RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

August 11, 2023

Jennifer Flood
Permitting Director
SouthCoast Wind

**RE: SouthCoast Wind WQC File Number 23-044/Dredge Permit File Number DP23-198**

*Via Email*

Dear Ms. Flood,

The Department of Environmental Management (DEM) has completed an initial review of the application materials submitted on March 16, 2023 and offer the following comments.

- Given that the SouthCoast PPA is currently terminated, section 1.2.2 Purpose and Need should be updated.

- 2.3.2 Offshore Export Cable Construction Sequence
    - At what stages in the construction sequence updated reports be provided on construction activities?
    - Where are boulder clearance trials planned to take place?
    - During the seabed preparation, what will be done with any cleared ghost gear, lines, wires that collected during the pre-lay grapnel run?
        - Please note that actively fishing gear CANNOT be touched by unauthorized individuals.

- 2.3.4 Pre-Installation Seabed Preparation
    - Same question as in 2.3.2, what is planned for any "cleared" materials from the grapnel run?
    - Is there a boulder relocation plan?
    - 2.3.5 Offshore Cable Installation Methods
    - When is the survey expected to be completed? Once complete, official installation methods should be submitted to the RIDEM.

- 2.3.6 Confirmation of Installed Cable Depth

- Surveying of the cable route post-lay looking at reconstitution of the cable trench (e.g., side-scan sonar) should be conducted. The RIDEM will require this within the permit conditions.

- 2.3.7 Cable Joints
  - Will plans be provided to RIDEM in advance of the work?

- 2.4.2 Offshore HDD Pits
  - Sediment in the area is very fine so RIDEM does NOT recommend side casting HDD excavated materials. RIDEM recommends that materials be stored on a barge during construction and then used to refill the pits at the end.
  - The side casted sediment is not an appropriate barrier for suspended sediment. A silt screen or sheet pile may not be feasible in this location, but some form of mitigation should be implemented. RIDEM is happy to set up a meeting to discuss potential options.

- 2.6.6 Marine Monitoring
  - Please state the NOAA requirements being followed within this section.

- 2.4.4 Cable Pulling
  - Cable installation and pulling may occur several months post HDD construction. How many months post? Please include in detailed construction schedule.
  - Additional excavation may be required to access capped ends offshore. RIDEM will require additional details on timing, potential excavation volume, etc.

- 2.4.5 Operation and Maintenance
  - This plan should be provided to RIDEM once developed.

- 2.6.8 Proposed Avoidance, Minimization, and Mitigation Measures
  - Table 2-7 has some incomplete statements in it. Primarily, "The Electric Fields (EF) arising from the voltage on the export cables will be completely shielded by cable materials." While EF will be shielded, the unshielded magnetic field will induce a secondary EF.
  - How is SouthCoast striving to achieve target burial depth as mitigation?

- 3.3.2.1 Impacts to Benthos at HDD Locations
  - Staff have concerns with the side casting of some dredge materials with no silt-screens or collection/dewatering plans. Instead, the applicant proposes that the side-casted material is to "be used to backfill the HDD construction areas" (p27/RIDEM WQ Dredge Apps and Narrative Book 1). Given the unclear plan for using the dredge materials and large amount 11000 M3, this part of the Impacts section should be detailed more clearly.

- Impacts to benthos are aimed primarily at Crepidula (p 90). Other benthic species are likely to be affected and should be addressed.
- Plans in Attachment C-3 (Drawings and Dredge Calculations) do not show HDD work proposed within the Town Pond Restoration and Conservation Area. Please confirm that the Town Pond system is no longer being considered for HDD work.

- 3.3.1.1. Submerged Aquatic Vegetation
  - SAV beds were not mapped by URI within the ECC. The closest SAV mapped by URI is near the mouth of the Sakonnet River, located over 1.0 km from the edges of the ECC (Figure 4-3, Attachment H).
    - The Sakonnet was not consistently included, and perhaps was not included in any year(s), in the aerial overflights.
  - Based on distinct side-scan sonar signatures in the geophysical data collected by South Coast Wind, SAV and/or macroalgae may be present in the vicinity of the ECC in the Sakonnet River south of the onshore Aquidneck Island crossing, but this area has not yet been field verified (Figure 4-4, Attachment H).
  - The area will be re-surveyed for SAV prior to construction, as necessary, to guide HDD placement to avoid impacts to SAV.
    - This will need to be addressed and may influence the cable route. There is a window for SAV presence to be assessed (CRMC Reg 1.3.1.R.1.J).
    - CRMC Reg 1.3.1.R.1.J: "It is the policy of the Council that SAV surveys shall be completed during peak biomass. SAV surveys shall be completed in Narragansett Bay between July 1 and September 15. SAV surveys shall be completed in the south shore coastal ponds and other shallow water embayments between July 1 and August 15."

- 3.3.1.2. Consistency with Previous Studies
  - Star Coral recorded is as sensitive taxa observed in ground truthing in table 3-8 but is never mentioned in text (Rhode Island Sound mixed cobble). There should be discussion regarding potential impacts to this species.

- 3.3.1.3. Shellfish
  - We will require shellfish surveying at least for the HDD landing/exit sites.
  - We will also recommend a whelk pot survey along the full extent of the route.

- 3.3.2.4. Displacement of Benthic Communities during Construction Activities
  - Where are the SAV beds located relative to the proposed HDD work? RIDEM will require the distance of the SAV to estimate potential impacts from suspended sediment.
  - Shellfish resources will be impacted within the ECC and offshore HDD construction areas. As stated earlier, we will require that SouthCoast perform a shellfish survey and a shellfish transplant, if deemed necessary based upon survey results.

- 3.3.2.5. Changes in Ambient EMF
    - No discussion is provided on a potential induced electric field from the unshielded magnetic field. While likely to be limited in impact/effect, it should be discussed.

- 3.4.2.2. EMF Impacts Assessment - Finfish
    - See comments on 3.3.2.5. EMF. Finfish are unlikely to have much interaction based on current literature, but American eel sensitivity and navigation should be discussed based on European eel studies.

- 3.4.3. Proposed Avoidance, Minimization, and Mitigation Measures
    - More detail is needed on these measures (e.g., explain how a coffer dam would reduce the dredging footprint; is the cable route selecting for sediments that are more likely to be successfully jet-plowed within).

- 3.6.1.6. Common Commercial Gear Types in the ECC
    - Correction: midwater trawling is not legal in RI state waters.

- 3.6.4.2. Proposed Fisheries Mitigation Measures
    - "SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities." This is taking place in Massachusetts and is not relevant to this application.
    - It is suggested to add a frequency of mariner updates/web updates to the mitigation measures (e.g., daily or more during active construction.)

If you have any questions regarding these comments, or wish to discuss them further, please contact me at ron.gagnon@dem.ri.gov or (401) 222-4700 x 2777500.

Sincerely,

Ronald Gagnon

Ronald Gagnon, P.E., Administrator
Office of Customer and Technical Assistance

CC: Neal Personeus, RIDEM
Julia Livermore, RIDEM

SOUTHCOAST WIND

SouthCoast Wind Energy LLC
101 Federal Street
Boston, MA 02110

October 16, 2023

Mr. Ronald Gagnon
Administrator
Rhode Island Department of Environmental Management
Office of Customer and Technical Assistance
235 Promenade Street
Providence, RI 02908-5767

RE: SouthCoast Wind WQC File Number 23-044/Dredge Permit File Number DP23-198

Dear Mr. Gagnon,

SouthCoast Wind Energy LLC (formerly known as Mayflower Wind Energy LLC) (SouthCoast Wind) is in receipt of a letter, dated August 11, 2023, received from the Rhode Island Department of Environmental Management (DEM) via email requesting clarification and additional information in support of the Joint Application for a State Water Quality Certification and Marine Dredging Application filed by SouthCoast Wind for the SouthCoast Wind 1 Project on March 16, 2023. Enclosed please find updated redlined and clean versions of the 401 WQC/Marine Dredging application Sections 1, 2, and 3 and Attachment N (Benthic Monitoring Plan) which serve to respond to the comments posed by the DEM. Section 4 and Attachments A through M have not been changed from the original filing.

**Comment 1:** ***Given that the SouthCoast PPA is currently terminated, section 1.2.2 Purpose and Need should be updated.***

**Response 1:** SouthCoast Wind was awarded power purchase agreements (PPAs) for a total of 1,209 megawatts (MW) through Massachusetts offshore wind generation competitive solicitations conducted pursuant to Rounds II and III of Section 83C of c. 169 of the Acts of 2008 et seq., as amended by the Energy Diversity Act, c. 188 of the Acts of 2016 and the Act Driving Clean Energy and Offshore Wind, c. 179 of the Acts of 2022 (Section 83C), and thus has demonstrated its ability to secure awarded PPAs. The Company terminated these existing PPAs because they have become uneconomic due to unforeseen macroeconomic developments affecting the offshore wind industry. As of September 29, 2023, the agreements to terminate Massachusetts PPAs were approved by the Massachusetts Department of Public Utilities (DPU), thereby enabling the Project to compete in the upcoming Rhode Island, Connecticut, and Massachusetts solicitations for up to six gigawatts of offshore wind power. SouthCoast Wind fully expects to have PPAs in place for the full amount of the Project's capacity before construction commences. See, Massachusetts, Rhode Island, and Connecticut Sign First-Time Agreement for Multi-State Offshore Wind Procurement | Mass.gov

SouthCoast Wind provided to the Rhode Island Energy Facility Siting Board (RI EFSB) an analysis of the governing statute in Rhode Island and explained why the Energy Facility Siting Act (EFSA; R.I.G.L. §§ 42-98- 1 et seq.) does not require a PPA, or any commercial offtake arrangement, as a prerequisite to a demonstration of need. Instead, the EFSA allows for a broad and flexible consideration of the need standard, and can take into account public policies, consideration of the need for the facilities in relation to the overall impact of the facilities upon public health and safety, the environment, and the economy of the state, as well as studies and forecasts showing a need for the type of energy to be delivered by the Project. SouthCoast Wind also explained to the RI EFSB the numerous indicators of Project progress and development commitment that demonstrate that in addition to being needed, the SouthCoast Wind Project is also viable. These indicators of Project progress and development commitment include, but are not limited to: (1) very significant permitting progress on the federal level; (2) well-advanced Massachusetts environmental review; (3) interconnection secured to the regional transmission grid at Brayton Point with a signed interconnection agreement with National Grid; (4) $100 million budget for development expenses for 2023; and (5) over 75 full-time employees dedicated 100% to working on the Project and associated Clean Energy Resource.

