REVOLUTION WIND CATEGORY B ASSENT APPLICATION REVIEW

Other documents in the application packet that require our review:

- Appendix B: Sampling Plan
- A species inventory is provided in the RWEC-RI Benthic Habitat Maps and Report provided at Appendix C
- Essential Fish Habitat Assessment Revolution Wind Offshore Wind Farm provided at Appendix D
- Assessment of Impacts to Marine Mammals, Sea Turtles, and ESA-Listed Fish Species Revolution Wind Offshore Wind Farm provided at Appendix E
- Site assessment plan (necessary data and information to be provided in the Site Assessment Plan ((and again in the Construction and Operations Plan (COP))) should include a Biological Survey Report, and Fish and Fisheries Survey Report.
- Adopted Fisheries management plans, programs strategies
- Existing study of the project area as being located in the Cod Spawning ground (Jeremy Colly??)
- Any consistency certificates filed with or received from Rhode Island, Massachusetts, Connecticut
- Cable burial risk assessment to be conducted for the Project, the results of which will inform the target depth for the cables (see App T)

Document Needs:

- Economic impact study: Guidehouse, 2020
- Cat B Phase 2: cable burial feasibility
- All GIS files (VTR and VMS rasters) in Appendix S for FAB analysis

Phase 2 (as needed after discussion with client)

Cat B Appendices:

App A – Site Plans

App D – Cable Burial Feasibility Study

App G – Oil Spill Response Plan

App O – Sediment Transport Modeling Report

Water Quality/Dredge App

Freshwater Wetland App

Revolution Wind – Cat B Assent Application Review & Summary

1) The Application Fails to Meet the Necessary Requirements

Category B Applications must meet certain requirements. (See Section 1.3.1 (A)). The information provided indicates that the project fails to meet the applicable requirements, and in other instances additional information is needed:

a) Requirement 1.3.1 (A)(e): Demonstrate that the alteration or activity will <u>not</u> result in significant impacts on the abundance and diversity of plant and animal life.

According to the Applicant at Section 3: "In areas of sediment disturbance, benthic habitat recovery and benthic infauna land epifaunal species abundances may take up to 1 to3 years to recover to pre-impact levels, based on the results of a number of studies on benthic recovery....

Benthic species may also experience localized, "long-term" impacts caused by the conversion of soft-bottom habitat to hard-bottom habitat associated with cable protection along portions of the RWEC-RI route....

...impacts on EFH will vary for different species based on several factors including behavior and distribution in the water column diet, habitat preferences, the amount of suitable habitat present in the area, and life stage...

Seafloor disturbances associated with installation and removal of the RWEC-RI may impact marine mammals and sea turtles by disrupting and temporarily displacing potential benthic prey species in the immediate area around the cable route."

Based on this, the proposed project is clearly going to have significant impacts on the abundance and diversity of plant and animal life.

b) Requirement 1.3.1 (A)(j): Demonstrate that the alteration or activity will not result in significant conflicts with water dependent uses and activities such as recreational boating, fishing, swimming, navigation, and commerce:

According to the Applicant at Section 3.2.8: "vessel intensity for the Atlantic herring, pelagic species (herring, mackerel, squid), monkfish, and squid fisheries are medium-high to very high along portions of the RWEC-RI route; therefore these fisheries are most likely to be affected during installation of the RWEC-RI"

The Applicant claims that RWEC RI will have no impact on recreation and tourism. (Ocean SAMP §11.9.5 Recreation and Tourism) This is obviously not true in that during construction, maintenance and decommissioning, recreational fishers and boaters must avoid the area. There are explicit welfare losses to recreational fishers who must either fish in a second-best choice area or not fish that day. These can be quantified and valued and should be assessed, which are not completely addressed in the application of appendices. There are many academic of studies that value recreational fishing which support this view that access is valued (Raguragavan et al., 2013; Young et al., 2020; Abbott et al., 2022).

2. The Application fails to comply with the Ocean SAMP:

a) Section 11.9.1C: Ecology states: "The Council recognizes that while all fish habitat is important, spawning and nursery areas are especially critical in providing shelter for these species during the most vulnerable stages of their life cycles. The Council will ensure that proposed activities shall be designed to avoid impacts to these sensitive habitats, and, where unavoidable impacts may occur, those impacts shall be minimized and mitigated. In addition, the Council will give consideration to habitat used by species of concern as defined by the NMFS Office of Protected Resources."

Information provided by the Applicant in Section 3.2.3 states that: the RWEC-RI is designed to avoid and minimize any adverse impacts to sensitive habitats. Where impacts cannot be fully avoided, they will be minimized and mitigated. Revolution Wind is committed to adhering to TOY restrictions to avoid impact to sensitive taxa during critical times in their life cycles (e.g., winter flounder eggs) (see Section 2.2.5.1).

Additional information is needed as to minimization and mitigation measures proposed to protect sensitive habitats.

Not all species affected are addressed in the application. There are missing species from the application which may be affected by disturbances but do not have habitat defined as Essential Fish Habitat, such as the Mantis Shrimp, but will have impacts for fisheries.

b) Section 11.9.6B: Marine Transportation, Navigation and Infrastructure states: "The Council recognizes the economic, historic, and cultural value of marine transportation and navigation uses of the Ocean SAMP area to the state of Rhode Island. The Council's goal is to promote uses of the Ocean SAMP area that do not significantly interfere with marine transportation and safe navigation within designated navigation areas, which include shipping lanes, precautionary areas, recommended vessel routes, pilot boarding areas, anchorages, military testing areas, and submarine transit lanes. See § 11.10.2 of this Part for discussion of navigation areas which have been designated as Areas of Particular Concern."

Information provided by the Applicant in Sections 3.2.10 and 3.2.11 of the Category B Assent application references an evaluation of commercial shipping and other marine uses (e.g., anchorage areas, ferry routes, pilot boarding areas, etc.), respectively, within state waters and potential impacts associated with the RWEC-RI.

Revolution Wind does not intend to request that the USCG modify any precautionary areas, recommended vessels routes, pilot boarding areas, etc. In conjunction with the RWEC-RI route through the West Passage of Narragansett Bay, the USCG may consider modifying some of the U.S. Navy anchorages north of the Jamestown Bridge, which the USCG considers to be obsolete.

<u>The cables will run through navigation lanes that are designated as areas of particular</u> <u>concern. (See Section 5.2.2; Item: (c)(6) "Revolution Wind has also reviewed the data</u> <u>depicted ... and finds that the RWEC-RI corridor passes through the Recreational Boating</u> <u>APCs south of Brenton Point."</u>)

c) Section 11.9.7(A)(2) Offshore Renewable Energy and other Offshore Developments states: "The Council supports offshore development in the Ocean SAMP area that is consistent with the Ocean SAMP goals, which are to:... Promote and enhance existing uses"

Information provided by the Applicant in Section 1.3 includes that "Revolution Wind developed the Project in direct response to the expressed needs of the States of Rhode Island and Connecticut to increase the renewable energy load serving each state. ... The RWEC-RI is a water dependent use proposed in Type 4 and Type 6 waters which will facilitate transfer of renewable energy generated by the Project to the States of Rhode Island and Connecticut. The RWEC-RI was sited, planned, and designed to avoid and minimize impacts to ecological resources. To the extent there are potential adverse impacts that cannot be avoided, these will be mitigated."

<u>Based on the impacts from project construction, operation, maintenance and</u> <u>decommissioning this proposal will have negative impacts and will neither promote or</u> <u>enhance existing uses. Specific, mitigation measures should be identified.</u>

d) Section 11.9.8(C) Application Requirements in State Waters; Design, fabrication and installation standards:

According to the Applicant at Section 5.1.8(C), Items 1-21 were omitted from this Category B Assent Application.

Information provided by the Applicant in Section 5.1.8(C) states that "Revolution Wind acknowledges and will comply with requirements of Section 11.9.8(C)(1)-(21). Revolution Wind has submitted a CVA nomination to BOEM. BOEM approved the CVA nomination on June 10, 2021. Revolution Wind anticipates filing a similar nomination with CRMC to support this requirement of the Category B Assent application."

A CVA nomination must be submitted.

e) Section 11.10.1(E) Overall Regulatory Standards states: "The Council shall prohibit any other uses or activities that would result in significant long term negative impacts to Rhode Island's commercial or recreational fisheries. Long-term impacts are defined as those that affect more than one or two seasons."

Information provided by the Applicant in Section 5.2.1 (E) states that "Revolution Wind is committed to minimizing Project impacts on commercial and recreational fisheries and the RWEC-RI will not result in significant impacts to Rhode Island's commercial or recreational fisheries. Construction and decommissioning activities associated with the RWEC-RI are

generally expected to have "short-term", localized impacts on access to fishing grounds due to safety measures on entering the area. During O&M of the RWEC-RI, commercial and recreational fisheries are expected to experience no effect or limited effects because the cables will be buried beneath the seabed. Refer to Section 3.2.8 and Appendix S of this Category B Assent application for evaluation of fisheries in the RWEC-RI corridor. Finally, Revolution Wind has developed a Fisheries Communication and Outreach Plan in consultation with relevant stakeholders and remains committed to continuous dialogue with these stakeholders (see Appendix DD of the Project's COP).

