimization Alternative B impacting approximately 5.3 fewer acres of complex and potentially complex habitat than Alternative A. Relative to the Proposed Action, the NMFS layout option would reduce the impacts to complex and potentially complex habitat in the lease area from 16.9 acres to 9.5 acres (a reduction of 7.4 acres). Impacts to complex and potentially complex habitat from the inter-array cables would be reduced from 146.8 acres to 118.5 acres (a reduction of 28.3 acres). Relative to the Proposed Action, the SFW layout option would reduce impacts to complex and potentially complex habitat in the lease area from 16.9 acres to 12.6 acres (a reduction of 4.3 acres). Impacts to complex and potentially complex habitat from the inter-array cables would be reduced from 146.8 acres to 110.1 acres (a reduction of 36.7 acres). In comparing the total (lease area + inter-array cable corridor) impacts to complex and potentially complex habitat for the NMFS and SFW layouts, the NMFS layout would result in total impacts to complex and potentially complex habitat of 128 acres. The SFW layout would result in total impacts to the two habitat types of 122.7 acres.

For either scenario, the avoidance of geologically complex areas, to the extent practicable, is preferable for the installation and operation of offshore wind infrastructure. As there is a strong correlation between geologically and biologically complex areas, the avoidance of benthic habitats is intrinsically built into the layout development and micrositing process. Additionally, CR #5 details measures BOEM is adopting to ensure that habitat that is modified by scour protection and cable protection materials are designed to minimize any negative effects of this habitat modification to the maximum extent practicable.

3. CR #3 stated:

> Based on the available habitat delineations and data, we [NMFS] have also determined that micrositing turbine locations will be necessary to avoid and minimize substantial adverse impacts to complex habitats. We recommend that turbine locations WTG 2, WTG 4, WTG 6, WTG 8, WTG 9, WTG 10, WTG 12, WTG 13, WTG 14, offshore substation (OSS), and the associated inter-array cables be microsited into low multibeam backscatter return areas and that restrictions on seafloor disturbance (e.g., anchoring) during construction be required to avoid impacts to higher multibeam backscatter return areas. BOEM should require a micrositing plan be developed for each of the identified turbine locations and associated cable routes. The micrositing plan should be submitted for our review and comment prior to BOEM approval.

At a minimum, BOEM will partially adopt this recommendation. BOEM would include a condition in the Project ROD for SFW to microsite eight of NMFS's ten recommended structures (WTG 2, WTG 4, WTG 8, WTG 10, WTG 12, WTG 13, WTG 14, and the OSS), and the associated inter-array cables, into low multibeam backscatter return areas. If the Project is approved, BOEM would require the removal of WTG 5, WTG 6, WTG 9, WTG 16A and WTG 17A (see CR #2) and would approve the construction of WTG 1 and WTG 15. Therefore WTG 6 and WTG 9 would be removed from the layout and would not be available for micrositing. However, SFW has raised technical and economic concerns regarding the micrositing of five of the recommended structures (WTG 2, WTG 12, WTG 13, WTG 14, and the OSS) and associated inter-array cables, and proposes to microsite WTG 1, WTG 4, WTG 8, WTG 10, and WTG 15. Three turbines (WTG 4, WTG 8, and WTG 10) are consistent between the two scenarios. Five additional structures would be microsited under NMFS's CR #3 recommendation. Two additional structures would be microsited under SFW's proposal. BOEM is still weighing the technical and economic burdens associated with fully adopting this CR.

BOEM will require a micrositing plan to be developed for each of the identified turbine locations and associated cable routes. SFW must not microsite approved structure locations in a way that narrows any north-south or east-west transit corridors to less than 1.0 nautical miles (nmi) nor any northwest-southeast or northeast-southwest transit corridors to less than 0.6 nmi. SFW will be required to prepare and submit a micrositing plan to NMFS and BOEM for a 30-day review and comment period 120 days after approval of the COP. SFW must resolve all comments on the plan to BOEM's satisfaction prior to implementation of the plan. Note that the restrictions on seafloor disturbance proposed by NMFS in CR #3 are incorporated into BOEM's response for CR #4 (anchoring plan) below.