**Comment 2:** ***2.3.2 Offshore Export Cable Construction Sequence***

- ***At what stages in the construction sequence updated reports be provided on construction activities?***
- ***Where are boulder clearance trials planned to take place?***
- ***During the seabed preparation, what will be done with any cleared ghost gear, lines, wires that collected during the pre-lay grapnel run?***
  - ***Please note that actively fishing gear CANNOT be touched by unauthorized individuals.***

**Response 2:** SouthCoast Wind expects to have Project Execution Plans before installation activities begin, then final reports (including as-builts) after the completion of the work. The boulder clearance trials will take place in a selected location (location TBD) that will allow the cable installation contractor to facilitate trials in an equivalent area.

Additionally, SouthCoast Wind will work with fishermen actively working in the area to notify them of pre-lay grapnel activities as a way to minimize gear entanglement. SouthCoast Wind will develop a gear-clearance plan, in consultation with the RI DMF, which will include advance notification to fishermen allowing them the opportunity to relocate or remove their gear. Cleared ghost gear and(or) fishing lines will be disposed of responsibly during the pre-lay grapnel run, if brought aboard the vessel. SouthCoast Wind and its contractor will clear the ECC to make it safe for cable-lay operations and for overall safety to marine navigation, however, a salvage operation is not intended nor considered safe for the marine contractor. Otherwise ghost gear will be moved outside of the cable corridor. SouthCoast Wind will however consider providing details of identified gear to programs designed to remove the ghost gear.

**Comment 3:** ***2.3.4 Pre-Installation Seabed Preparation***

- ***Same question as in 2.3.2, what is planned for any "cleared" materials from the grapnel run?***
- ***Is there a boulder relocation plan?***

**Response 3:** A boulder relocation plan will be developed upon selection of a cable installation contractor, who will also clear debris and boulders from the export cable route, as necessary. If it is determined that a boulder cannot be avoided with micro-routing, a zone (or zones) will be identified for where cleared boulders/debris can be deposited. The boulder relocation areas will be determined by evaluating the benthic survey data, in order to relocate boulders to other boulder fields, if feasible, and to avoid introducing new obstacles on the seafloor that may be encountered by fishermen.

Additional survey data will likely be collected closer to installation to identify any anomalies or changes from prior surveys (such as fishing gear, debris, unexploded ordnance, or boulders) for the vessels and installation team to ensure safe vessel operations and successful cable burial. These surveys assist in building a framework for the seafloor and subsurface along the export cable route and highlight areas requiring pre-lay route preparation.

SouthCoast Wind is committed to clear communication with the fishing industry, fisheries representatives, management agencies, and with individual fishermen, on boulder relocation activities including notification of precise locations of moved boulders to proactively avoid potential issues with gear hangs. In addition to direct contact with fishermen through SouthCoast Wind's Fisheries Manager, maps and precise coordinates of relocated boulders will be broadcast through Local Notices to Mariners and shared with the Division of Marine Fisheries.

**Comment 4:** ***2.3.5 Offshore Cable Installation Methods***

- ***When is the survey expected to be completed?***
- ***Once complete, official installation methods should be submitted to the RIDEM.***

**Response 4:** The Project has already conducted some surveys along the export cable corridor, with more planned in 2023-2024. Once complete, those data will be provided to the yet to be selected contractor who will propose the installation methodology based on the anticipated soil conditions and potential hazards. Once a determination is made, the official installation methods will be provided to RIDEM. The Cable Burial Risk Assessment (CBRA) has been provided with the application filed by SouthCoast Wind (Attachment D).

**Comment 5:** ***2.3.6 Confirmation of Installed Cable Depth***

- ***Surveying of the cable route post-lay looking at reconstitution of the cable trench (e.g., side-scan sonar) should be conducted. The RIDEM will require this within the permit conditions.***

**Response 5:** As noted within the application, the Project will be conducting post-installation surveys to verify the position and burial depth of the cable and to assess the reconstitution of the trench.

**Comment 6**: ***2.3.7 Cable Joints***

- ***Will plans be provided to RIDEM in advance of the work?***

**Response 6:** SouthCoast Wind acknowledges RIDEM's comment, and the Project will provide information on where the jointing activities will occur prior to the works commencing.

**Comment 7:** ***2.4.2 Offshore HDD Pits***

- ***Sediment in the area is very fine so RIDEM does NOT recommend side casting HDD excavated materials. RIDEM recommends that materials be stored on a barge during construction and then used to refill the pits at the end.***
- ***The side casted sediment is not an appropriate barrier for suspended sediment. A silt screen or sheet pile may not be feasible in this location, but some form of mitigation should be implemented. RIDEM is happy to set up a meeting to discuss potential options.***

**Response 7:** SouthCoast Wind has verified seabed conditions of primarily soft sediments in Mount Hope Bay and the Sakonnet River (expected to be suitable for cable burial) and will further evaluate and propose potential burial and suspended sediment mitigation options to RIDEM for further discussion.

As mentioned in the Project's CRMC Assent application [at 2-19, 3-22, Appendix A Soil Erosion and Sediment Control (SESC) Plan, and Appendix G - HDD Inadvertent Release of Drilling Muds Contingency Plan], SouthCoast Wind will select and use Best Management Practices (BMPs) including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. Recently SouthCoast Wind has reestablished regular check in meeting with RIDEM and CRMC and the Project can make a point to add this as a primary discussion topic.

**Comment 8:** ***2.6.6 Marine Monitoring***

- ***Please state the NOAA requirements being followed within this section.***

**Response 8:** National Oceanic and Atmospheric Administration (NOAA) requirements to be followed include those approved in the final Incidental Take Authorization, Endangered Species Act consultation, and Essential Fish Habitat consultation, where applicable. The Marine Mammal Protection Act (MMPA) consultation, Endangered Species Act consultation, and Essential Fish Habitat consultation are all currently ongoing with the SouthCoast Wind federal NEPA process. Final NOAA requirements that are applicable to Project activities in Rhode Island state waters can be provided to RIDEM once available. SouthCoast Wind will also implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (see Appendix O of the Construction and Operations Plan [COP]).

**Comment 9:** ***2.4.4 Cable Pulling***

- ***Cable installation and pulling may occur several months post HDD construction. How many months post? Please include in detailed construction schedule.***
- ***Additional excavation may be required to access capped ends offshore. RIDEM will require additional details on timing, potential excavation volume, etc.***

**Response 9:** SouthCoast Wind's preliminary schedule has HDD work occurring one to two years before cable pull-in. SouthCoast Wind will include these activities in the detailed construction schedule, once specific date and timelines are more refined.

SouthCoast Wind acknowledges RIDEM's request for additional details on accessing capped ends. This information will become available during the development of the detailed engineering design.

**Comment 10:** ***2.4.5 Operation and Maintenance***

- ***This plan should be provided to RIDEM once developed.***

**Response 10:** Once available, SouthCoast Wind will provide RIDEM with the applicable portions of their Operations & Maintenance Plan, which will include visual inspection and maintenance schedules that will be based on manufacturer recommendations. These inspections will occur at regular intervals and after major storm events as will be agreed upon by the permit and COP conditions.

**Comment 11:** ***2.6.8 Proposed Avoidance, Minimization, and Mitigation Measures***

- ***Table 2-7 has some incomplete statements in it. Primarily, "The Electric Fields (EF) arising from the voltage on the export cables will be completely shielded by cable materials." While EF will be shielded, the unshielded magnetic field will induce a secondary EF.***
- ***How is SouthCoast striving to achieve target burial depth as mitigation?***

**Response 11:** As indicated in Table 2-7, the electric fields arising from the voltage on offshore export cables will be completely shielded by cable materials, such as metallic sheathing and steel armoring. Although the steady MFs emitted by DC submarine cables do not create induced electric fields like those created by the time-varying MFs from 60-Hz AC submarine cables, motion-induced electric fields are created by the movement of seawater or marine species through the steady MFs emitted by DC submarine cables. These motion-induced electric fields have the same properties as the motion-induced electric fields that are created by the movement of seawater or marine species through the earth's steady geomagnetic field. For the typical buried HVDC offshore cable installation case, the motion-induced electric fields associated with movement through the steady MFs emitted by the Project HVDC submarine cables will be small relative to the motion-induced electric fields associated with movement through the earth's steady geomagnetic field. The strength of these motion-induced electric fields also similarly drops off with distance from the cables like the DC MFs associated with the current on the submarine cables. See later comment for additional discussion of the limited impact/effect of these motion-induced electric fields.

SouthCoast Wind has specific burial performance criteria that the cable installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.

Further, SouthCoast Wind is proposing two "long-distance" Horizontal Directional Drill operations, HDD from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features. Achieving target burial depth at the HDD landfalls is expected, and will be the objective of the final engineering design.