Based on impacts identified by the Applicant this project has a potential to result in long term impacts because species abundances may take up to 1 to 3 years to recover to preimpact levels, based on the results of a number of studies on benthic recovery (See Section 3.2.3.2; 3.2.4.2; and Table 3.1-3).

During construction, maintenance and decommissioning, commercial and recreational fishers and boaters must avoid the area.

There are explicit welfare losses to recreational fishers who must either fish in a secondbest choice area or not fish that day. These can be quantified and valued and should be assessed, which are not completely addressed in the application of appendices. There are many academic of studies that value recreational fishing which support this view that access is valued (Raguragavan et al., 2013; Young et al., 2020; Abbott et al., 2022).

These can be quantified and valued, and should be according to the FAB.

f) Section 11.10.2(B) Areas of Particular Concern states: "The Council has designated the areas listed below in § 11.10.2(C) of this Part in state waters as Areas of Particular Concern. All large-scale, small-scale, or other offshore development, or any portion of a proposed project, shall be presumptively excluded from APCs. This exclusion is rebuttable if the applicant can demonstrate by clear and convincing evidence that there are no practicable alternatives that are less damaging in areas outside of the APC, or that the proposed project will not result in a significant alteration to the values and resources of the APC. When evaluating a project proposal, the Council shall not consider cost as a factor when determining whether practicable alternatives exist. Applicants which successfully demonstrate that the presumptive exclusion does not apply to a proposed project because there are no practicable alternatives that are less damaging in areas outside of the APC must also demonstrate that all feasible efforts have been made to avoid damage to APC resources and values and that there will be no significant alteration of the APC resources or values. Applicants successfully demonstrating that the presumptive exclusion does not apply because the proposed project will not result in a significant alteration to the values and resources of the APC must also demonstrate that all feasible efforts have been made to avoid damage to the APC resources and values. The Council may require a successful applicant to provide a mitigation plan that protects the ecosystem. The Council will permit underwater cables, only in certain categories of Areas of Particular Concern, as determined by the Council in coordination with the Joint Agency Working Group. The maps listed below in § 11.10.2(C) of this Part depicting Areas of Particular Concern may be superseded by more detailed, sitespecific maps created with finer resolution data."

Information provided by the Applicant in Section 5.2.2 (B) includes that "Revolution Wind has sited the RWEC-RI to avoid APC to the extent practicable. To the extent any portion of the RWEC-RI subject to this Category B Assent application overlaps with APC, no practicable alternatives exist that are less damaging in areas outside of the APC, and the RWEC-RI will not result in a significant alteration to the values and resources of the APC. Revolution Wind will take all feasible efforts to avoid damage to APC resources and values, and there will be no significant alteration of APC resources or values as a result of the RWEC-RI. Refer to response to Section 11.10.2(C)."

This requirement has not been met. The Applicant has not demonstrated that there are no practicable alternatives; and merely states that the Project is sited to avoid APC to the extent practicable.

g) Section 11.10.2(C)(1) Areas of Particular Concern states: "Historic shipwrecks, archeological or historical sites and their buffers as described in Ocean SAMP Chapter 4, Cultural and Historic Resources, Sections 440.1.1 through 440.1.4, are Areas of Particular Concern. For the latest list of these sites and their locations please refer to the Rhode Island State Historic Preservation and Heritage Commission."

Information provided by the Applicant in Section 5.2.2 (C)(1) states that "Revolution Wind understands shipwrecks are designated as APCs per the Ocean SAMP. Within the portion of the RWEC-RI corridor subject to the Ocean SAMP (i.e., from the mouth of the Narragansett Bay to the three nautical mile state water line), one shipwreck was identified during Project surveys and the Project's QMA has recommended a 50-meter avoidance buffer around this resource (see Appendix N). The RWEC-RI will avoid this shipwreck and associated buffer to the extent practicable. BOEM is required to satisfy Section 106 of the NHPA, which requires consultation with SHPOs, THPOs, and other interested parties, as well as assessment and mitigation of unavoidable adverse effects to historic properties."

<u>There is a shipwreck located along the cable route.</u> The Applicant merely states in the above cited section that it is going to "avoid this shipwreck to the extent practical." "[E]xtent practical" is not the burden of proof. The Applicant must demonstrate that there are no practicable alternatives.

h) Section 11.10.2(C)(3) Areas of Particular Concern states: "Glacial moraines..." Information provided by the Applicant in Section 5.2.2 (C)(3) states that "As shown in Appendix A (Export Cable Plan Set), Revolution Wind anticipates avoidance of Glacial Moraine A and B with siting of the RWEC-RI. Should complete avoidance of Glacial Moraine A and B habitats not be possible due to other, currently unknown, constraints (e.g., unexploded ordnance – refer to Section 2.2.3.5 of this application), Revolution Wind will take all feasible efforts to avoid any damage to the glacial moraine benthic habitats..."

This requirement has not been met. The Applicant has made it clear that the cable corridor may impact glacial moraine A and B. Since this is the case, there exists a

presumption against approval. The Applicant must provide additional information as set forth in the regulations to rebut the negative presumption.

i) Section 11.10.2(C)(6) Areas of Particular Concern states: "Several heavily-used recreational boating and sailboat racing areas, as shown in Figure 6 in § 11.10.2 of this Part, are designated as Areas of Particular Concern. The Council recognizes that organized recreational boating and sailboat racing activities are concentrated in these particular areas, which are therefore important to sustaining Rhode Island's recreation and tourism economy."

Information provided by the Applicant in Section 5.2.2 (C)(6) states that "Revolution Wind has assessed available data regarding recreational boating and sailboat racing areas (refer to Section 3.2.9). Revolution Wind has also reviewed the data depicted in Figure 6 of Section 11.10.2 of the Ocean SAMP and finds that **the RWEC-RI corridor passes through the Recreational Boating APCs south of Brenton Point**. Siting of the RWEC-RI in this location was determined through detailed G&G surveys within the proposed corridor and consultation with the DoD. The G&G surveys identified the presence of geological obstructions extending southwesterly from Brenton Point into Rhode Island Sound (Refer to Section 3.2.1). The presence of shallow bedrock prohibits cable burial throughout much of this area. The G&G surveys identified a gap in the bedrock formation where sufficient depth to bedrock below the sediment surface would allow for cable installation. Similarly, consultation with the DoD led Revolution Wind to avoid a restricted area south of the entrance to Narragansett Bay. Routing around these other constraints causes the RWEC-RI corridor to intersect with the Recreational Boating APCs south of Brenton Point.

Given Revolution Wind's commitment to complying with TOY restrictions, construction of the RWEC-RI will generally occur **between Labor Day and February 1** and will avoid times of the year when a heavy concentration of recreational boating is occurring in the Recreational Boating APCs. Construction impacts will be limited in duration and will avoid significant impact to these areas of substantial recreational value. Once installed, the RWEC-RI will be buried below the seafloor and will not interfere with use of these Recreational Boating APCs. Consequently, the RWEC-RI will not result in a significant alteration of the values and resources of the Recreational Boating APCs and Revolution Wind has made all feasible efforts to avoid affecting the Recreational Boating APC resources and values. "

In addition to Glacial Moraine APCs here the Applicant also states that the project also passes through the Recreational Boating APCs south of Brenton Point. The timeline identified by the Application between Labor Day and February 1, needs additional information, there is still a substantial amount of commercial and recreational fishing during this time. See Important Recreational Species Availability Chart. 2018 Rhode Island Saltwater Regultaion Guide at 10; http://www.dem.ri.gov/programs/marinefisheries/mfsizes.php; See also: Figure 3. Average monthly value of landings, Baseline Value of Commercial Fisheries Landings from the Revolution Wind Export Cable Corridor In Rhode Island State Waters at 12.

A construction schedule should be provided by the Applicant to determine what activities are scheduled to occur and may overlap and so that the FAB can determine which fishery seasons will be impacted.

3. Project Impacts

<u>See attached Exhibit A for a listing of specific project impacts identified by the Applicant.</u> <u>and applicable Ocean SAMP provisions.</u>

a) Specific Impacts to Fisheries

Based on the Applicant's representations there are significant impacts to fisheries expected from installation, O&M and decommissioning of Cables in state waters. In addition to the impacts identified by the Applicant in the attached Exhibit A, and based on the Applicant materials, the following are anticipated impacts specific to fisheries:

Construction

Seafloor disturbance from seafloor preparation, impact pile driving and/or vibratory pile driving/foundation installation, RWF IAC and OSS Link Cable installation, and vessel anchoring (including spuds), are expected to have both direct and indirect short term impacts.