4. CR #4 stated that:

> Given the extent of complex habitats in the project areas, BOEM should require the applicant to develop an anchoring plan to ensure anchoring is avoided and minimized in complex habitats during construction and maintenance of the project. This plan should specifically delineate areas of complex habitat around each turbine and cable locations, and identify areas restricted from anchoring. Anchor chains should include mid-line

> buoys to minimize impacts to benthic habitats from anchor sweep where feasible. The habitat maps and inshore maps delineating eelgrass habitat adjacent to the [Operations and Maintenance] (O&M) facility should be provided to all cable construction and support vessels to ensure no anchoring of vessels be done within or immediately adjacent to these complex habitats. The anchoring plan should be provided for our review and comment prior to BOEM approval.
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> Note that NMFS provided a correction to this CR on 9/1/21 with the second-to-last sentence in the CR above edited for clarity to "The habitat maps and inshore maps, delineating eelgrass habitat adjacent to the O&M facility, should be provided to all construction and support vessels to ensure no anchoring of vessels be done within or immediately adjacent to these complex habitats."

BOEM will partially adopt this CR. At least 30 calendar days prior to conducting seabed-disturbing activities, SFW must submit for review and comment an anchoring plan for all areas where anchoring occurs within 1,640 feet (500 m) of sensitive habitats, including hard bottom and complex habitats. Complex habitats include glacial moraine and coarse sediment, as defined in Section 3.4.2.1.1 of the SFW Final Environmental Impact Statement (FEIS). The anchoring plan must include the planned location of anchoring activities, sensitive habitats and their locations, seabed features, potential hazards, and any related facility-installation activities (such as cable, turbine, and OSS installation). SFW will provide to all construction and support vessels the habitat delineations from Figure 3.4.2-1 and 3.4.2-2 of the SFW FEIS, with the addition of a GIS layer showing boulder locations. SFW will identify areas characterized by a high prevalence of cobbles and boulders as areas in which anchoring should be avoided to the extent technically and economically feasible. BOEM will require all vessels deploying anchors to use mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor, unless SFW demonstrates, and BOEM accepts, that (i) the use of mid-line anchor buoys to reduce the amount of anchor chain or line that touches the seafloor is not technically and economically feasible; or (ii) a different alternative is as safe and provides the same or greater environmental protection. SFW will be required to submit the anchoring plan to BOEM and NMFS for a 30-day review and comment period 90 days before construction may begin. SFW must resolve all comments on the plan to BOEM's satisfaction prior to implementation of the plan.

For the inshore components (within 3 nautical miles of the shoreline) of this CR, SFW would provide to all vessels associated with construction and dredging at the O&M facility the most recent New York State Department of Environmental Conservation submerged aquatic vegetation map for Long Island ("New York Seagrass Map", https://www.dec.ny.gov/lands/110813.html) or a comparable product, showing delineated eelgrass habitat adjacent to and near the O&M facility. SFW would also be required to comply with the anchoring chain and anchoring plan requirements, as stated above, for construction and dredging vessels at the O&M facility. SFW would be required to submit an anchoring plan to USACE and NMFS for a 30-day review and comment period 90 days before construction may begin. SFW must resolve all comments on the plan to USACE's satisfaction prior to implementation of the plan. BOEM supports these sections of this CR; however, BOEM cannot adopt them because their implementation and enforcement are outside of BOEM's jurisdictional authority. BOEM has

communicated with the USACE regarding associated project activities within USACE jurisdiction. The USACE informed BOEM that it will consider including these components of the CR in any permit issued for this activity.

5. CR #5 stated that:

> BOEM should require scour and cable protection within complex habitats of the lease area use natural, rounded stone of consistent grain size to match existing conditions. Scour and cable protection placed within soft-sediment habitats should incorporate natural, rounded cobble and boulders (2.5-10 inches in diameter for cobble or >10-inch diameter for boulder). Concrete mattresses should not be permitted to be used as scour protection within hard bottom and structurally complex habitats, and any required use of concrete mattresses for cable protection should be mitigated through the addition of natural, rounded stone. Should the use of any engineered stone be necessary, it should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes. BOEM should require that the applicant provide descriptions and specifications for any proposed engineered stone for agency comment and review prior to final design selection.