**Comment 12:** ***3.3.2.1 Impacts to Benthos at HDD Locations***

- ***Staff have concerns with the side casting of some dredge materials with no silt-screens or collection/dewatering plans. Instead, the applicant proposes that the side-casted material is to "be used to backfill the HDD construction areas" (p27/RIDEM WQ Dredge Apps and Nrurntive Book 1). Given the unclear plan for using the dredge materials and large amount 11000 M3, this part of the Impacts section should be detailed more clearly.***
- ***Impacts to benthos are aimed primarily at Crepidula (p 90). Other benthic species are likely to be affected and should be addressed.***
- ***Plans in Attachment C-3 (Drawings and Dredge Calculations) do not show HDD work proposed within the Town Pond Restoration and Conservation Area. Please confirm that the Town Pond system is no longer being considered for HDD work.***

**Response 12:** SouthCoast Wind acknowledges that side-casting may not be the best methodology for the area due to other soft sediment taxa, such as polychaetes, Ampelisca amphipods, etc., present in Mount Hope Bay. SouthCoast Wind will conduct further studies to propose options for the dredging material, such as backfill in the HDD construction areas, and will propose these options to RIDEM (see response to Comment #7). A benthic monitoring plan, developed in accordance with BOEM recommendations, is being submitted as a new attachment to the WQC/Marine Dredge Application (Attachment N).

At this time the route near Town Pond is not the preferred route for SouthCoast Wind, however further geotechnical surveys occurring this fall will confirm.

**Comment 13:** ***3.3.1.1. Submerged Aquatic Vegetation***

- ***SAV beds were not mapped by URI within the ECC. The closest SAV mapped by URI is near the mouth of the Sakonnet River, located over 1.0 km from the edges of the ECC (Figure 4-3, Attachment H).***
  - ***The Sakonnet was not consistently included, and perhaps was not included in any year(s), in the aerial overflights.***
- ***Based on distinct side-scan sonar signatures in the geophysical data collected by South Coast Wind, SAV and/or macroalgae may be present in the vicinity of the ECC in the Sakonnet River south of the onshore Aquidneck Island crossing, but this area has not yet been field verified (Figure 4-4, Attachment H).***
- ***The area will be re-surveyed for SAV prior to construction, as necessary, to guide HDD placement to avoid impacts to SAV.***
  - ***This will need to be addressed and may influence the cable route. There is a window for SAV presence to be assessed (CRMC Reg 1.3.1 .R.1.J).***
  - ***CRMC Reg 1.3.1 .R.l.J: "It is the policy of the Council that SAV surveys shall be completed during peak biomass. SAV surveys shall be completed in Narragansett Bay between July 1 and September 15. SAV surveys shall be completed in the south shore coastal ponds and other shallow water embayments between July 1 and August 15."***

**Response 13:** SouthCoast Wind has previously proposed that, if necessary, it will conduct a SAV survey for field verification during the acceptable time period outlined in the CRMC regulations. If necessary and applicable based on final cable routing and agency discussions, SouthCoast Wind would conduct the SAV survey during the appropriate and agreed upon time frame, and use the Colarusso & Verkade methodology as reference.

**Comment 14:** ***3.3.1.2. Consistency with Previous Studies***

- ***Star Coral recorded is as sensitive taxa observed in ground truthing in table 3-8 but is never mentioned in text (Rhode Island Sound mixed cobble). There should be discussion regarding potential impacts to this species.***

**Response 14:** The only locations in the Project ECC sampled by SouthCoast Wind where northern star coral were observed were in RI Sound, outside of the Sakonnet River, and are well removed from the proposed dredge areas.

The sensitive taxa of the northern star coral (*Astrangia poculata)* were observed in the ECC in federal waters (20% of stations) and in Rhode Island State Waters (80% of stations).

Northern star coral were observed in the ECC in federal waters, corresponding with Glacial Moraine A and Sand – with Boulder Field(s) habitats at Southwest Shoal and in Rhode Island State Waters in Rhode Island Sound, seaward of the Sakonnet River, corresponding with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats. See Figure 3-19 from the Benthic Habitat Mapping Report (Attachment H). SouthCoast Winds continues to evaluate micro-routing options for the offshore export cable to avoid and/or minimize impacts to habitats.

SouthCoast Wind has added text to Section 3.3.1.2 of the application to detail this.

**Comment 15:** ***3.3.1.3. Shellfish***

- ***We will require shellfish surveying at least for the HDD landing/exit sites.***
- ***We will also recommend a whelk pot survey along the full extent of the route.***

**Response 15:** SouthCoast Wind acknowledges RIDEM's comment above. SouthCoast Wind will be conducting a whelk pot survey within the Sakonnet River as part of a Fisheries Monitoring Plan (FMP), which RIDEM reviewed and provided comments on July 27, 2023. The whelk survey component of the FMP focuses on parts of the ECC that are known whelk fishing grounds. SouthCoast Wind believes the sampling locations for the whelk survey are appropriately located to understand the potential impacts from cable installation.

**Comment 16:** ***3.3.2.4. Displacement of Benthic Communities during Construction Activities***

- ***Where are the SAV beds located relative to the proposed HDD work? RIDEM will require the distance of the SAV to estimate potential impacts from suspended sediment.***
- ***Shellfish resources will be impacted within the ECC and offshore HDD construction areas. As stated earlier, we will require that SouthCoast perform a shellfish survey and a shellfish transplant, if deemed necessary based upon survey results.***

**Response 16:** SouthCoast wind acknowledges RIDEM's shellfish resources comment above. The potential SAV bed in the vicinity of the HDD at Portsmouth is approximately 656 ft (200 m) northeast of the indicative HDD pit location.

**Comment 17:** ***3.3.2.5. Changes in Ambient EMF***

- ***No discussion is provided on a potential induced electric field from the unshielded magnetic field. While likely to be limited in impact/effect, it should be discussed.***

**Response 17:** As mentioned above in comment 11, the steady MFs associated with DC submarine cables do not directly induce electric fields, but weak DC electric fields will be induced by water flow or marine animal movement through the DC MFs associated with DC submarine cables. CSA Ocean Sciences Inc. and Exponent (2019) discussed that a typical buried HVDC offshore cable produces a DC electric field strengths of approximately 0.075 mV/m (0.000075 V/m) or less. There is a lack of evidence demonstrating a likelihood of significant impacts/effects from the motion-induced electric fields associated with DC submarine cables. CSA

Ocean Sciences Inc. and Exponent (2019) also discussed how electrosensitive marine species can distinguish natural bioelectric fields used locate prey, mates, and predators from naturally occurring motion-induced electric fields. This is discussed in greater detail in Section 3.3.2.5 of the Affected environments, potential impact, and proposed avoidance, minimization and mitigation (Section 3) of SouthCoast Wind's revised application.

**Comment 18:** ***3.4.2.2. EMF Impacts Assessment - Finfish***

- ***See comments on 3.3.2.5. EMF. Finfish are unlikely to have much interaction based on current literature, but American eel sensitivity and navigation should be discussed based on European eel studies.***

**Response 18:** The 2019 study as well as an additional BOEM sponsored study in 2021 have discussed the scientific evidence bearing on the potential impacts of EMFs from submarine power cables on the European eel and the American eel. While acknowledging the evidence indicating that multiple eel species can potentially detect the earth's steady (DC) geomagnetic field and the "mixed evidence" that eel species can detect electric fields, the 2019 report highlighted findings from two studies of European eels supporting a lack of significant effects of AC magnetic fields on eel species. In particular, this report described one laboratory study as reporting no effect of a 950 mG magnetic field from a 50-Hz AC power source on the swim behavior or orientation of European eels, and a field study as reporting findings that migration of European eels was not prevented by an unburied AC power cable. The 2021 report also discussed findings from these two studies of European eels, concluding that they provide "insufficient evidence to confidently decipher the behavioral response to cable EMFs in the context of AC or DC cables." The 2019 report concluded overall that the impact consequence of any exposure of American eels to EMFs from buried submarine power cables was "negligible." This conclusion was based on the small and localized portion of the pelagic habitat that would experience detectable EMFs from buried submarine power cables, and the available scientific evidence supporting any biological effects as being either not detectable or small changes. This report highlighted how changes in the earth's magnetic field are potentially just one of many environmental cues (e.g., water temperature, light, salinity) that can guide the migratory behavior of eels.

***References:***

CSA Ocean Sciences Inc.; Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England.* Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

Hutchison, ZL; Sigray, P; Gill, AB; Michelot, T; King, J. 2021. *Electromagnetic Field Impacts on American Eel Movement and Migration from Direct Current Cables.* Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2021-83. 150p., December.

**Comment 19:** ***3.4.3. Proposed Avoidance, Minimization, and Mitigation Measures***

- ***More detail is needed on these measures (e.g., explain how a coffer dam would reduce the dredging footprint; is the cable route selecting for sediments that are more likely to be successfully jet-plowed within).***

**Response 19:** SouthCoast Wind acknowledges RIDEM's comment. Table 2-9 of the Project's RI CRMC Assent application and Table 16-1 of the COP Volume II summarizes the various avoidance, minimization and mitigation measures the Project intends to abide by to minimize impact during all phases of construction, operations, and decommissioning. These tables also illustrate that the Project intends to apply Best Management Practices (BMPs) that are included in Attachment A of BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan.*

As indicated in Table 16-1 of the COP, SouthCoast Wind will select and use BMPs including the use of a Stormwater Pollution Prevention Plan to minimize sediment mobilization during offshore construction of WTGs and OSPs, scour protection placement, and HDD operations. SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.

As indicated in Table 2-9 of the Assent application, SouthCoast Wind will select and use BMPs including the use of a Soil Erosion and Sediment Control (SESC) plan to minimize sediment mobilization during offshore construction and HDD operations. SouthCoast Wind will have an HDD Contingency Plan in place to mitigate, control, and avoid unplanned discharges related to HDD activities. SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook, and in accordance with approved plans and permit requirements. The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas.