Cable protection made up of concrete mattresses may be placed in some areas. In those areas both negative and beneficial indirect impacts on fisheries may occur. This is due to the conversion of what is currently soft-bottom habitat to hard-bottom habitat and the subsequent effects that such conversion has on fisheries. Concrete mattresses may have long term impacts on fisheries with current soft bottom habitats and long term beneficial impacts on species that have currently hard bottom habitats. This will depend on the quality of the habitat created, and the quality of the benthic community that colonizes the habitat. Dredgers and trawlers (surfclam/ocean quahog and scallop fisheries) may lose a small amount of fishing ground if additional cable protection is needed in areas that are fished or in association with altered seabed structure.

Impacts to fisheries may result from a temporary degradation of habitat quality due to elevated noise levels but are not expected to substantially affect the existing underwater noise environment. Installed as either a sheet piled structure into the sea floor or a gravity cell structure placed on the sea floor using ballast weight, sheet pile installation requires the use of vibratory hammers to drive the sidewalls and endwalls into the seabed, which may take up to three days. Noise from vibratory pile driving may impact fisheries causing reduced habitat quality, behavioral changes, or cause species to leave the area.

Seafloor disturbing activity will result in temporary increases in sediment suspension and deposition. Sediment suspension and deposition from seafloor preparation, cable installation and vessel anchoring are expected to have indirect, short-term impacts.

Direct impacts include disruption of access to fishing areas for commercial and recreational fisheries including that fishing activity will be restricted in the immediate area of seafloor

preparation operations due to a 500 yard radius safety zone established around construction operations, based on engagement with USCG regulations as well as "recent precedent set by an offshore renewable energy project constructed in the United States."

Similarly, the Applicant's table for impacts related to the turbines, states that "[t]he physical presence of installation and decommissioning vessels and turbine components may affect fishing activity because there will be a minimum safety perimeter around installation and decommissioning vessels and locations where the turbine components will be installed and removed. This temporarily restricted area will consist of a 500-yard radius safety zone.

The USCG will also provide moving safety zones centered on cable laying vessels.

Commercial and recreational fisheries may experience short-term impacts due to increased vessel traffic during the construction, as fisherman may avoid areas of increased vessel activity. Primary conclusions of the NSRA included that vessel traffic near the project area is light, recreational/pleasure vessels represent the greatest proportion of vessel tracks in the study area, and deep draft vessel traffic in the wind farm area is expected to be limited to emergency circumstances.

Additional indirect negative impacts on commercial and recreational fisheries include negative impacts to species that have benthic/demersal life stages and prefer the types of habitats that will be disturbed by seafloor preparation. These activities could cause injury or mortality to benthic/demersal species. These effects are expected to cease upon completion of seafloor preparation.

Pelagic species may temporarily vacate the area of disturbance.

Habitat alteration from seafloor preparation, cable installation and vessel anchoring is expected to have indirect, long term impacts.

In areas where there is sediment disturbance and/or increased sedimentation, habitat alteration is expected to occur.

Impacts to benthic habitat that may take up to 1 to 3 years to recover "based on results of a number of studies on benthic recovery...".

Communities not well adapted to frequent disturbance may take upwards of a year to begin recolonization and several years to become substantially re-established to pre-disturbance levels.

Such recovery time would result in loss of productivity in the disturbed area and a subsequent indirect impact on commercial and recreational fisheries.

Operation and Maintenance

Indirect impacts from O&M include the same as for construction (negative impacts to species that have benthic/demersal life stages and prefer the types of habitats that will be disturbed and

could cause injury or mortality to benthic/demersal species. Pelagic species may temporarily vacate the area.

O&M activities are expected to have indirect short term impacts related to non-routine O&M and vessel anchoring that require exposing portions of the cable. Identified indirect impacts to habitat from cable O&M may be both short and long term.

Cable related non-routine O&M would have direct and indirect short term impacts including that if cables have to be uncovered and reburied or if there is maintenance of cable protection these activities would temporarily disrupt fishing access.

Cable related non-routine O&M would have direct and indirect short term impacts including that if cables have to be uncovered and reburied or if there is maintenance of cable protection these activities would temporarily disrupt fishing access.) Additional seafloor disturbance during O&M will occur with vessel anchoring (including spuds).

Decommissioning

During decommissioning, foundations (for turbines) and other facilities will be removed to a depth of 15ft below the mudline unless otherwise authorized by BOEM.

Decommissioning activities for cables are expected to cause similar impacts as construction but would be shorter in duration. Recovery from decommissioning will be similar to seafloor preparation and would also result in indirect long-term impact on commercial and recreational fisheries. Sediment suspension and deposition associated with decommissioning activities are expected to be similar, but slightly lower in magnitude.

Commercial and recreational fisheries may experience short-term impacts due to increased vessel traffic during decommissioning, as fisherman may avoid areas of increased vessel activity. Primary conclusions of the NSRA included that vessel traffic near the project area is light, recreational/pleasure vessels represent the greatest proportion of vessel tracks in the study area, and deep draft vessel traffic in the wind farm area is expected to be limited to emergency circumstances.

4. Additional Findings

a) Areas of Particular Concern

The Council shall designate glacial moraines as identified in Part 11 as Areas of Particular Concern. See 650-RICR-20-05-11.10.2 (C)(3).

The OSAMP presumptively excludes development from APCs unless an applicant demonstrates, for example, "by clear and convincing evidence that there are no practicable alternatives that are less damaging in areas outside of the APC, or that the proposed project will not result in a significant alteration to the values and resources of the APC."

- Three benthic habitat types which are direct remnants of glaciation were identified within the Ocean SAMP area subject to this Category B Assent application ...: Glacial Moraine A, Glacial Moraine B, and Bedrock. See Appendix P
- One shipwreck was identified during Project surveys and the Project's QMA has recommended a 50-meter avoidance buffer around this resource
- RWEC-RI corridor passes through the Recreational Boating APCs south of Brenton Point.

See Cat B Assent Application

- Three of the primary benthic habitat types mapped for the present assessment are direct remnants of glaciation that remain present at the seafloor surface. These three habitat types are Glacial Moraine B, Glacial Moraine A, and Bedrock, all of which have distinct geophysical signatures (Figure 3-1).
- Revolution Wind <u>anticipates avoidance</u> of Glacial Moraine A and B with siting of the RWEC-RI. Should complete avoidance of Glacial Moraine A and B habitats not be possible due to other, currently unknown, constraints (e.g., unexploded ordnance), Revolution Wind <u>will take all feasible efforts</u> to avoid any damage to the glacial moraine benthic habitats. See Appendix P Benthic Habitats
- Within the areas designated as EFH for various species, particular areas termed Habitat Areas of Particular Concern (HAPCs) are also identified. HAPCs are discrete subsets of EFH that provide extremely important ecological functions or are especially vulnerable to degradation...
- The RWEC-RI corridor crosses HAPC for juvenile Atlantic cod in Rhode Island state waters. This HAPC contains structurally complex rocky-bottom habitat that provides juvenile cod with protection from predation and supports a wide variety of prey items (NEFMC, 2017).
- Juvenile and adult summer flounder EFH is present within the RWF area, RWEC-OCS, and RWEC-RI, but summer flounder HAPC, if present, is most likely to occur within Narragansett Bay and nearshore portions of the Project Area.
 See Appendix O – Essential Fish Habitat Assessment

<u>Proposed cables for the wind farm appear to intersect two APC's. First, the cables appears</u> to run through an "End Moraine-Boulder". Second, the cable intersects navigation routes designated as APCs including a designated shipping lane, a recommended vessel route, and a ferry route.

Looking generally at the Ocean SAMP maps of designated APCs and comparing them to the Revolution Wind Offshore Project Location Map, it appears the proposed location of the wind farm overlaps with the "End Moraine-Boulder" meaning that turbines are located in a designated APC. <u>Pursuant to CRMC regulations, the Council shall protect sensitive habitat areas where</u> they have been identified through the site assessment plan or construction and operation plan review processes for offshore developments as described in § 8.5.2(F). See 650-RICR-20-05-11.10.1 (I). The Council will permit underwater cables, only in certain categories of APCs, as determined by the Council in coordination with the Joint Agency Working Group. (§11.10.2 (C)).

When the Applicant states: "To the extent any portion of the RWEC-RI subject to this Category B Assent application overlaps with APC, *no practicable alternatives exist that are less damaging* in areas outside of the APC, *and the RWEC-RI will not result in a significant alteration to the values and resources of the APC*. Revolution Wind will take *all feasible efforts* to avoid damage to APC resources and values, and *there will be no significant alteration* of APC resources or values as a result of the RWEC-RI." More information is needed.