BOEM will adopt this conservation recommendation. However, it is unlikely that it is technically and financially feasible for SFW to obtain rounded cobble and boulders that would meet the engineering requirements for cable protection. Additionally, secondary protection using native material is typically not suitable to provide the necessary protection, nor is it likely to be hydraulically stable, resulting in dispersion of the berm and rapid loss of protection. The industry standard secondary protection types included within the COP do not match the native sediment as they are designed to maintain protection and hydraulic stability. Rock protection is carefully graded, with consideration for the site conditions. Thus, BOEM will require SFW to provide Project cable protection measures in hard bottom and structurally complex habitat to consist of natural or engineered stone that does not inhibit epibenthic growth and provides three-dimensional complexity, both in height and in interstitial spaces, as technically and economically feasible. BOEM will require SFW to develop and submit a cable protection plan that provides descriptions and specifications for all cable protection materials used in hard bottom and structurally complex habitat, as shown in Figure 3.4.2-1 and 3.4.2-2 of the SFW FEIS. The plan must also include a proposal for the use of nature-inclusive design materials or materials appropriate for Atlantic cod habitat to mitigate for impacts to complex habitat permanently disturbed at WTG 1 and WTG 15 (see CR #2). SFW will be required to prepare and submit the cable protection materials plan to NMFS and BOEM for a 30-day review and comment period no later than 4 months prior to the placement of cable protection measures. SFW must resolve all comments on the plan to BOEM's satisfaction prior to placement of cable protection measures. Additionally, BOEM is considering a study to evaluate the effectiveness and feasibility nature inclusive design materials in the 2022-2023 Studies Development Plan (see pg. 229 https://www.boem.gov/sites/default/files/documents/environment/environmental-studies/SDP_2022-2023.pdf). BOEM believes the results of this study, if funded, will improve the state of knowledge on the availability and feasibility of using these materials in offshore wind energy projects.

6. CR #6 stated that:

> BOEM should restrict pile driving and all bottom-disturbing activities within the lease area during periods of Atlantic cod spawning. Pile driving activity and bottom-tending disturbances should be prohibited during peak spawning, from November through March, to avoid and minimize substantial adverse impacts to Atlantic cod EFH.

At a minimum, BOEM will partially adopt this conservation recommendation, to include a restriction on all pile driving between January 1 and April 30 or as authorized by the final incidental harassment authorization issued by NMFS pursuant to the Marine Mammal Protection Act. SFW has already committed to this measure. BOEM will also require SFW to avoid pile driving between December 1 and December 31, unless anticipated delays due to weather or technical problems arise that necessitate extending pile driving through December, and the pile driving is approved by BOEM. This measure, while primarily focused on the highly endangered North Atlantic right whale, will also confer benefits to Atlantic cod that also spawn in the winter/spring time frame.

Additional restrictions on pile-driving in November and potentially December, and on all bottom-disturbing activities within the lease area from November through March, could extend the overall Project construction schedule beyond what SFW has represented is technically and economically feasible. If the proposed CR were implemented, completion of offshore construction could be extended over multiple seasons or years, which may ultimately increase potential impacts to all marine species, including Atlantic cod and protected species. The incidence of user conflicts could also increase. The current construction schedule includes a window for all project activities to occur between May 1 and December 31 (COP Table 1.5-1), including the ability to install foundations throughout this entire period. In addition, seabed preparation and cable installation activities would need to occur between November and March prior to the start of foundation installation.

In addition to concerns regarding technical and economic feasibility, BOEM has also evaluated biological factors. SFW is already restricted to the commencement of impact pile driving only during daylight hours no earlier than one hour after (civil) sunrise until 1.5 hours (hrs) before (civil) sunset[5]. Pile driving may only continue after dark if the installation of the same pile began 1.5 hrs before sunset and must proceed for safety or installation feasibility reasons. For the largest pile (11 meters), driving time to install the pile would range from a minimum of 140 minutes to a maximum of 250 minutes for a pile that is difficult to drive. Only one pile would be driven in a day[6].

[5] Proposed Incidental Harassment Authorization, https://www.fisheries.noaa.gov/action/incidental-take-authorization-south-fork-wind-llc-construction-south-fork-offshore-wind.

[6] Denes, SL, DG Zeddies, and MM Weirathmueller. 2021. Turbine Foundation and Cable Installation at South Fork Wind Farm: Underwater Acoustic Modeling of Construction Noise. Document 01584, Version 4.0. Technical report by JASCO Applied Sciences for Jacobs Engineering Group, Inc. and Deepwater Wind, LLC.