Impacts associated with the installation of a cofferdam or casing pipe with goal posts (if necessary) would be similar to those discussed for seafloor preparation, but on a smaller scale. The cofferdam or casing pipe with goal posts will be a temporary structure used during construction only. Therefore, no conversion of habitat is expected, and the cofferdam will be removed prior to the operations phase.

**Comment 20:** ***3.6.1.6. Common Commercial Gear Types in the ECC***

- ***Correction: midwater trawling is not legal in RI state waters.***

**Response 20:** SouthCoast Wind acknowledges RIDEM's comment referenced above and has deleted the incorrect reference in the Application.

**Comment 21:** ***3.6.4.2. Proposed Fisheries Mitigation Measures***

- ***"SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities." This is taking place in Massachusetts and is not relevant to this application.***
- ***It is suggested to add a frequency of mariner updates/web updates to the mitigation measures (e.g., daily or more during active construction.)***

**Response 21:** SouthCoast Wind acknowledges RIDEM's comments referenced above, and has deleted the irrelevant reference from the Application. Per RIDEM's suggestion, SouthCoast Wind has added an intended frequency of mariner updates/web updates to the mitigation measures. SouthCoast Wind will provide updates to mariners as they become available - the frequency will be dictated by the type of activity, which could be as frequent as daily notifications during construction. SouthCoast shared the final fisheries monitoring plan with RIDEM on September 15, 2023.

We very much appreciate the thorough review the RIDEM staff are performing for the SouthCoast Wind 1 Project, and we hope that the responses address your comments.

SouthCoast Wind makes the following statement, in accordance with 40 C.F.R. § 121.5(8): *The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief.*

SouthCoast Wind makes the following statement, in accordance with 40 C.F.R. § 121.5(9): *The project proponent hereby requests that the certifying authority review and take action on the CWA 401 certification request within the applicable reasonable period of time.*

SouthCoast Wind appreciates your continued consideration of this submittal. We look forward to continuing to work with the DEM to support your review of the SouthCoast Wind 401 WQC/Dredge Permit application.

Sincerely,

Jennifer Flood
Permitting Director
SouthCoast Wind Energy LLC

SOUTHCOAST WIND

# SouthCoast Wind 1 Project

## Joint Application for a State Water Quality Certificate and Marine Dredging Permit

**Amended October 2023**

## AMENDED NARRATIVE – Sections 1, 2, and 3

**Submitted to: Rhode Island Department of Environmental Management**

**Location: Rhode Island State Waters and Portsmouth, Rhode Island**

**Project Proponent: SouthCoast Wind Energy LLC**

**Preparer: POWER Engineers, Inc.**

CONTENTS

**TABLES:**

**NEW ATTACHMENT:**

# 1. INTRODUCTION

SouthCoast Wind Energy LLC (SouthCoast Wind) is a 50:50 joint venture between Shell New Energies US LLC (Shell New Energies) and Ocean Winds North America LLC (Ocean Winds). The combined experience brings a depth of real-world experience in designing, permitting, financing, constructing, and operating wind projects. SouthCoast Wind is registered to do business in Rhode Island.

SouthCoast Wind is developing an offshore wind renewable energy generation facility in federal waters in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0521 (Lease Area) located approximately 51 nautical miles (nm) (94 kilometers [km]) southeast of the Rhode Island coast. The Lease Area is not within Rhode Island jurisdictional areas, and specifically, it is not within the Geographic Location Descriptions (GLDs) defined in the Rhode Island Ocean Special Area Management Plan (Ocean SAMP).

Up to 147 wind turbine generators (WTGs) are planned within the Lease Area with the potential to generate an estimated 2,400 megawatts (MW) of clean renewable energy. SouthCoast Wind is developing two interconnection projects to connect export cables from the Lease Area to the regional power grid. The SouthCoast Wind 1 Project will connect at Brayton Point in Somerset, Massachusetts and the Falmouth Connector Project will connect in Falmouth, Massachusetts (see Figure 1-1 in Attachment A). The Brayton Point interconnection location was selected for the Project due to its robust capacity for energy injection into the existing electrical grid and the opportunity to redevelop a previously disturbed brownfield site formerly occupied by a coal burning power generation plant, which makes it situated in a prime location for an interconnection to the grid. This connector system is necessary to deliver the renewable clean energy generated by SouthCoast Wind's offshore energy generation facility to the New England region via the Independent System Operator - New England (ISO-NE) administered regional transmission system.

For purposes of this application, the Project includes export cables with 1,200 MW of capacity running through Rhode Island - specifically through Rhode Island Sound, the Sakonnet River, onshore underground crossing at Aquidneck Island in Portsmouth, Rhode Island (see Figure 1-2, Attachment A), then into Mount Hope Bay. At the onshore underground crossing of Aquidneck Island, the Project includes additional conduits (not additional cables) to accommodate 1,200 MW of additional transmission capacity if needed in the future. In the filing with the Rhode Island Energy Facility Siting Board (RI EFSB), this option is referred to as the "Noticed Variation." The *Project Concept Schematic* illustrating the regulatory jurisdictional areas of the SouthCoast Wind 1 Project is presented below.

SouthCoast Wind is submitting this application to the Rhode Island Department of Environmental Management (RIDEM) for the following permits:

- State Water Quality Certification (WQC) pursuant to the Rhode Island state Water Quality Regulations (250-Rhode Island Code of Regulations [RICR]-150-05-1.15(A)(3)) and Section 401 of the federal Clean Water Act (CWA).
- Marine Dredging Permit pursuant to the Marine Infrastructure Maintenance Act of 1996 and the Marine Waterways and Boating Facilities Act of 2001, Chapter 46-6.1 of the Rhode Island General Laws (R.I.G.L.); and § 2.4.13 in the Rules and Regulations for Dredging and the Management of Dredged Materials ("Dredging Regulations") (250 RICR-150-05-2).

SouthCoast Wind is also submitting this package to the United States Army Corps of Engineers (USACE) - New England District in compliance with the 2020 CWA Section 401 Rule.

SouthCoast Wind will be filing a separate permit application with the RIDEM for coverage under the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program General Permit for Stormwater Discharge Associated with Construction Activity (Construction General Permit or CGP), in compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended and regulations for the RIPDES Program (250-RICR-150-10-1).

SouthCoast Wind filed a Joint Category B Assent application (650-RICR-20-00-1) and Freshwater Wetlands Permit application under the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9) with the Rhode Island Coastal Resources Management Council (RI CRMC) on February 24, 2023. Please see Figure 1-3 for an illustration of RIDEM and RI CRMC regulatory jurisdiction. SouthCoast Wind anticipates that the RIDEM and RI CRMC will continue their joint consultations and reviews of SouthCoast Wind's filings for the SouthCoast Wind 1 Project.

## 1.1 REGULATORY REQUIREMENTS

SouthCoast Wind is seeking the following permits from the RIDEM for the SouthCoast Wind 1 Project in Rhode Island state waters.

### 1.1.1 State Water Quality Certification

The Project includes the following proposed activities in Rhode Island state waters extending seaward to the three-nautical mile limit and subject to the jurisdiction of RIDEM pursuant to the RIDEM Water Quality Regulations (WQR) (250-RICR-150-05-1) and will require a WQC pursuant to WQR Section 1.15(A)(3):

- Installation, operation, and maintenance of two underwater power export cables and associated communications cabling, each approximately 20.4 miles (mi) (32.8 km) long.
- Possible placement of fill (i.e., secondary cable protection) in state waters over the proposed underwater export cables to protect segments of the submarine export cables and existing utilities.
- Installation of the underwater export cables at the Project's proposed landfall construction areas utilizing horizontal directional drilling (HDD) with work including temporary excavation / dredging at eight offshore HDD pits.

The RIDEM and the RI CRMC regulate waterbodies within Rhode Island jurisdiction through the RIDEM Surface Water Quality Standards and the Rhode Island Coastal Resources Management Plan (CRMP), respectively. The RIDEM Surface Water Quality Standards and Section 401 WQC Regulations categorize water quality standards for each waterbody. The waters of the state of Rhode Island are assigned a Use Classification which is defined by the most sensitive uses that it is intended to protect (see Section 3.2 of this Application for additional information).[1]