When the Applicant states: "Revolution Wind *anticipates avoidance* of Glacial Moraine A and B with siting of the RWEC-RI. *Should complete avoidance of Glacial Moraine A and B habitats not be possible* due to other, currently unknown, constraints (e.g., unexploded ordnance – refer to Section 2.2.3.5 of this application), Revolution Wind will take all *feasible efforts* to avoid any damage to the glacial moraine benthic habitats." More information is needed.

b) Species Affected:

According to the Applicant, the following species are located within the project area (includes all life stages):

- Atlantic herring (RWF, RWEC-OCS corridor, and RWEC-RI corridor)
- Atlantic wolffish (RWF)
- Haddock (RWF, RWEC-OCS corridor)
- Monkfish (RWF, RWEC-OCS and RWEC-RI corridor)
- Ocean pout (RWF, RWEC-OCS and RWEC-RI corridor)
- Pollock (RWF, RWEC-OCS, and RWEC-RI corridor).
- Red hake (RWF, RWEC-OCS, and RWEC-RI corridor)
- Silver hake (RWF, RWEC-OCS, and RWECRI corridor)
- White hake (RWF, RWEC-OCS, and RWEC-RI corridor)
- Windowpane flounder (RWF, RWEC-OCS, and RWEC-RI corridor)
- Winter flounder (RWF, RWEC-OCS, and RWEC-RI corridor)
- Witch flounder (RWF and RWEC-OCS corridor)
- Yellowtail flounder (RWF, RWEC-OCS and RWEC-RI corridor)
- Atlantic butterfish (RWF, RWEC-OCS and RWEC-RI corridor)
- Atlantic mackerel (RWF, RWEC-OCS and RWEC-RI corridor)
- Black sea bass (RWF, RWEC-OCS and RWEC-RI corridor)
- Bluefish (RWF, RWEC-OCS and RWEC-RI corridor)
- Scup (RWF, RWEC-OCS and RWEC-RI corridor)

- Summer flounder (RWF, RWEC-OCS and RWEC-RI corridor)
- Atlantic sea scallop (RWF, RWEC-OCS and RWEC-RI corridor)
- Atlantic surfclam (RWEC-OCS and RWEC-RI corridor)
- Longfin inshore squid (RWF, RWEC-OCS and RWEC-RI corridor)
- Northern shortfin squid (RWF)
- Ocean quahog (RWF, and RWEC-OCS corridor)
- Albacore tuna (RWF, RWEC-OCS, and RWEC-RI corridor).
- bluefin tuna (RWF, RWEC-OCS and RWEC-RI corridor)
- Skipjack tuna (RWF, RWEC-OCS and RWEC-RI corridor)
- Yellowfin tuna (RWF, RWEC-OCS and RWEC-RI corridor)
- Little skate (RWF, RWEC-OCS and RWEC-RI corridor)
- Winter skate (RWF, RWEC-OCS and RWEC-RI corridor)
- Basking shark RWF, RWEC-OCS corridor)
- Blue shark (RWF, RWEC-OCS corridor)
- Common thresher shark (RWF, RWEC-OCS and RWEC-RI corridor)
- Dusky shark (RWF and RWEC-OCS corridor)
- Sand tiger shark (RWF, RWEC-OCS and RWEC-RI corridor)
- Sandbar shark (RWF, RWEC-OCS and RWEC-RI corridor)
- Shortfin mako shark (RWF and RWEC-OCS corridor)
- Smoothhound shark (RWF, RWEC-OCS and RWEC-RI)
- Spiny dogfish (RWF, RWEC-OCS and RWEC-RI corridor)
- White shark (RWF, RWEC-OCS and RWEC-RI corridor)

(Note: All but one are located in the Turbine area. All but two are located in the turbine and RWEC-OCS area. All but nine are located in the RWEC-RI corridor area.

<u>The number and location of the species involved with this project only strengthens the</u> argument that the project will have far reaching significant impacts and for this reason should be evaluated as a whole, both turbines and cable areas alike.

There are missing species from the report which may be affected by disturbances but do not have habitat defined as Essential Fish Habitat, such as the Mantis Shrimp, but will have impacts for fisheries.

The finfish, shellfish, and crustacean species that are targeted by commercial and recreational fishermen rely on appropriate habitat at all stages of their life cycles. While all fish habitat is important, spawning and nursery areas are especially important in providing shelter for these species during the most vulnerable stages of their life cycles.

c) Cox Ledge

According to correspondence from NOAA to the BOEM dated June 1, 2021, a portion of the project will be located on Cox Ledge and the surrounding area in water depths ranging from approximately -25 to -50 meters. In this letter, NOAA raises several concerns regarding the potential negative impacts of this proposal.

d) Cumulative Effects

According to the CRMC Ocean SAMP, the potential effects of any off-shore renewable energy projects include the cumulative effects of the Project. *See 650-RICR-20-05-8.4.12 (B).*

Legitimate concerns to fisheries exist for this Project and include: existing activities such as fishing, marine transportation, and recreation will need to be considered alongside the proposed project, as should the effects of multiple renewable energy or other development projects on this area. More information is needed to properly quantify these impacts

Given a project of this size, it is the FABs position that this should mean consideration OF impact to fisheries from both turbines and cables and not cables only.

Four Orsted-proposed wind farms include:

<u>Revolution Wind Farm</u>
<u>South Fork Wind Farm</u>
<u>Bay State Wind Farm</u>
<u>Sunrise Wind Farm</u>

<u>See Appendix T – Navigation Safety Risk Assessment states that:</u>

<u>Cumulative effects on navigation safety from the four projects in combination could</u> <u>include:</u>

- <u>Commercial fishing traffic may instead decide to take routes to the east or west around</u> <u>the lease areas, so a result would be an increase in interaction among the various users,</u> <u>which may pose a potential safety risk.</u>
- <u>Potential increase in distance sailed and resultant increase in vessel transit time which can result in:</u>
 - Additional fuel cost and additional emissions;
 - Longer exposure time for the potential failure of propulsion and steerage equipment, which increases the risk of being adrift approximately in proportion to the additional amount of time spent transiting;
 - Increase in the number of fishing vessel transits in the Buzzards Bay traffic lanes, and therefore increased interactions with tugs.
 - <u>Changes to commercial and recreational fishing patterns, which are largely</u> <u>unpredictable at this time.</u>
 - 5. Preliminary Conclusions
 - The FAB is forced to accept the information provided by Revolution Wind as both complete and credible. This is especially problematic when, and occurring several times,

the Applicant states that additional studies will be forthcoming, or the effects haven't yet been fully determined, or decisions as to mitigation will be made later.

- Timing and length of construction details are missing so impacts cannot be said to have short term impacts or demonstrated as such (ex.no apparent consideration of project timeline delays on winter flounder). Timelines were an issue in past cases(Block Island which took 2x their estimate at every stage to actually complete).
- *"The impacts are expected to be temporary and localized to the area surrounding the cable corridor."* Pg. 12. Impacts may not be temporary, as it depends on the effect.
- *"The Revolution Wind Export Cable will be <u>completely buried</u> for the entire duration of <i>project operations."* is at odds with the use of 10% of cable will require secondary protection.
- According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist for this Project including electromagnetic fields created by cables connecting the turbines and carrying the electricity to land. ("It has been predicted that the electromagnetic fields that would be produced by 26 kVA power cables could have behavioral effects on marine life within 20 m (66 feet) of the cables.") See Miller et al. (2010). See James H. Miller et al., Acoustic Noise and Electromagnetic Study in Support of the Rhode Island Ocean SAMP, at 35 (2010).

The depth of the cable burial is said to be between 4 and 6 feet, which does not appear adequate based on the most recent literature and the size of the project (Hutchison et al., 2020; Hutchison et al., 2020; Ernst and Lohmann, 2018). The application seems to be misquoting the report Copping et al. (2016). The report specifically cites small projects to be "low risk"- this is not a small project. Further there are newer studies, cited above, that do suggest behavior changes to marine animals. The applicant also uses a much smaller project in Denmark to generalize the results from Leonard (2011) to Rhode Island which is likely not applicable.

Further, there are long term implications for commercial fisheries where the cable is not buried but will be covered with concrete mattresses- these are not addressed in the application.

- The Applicant makes the following statements as to electromagnetic fields such that additional information or a third party independent review for clarification is needed:
 - The EMF levels, calculated using conservative assumptions likely to overestimate field levels, indicate that the magnetic-field and induced electric field produced by the Project cables will be below the detection thresholds for magnetosensitive and electrosensitive marine organisms
 - As discussed for the RWF IACand OSS-Link Cable in Table 3.1-2, behavioral effects and/or changes in EFH species abundance and distributions due to EMF are not expected."
 - "Moreover, a 2019 BOEM report that assessed the potential for AC EMF from offshore wind facilities to affect marine populations concluded that, for the southern New England area, no negative effects are expected for populations of key commercial and recreational fish species (Snyder et al., 2019).
 - "Based on this information, it is not expected that EFH species will be measurably affected by EMF from the cables."