Atlantic cod exhibit courtship and spawning behavior, including vocalizations, primarily at night[7, 8]. A primary concern regarding acoustic impacts to Atlantic cod is acoustic masking, which occurs when noise precludes animals from detecting biologically important acoustic cues. Given that all pile-driving activities will begin during the day, acoustic impacts will not coincide with peak spawning communication, which typically occurs in the evening, approximately 4 – 6 hrs after sunset[9], and thus would not mask peak Atlantic cod acoustic communication. It should be noted that acoustic masking is an environmental stressor that ceases as soon as the noise source stops; unlike other stressors, there is no lingering effect. Therefore, even if pile driving began at the latest permissible time (i.e., 1.5 hrs before sunset), the stressor would cease before the likely peak of spawning behavior in the evening.

It is possible that aggregated Atlantic cod close to the inter-array cable corridor could be temporarily disturbed by site preparation and cable installation activities. However, disturbances from these activities would be localized and transient, as they would occur along narrow corridors extending for miles, and thus would not be at any fixed location for an extended period. Because Atlantic cod exhibit strong site fidelity during spawning and the duration and areal extent of disturbance in any one area would be limited, permanent dispersion of aggregated cod is unlikely to occur.

The result of physical disturbance of spawning aggregations is reported in Dean et al. (2012)[10] in a study examining impacts of fishing on cod spawning aggregations or stacks. The reported disturbance was the result of continuous localized deployment of multiple gillnets in the spawning aggregation by several vessels over several days, and the authors concluded that the spawning aggregation was completely dispersed by the extensive commercial fishing activity. In contrast, a short-term impact from a single bottom trawl created an area of avoidance within an Atlantic cod spawning aggregation stack for slightly over an hour but did not result in permanent dispersion of the spawning aggregation[11]. It is likely that impacts from project activities could temporarily disturb aggregated Atlantic cod. However, because the fish exhibit strong site fidelity when they are reproductively active, impulsive acoustic impacts (e.g., pile driving) would be of limited duration and would not occur during peak spawning, and the duration and areal extent of other bottom-disturbing activities (e.g., site preparation and cable installation) at any location would be limited, permanent dispersion of aggregated Atlantic cod is unlikely to occur.

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[7] Dean MJ, WS Hoffman, DR Zemeckis, and MP Armstrong. 2014. Fine-scale diel and gender-based patterns in behaviour of Atlantic cod (*Gadus morhua*) on a spawning ground in the Western Gulf of Maine. ICES Journal of Marine Science. 71(6):1474-89.

[8] Zemeckis DR, MJ Dean, AI DeAngelis, SM Van Parijs, WS Hoffman, MF Baumgartner, LT Hatch, SX Cadrin, CH McGuire. 2019. Identifying the distribution of Atlantic cod spawning using multiple fixed and glider-mounted acoustic technologies. ICES Journal of Marine Science. 76(6):1610-25.

[9] Zemeckis et al. 2019.

[10] Dean MJ, WS Hoffman, and MP Armstrong. 2012. Disruption of an Atlantic cod spawning aggregation resulting from the opening of a directed gill-net fishery. North American Journal of Fisheries Management. 32(1):124-34.

[11] Morgan, MJ, EM DeBlois, and GA Rose. 1997. An observation on the reaction of Atlantic cod (*Gadus morhua*) in a spawning shoal to bottom trawling. Canadian Journal of Fisheries and Aquatic Sciences 54:217–223 *in* Dean et al. 2012.

It should also be noted that any conservation benefit from prohibiting pile driving and other bottom-disturbing activities would likely not be realized, as the fishing methods described in the previous referenced studies are allowed to occur, and do occur, in the Southern New England regulated mesh area (which includes the action area) during the periods that are recommended for Project avoidance.

As only 13 monopiles (12 WTGs plus the OSS) would be installed at a maximum duration of a little over 4 hrs each on any given day, over a total of an 8-month period, the likelihood of any impacts from daytime pile driving impacting nighttime spawning during November and December and resulting in population-level effects is low. Additionally, although the inter-array cable corridor is extensive, bottom-disturbing activities at any location along the cable corridor would be temporary and transient and would be unlikely to result in population-level effects. However, although active commercial and recreational fishing currently may occur on Atlantic cod spawning aggregations in the Project area, BOEM recognizes that the New England Fishery Management Council and NMFS are currently evaluating Atlantic cod stock structure and identifying management measures that are responsive to the potential new stock designations (see: https://www.nefmc.org/library/2021-atlantic-cod-stock-structure-workshops). In order to minimize physical disruption of Atlantic cod spawning aggregations, BOEM will require SFW to avoid impacts to Atlantic cod aggregations indicative of spawning behavior during certain bottom-disturbing Project activities in the lease area between November and March.