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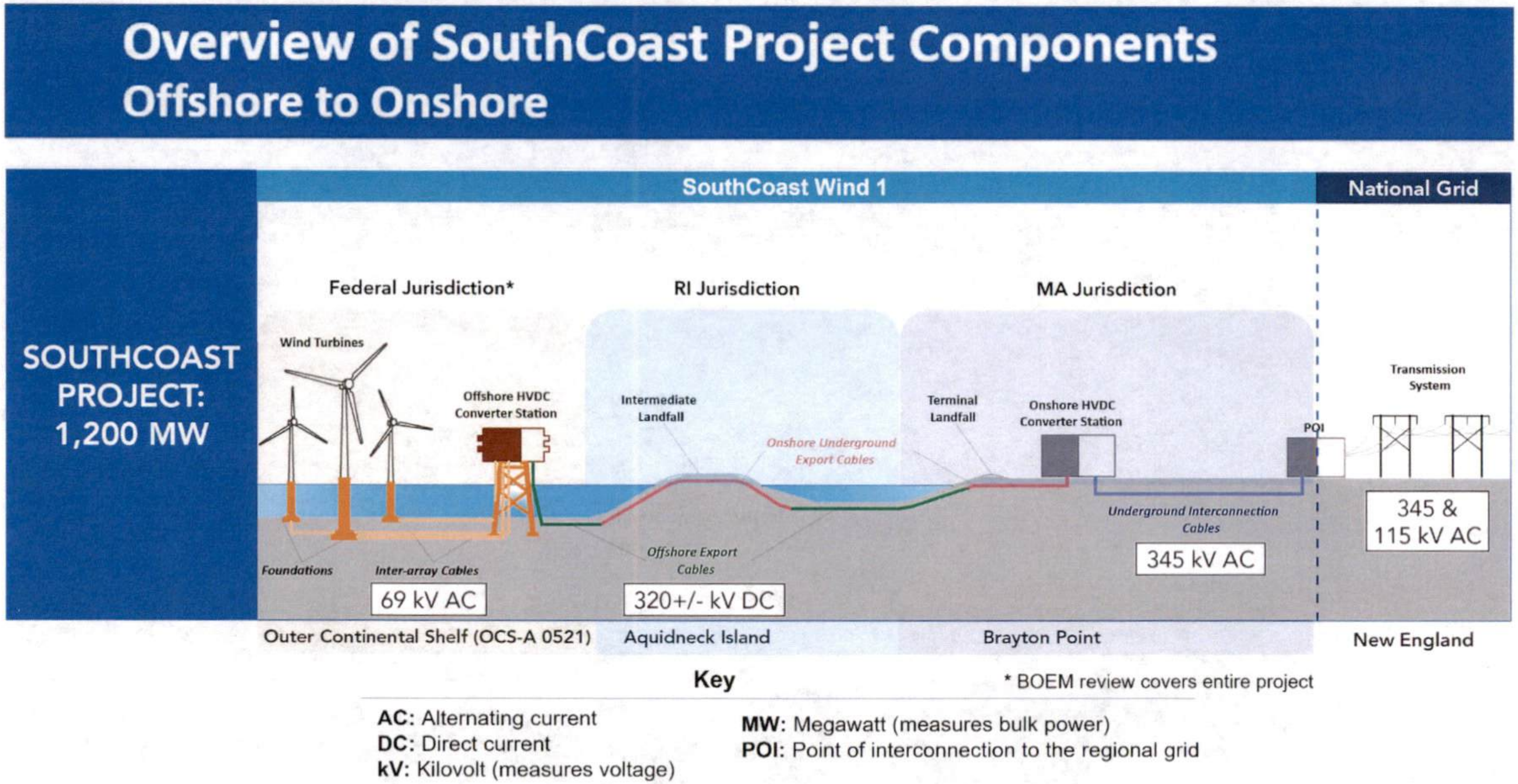
[1] 250-RICR-150-05-1




**SOUTHCOAST WIND 1 PROJECT CONCEPT SCHEMATIC**

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The RI CRMC assigns water use categories for marine and coastal waters in accordance with the CRMP as amended (aka, "The Redbook") Section 1.2.1 Tidal and Coastal Pond Waters A.[2] The ECC crosses the following water use categories (see Figure 1-5 Attachment A):

- Open waters in Rhode Island Sound that support a variety of commercial and recreational activities while maintaining good value as a fish and wildlife habitat and open waters in Mount Hope Bay that could support water dependent commercial, industrial, and/or high intensity recreational activities are classified as Type 4 Multipurpose Waters.
- The Sakonnet River is classified as Type 2 Low Intensity Use Waters characterized by high scenic value that support low intensity recreational and residential uses. These waters include seasonal mooring areas where good water quality and fish and wildlife habitat are maintained.
- A short segment of the Brayton Point ECC in lower Mount Hope Bay overlaps with Type 6 waters (see Figure 1-5, Attachment A). However, SouthCoast Wind has committed to routing the cable to avoid the Type 6 water area. To establish the boundaries of Type 6 waters, the CRMC established a buffer to federal navigation channels that measures three times the channel depth. Type 6 waters are categorized for (i) industrial waterfronts, and (ii) commercial navigation channels. SouthCoast Wind has committed to the USACE and the United States Coast Guard (USCG) to routing the offshore export cables outside of Type 6 waters including the Mount Hope Bay main shipping channel, the Tiverton channel, and outside of the buffers to these federal navigation channels.

Compliance of the Project with the RIDEM regulatory standards is addressed in Section 4 of this Application.

### 1.1.2 Marine Dredging and Associated Activities Permit

A Marine Dredging Permit from RIDEM is required for the offshore HDD pits in the Sakonnet River and in Mount Hope Bay pursuant to the Marine Infrastructure Maintenance Act of 1996 and the Marine Waterways and Boating Facilities Act of 2001, Chapter 46-6.1 of the R.I.G.L.; and §2.4.13 in the Dredging Regulations (250 RICR-150-05-2). The estimated volume of sediment to be temporarily excavated / dredged at each of the eight offshore HDD pits is 1,867 cubic yards (1,427 cubic meters). SouthCoast Wind plans to side-cast sediments adjacent to the offshore construction areas within the ECC to allow a readily available means of backfilling the trench and underwater cables. No offsite disposal of excavated sediment is planned.

### 1.1.3 Wetlands

The onshore Project components lie on or cross the jurisdictional boundary between RI CRMC and RIDEM review of wetlands. RI CRMC will be the sole freshwater wetland review agency in accordance with 650-RICR-20-00-9.5.4. Any Project impacts to freshwater wetlands within RIDEM jurisdiction or their contiguous areas is addressed in the Joint Application for a Category B Assent and Freshwater Wetlands Permit in the Vicinity of the Coast filed with the RI CRMC. No components of the Project are located within biological freshwater wetlands or biological coastal features as defined by Rhode Island regulations; nor is there any proposed discharge of fill or dredged material into freshwater wetlands. However, portions of the Aquidneck Island intermediate underground cable crossing route fall within contiguous areas of freshwater wetlands and river/stream pursuant to the CRMC Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast.[3]

[2] 650-RICR-20-00-1
[3] 650-RICR-20-00-9

## 1.2 Purpose and Need

The SouthCoast Wind 1 Project will help meet Rhode Island's important public policy requirements regarding clean energy, climate change, energy security and economic advancement for the benefit of the region. The overall purpose of the Project is to deliver approximately 1,200 MW of renewable clean energy to the New England regional electric grid. The SouthCoast Wind 1 Project is necessary to meet the needs of the state and region for substantial reductions in Greenhouse Gas (GHG) emissions and substantial increase to the renewable clean energy supply, delivered safely and reliably to the region from offshore wind. By enabling delivery of the offshore wind energy, the Project will provide the region with substantial benefits, including environmental and economic benefits and strengthening of energy system reliability and energy security. The policies and legislative directives of the New England states, including Rhode Island, express a clear need for additional renewable clean energy generation from offshore wind.

The key public policy requirements in Rhode Island that drive the need for the Project are highlighted below.

### 1.2.1 Rhode Island Climate Change Legislation and Policies

Energy 2035: Energy 2035 identified offshore wind as Rhode Island's "most significant renewable energy resource."[4] Significantly, Energy 2035 established the goals to "increase sector fuel diversity, produce net economic benefits, and reduce greenhouse gas emissions by 45 percent by the year 2035."[5] To achieve these goals, Energy 2035 recommended numerous policy actions, including the promotion of local and regional renewable energy.[6] To achieve this goal, Energy 2035 specifically prescribed procuring additional renewable energy "through support for state and federal offshore wind projects."[7]

Rhode Island 2030 Vision Plan: While only 19% of the State's electricity consumption currently comes from renewable resources, Rhode Island has a roadmap to source 100% of its electricity from renewable resources by 2030. In October 2021, Governor Dan McKee released a working draft of a vision plan for the next decade in Rhode Island, *Rhode Island 2030: Charting a Course for the Future of the Ocean State* (Rhode Island 2030).[8] Rhode Island 2030 focuses on harnessing the State's "Blue Economy" as well as the "Green Economy." An industry that perfectly fits in both of these categories is the offshore wind industry. As an Infrastructure and Transportation Objective, Rhode Island 2030 states, "Infrastructure that supports the Blue Economy and life sciences, including ports that support offshore wind activity and site readiness work that enables future industrial and commercial development."[9] The plan notes that the State will continue to invest in needed infrastructure for offshore wind in pursuit of the State's renewable energy goals.

Executive Order No. 20-01, Advancing a 100% Renewable Energy Future for Rhode Island by 2030: In January 2020, then Governor Gina Raimondo issued an Executive Order committing Rhode Island to be powered by 100% renewable electricity by 2030.[10] This Executive Order committed Rhode Island "to mitigating economy-wide greenhouse gas emissions and their effect on climate change, while spurring new and innovative opportunities for investment and job growth throughout the state's clean energy economy."[11] The Executive Order further found that "a clean and affordable future electric grid will require a diverse combination of

[4] Energy 2035 at 15.
[5] *Id.* at 34.
[6] *Id.* at 62-63.
[7] *Id.* at 63.
[8] Rhode Island 2030: Charting a Course for the Future of the Ocean State, Working Document (2021) https://www.ri2030.com/_files/public/RI%202030_final.pdf.
[9] *Id.* at 50.
[10] Rhode Island Executive Order No. 20-01, Advancing a 100% Renewable Energy Future for Rhode Island by 2030 (Jan. 17, 2020) https://governor.ri.gov/executive-orders/executive-order-20-01 .
[11] *Id.*

responsibly- developed resources to power our economy while maintaining reliability, including, but not limited to, offshore wind, solar, on-shore wind, and storage."[12]

Resilient Rhode Island Act and Rhode Island Greenhouse Gas Emissions Reduction Plan: In 2014, the General Assembly passed the *Resilient Rhode Island Act*. That act created the Rhode Island Executive Climate Change Coordinating Council (RIEC4), which is charged with working to achieve GHG reduction targets: 10% by 2020, 45% by 2035, and 80% by 2050.[13] In 2016, RIEC4 released the *Rhode Island Greenhouse Gas Emissions Reduction Plan*, which identified strategies and actions to meet the GHG reduction targets.[14] The 2016 Plan specifically emphasized the importance of renewable and clean energy, specifically offshore wind, to aid Rhode Island in meeting its GHG reduction goals.[15]

2021 Act on Climate: In 2021, the General Assembly amended the *Resilient Rhode Island Act* through the passage of the *2021 Act on Climate* with the intent of increasing Rhode Island's efficiency and effectiveness in responding to climate change. The *2021 Act on Climate* sets mandatory and enforceable targets for reducing greenhouse-gas emissions and transitioning to a low carbon economy.[16] The *2021 Act on Climate* requires that the RIEC4 update the *Greenhouse Gas Emissions Reduction Plan* to develop a plan to reduce climate emissions to net zero by 2050. This plan is required to be delivered to the General Assembly by December 31, 2025.