- "A modeling analysis of the magnetic fields and induced electric fields anticipated to be produced during operation of the RWF IAC, OSS-Link Cable..."
- Many of the Applicant's conclusions are phrased in generalities. For example, the Applicant represents that no impacts are expected or that a stated impact would be temporary, but there is no additional information on what the potential impacts would be if they DID occur or if "temporary" how long exactly that means? Where indicated, more information is needed.
- There doesn't appear to be any assessment of recreational fishing of the area, which the Applicant suggests is the majority of traffic in this area. That is confusing and contradictory.
- "short" and "long-term" impacts do not refer to any defined period.
 - Short term impacts are typically expected to occur within the approximate 1-year construction phase.
 - Long-term impacts are likely to be recurring or permanent or is something which a resource does not recover quickly.
- "Short-term" impact is mischaracterized if sediment kills eggs and larvae.
- Applicant should provide CVs of team members who prepared the Application materials.
- Under habitat alteration the Applicant represents that the impacts identified are due to the conversion of what is currently soft-bottom habitat to hard-bottom habitat and the subsequent effects that such conversion has on fisheries. A determination is needed to specify the exact impacts to be anticipated.
- The Applicant phrases impacts in general terms when it states that concrete mattresses may have long term impacts on fisheries with current soft bottom habitats and long term beneficial impacts on species that have currently hard bottom habitats. This will depend on the quality of the habitat created. No details are provided on what the Applicant means by quality of the habitat created. Again, the Applicant says that the quality of the benthic community that colonizes the habitat will be important, but no details or explanation of what this means is provided. A determination is needed to specify the exact impacts to be anticipated.
- An independent third party review should be performed by qualified individuals who can confirm the credibility of the Applicant's information and conclusions.
- Safety concerns related to buried cables are being experienced currently in Rhode Island. Appendix T states that "a cable burial risk assessment will be conducted for the Project, and the results of that study will inform the target depth for the cables. A similar study was recently conducted in the region (Deepwater Wind, 2012). It concluded that disturbance of the seabed from fishing gear was found to be less than 1.6 ft (0.49 m) below the surface of the seabed." Given the potential risks, this study should be reviewed and compared to current conditions off Block Island before any approval is issued.
- Project-related traffic will include vessels (including barges, tugs, and a freighter), onshore vehicles, and helicopters. Cat B Assent Application 4.1.8. More information is needed as to location and duration of impacts.
 - During construction fishing activity will be restricted via a 500-yard-radius safety zone. Cat B Assent Application 3.2.1.2
 - According to the Applicant, such impacts cannot be quantified at this time"..., but anchoring will be limited to within the RWEC-RI's 1,312-ft (400-m) ROW. More information is needed to properly quantify these impacts.

- Due to safety measures on entering the area construction and decommissioning activities associated with the RWEC-RI are generally expected to have "short-term", localized impacts on access to fishing grounds. Cat B Assent Application 3.2.8.2.
- According to the Applicant, construction of the RWEC-RI will generally occur between Labor Day and February 1 and will avoid times of the year when a heavy concentration of recreational boating is occurring in the Recreational Boating APCs. The FAB needs more information on timing, duration, location(s) and intensity of construction, as well as for planned O&M and for subsequent decommissioning in order to properly evaluate the effect of the stated impacts on Rhode Island fisheries.
 - winter flounder generally spawn in shallow coastal waters between late November and early December and their eggs are known to be susceptible to adverse effects related to sediment deposition. Section 3.2.4.2
- Operations & Maintenance (O&M) impacts are also considered "long-term" and will occur over the life of the Project (i.e., 25 years per the Lease but could be extended up to 35 years.) App Q Essential Fish Habitat (EFH) Assessment. Based on this CRMC should be evaluating O&M impacts to fisheries based on a potential 35 year timeframe.
- For Areas of Particular Concern (APCs) the Council shall protect sensitive habitat areas where they have been identified through the site assessment plan or construction and operation plan review processes for offshore developments as described in § 8.5.2(F). According to the Applicant, they anticipate avoidance of APCs: Glacial Moraine A and B with siting of the RWEC-RI. However, the Applicant states that while it anticipates avoidance of Glacial Moraine A and B with siting of the RWEC-RI. Should complete avoidance of Glacial Moraine A and B habitats not be possible due to other, currently unknown, constraints (e.g., unexploded ordnance), Revolution Wind will take all feasible efforts to avoid any damage to the glacial moraine benthic habitats. More information is needed.
- Affected benthic communities are expected to re-establish within 1 to 3 years...native assemblages will either recolonize the affected area or a new community develops as a result of immigration of organisms from nearby areas or from larval settlement. Section 3.2.5 Finfish and essential Fish Habitat
- Negative impacts to fish catches are likely the greatest during the construction phase, when the noise generated by construction activities may drive some mobile species out of the immediate area. Additional information is needed on the types of noise, when it would be occurring, and the duration for both cables and turbines. The Applicant states that under water noise can elicit avoidance behavior of pelagic fishery resources (5.1.8(9)) caused by:
 - Impact piledriving and /or vibratory pile driving,
 - Vessel noise,
 - Construction equipment noise, and/ or
 - Aircraft noise impacts.
 - The Applicant then states that no piling driving will occur during installation of the RWEC-RI within the Ocean SAMP Area subject to this Category B Assent application
 - The Applicant then states that underwater noise generated by construction activities (including use of a pneumatic hammer and/or vibratory hammer at the landfall

location for installation of the casing pipe and "goal posts") could result in potential physiological and behavioral impacts on marine mammals and sea turtles. 3.2.5.2 And then states: Expected impacts during Construction AND Decommissioning include: Vibratory pile driving (cofferdam) See App Q – Essential Fish Habitat (EFH) Assessment Cables (pg 851, 853)

Expected impacts during Operations and Maintenance include: "Operational lighting", which includes direct "long-term" impacts on EFH for both early and late life stages. Additional information is needed as to location, intensity and duration.

• The Applicant states that "Revolution Wind has met with the FAB and in coordination with the FAB has submitted an acceptable analysis for review of any potential coastal effects and potential cumulative impacts resulting from the construction and operation of the project." See Pg 60. This has not occurred.

Exhibit A

Ocean SAMP and Project Impacts Listing

The following materials were reviewed:

CRMC Ocean SAMP; Category B Assent Application Executive Summary and; Appendix P; Appendix Q; Appendix S; and Appendix T

According to the Applicant the following abbreviated/defined terms apply:

EFH = Essential Fish Habitat RWF = Revolution Wind Farm WTG = Wind Turbine Generators RWEC-RI = Revolution Wind Farm Export Cable-Rhode Island State Waters RWEC-OCS = Revolution Wind Farm Export Cable-Outer Continental Shelf IPF = Impact-Producing Factor SAV = Submerged aquatic vegetation

- "short" and "long" term impacts do not refer to any defined period
- Short term impacts are typically expected to occur within the approximate 1-year construction phase
- Long-term impacts are likely to be recurring or permanent or is something which a resource does not recover quickly

As to CRMC decision making, the Council shall prohibit any other uses or activities that would result in significant "long-term" negative impacts to Rhode Island's commercial or recreational fisheries meaning affecting more than one or two seasons. See 650-RICR-20-05-11.10.1(E); 650-RICR-20-05-5.3.2(B).

Where it is determined there is a significant conflict with season-limited commercial or recreational fisheries activities, recreational boating activities or scheduled events, or other navigation uses, the Council shall modify or deny activities to minimize conflict. See 650-RICR-20-05-11.9.8(D)(4);650-RICR-20-05-5.3.2(H).

According to the CRMC Ocean SAMP, the degree to which offshore renewable energy structures may affect the natural environment or human activities varies in large part on the specific siting of a project.... careful consideration when planning a project should be given to the: Location and Mitigation. See 650-RICR-20-05-8.4 (A).

a) The following project impacts to <u>seafloor and land disturbance</u> were identified by the Applicant:

According to the Ocean SAMP, legitimate concerns to fisheries exist including:

- The most serious threats are to submerged aquatic vegetation, which serves as an important habitat for a wide variety of marine species. See 650-RICR-20-05-8.4.3 (C)(7).
- Shellfish beds and hard-bottom habitats are also especially at risk. Id.
- Decommissioning and removal of the undersea structures, will also reduce habitat heterogeneity and remove a large component of the benthic community that has established while the wind farm was in operation. See 650-RICR-20-05-8.4.3 (C)(6).
- Boulder clearance
- Sandwave leveling
- Cable installation
- Installation of secondary cable protection
- Vessels that require anchoring
- Total disturbance corridor of approximately 730 acres (295 ha) (see Table 2.2-7)
- During construction fishing activity will be restricted via a 500-yard-radius safety zone
- Such "impacts cannot be quantified at this time, but anchoring will be limited to within the RWEC-RI's 1,312-ft (400-m) ROW."

See Category B Assent Application, Section 3.2.1.2.