Specifically, BOEM will require SFW to conduct real-time adaptive acoustic monitoring for Atlantic cod aggregations indicative of spawning behavior during bottom-disturbing Project activities associated with inter-array cable installation (e.g., boulder relocation, pre-cut trenching, cable-crossing installation, cable lay and burial) and foundation site preparation (e.g., scour protection installation) from November through March, and to avoid these Project activities in any area with aggregations of Atlantic cod indicative of spawning behavior. SFW will be required to develop a real-time adaptive acoustic monitoring plan using active acoustic monitoring (e.g., echosounder) to detect large aggregations of adult Atlantic cod and/or passive acoustic monitoring (PAM) to detect Atlantic cod spawning vocalizations. Acoustic telemetry may be used to monitor previously tagged Atlantic cod in the Project area for spawning behavior but should not be the sole method employed. The plan must include details on detection thresholds (e.g., density and location) of spawning Atlantic cod aggregations that would trigger the adaptive management of defined bottom-disturbing activities, including restrictions on defined Project activities in any area with aggregations of Atlantic cod indicative of spawning behavior. SFW will be required to submit the real-time adaptive acoustic monitoring plan to BOEM and NMFS for a 30-day review and comment period 90 days before inter-array cable installation activities and foundation site preparation defined in the plan may begin. SFW must resolve all comments on the plan to BOEM's satisfaction prior to implementation of the plan.

Lastly, BOEM is currently funding the study "*Movement Patterns of Fish in Southern New England*" through an interagency agreement with the NMFS, through fiscal year (FY) 2023. BOEM will evaluate potential follow-on related to potential monitoring of Atlantic cod sound

production during November and December through the FY 2023 Study Development Plan, depending on availability of funds and management priorities.

7. CR #7 stated that:

> BOEM should require the applicant to use noise mitigating measures during construction, such as soft start procedures, to ensure fish have the opportunity to evacuate the area prior to pile driving activity, and the deployment of noise dampening equipment such as bubble curtains. BOEM should require the development of a plan outlining noise mitigation procedures in consultation with the resource agencies prior to any construction activities. This should include a minimum of 30 days for the resource agencies to review and provide comments. The noise mitigation plan should be filed with BOEM for approval before construction commences. The noise mitigation plan should include a process for notifying resource agencies within 24 hrs if any evidence of a fish kill during construction activity is observed, and contingency plans to resolve issues.

BOEM will adopt this CR for pile driving activities. BOEM will require SFW to implement soft start techniques for all impact pile driving, both at the beginning of a monopile installation and at any time following the cessation of impact pile driving of 30 minutes or longer. The soft start procedure must include a minimum of 20 minutes of 4-6 strikes/minute at 10-20 percent of the maximum hammer energy.

BOEM will require SFW to employ a noise mitigation device(s), such as a bubble curtain, during all impact pile driving. The noise mitigation device(s) must perform such that measured ranges are consistent with those modeled assuming 10 dB attenuation, determined via sound source verification (described in #8, below).

If a bubble curtain is used, the following requirements would apply:

1. The bubble curtain(s) must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column;

2. 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;

3. No parts of the ring or other objects may prevent full seafloor contact of the lowest bubble ring; and

4. Construction contractors must train personnel in the proper balancing of air flow to the bubblers. Construction contractors must submit an inspection/performance report for approval by South Fork Wind within 72 hrs following the performance test. Corrections to the attenuation device to meet the performance standards must occur prior to impact driving.

In addition, any occurrence of dead non-ESA-listed fish of 10 or more individual fish within established shutdown and/or monitoring zones must also be reported to BOEM as soon as practicable, but no later than 24 hrs after the sighting.

SFW has prepared a Protected Species Monitoring and Mitigation Plan (PSMMP), which is included in the COP as Appendix P3 (www.boem.gov/south-fork). The PSMMP describes noise mitigation measures, a sound source verification measurement plan, and the use of passive acoustic monitoring during construction. SFW will be required to submit the PSMMP to NMFS-Habitat for a 30-day review and comment period 90 calendar days prior to commencement of field activities for pile driving. SFW must resolve all comments on the revisions to BOEM's satisfaction prior to implementation of the PSMMP.