Affordable Clean Energy Security Act of 2022: On July 6, 2022, Governor Dan McKee signed into law the *Relating to Public Utilities and Carriers – Affordable Clean Energy Security Act* that seeks to expand Rhode Island's offshore energy resources. In issuing the legislation, Governor McKee stated: "Adding offshore wind clean energy capacity is essential to meeting our new 100 percent renewable energy by 2033 goal and our Act on Climate emissions reduction target."[17]

### 1.2.2 Regional Energy Supply and Transmission System Reliability

States in the New England region have conducted procurements of offshore wind energy through competitive solicitations.[18] SouthCoast Wind was awarded power purchase agreements (PPA) for a total of 1,209 MW through Massachusetts offshore wind generation competitive solicitations conducted pursuant to Rounds II and III of Section 83C of c. 169 of the Acts of 2008 et seq., as amended by the Energy Diversity Act, c. 188 of the Acts of 2016 and the Act Driving Clean Energy and Offshore Wind, c. 179 of the Acts of 2022 (Section 83C), and thus has demonstrated its ability to secure awarded PPAs. The Company terminated these existing PPAs because they have become uneconomic due to unforeseen macroeconomic developments affecting the offshore wind industry. As of September 29, 2023, the agreements to terminate Massachusetts PPAs were approved by the Massachusetts Department of Public Utilities (DPU), thereby enabling the Project to compete in the upcoming Rhode Island, Connecticut, and Massachusetts solicitations for up to six gigawatts of offshore wind power. SouthCoast Wind fully expects to have PPAs in place for the full amount of the Project's capacity before construction commences. See, Massachusetts, Rhode Island, and Connecticut Sign First-Time Agreement for Multi-State Offshore Wind Procurement | Mass.gov

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[12] *Id.*
[13] R.I.G.L. § 42-6.2 et seq.
[14] RIEC4, Rhode Island Greenhouse Gas Emissions Reduction Plan (December 2016). http://climatechange.ri.gov/documents/ec4-ghg-emissions-reduction-plan-final-draft-2016-12-29-clean.pdf.
[15] *Id.* at 18, 27, 30, 36.
[16] R.I.G.L. § 42-6.2 et seq.
[17] State of Rhode Island Office of Energy Resources. 2022. Governor McKee Signs Legislation Requiring Offshore Wind Procurement for 600 to 1,000 Megawatts. July 6, 2022. https://energy.ri.gov/press-releases/governor-mckee-signs-legislation-requiring-offshore-wind-procurement-600-1000.
[18] *See* CT Public Act 19-71 (directing DEEP to procure 2,000 MW of offshore wind energy).

The Project is necessary to connect the SouthCoast Wind offshore wind renewable energy generation facility to the ISO-NE grid. The offshore wind generation will help meet the need for GHG emissions reductions and increase in clean energy supply, including from offshore wind, in the region, as expressed in the state policies and legislative directives listed above.

SouthCoast Wind's offshore energy generation facility is approximately 51 nm (94 km) southeast of the coast of Rhode Island and requires new transmission infrastructure to connect to the onshore electric grid. Both the offshore and the onshore Project components are integral to the Project being able to deliver its energy to the New England grid and to facilitate a safe and reliable interconnection.[19]

Therefore, the existing transmission system is inadequate to interconnect SouthCoast Wind's offshore wind renewable energy generation facility and the proposed new transmission is needed to interconnect it to the regional electrical grid safely and reliably.

In developing this new transmission in the Project, SouthCoast Wind has engaged in an extensive analysis of offshore and onshore routing alternatives to avoid, minimize and/or mitigate impacts in the Town of Portsmouth, Rhode Island and surrounding communities including those on the Sakonnet River and Mount Hope Bay. See Attachment B Route Alternatives Assessment. The SouthCoast Wind 1 proposed Point of Interconnection (POI) at Brayton Point will provide the offshore wind renewable energy generation facility with a strong interconnection to the regional transmission system for the reliable delivery of renewable clean energy.

## 1.3 OTHER PROJECT APPROVALS AND PERMITS

In addition to a state water quality certification and a marine dredging permit, the Project requires permits and approvals from other state and federal regulatory agencies. Notably, SouthCoast Wind will also apply for several environmental permits and approvals at the state level through the RI CRMC.

### 1.3.1 Rhode Island Coastal Resources Management Council

**Category B Assent.** SouthCoast Wind filed a joint Category B Assent and Freshwater Wetlands Permit Application with the RI CRMC on February 24, 2023. The Project falls under the jurisdiction of the CRMC as it is located in areas regulated by the RI CRMC's CRMP (650-RICR-20-00-01) under Sections 1.2.1 - Tidal and Coastal Pond Waters and Section 1.2.2 - Shoreline Features.

**Freshwater Wetlands Permit**. The Project will require a Freshwater Wetlands Permit from the RI CRMC for work activities located within the 200-foot contiguous area to a coastal wetland pursuant to the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast. Updated RI CRMC regulations relating to Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9 et seq.) went into effect on July 1, 2022. Under these new regulations, RI CRMC no longer regulates "Riverbank Area" and "Perimeter Wetland" portions of freshwater wetlands in the vicinity of the coast. Under the new regulations, RI CRMC regulates a Jurisdictional Area which includes the resource (i.e., wetland or stream) and a contiguous area extending 200 feet (ft) outward from a river / stream and 100 ft outward from a freshwater wetland. The contiguous area includes the resource's Buffer Zone and Buffer.

**Submerged Lands Lease**. The Project, namely the offshore underwater export cables extending between the mean high-water mark seaward to the limit of the Rhode Island territorial waters, is under the purview of the

[19] *See In re: the Issuance of an Advisory Opinion to the Energy Facility Siting Board Regarding Revolution Wind, LLC's Application to Construct and Alter Major Energy Facilities*, RI EFSB Docket No. 5151 (August 26, 2021) http://www.ripuc.ri.gov/efsb/2021_SB-01/PUC%20Advisory%20Opinion%20-%20Revolution%20Wind%20(8-26-2021).pdf.

Rhode Island Coastal Zone Management Act G.L. 46-23-1 et seq. authorizing the RI CRMC to review and issue Submerged Lands Lease. The regulations set forth in the Rhode Island Ocean Special Area Management Plan allow the RI CRMC to issue a Submerged Lands License for Renewable Energy Development, such as the offshore underwater export cables proposed by SouthCoast Wind.

**Construction General Permit**. The RIDEM Office of Water Resources implements the RIPDES program. The purpose of this program is to restore, preserve, and enhance the quality of the surface waters and to protect the waters from discharges of pollutants so that the waters will remain available for all beneficial uses and thus protect the public health, welfare, and the environment. A CPG will be required to authorize discharges pursuant to R.I.G.L. § 46-12 as amended and regulations for the RIPDES Program (250-RICR-150-10-1).

**Federal Consistency Concurrence.** The Project will require concurrence from RI CRMC with SouthCoast Wind's Federal Consistency Certification pursuant to Section 307 of the Coastal Zone Management Act, Coastal Zone Management Act regulations and § 11.10 of Rhode Island Ocean SAMP. SouthCoast Wind filed the Rhode Island Coastal Zone Management Act Consistency Certification with the RI CRMC in March 2022.

### 1.3.2 Rhode Island Natural Heritage Program

**RIDEM Natural Heritage Area Review.** Pursuant to the Rhode Island Endangered Species Act, SouthCoast Wind has consulted with the Rhode Island Natural Heritage Program. SouthCoast Wind reviewed the RIDEM Natural Heritage Area overlays available on the RIDEM Environmental Resource Mapping website and determined that there are three natural heritage areas that overlap the Project Study Area, indicating potential state-listed species. SouthCoast Wind contacted RIDEM on April 8, 2022, to inquire about the species listing for these areas. RIDEM responded on April 11, 2022, with a list of species of concern identified near the Project Area. SouthCoast Wind followed up with RIDEM on February 10, 2023, for an updated list of species of concern near the Project Area.

### 1.3.3 Summary of Other Permits, Reviews, and Approvals

Table 1-1 provides a summary of the other required approvals and permits along with dates of approval or estimated dates of approvals for those permits that have not been issued.