- Seafloor preparation activities could also include:
 - Dredging
 - Cable installation
 - Up to 155 mi to be installed to connect the turbines and OSS;
 - Depth of 4-6 ft;
 - Trench depth of up to10 ft
 - Cable long term disturbance area is 74.1 ac

See Appendix O - Hydrodynamic and Sediment Transport Modeling Report at Section 4.1.1

- Potential "long-term" impacts from construction activities include conversion of soft-bottom to hard-bottom habitat due to cable protection and scour protection (and turbine foundations)
- Operations & Maintenance (O&M) impacts are also considered "long-term" and will occur over the life of the Project (i.e., 25 years per the Lease but could be extended up to 35 years.) *App Q – Essential Fish Habitat (EFH) Assessment*

- Impacts to EFH species are expected at all phases from seafloor disturbance
- Seafloor preparation, vessel anchoring and cable work will occur at both construction AND decommissioning
 - Construction and decommissioning will have direct "short-term" impacts on EFH at both early and late life stages
- Operation and Maintenance will have impacts as well:
 - Vessel anchoring
 - Non-routine O&M
 - O&M will include direct "short-term" impacts on EFH at both early and late life stages

(pg 853)

See also tables also provided by the Applicant at Appendix S – Commercial and Recreational Fisheries

- It appears that the 400m disturbance zone does not fully account for the area impacted by sediment.
- No mention of unburial risk evaluation as a function of depth. Cables were buried on Block Island and came unburied.
- Lack of impact for recreational fisheries. Construction would impact recreation.

b) The following impacts to <u>habitats</u> were identified by the Applicant:

According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist including:

- Burial of submarine cables causes temporary habitat destruction through plowing and from barge anchor damage, and can cause permanent habitat alteration if the top layers of sediment are replaced with new material during the cable-laying process, or if the cables are not sufficiently buried within the substrate. Similar harm would be expected during cable repair and decommissioning. See 650-RICR-20-05-8.4.3(C)(6).
- Scour protection around the structures, which can be rock or concrete mattresses, increases the loss or conversion of habitat. See 650-RICR-20-05-8.4.7(E)(2).
- Decommissioning and removal of the undersea structures, will also reduce habitat heterogeneity and remove a large component of the benthic community that has established while the wind farm was in operation as the new habitat and accompanying species are removed. See 650-RICR-20-05-8.4.7 (E)(5).
- Individual fish are likely to move out of the area during construction because of the disturbance and loss of food (MMS 2007a). See 650-RICR-20-05-8.4.7 (G)(2).
- After the activity has ceased, recolonization may take months or years (Gill 2005). See 650-RICR-20-05-8.4.7 (G)(2).
- During the construction and decommissioning, eggs and larvae of many species of fish are vulnerable burial or removal. See 650-RICR-20-05-8.4.7 (G)(2).
- Seafloor/land disturbance will result in habitat alteration
- Inspection and maintenance activities may disturb and consequently negatively affect habitats

See Cat B Assent Application, Section 4.1.2

- Benthic habitat recovery and benthic infaunal and epifaunal species abundances may take up to 1 to 3 years to recover to pre-impact levels, based on the results of a number of studies on benthic recovery (e.g., AKRF, Inc. et al. 2012; Germano et al. 1994; Hirsch et al. 1978; Kenny and Rees 1994).
- Benthic species may also experience localized, "long-term" impacts caused by the conversion of soft-bottom habitat to hard-bottom habitat associated with cable protection along portions of the RWEC-RI route
- Benthic habitats mapped within the RWEC-RI corridor that are currently subject to CRMC regulations include Glacial Moraine B, Glacial Moraine A, and Mud and Sandy Mud with submerged aquatic vegetation.

- Glacial Moraine is defined by CRMC as an Area of Particular Concern (per Section 11.10.2 of the Ocean SAMP) given its importance to fish and other marine plants and animals.
- Glacial Moraine A and B habitats comprised 0.3% (5 acres) of the habitats mapped within the portion of the RWEC-RI Project Area in Rhode Island Sound
- 3% (132 acres) of the habitats mapped within the RWEC-RI Project Area in Narragansett Bay
- The Applicant states that it anticipates avoidance of Glacial Moraine A and B with siting of the RWEC-RI. More information is needed on how such avoidance will be accomplished. *See Section 3.2.3.2*
- ...native assemblages will either recolonize the affected area or a new community develops as a result of immigration of organisms from nearby areas or from larval settlement. *See Section 3.2.3 Finfish and essential Fish Habitat*
- The benthic habitats mapped within the RWEC-RI Study Area that are currently subject to CRMC regulations include Mud and Sandy Mud with submerged aquatic vegetation, Glacial Moraine B, and Glacial Moraine A.

• Submerged aquatic vegetation beds... experience peak growth during late summer months. *See Appendix P – Benthic Habitats*

- During the site-specific benthic habitat surveys isolated patches of attached macroflora were observed at four stations along the RWEC in Narraganset Bay. *See Appendix O Essential Fish Habitat Assessment*
- EFH species are expected to be exposed to direct impacts from seafloor disturbance, and indirect impacts from habitat alteration.
- Potential "long-term" impacts may result from the Cables and the conversion of soft-bottom habitat to hard-bottom habitat associated with the protection of the RWEC.
- Expected impacts during Construction AND Decommissioningall include some impact on EFH for both early and late life stages
- (According to the applicant "short" and "long" term impacts do not refer to any defined period. However, "long-term" is defined to mean likely to be recurring or permanent or is something which a resource does not recover quickly)
- Expected impacts during Operations and Maintenance include... some impact on EFH for both early and late life stages
- Species most likely to experience some level of "short-term" or "long-term", direct or indirect impact:
 - Atlantic Cod
 - Haddock

- o Monkfish
- Ocean pout
- Red hake
- Silver hake
- White hake
- Windowpane flounder
- Winter flounder
- Yellowtail flounder
- Black sea bass
- o Scup
- Summer flounder
- Atlantic sea scallop
- Atlantic Surfclam
- Longfin inshore squid
- Ocean quahog
- Little skate
- Winter skate
- Spiny dogfish

See also Executive Summary Table 3.2-7 for a list of the EFH most likely to experience impacts to habitat. Table 3.2-8 is a list of species that may experience beneficial effects.

- Top individual species in terms of revenue (reported by federally permitted vessels):
 - Atlantic herring,
 - o lobster,
 - o squid,
 - o flounder,
 - o scup,
 - o butterfish,
 - o hake,
 - o black sea bass, and
 - spiny dogfish
- In terms of pounds landed, the top species are:
 - o Atlantic herring,
 - o scup,
 - o squid,
 - spiny dogfish,
 - \circ hake and
 - Atlantic mackerel.
- The species with the greatest proportion of Greater Atlantic total revenue that was sourced from within the RWEC fisheries study corridor were:
 - Eel (40.00 percent),
 - Bonito (4.30 percent),
 - Sea robin (2.39 percent),
 - Atlantic herring (1.95 percent), and

• Butterfish (1.93 percent).

See Appendix S – Commercial and Recreational Fisheries Technical Report Cables

See also Table 2.2-5 in the materials provides the full species summary of revenue and landings from 2009 to 2018

- The application states on Pg. 65 of the Essential Fish Habitat Assessment Technical Report "Fisheries monitoring studies are being planned to assess the impacts associated with the Project on economically and ecologically important fisheries resources. These studies will be conducted in collaboration with the local fishing industry and will build upon monitoring efforts being conducted by affiliates of Revolution Wind at other wind farms in the region."
- Are there pre construction studies of the fisheries being done now before impacts occur in consultation with the FAB? Establishing any impact of the cable would critically need a preconstruction study of the fishery.

c) The following project impacts from <u>sediment suspension and deposition</u> were identified:

According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist and include increased turbidity and sediment disturbance and settling. See 650-RICR-20-05-8.4.3 (C).

- benthic resources and shellfish will experience impacts from sediment suspension and deposition during construction and decommissioning
- Eggs and larval organisms are especially susceptible to smothering through sedimentation
- Winter flounder generally spawn in shallow coastal waters between late November and early December and their eggs are known to be susceptible to adverse effects related to sediment deposition
- Benthic habitat recovery and benthic infaunal and epifaunal species abundances may take up to 1 to 3 years to recover to pre-impact levels, based on the results of a number of studies on benthic recovery (e.g., AKRF, Inc. et al. 2012; Germano et al. 1994; Hirsch et al. 1978; Kenny and Rees 1994).