8. CR #8 stated that:

> BOEM should require passive acoustic monitoring to be conducted along a range of gradients from the proposed turbine locations before, during, and after pile driving activities. Resource agencies should be provided a draft of the acoustic monitoring plan for review and comment. The plan should also include sound verification monitoring during pile driving activities. Additional noise dampening technology should be applied should real-time monitoring indicate noise levels are not attenuated to the minimum required 10 decibels. Acoustic monitoring should be provided to the resource agencies.

BOEM will partially adopt this CR. BOEM will require SFW to conduct passive acoustic monitoring during all pile driving and adhere to all related measures required in the Project's Biological Opinion (BiOp) and Incidental Harassment Authorization (IHA), including sound source verification during pile driving, the use of additional sound attenuation measures should real-time monitoring indicate that the isopleths of concern are larger than those considered in the Proposed Action, and the submission of acoustic monitoring reports to the resource agencies. Additional details in the CR that are not included in the Project's BiOp and IHA requirements, such as requiring passive acoustic monitoring along a range of gradients from the proposed turbine locations before, during, and after pile driving activities, would be considered for funding in BOEM's annual Studies Development Plan, depending on availability of funds and management priorities.

SFW will be required to prepare a sound source verification plan to include sound source verification to be carried out for the first monopile to be installed. Should larger diameter piles be installed, or greater hammer size or energy used, additional field measurements must be conducted. The plan must describe how SFW will ensure that the location selected is representative of the rest of the piles of that type to be installed and, in the case that it is not, how additional sites will be selected for sound source verification or how the results from the first pile can be used to predict actual installation noise propagation for subsequent piles. The plan must describe how the effectiveness of the sound attenuation methodology will be evaluated based on the results and must be sufficient to document sound propagation from the pile and distances to isopleths for potential injury and harassment. The measurements must be compared to the injury and behavioral disturbance zones for protected fish species.

As described in the response to CR #7 above, SFW has already prepared the PSMMP, which is included in the COP as Appendix P3 (www.boem.gov/south-fork). The PSMMP describes noise mitigation measures and a sound source verification measurement plan. SFW will be required to submit the plan to BOEM and NMFS-Habitat for a 30-day review and comment period 90 calendar days prior to commencement of field activities for pile-driving. SFW must resolve all comments on the plan to BOEM's satisfaction prior to implementation of the plan.

9. CR #9 stated that:

> BOEM should require the applicant to revise the proposed Benthic Habitat Monitoring Plan to address agency concerns related to the adequacy of the proposed methods to detect changes, and to require that the plan address potential changes to macrobenthic communities across and within each habitat type in the project area, including the artificial substrates to be constructed. The plan should include monitoring of invasive species growth on constructed habitats, habitats impacted by project construction as well as expansion to the adjacent habitats. The monitoring plan should also include measures to evaluate demersal juvenile fish species response to habitat impacts as a result of the project. The applicant should consult with the resource agencies in the revision and refinement of this plan and give the resource agencies a minimum of 30 days to review and comment on the plan. The applicant should ultimately file the plan with BOEM for approval. BOEM should ensure that the applicant's filing addresses, and includes, all resource agency comments, as well as the applicant's response to those comments.

BOEM will partially adopt this CR. SFW submitted the Fisheries Research and Monitoring Plan (FRMP), which includes a section for their Benthic Habitat Monitoring Plan, to state and Federal resource agencies for extensive review and comment several times from 2018 through 2020, with modifications made to the FRMP after each review and comment period, with the most recent review in September 2020 (see Section 1.1 of the FRMP for more detail). On October 2, 2020, SFW submitted the updated FRMP to stakeholders, including matrices providing responses to specific agency comments. BOEM notes that NMFS submitted their comments on the September 2020 version of the FRMP to BOEM on September 16, 2021. BOEM will share these comments with SFW to address NMFS comments.

BOEM believes the FRMP and the opportunities for public and agency input are adequate for monitoring the impacts to fish and benthic habitat. Thus, BOEM will require SFW to review and respond to the recommendations made in this CR, as well as the comments BOEM recently received on the FRMP from NMFS, and provide revisions as feasible. SFW has indicated that some revisions will be made to the draft FRMP in response to this CR. BOEM will also review the revised FRMP and provide comments, if any, on the revisions within 30 days of its submittal. Please note that, while BOEM does not approve or disapprove monitoring plans, SFW must resolve all comments on revisions to the FRMP to BOEM's satisfaction prior to implementation of the revisions.