**TABLE 1-1. SUMMARY OF THE PROJECT'S FEDERAL AND STATE PERMITS, REVIEWS, AND APPROVALS**

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| Federal | | |
| **BOEM*** | Site Assessment Plan (SAP) | Approved by BOEM May 26, 2020. |
| | Certified Verification Agent (CVA) Nomination | Approved by BOEM November 4, 2020. |
| | Departure request for the early fabrication of SouthCoast Wind's Offshore Substation Platform(s) (OSP) and inter-array cables. | Approved by BOEM December 1, 2020. |
| | Construction and Operations Plan (COP) | COP filed February 15, 2021. BOEM published a Notice of Intent to Prepare |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| | | an Environmental Impact Statement for the review of the COP on November 1, 2021. Draft Environmental Impact Statement issued on February 13, 2023. |
| | National Environmental Policy Act (NEPA) Review | Initiated by BOEM on November 1, 2021. |
| | Facilities Design Report and Fabrication & Installation Report | Filing planned for Q1 2024. |
| **U.S. Department of Defense Clearing House** | Informal Project Notification Form | Submitted May 11, 2020 . |
| **U.S. Army Corps of Engineers (USACE)** | Individual Clean Water Act (CWA) Section 404 Permit.<br>Rivers and Harbors Act of 1899 Section 10 Permit. | Submitted December 2, 2022. Application deemed complete by USACE on February 2, 2022. |
| **U.S. Coast Guard (USCG)** | Private Aids to Navigation Authorization | To be filed 3 to 6 months prior to offshore construction. |
| | Local Notice to Mariners | To be filed prior to offshore construction. |
| **U.S. Environmental Protection Agency (USEPA)** | National Pollutant Discharge Elimination System General Permit for Construction Activities | Submitted October 31, 2022. |
| | Outer Continental Shelf Permit Clean Air Act | Submitted November 23, 2022. |
| **U.S. Fish and Wildlife Service (USFWS)** | Endangered Species Act Section 7 consultation<br>Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA) compliance. | No take authorization is expected to be requested and coordination with USFWS has been initiated and will continue. Basic site evaluation and characterization studies completed and detailed studies ongoing. |
| **National Oceanic and Atmospheric Administration (NOAA)**<br>**U.S. National Marine Fisheries Service (NMFS)** | Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) | Pre-construction: Concurrence for 2019 Geophysical and Geotechnical (G&G) surveys was issued by NMFS on July 26, 2019.<br>IHA for 2020 G&G surveys issued on July 23, 2020.<br>IHA for 2021 G&G surveys issued on July 1, 2021.<br>LOA Application for offshore construction and operations filed March 18, 2022 and deemed complete by NMFS September 19, 2022.<br>IHA for 2023 G&G surveys submitted on November 16, 2022. Submitted request for IHA Abbreviated Notice per NMFS guidance on January 13, 2023. Application deemed Adequate and Complete on January 24, 2023. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Federal Aviation Administration (FAA)** | Determination of No Hazard to Air Navigation | It is not currently anticipated that a Determination of No Hazard will be required for offshore structures in the Lease Area due to their location outside of 12 nm (22 km); nor will this be required for the onshore substation or converter station due to the maximum height of these structures.<br>SouthCoast Wind continues to engage with the Federal Aviation Administration with regards to whether any review and/or authorization is required for offshore equipment deployed to support horizontal directional drilling installation of the export cables. |
| State/Rhode Island | | |
| **Rhode Island Coastal Resources Management Council (RI CRMC)** | Coastal Zone Management Consistency Determination under the Federal Coastal Zone Management Act (16 United States Code [U.S.C.] §§ 1451-1464) and in accordance with the Rhode Island Coastal Resources Management Program and Special Area Management Plans. | Filed March 15, 2022. |
| | Category B Assent and Submerged Lands License pursuant to R.I.G.L. § 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2. | Filed February 24, 2023. |
| | Submerged Lands License pursuant to R.I.G.L. § 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2. | Filing TBD based on consultation with CRMC. |
| | Freshwater Wetlands Permit pursuant to the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-2.1 et seq.) (R.I.G.L. § 46-23-6). | Filed February 24, 2023. |
| | LOA/Survey Permit, if needed, in accordance with the R.I.G.L. § 46-23 and 650-RICR-20-00-1. | Approved July 7, 2021 for Summer 2021 benthic surveys; Approved February 4, 2022 for Spring 2022 benthic surveys. |
| **Rhode Island Energy Facility Siting Board (RI EFSB) and Rhode Island Public Utilities Commission (RI PUC)** | Certificate of necessity/public utility. | Application for a License to Construct Major Energy Facilities filed May 31, 2022, and docketed as of June 24, 2022 (Docket Number SB-2022-02). |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Rhode Island Historical Preservation and Heritage Commission (RIHPHC)** | Permission to conduct archaeological field investigations (pursuant to the Antiquities Act of R.I.G.L. 42-45 and the Rhode Island Procedures for Registration and Protection of Historic Properties). | Marine Survey approved on July 2, 2021.<br>Phase 1 Permit (No. 21-32) issued on December 17, 2021; Terrestrial Archaeological Resources Assessment (Phase 1A/1B Report) filed March 14, 2022.<br>Marine Archaeological Resources Assessment (MARA) submitted March 16, 2022. |
| | Section 106 Consultation | Initiated November 1, 2021 |
| **Rhode Island Department of Environmental Management (RIDEM)** | Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife | Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022. |
| | Water Quality Certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1251 et seq. and R.I.G.L. § 46-12-3 and Dredging Permit pursuant to the Marine Infrastructure Maintenance Act of 1996 and RI Rules and Regulations for Dredging and the Management of Dredged Materials (R.I.G.L. §§ 46-6.1 et seq.) and Rhode Island Water Quality Regulations (R.I.G.L. §§ 46.12 et seq.); (Dredging permit is issued jointly by RIDEM and RI CRMC under RIDEM dredging regulations). | Filed March 16, 2023. |
| | Rhode Island Pollution Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity pursuant to R.I.G.L. § 42-12 as amended. Authorization under the RIPDES CGP. | Filing anticipated on or about Q3 2023 - prior to construction by SouthCoast Wind. |
| **RIDEM Division of Fish and Wildlife (RI DFW)** | Letter of Authorization and/or Scientific Collector's Permit (for surveys and pre-lay grapnel run), if needed. | TBD based on consultations with RIDEM Division of Fish & Wildlife. |
| | Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife | Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022.<br>RI Natural Heritage Program confirmed state listed species data again on February 10, 2023. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Rhode Island Department of Transportation (RIDOT)** | Utility Permit/Physical Alteration Permit pursuant to R.I.G.L. Chapter 24-8. | Filing planned for Q4 2023 (if applicable). |
| **Local (for portions of the SouthCoast Wind Project within local Rhode Island jurisdiction)** | | |
| **Portsmouth Department of Public Works** | Street Excavation and Curb Cuts Permit | Filing planned 2023. TBD based on consultation with Town and Portsmouth and Director of Public Works. |
| **Portsmouth Zoning and Planning Boards** | Special Use Permit/Variances and Consistency with Comprehensive Community Plan | Filing planned 2023. TBD based on consultation with Town and Portsmouth Planning Director. |
| **Portsmouth Town Council** | Noise Variance | Filing planned 2023. TBD based on consultation with Town and Town Council. |
| **State/Massachusetts** | | |
| **Massachusetts Executive Office of Energy and Environmental Affairs (EEA)** | MEPA Environmental Notification Form (ENF) and Environmental Impact Report (EIR)<br><br>Certificate of Secretary of EEA. | Advanced notice of MEPA ENF Filing was sent to all relevant Community-Based Organizations and tribes on June 22, 2022. ENF filed on August 12, 2022. ENF Certificate of EEA Secretary issued on October 11, 2022.<br><br>Filed SouthCoast Wind 1 Draft Environmental Impact Report (DEIR) on February 1, 2023. Final EIR (FEIR) anticipated in Q2/Q3 2023. |
| **Massachusetts Energy Facilities Siting Board (MA EFSB)** | Approval to construct the proposed Project, pursuant to G.L. c. 164, § 69J (Siting Petition).<br><br>Certificate of Environmental and Public Need (Section 72 Approval Consolidated with MA EFSB). | Filed May 27, 2022. Public Comment Hearing held on October 11, 2022. |
| **Massachusetts Department of Public Utilities (MA DPU)** | Approval to construct and use proposed Project pursuant to G.L. c. 164, § 72 (Section 72 Petition) consolidated with MA EFSB proceeding.<br><br>Individual and comprehensive exemptions from the zoning bylaws of Somerset for the proposed Project pursuant to G.L. c. 40A § 3 (Zoning Petition) consolidated with MA EFSB proceeding. | Filed concurrently with the MA EFSB Petition and Analysis on May 27, 2022. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Massachusetts Department of Environmental Protection (MassDEP)** | Chapter 91 Waterways License/Permit for dredge, fill, or structures in waterways or tidelands.<br>Section 401 Water Quality Certification. | Joint application filing planned for Q2 2023. |
| **Massachusetts Office of Coastal Zone Management (MA CZM)** | MA CZM Consistency Determination | Filed with COP on February 15, 2021 (Appendix D1). Revised version filed January 13, 2022. Executed one-year stay with MA CZM beginning on December 30, 2021, with MA CZM's review re-starting on December 30, 2022, and anticipated completion by May 31, 2023. |
| **Massachusetts Department of Transportation (MassDOT)** | State Highway Access Permit(s) (if needed) | Filing planned for Q3 2023, if needed. |
| **Massachusetts Board of Underwater Archaeological Resources (MA BUAR)** | Special Use Permit (SUP) | SouthCoast Wind 1 Provisional SUP issued on June 25, 2021. Filed MA BUAR SUP application for SouthCoast Wind 1 on August 26, 2021. SUP approved on September 30, 2021. SUP renewal approved on September 29, 2022. |
| **Massachusetts Historical Commission (MHC)** | Project Notification Form/Field Investigation Permits (980 CMR § 70.00) | Project Notification Form (PNF) submitted July 26, 2021.Terrestrial Archaeological Resources Assessment (Brayton Point Phase 1A Report) filed on March 14, 2022. |
| | Section 106 Consultation | Initiated November 1, 2021 |
| **Massachusetts Fisheries and Wildlife (MassWildlife) - Natural Heritage and Endangered Species Program (NHESP)** | MA Endangered Species Act Checklist<br>Conservation and Management Permit (if needed) or No-Take Determination. | Submitted Information Request for state-listed rare species on June 17, 2021. Massachusetts' NHESP issued a letter identifying state-listed protected species in proposed Brayton Point Project Area on July 23, 2021.<br>Request for updated list filed with NHESP on March 31, 2022. NHESP issued letter regarding the SouthCoast Wind 1 Project Area on April 28, 2022; determined that the site is not mapped as Priority or Estimated Habitat.<br>Endangered Species Act Checklist filing planned for Q3 2023, if applicable (upon Final Environmental Impact Report certificate). |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Massachusetts Division of Marine Fisheries (MA DMF)** | Letter of Authorization and/or Scientific Permit (for surveys and pre-lay grapnel run). | To be determined based on consultations with MA DMF. |
| Local (for portions of the SouthCoast Wind 1 Project within local Massachusetts jurisdiction) | | |
| **Somerset Planning & Zoning Board** | Local Planning/Zoning Approval(s) (if needed) | Filing of application(s) tentatively anticipated for Q2 2024.<br>Request for individual and comprehensive zoning exemptions filed [pursuant to G.L. c. 40A § 3 filed concurrently with the MA EFSB Petition and Analysis]. |
| **Somerset Conservation Commission** | Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws), as applicable. | Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA). |
| **Somerset Department of Public Works, Board of Selectmen, and/or Town Council** | Street Operating Permits/Grants of Location. | Filing of application(s) planned for Q4 2023 (if applicable). |
| **Swansea Conservation Commission** | Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws). | Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA), if applicable. |