See Cat B Assent Application – Section 3.2.4.2

• Suspension of sediments into the water column in excess of naturally occurring conditions is expected during construction and decommissioning activities including clearing and/or leveling of the seafloor prior to foundation and cable installation (e.g., boulder clearance and sandwave leveling)

- Cable burial will resuspend sediments, causing "short-term" localized increases to the natural turbidity
- Additionally, the placement of infrastructure on the seafloor will change the hydrodynamics local to the infrastructure, causing localized movement of surrounding sediment and potential undermining of foundations and submarine cables
- See Section 4.1.3
- Increased total suspended solids in the water column has the potential to block photosynthetically active radiation ("PAR)" levels. *See Section 4.6.8*
- The primary concern to surface water quality is sediment suspension and deposition
- The volume of resuspended sediment (i.e., total suspended solid [TSS]) into the water column was predicted to be 103,875.3 cy (79,418.4 m3), 103,163.2 cy (78,873.9 m3), 103,875.3 cy (79,418.4 m3), 46,287.1 cy (35,388.9 m3), and 3,097.8 cy (2,368.4 m3) for CFE, TSHD split bottom, TSDH continuous overflow, jet plow, and HDD, respectively.

• Sediment plumes with total suspended solids (TSS) concentrations exceeding the ambient conditions by 100 mg/L could extend up to 853 feet (260 m) from the cable centerline. *See Section 3.2.2.3 Water Quality*

- Revolution Wind will utilize an HDD cable installation methodology to avoid documented submerged aquatic vegetation near the Project's landfall location. *See Appendix P Benthic Habitats*
- Sediment plumes with TSS concentrations exceeding the ambient conditions by 100 mg/l could extend up to 4,528 feet (1,380 m) from the RWEC-RI centerline in state waters and up to 1,542 feet (470 m) from RWEC-OCS centerline in federal waters.
- Modeling indicated that sedimentation from RWEC burial may exceed .4 inch (10mm) of deposition up to 919 feet from the cable centerline in state waters and up to 328 feet in federal waters.
- This thickness of sedimentation could cover up to 1,126 acres in state waters and 1,020 acres in federal waters.

See Appendix S – Commercial and Recreational Fisheries

- The FAB asserts that the expected impact area should be larger than modeled for impacts to eggs.
- Smothering along the corridor is a long term impact that is not addressed, which would affect a number of species (ex. Squid eggs, Flounder).
- No mention of smothering of species from sediment disturbance.
- It appears that the 400m disturbance zone does not fully account for the area impacted by sediment.
- Many species have spawning grounds which will be disturbed. But this doesn't seem reflected.

d) The following impacts from <u>noise</u> were identified:

According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist for and include noise from increased vessel traffic, and surveys: See 650-RICR-20-05-8.4.3 (F).

- Construction,
 - Negative impacts to fish catches are likely the greatest during the construction phase, when the noise generated by construction activities may drive some mobile species out of the immediate area. See Category B Assent Application Appendix S: Commercial and Recreational Fisheries Technical Report, Table 3.1-1
 - Pile driving activities during construction may be the most significant noise generator and potentially the most harmful to fish individuals and their overall populations. See 650-RICR-20-05-8.4.7 (C) (1).
 - The construction phase is most likely to produce levels of sound that could generate temporary and permanent harm to auditory function for fish; and injuries of tissues or auditory organs can also occur at close range
 See 650-RICR-20-05-8.4.7 (C) (5)
- Decommissioning.
 - Noise created during the decommissioning process may cause some fish species to leave the area. See Category B Assent Application Appendix S: Commercial and Recreational Fisheries Technical Report, Table 3.1-1

Noise = Unwanted sound. See Cat B Assent Application – Section 5.1.8(9)

- Under water noise can elicit avoidance behavior of resources caused by:
 - Impact piledriving and /or vibratory pile driving,
 - Vessel noise,

- Construction equipment noise, and/ or
- Aircraft noise impacts.
- O&M of the Onshore Facilities could likely result in indirect impacts to adjacent habitats and habitat utilization caused by nuisance activities such as increased noise ...

See Section 3.2.3.2 Onshore Facilities

• Underwater noise generated by construction activities (including use of a pneumatic hammer and/or vibratory hammer at the landfall location for installation of the casing pipe and "goal posts") could result in potential physiological and behavioral impacts on marine mammals and sea turtles

See Section 3.2.5.2

- Expected impacts during Construction AND Decommissioning include:
 - Vibratory pile driving (cofferdam)
 - Vessel noise
 - Construction equipment noise
 - Aircraft noise
- Expected impacts during Operations and Maintenance include:
 - Vessel noise
 - o Aircraft noise
- Increased noise during construction, O&M and decommissioning, will come from vessels, equipment and aircrafts, as well as vibratory pile driving (cofferdam) and are expected to have indirect short term impacts.
- Impacts include avoidance behavior; therefore fisheries with more mobile species may be affected.
- Mechanical/hydro-jet plows, vessels, or aircraft during construction and decommissioning are continuous or non-impulsive sounds, which have different characteristics underwater and impacts on marine life.
- Noise from mechanical/hydro-jet plows is expected to be masked by louder sounds from vessels.
- The duration of construction equipment and vessel noise at a given location will be short as the installation vessel will only be present for a short period at any given location along the corridor.
- Underwater noise associated with helicopters is generally brief as compared to audibility in air.

See Section Appendix Q – Essential Fish Habitat (EFH) Assessment - (pg 851, 853)

See attached tables provided by the Applicant. See Appendix S – Commercial and Recreational Fisheries

- Mechanical noise from the WTGs and OSS are anticipated to be minimal. The aerodynamic noise is strongly dependent on local conditions such as wind speed and is expected to be within similar ranges of the predicted levels for Horns Rev 3 : 111 dB(A) to 113 dB(A), for 8 MW and 10 MW turbines (Energinet.dk, 2014).
- An estimated background noise level of 68 dB is greater than the noise level of a wind farm from 1,148 ft (350 m) away (68 dB and 35-45 dB respectively)...
 See Appendix T Navigation Safety Risk Assessment

COP Section 4.3.3.2 (not reviewed in Phase I) also has a detailed discussion of potential noise impacts on fishery resources.

e) The following impacts from <u>electromagnetic fields</u> were identified:

According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist for this Project including electromagnetic fields created by cables connecting the turbines and carrying the electricity to land. See 650-RICR-20-05-8.4.7 (D).

- It has been predicted that the electromagnetic fields that would be produced by 26 kVA power cables could have behavioral effects on marine life within 20 m (66 feet) of the cables. See Miller et al. (2010).See 650-RICR-20-05-8.4.7 (D)(6). *See 650-RICR-20-05-8.4.7 (D)*.
- The 60-Hz magnetic- and induced electric-field levels calculated from conservative models of the Project's cables during operation will be below the detection thresholds of magnetosensitive and electrosensitive marine organisms in the Project Area. *See Section 3.2.3.2*
- The EMF surrounding the IAC, OSS-Link Cable, RWEC, and Onshore Transmission Cable will oscillate with a frequency of 60 Hz
- The EMF levels, calculated using conservative assumptions likely to overestimate field levels, indicate that the magnetic-field and induced electric field produced by the Project cables will be below the detection thresholds for magnetosensitive and electrosensitive marine organisms

See Section 4.1.5

• Expected impacts during Operations and Maintenance include:"Revolution Wind operations" which includes direct "long-term" impacts on EFH for both early and late life stages

- "Once the RWEC becomes energized, the cables will produce a magnetic field, both perpendicularly and in a lateral direction around the cables." *See Category B Assent Application section 3.2.4.2.*
- "Shielded electrical transmission cables do not directly emit electrical fields into surrounding areas, but are surrounded by magnetic fields that can cause induced electrical fields in moving water (Gill et al., 2012)."
- "Exposure to EMF could be short- or "long-term", depending on the mobility of the species."
- "A modeling analysis of the magnetic fields and induced electric fields <u>anticipated to be</u> <u>produced during operation</u> of the RWF IAC, OSS-Link Cable..."
- These conclusions are consistent with the findings of a previous comprehensive review of the ecological impacts of marine renewable energy projects, where it was determined that there has been no evidence demonstrating that EMF at the levels expected from marine renewable energy projects will cause an effect (negative or positive) on any species (Copping et al., 2016)."