10. CR #10 stated that:

> Given the potential for adverse impacts to Atlantic cod spawning activity as a result of construction and operation of this project, as well as cumulatively as wind expands in southern New England, BOEM should continue and expand the on-going telemetry and passive acoustic survey. The study should be extended to provide continuous monitoring of Atlantic cod spawning aggregations prior to the construction of the project, and post-construction. NMFS also recommended that the survey be expanded throughout the entire MA and RI/MA wind energy areas (WEA) to allow for detection of shifts to spawning activity and any other spawning activity that may overlap with the WEAs that may be affected by this project and future development.

As this CR is not Project-related, BOEM will not adopt this CR as a result of this consultation. However, BOEM is currently funding the study "*Movement Patterns of Fish in Southern New England*" through an interagency agreement with the NMFS, through FY 2023. BOEM will evaluate potential follow-on studies through the FY 2023 Study Development Plan, depending on availability of funds and management priorities.

11. CR #11 stated that:

> Given the uncertainties surrounding potential impacts to hydrodynamics and predator-prey relationships that may result from this project and cumulatively across the southern New England WEAs, BOEM should take measures to address this uncertainty. BOEM should develop and implement a regional scale study to evaluate and monitor shifts and changes in hydrodynamics (e.g., vertical stratification, current velocities, and direction), primary production, and predator-prey relationships that may occur across wind development areas and result in broader scale impacts for the region, managed fisheries, and NOAA-trust species.

As this CR is not Project-related, BOEM will not adopt this CR as a result of this consultation. However, BOEM has provided over $70,000,000 in fisheries-related funding for renewable energy over the last 11 years, including a study examining changes in hydrodynamics in the Mid-Atlantic Bight (Hydrodynamic Modeling, Particle Tracking and Agent-Based Modeling of Larvae in the U.S. Mid-Atlantic Bight). NMFS has regularly provided research study ideas to BOEM's annual Studies Plan and has been the recipient of funding to support studies of impacts of offshore wind on NMFS resources. BOEM looks forward to a continued relationship with NMFS in the development of future studies. Support for studies depends on availability of funds and management priorities.

12. CR #12 stated that:

> BOEM should restrict nearshore dredging and silt-producing activities associated with the sea-to-shore cable installation and proposed O&M facility improvements that occur at or adjacent to water depths of 5 meters or less, from January 1 through May 31, of any calendar year, to protect sensitive life history stage winter flounder EFH.

> A revision to CR #12 was provided to BOEM on August 31, 2021 in the NMFS EFH Addendum response letter. The revised CR recommends that BOEM restrict nearshore dredging and silt-producing activities associated with the proposed O&M facility improvements that occur at or adjacent to water depths of 5 meters or less, from January 1 through May 31, of any calendar year, to protect sensitive life history stage winter flounder EFH.

BOEM supports this CR; however, BOEM cannot adopt it because its implementation and enforcement are outside of BOEM's jurisdictional authority. BOEM has communicated with the USACE regarding associated project activities within USACE jurisdiction. The USACE informed BOEM that it will consider including this CR in any permit issued for this activity.

13. CR #13 stated that "the EFH consultation should be reinitiated prior to decommissioning turbines to ensure that the impacts to EFH as a result of the decommissioning activities have been evaluated and minimized to the extent practicable."

BOEM will adopt this CR. BOEM will initiate an EFH consultation based on the submittal of the decommissioning application required under 30 CFR 585 Subpart I.

14. CR #14 stated that:

> The location of identified and potential UXO within the project area should be clearly depicted on the micrositing plan (see CR #3). Should any UXOs be proposed to be relocated, the micrositing plan should clearly depict the initial location and all potential relocation sites. Information on the proposed mitigation measure for each UXO should also be provided with the micrositing plan. Upon receipt and review of the new information, NMFS will determine if additional EFH conservation recommendations are necessary if the location of any UXO, or a proposed UXO relocation affects the basis of our EFH conservation recommendations, or if NMFS determines that additional measures are necessary to avoid, minimize, or offset adverse impacts to EFH.

BOEM will adopt this CR by requiring SFW to depict all potential and identified MEC/UXOs in the micrositing plan, as well as the proposed mitigation measure, as practicable. However, as SFW has now determined that the only risk mitigation strategy to be considered for the presence of potential and identified MEC/UXOs is avoidance, relocation information for each potential and identified MEC/UXO is no longer relevant and therefore will not be available to provide in the micrositing plan.

Although relocation of potential and identified MEC/UXOs was a risk mitigation strategy considered in the COP, SFW has subsequently determined that the only risk mitigation strategy that will now be considered is avoidance of the potential and identified MEC/UXOs. If a potential or identified MEC/UXO could not be avoided, the result would be that no infrastructure would be installed if the infrastructure or installation activity intersects with the designated exclusion zone around a potential or identified MEC/UXO target. Activity-dependent exclusion zones follow the "as low as reasonably practical" principle.

SFW will provide BOEM with additional information regarding layout micrositing and design, as appropriate, during the Facility Design Report (FDR)/Fabrication and Installation Report (FIR) review process. As part of the initial FDR/FIR review process, the Certified Verification Agent will review aspects of the Project that inform the micrositing and final project design. At that time, technical siting constraints, such as MEC/UXOs, and environmental siting constraints, such as sensitive benthic habitats, will be considered. This will also include information regarding the location of any potential or identified MEC/UXO and the identified mitigation strategy.

15. CR #15 stated that:

> The spatial extent of boulder relocation should be considered in the evaluation of micrositing turbine and inter-array cable paths (see EFH conservation recommendation #3 of our June 7, 2021 letter). As feasible, the spatial extent of boulder relocation activities should be located fully within low multibeam backscatter areas. Boulder relocation activities associated with the installation of project turbines and inter-array cables should be clearly depicted on the micrositing plan for each turbine installation and inter-array cable route.

BOEM will adopt this CR. BOEM will require SFW to consider the spatial extent of boulder relocation in the micrositing of turbines and inter-array cable paths, and to relocate boulders into low multibeam backscatter areas, as technically and economically feasible. Boulder relocation activities associated with the installation of project turbines and inter-array cables will be clearly depicted on all micrositing plans for turbine installation and inter-array cable routes, as feasible.

SFW has raised technical and engineering concerns with the feasibility of boulder relocation to low multibeam backscatter areas, including major changes to the equipment planned for boulder relocation, the necessity of ship-based transport of boulders in order to achieve compliance, and the additional health and safety risks associated with these changes.

Fish and Wildlife Coordination Act

Under the FWCA, NMFS recommended that dredging and placement should be avoided between April 15 to July 15 at the proposed O&M facility to minimize potential impacts to horseshoe crab spawning. Please note that the Department of the Interior has consistently determined that the FWCA does not apply to Outer Continental Shelf (OCS) leases and permits[12]. Even still, BOEM supports this recommendation. However, BOEM cannot include this condition in the ROD because its implementation and enforcement are outside of BOEM's jurisdictional authority. BOEM has communicated with the USACE regarding associated project activities within USACE jurisdiction. The USACE informed BOEM that it will consider including this CR in any permit issued for this activity.

[12] Department of Interior. 1982. Memorandum, from Solicitor to the Directors of the Bureau of Land Management, the U.S. Geological Survey, and the Acting Director of the Minerals Management Service, "The Fish and Wildlife Coordination Act Does Not Apply to OCS Leases and Permits Issued by the Secretary," Feb. 12, 1982.

Conclusion

The terms and conditions of COP approval will not be finalized until after the ROD is reached on the Final Environmental Impact Statement; however, a draft table of conditions is provided as an enclosure with this letter. If needed, BOEM will update our responses to these EFH conservation recommendations with the final adopted measures after COP approval.

We look forward to working with you to develop a standard timeline for receiving and responding to NMFS's EFH CRs for offshore wind projects moving forward. To that end, we are working with our contractor (U.S. Department of Transportation, Volpe Center) to schedule discussions between BOEM, NMFS, and other cooperating agencies to standardize the National Environmental Policy Act and ESA/EFH consultation processes and content for the review of offshore wind COPs.

Thank you again for your continued collaboration on the review of offshore wind projects. If you have any questions, please feel free to contact Michelle Morin at (703) 787-1722 or michelle.morin@boem.gov.

Sincerely,

JAMES BENNETT

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Date: 2021.10.07 14:49:37 -04'00'

James F. Bennett
Chief
Office of Renewable Energy Programs

Enclosure