See Appendix Q – Essential Fish Habitat (EFH) Assessment

See attached tables provided by the Applicant. Appendix S – Commercial and Recreational Fisheries

- EMF impacts ignore studies and generalize from smaller cables in Denmark (from Leonard, 2011 study).
- Skate and other electromagnetic sensitive species should have impacts from the cable.
- The Applicant states at Pg 101; "These conclusions are consistent with the findings of a previous comprehensive review of the ecological impacts of marine renewable energy projects, where it was determined that there has been no evidence demonstrating that EMF at the levels expected from marine renewable energy projects will cause an effect (negative or positive) on any species (Copping et al., 2016)." The Applicant seems to be misquoting the report. The report specifically cites small projects to be "low risk"- this is not a small project. Further there are newer studies that do suggest behavior changes to marine animals which trump this older report. An export cable of this size using AC would generate 100-160 mG buried 3-6 feet and measured 3 feet above sea floor.

f) The following impacts from <u>discharges and releases</u> were identified:

• Potential risks exist for an inadvertent drilling fluid release *See Section 3.2.2.3*

• Expected impacts during Construction AND Decommissioning include:Hazardous materials spills; and Wastewater discharges, both of which include direct "short-term" impacts on EFH for both early and late life stages

See Appendix Q – Essential Fish Habitat (EFH) Assessment - (pg 851)

See attached tables provided by the Applicant. Appendix S – Commercial and Recreational Fisheries

g) The following impacts from trash and debris were identified:

• Trash and debris occurring during Construction AND Decommissioning have the potential to exist in any on the water activities and could include direct "short-term" impacts on EFH for both early and late life stages

See Appendix Q – Essential Fish Habitat (EFH) Assessment - (pg 851)

See attached tables provided by the Applicant. Appendix S – Commercial and Recreational Fisheries

h) The following impacts to <u>traffic</u> were identified:

According to the CRMC Ocean SAMP, legitimate concerns to fisheries exist and include that Offshore renewable energy projects may affect commercial and recreational fisheries by

- Inadvertently limiting fishermen's access to traditional fishing grounds;
- o Causing gear or vessel damage; and
- Other specific effects dependent on site-specific conditions

See 650-RICR-20-05-8.4.8 (A)

Fishing vessels may be required or may choose to avoid the area during construction to avoid conflict with activities and vessels. During the operation phase, fishermen may be required or may choose to avoid the turbines because of the potential risk to their vessels or fishing gear from collision with a turbine, snagging gear, or other safety concerns. *See 650-RICR-20-05-8.4.8 (D)(4).*

Construction and operation of offshore renewable energy facilities may result in short- or "long-term" displacement of marine recreational users, particularly recreational boaters.

The construction phase may result in temporary closures of the offshore project area and/or adjacent shoreline areas during activities such as driving piles or installing transmission cables.

Though less likely, the operation phase may also result in the "long-term" displacement of recreational users from all or part of the project area.

Such temporary or "long-term" closures could alter recreational activities and use patterns within the Ocean SAMP area by lengthening transit times between destinations, displacing fishing activities conducted by income-generating charter boat operations, or displacing largescale sailboat races that rely on the use of the project area.

Such a displacement could also cause individual users or entire events to relocate, resulting in increased recreational activity in other in-state or out-of-state locations. *See 650-RICR-20-05-8.4.10 (D).*

- There will be a disturbance cable corridor for each cable approximately:
 - o 131 feet (40 m) and
 - 23 miles (37 km):
 - Total approximately 730 acres (295 ha) (see Table 2.2-7)

• During construction, fishing activity will be restricted within a 500-yard-radius safety zone *See Cat B Assent Application - Section 3.2.1.2*

• Project-related traffic will include vessels (including barges, tugs, and a freighter), onshore vehicles, and helicopters

See Section 4.1.8

- More information is needed as to number of vessels, timing and duration
- What happens to gear in the path? It will be pushed to the side? Removed?
- Due to safety measures on entering the area construction and decommissioning activities associated with the RWEC-RI are generally expected to have "short-term", localized impacts on access to fishing grounds
- Vessel intensity for the Atlantic herring, pelagic species (herring, mackerel, squid), monkfish, and squid fisheries are medium-high to very high along portions of the RWEC-RI route; therefore these fisheries are most likely to be affected during installation of the RWEC-RI.

See Section 3.2.8.2

• More information is needed as to number of vessels, timing and duration

See attached tables provided by the Applicant. See Appendix S – Commercial and Recreational Fisheries

- Subsea (buried) cable A subsea cable could pose a hazard to a vessel if an anchor penetrated the seabed to the depth of the cable at a cable location or impacted cables that are otherwise protected.
- Mobile gear fishing techniques employed near and within the boundaries of the Project. present a potential hazard to and from mobile fishing gear and operations potentially damaging Project submarine power cables by penetrating the seabed or impacting unburied cables that are otherwise protected.
- Higher risk fishing activities include bottom trawling and shellfish dredging. Both are expected near the Project Area and export cable.

- Subsea cables are a hazard to anchoring and to fishing with bottom gear; conversely, anchoring and fishing with bottom gear are hazards to Project components. It is anticipated that deep draft vessels and tugs will avoid the wind farm and sail in historical or designated lanes; however, smaller vessels, such as pleasure vessels and commercial fishing vessels, will likely transit the wind farm. Some of these vessels will fish in the Project Area and some will transit through the Project Area and not fish during the transit.
- Assurance that the cable is buried at sufficient depth for any gear type, and/or adequately protecting cable that cannot be buried to target burial depth, and/or using gear that has limited penetration depth in the wind farm are important risk controls.
- <u>Where possible</u>, the cable will be buried to a depth of four to six feet deep. <u>More information is needed</u>
- Cable protection measures will be employed where cable burial depth is not adequate.
- To ensure the risk is sufficiently mitigated, a separate cable burial risk assessment <u>will be</u> <u>conducted</u> for the Project, and the results of that study will inform the depth of burial as well as cable protection measures for the Project. More information is needed
- Turbines and the movement of turbine blades can potentially interfere with communication signals from radio and radar transmitters by either blocking or reflecting the signals.
- In 2005, trials using at the UK North Hoyle Wind Farm using a Sea King Mark III helicopter (MCA, 2005), and with 5 MW WTGs, which are smaller and more closely spaced than those in the PDE. Effects of varying levels were noted:
 - Radar detection may be reduced for vessels that are close to turbines.
 - "Inability to effect surface rescues within wind farms in restricted visibility."
 - "Tracking, by vessel or shore-based marine radar, of helicopter movements within wind farms was generally poor."
 - "Increase of aircraft power requirements downwind of the wind farm."
- Figure 4-1 presents the annual revenue from these fisheries for the five-year period 2007 to 2017.
- Anchoring, bottom trawling, and dredging pose the greatest risk of contact.
- Offshore construction activities could be a hazard and Project construction vessels could experience hazards from passing vessels.
- It is anticipated that the Coast Guard will implement safety zones during construction of the Project.

- Project safety vessel(s) will be on scene to advise mariners of construction activity. (Orsted, 2020).
- As the Coast Guard has advocated for this authority and supported the legislation, <u>it is</u> <u>reasonable to assume</u> that subsequent to Orsted's request, temporary safety zones will be established and enforced to protect mariners during construction and selected maintenance activities.

More information is needed

- in the unlikely event that safety zone authority has not been granted ...<u>the project will</u> coordinate closely with the U.S. Coast Guard to develop an alternative plan to facilitate vessel safety. (Orsted, 2020)
- .. If there is any doubt, the vessel operator will assume that there is a risk of collision (IMO, 1972).
- In addition to the above hazards, construction vessels may experience hazards from weather or sea state and from each other.
- It is expected that mariners, including mariners onboard Project service vessels, will strictly adhere to all COLREGs and will be aware of the prevailing environment and situation to avoid unsafe situations.
- Anchorage has the potential to damage the export cable should an anchor penetrate the seabed to the applicable cable burial depth or penetrate applicable cable protections on the seabed to the extent the cable cannot reasonably be buried.
- Standard industry practice is that anchoring in a wind farm is a potentially hazardous activity and should be undertaken only by Project-related vessels or in emergency situations.
- Based on historic events, construction vessels are the most likely to inadvertently damage a cable during normal operations if unaware of the location (BOEM, 2011).

• Smaller vessels operating in or near the Project may experience radar clutter and shadowing. *See Appendix T – Navigation Safety Risk Assessment*

i) The following impacts from <u>air emissions</u> were identified:

- The primary causes of potential air quality impacts include air emissions from vessels, vehicles, helicopters, and stationary engines.
- Overall air quality impacts to Rhode Island from construction of the RWF, RWEC, and Onshore Facilities are considered direct and "short-term"
- O&M air emissions are expected to be of longer duration than construction air emissions,

• Annual air emissions from O&M activities are expected to be significantly less than those from construction activities

See Section 4.1.9 See attached tables provided by the Applicant. See Appendix S – Commercial and Recreational Fisheries

j) The following impacts from <u>visible structures and lighting</u> were identified:

The Applicant states that as a submarine cable, the RWEC-RI will not result in visual impacts.

- lighting of vessels during construction could impact offshore recreational boating and tourism resources (e.g., altered fishing, scuba diving or sight-seeing conditions). *See Section 3.2.9.2*
- O&M of the Onshore Facilities may result in indirect impacts to adjacent habitats and habitat utilization caused by nuisance activities such as lighting and increased noise and human activity

See Section 3.2.3.2 - Onshore Facilities

- Expected lighting impacts during Construction and Decommissioning include: vessel lighting; and construction lighting, both of which include direct "short-term" impacts on EFH for both early and late life stages
- Expected impacts during Operations and Maintenance include: Operational lighting, which includes direct "long-term" impacts on EFH for both early and late life stages See Appendix Q – Essential Fish Habitat (EFH) Assessment (pg 851, 846)