* In its review of the COP, BOEM must comply with its obligations under the NEPA, the National Historic Preservation Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Migratory Bird Treaty Act, the Clean Air Act, and the ESA. Thus, BOEM coordinates and consults with numerous other federal agencies including the National Marine Fisheries Service, United States Fish and Wildlife Service, the United States Environmental Protection Agency, and the United States Coast Guard during the review process. BOEM also coordinates with the states under the Coastal Zone Management Act to ensure that the project is consistent with the state's coastal zone management program.

# 2. SITING AND PROJECT DESCRIPTION

This section includes a description of the Project and an overview of the siting process used by SouthCoast Wind. Referenced Project figures are included in Attachment A, Offshore Export Cable Engineering Drawings (Attachment C -1) and HDD Engineering Drawings (Attachment C-2).

SouthCoast Wind is developing an offshore wind energy generation facility capable of generating an estimated 2,400 MW of renewable clean energy. Export cables connecting the energy generation facility with the regional transmission system at Brayton Point in Somerset, Massachusetts, will run through Rhode Island state waters (specifically Rhode Island Sound, the Sakonnet River and Mount Hope Bay) and overland at Portsmouth, Rhode Island. For purposes of this application, the Project is defined as the transmission components located within Rhode Island-jurisdictional areas listed below and shown on the Project overview maps (Figures 1-2 and 1-3 in Attachment A). The Project includes the following components proposed in Rhode Island state waters:

- Two HVDC submarine power cables and associated communications cabling located within the ECC. The cables will be installed in a bundled configuration where practicable (see cable bundle cross-sectional view in Attachment A). Approximate cable route lengths within Rhode Island state waters are as follows:
    - 5.3 mi (8.6 km) in Rhode Island Sound
    - 11.0 mi (17.7 km) in the Sakonnet River
    - 4.0 mi (6.4 km) in Mount Hope Bay (portion in Rhode Island state waters)
- Eight HDD offshore pits in total; four HDD pits at each of two landfalls on either side of Aquidneck Island at Portsmouth, Rhode Island, in the Sakonnet River and in Mount Hope Bay. These eight pits will require dredging/excavation to facilitate HDD of the cable landfalls. Each offshore HDD pit will be located approximately 1,000 ft (300 meters [m]) from the Portsmouth shoreline.

The Project also includes the following onshore components, which are not subject to this Application, in Portsmouth, Rhode Island:

- Two landfall construction areas on Aquidneck Island in Portsmouth, Rhode Island for HDD construction activities (subject to obtaining the necessary easements):
    - One landfall construction area on the northeast (Sakonnet River) side of Portsmouth will occupy the corner of Boyds Lane and Park Avenue.
    - One landfall construction area on the northwest (Mount Hope Bay) side of Portsmouth, either:
        - Within the Montaup Country Club parking lot (preferred)
        - Within land owned by Roger Williams University on the northern side of Anthony Road (RWU North parcel alternate)
- Two new underground onshore HVDC export power cables and associated communications cabling co-located within a single underground duct bank and manhole system through the proposed onshore export cable route in the Town of Portsmouth.

## 2.1 PROJECT SITING

The Project was sited based on a thorough assessment of alternative points of interconnection (POIs) to the electric grid and cable routing to connect to the selected POI. A detailed analysis of alternative routes considered for interconnection to the selected POI at Brayton Point is included in Attachment B and an overview is provided below.

Transmission and interconnection facilities are necessary to deliver electricity from the SouthCoast Wind Offshore Generation Facility to the regional electric grid. SouthCoast Wind considered and evaluated alternative potential POIs to the grid, offshore ECCs, landfall site alternatives, onshore export cable routes, and transmission technologies. Some of these alternatives were eliminated based on technical or commercial feasibility assessments, or the inability of the alternative to address the identified interconnection need. Other alternatives that were found to be feasible and capable of addressing the identified need were further examined on the basis of constructability, operability, environmental impacts, estimated costs and reliability assessments.

Delivery of an estimated 2,400 MW of clean power will likely necessitate multiple POIs for several reasons, most notably that individual connections to the regional transmission system are limited by ISO-NE to 1,200 MW maximum for reliability reasons. SouthCoast Wind considered multiple coastal interconnection points with suitable electrical characteristics, accessibility, and potential nearby land for the required substation/converter station facilities. Two POIs were selected: one at Brayton Point in Somerset, Massachusetts and one in Falmouth, Massachusetts.

Brayton Point was selected as the POI for 1,200 MW of clean renewable energy because SouthCoast Wind has a PPA to deliver energy to a POI to Brayton Point in Massachusetts. Brayton Point is a previously disturbed brownfield site and the site of a former coal burning power generation plant which makes it situated in a prime location for an interconnection to the grid.

Fourteen onshore and offshore export cable route combinations to connect to the Brayton Point POI were considered by SouthCoast Wind. The list captures a representative array of overland and in-water routes to the Brayton Point POI. Please refer to Attachment B for the SouthCoast Wind 1 Project Route Alternatives Assessment.

SouthCoast Wind evaluated the following cable landing and onshore route alternatives that would avoid cable installation in Narragansett Bay and the Sakonnet River:

- Three routes landing in Middletown, Rhode Island.
- Two routes landing in Little Compton, Rhode Island.
- One route landing in Westport, Massachusetts.

Key evaluation factors for the onshore routes included:

- Environmental resources and conservation areas.
- Archaeological resources and cultural resource areas.
- Conflicts with residential uses.
- Potential socioeconomic effects due to use and space conflicts in heavily developed commercial and tourism areas, including Environmental Justice (EJ) populations.
- Avoidance of existing infrastructure and potential for effects on local communities.

- Space limitation for construction adjacent to small, 2-lane roads.
- Duration of construction activities and increased impacts with longer duration construction periods.

Most of the routes were down-selected by the alternatives analysis screening process. The selected alternative is the route in the Sakonnet River with an approximately 2.0-mi (3.2-km) intermediate onshore underground crossing in Portsmouth. The HVDC export cables will make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island to avoid a narrow and highly constrained area of the Sakonnet River at the old Stone Bridge and Sakonnet River Bridge (an area referred to as "The Hummocks"). This reach of the Sakonnet River poses a significant risk and challenge to (i) maneuvering survey vessels and cable-lay vessels, (ii) achieving target burial depth of the cables, and (iii) minimizing impacts to the marine environment.

## 2.2 CONSTRUCTION SCHEDULE IN RHODE ISLAND

The construction schedule is being developed based on seasonal constraints including minimization of activities during months of peak recreational onshore and offshore uses, commercial and recreational fishing, and life cycles of sensitive species. To discuss seasonal constraints on in-water work schedules, SouthCoast Wind has met with staff from the Rhode Island Division of Marine Fisheries (RI DMF), Massachusetts Division of Marine Fisheries (MA DMF), the Rhode Island Coastal Resources Management Council (RI CRMC), the United States Army Corps of Engineers (USACE), the United States Environmental Protection Agency (USEPA), and National Marine Fisheries Service (NMFS); discussions are continuing to finalize a schedule. Tables 2-1 and 2-2 provide an overview of expected durations for both onshore and offshore construction activities.

**TABLE 2-1. PLANNED HDD CONSTRUCTION SCHEDULE IN PORTSMOUTH, RHODE ISLAND**

| Activity | Expected Duration |
|---|---|
| HDD – Exit Pit Excavation / Prep at Each Landfall | Less than 1 week (per landfall) |
| HDD – Drilling Operation at Aquidneck – Boyds Lane Landfall | 2-4 months |
| HDD – Drilling Operation at Aquidneck – Montaup Country Club Landfall/RWU North parcel Alternate | 2-4 months |

*HDD drilling may be conducted simultaneously

**TABLE 2-2. PLANNED CONSTRUCTION SCHEDULE IN RHODE ISLAND STATE WATERS**

| Activity | Expected Duration (In-Water) |
|---|---|
| Boulder Re-Location | Less than 1 week (1-4 days) |
| Crossing Preparation (Mattress/Rock Installation) | Less than 1 week (2-3 days) |
| Pre-Lay Grapnel Run (PLGR) | Less than 1 week (3-4 days) |
| Cable Lay & Burial: Rhode Island Sound & Sakonnet | 3-6 weeks |
| Cable Lay & Burial: Mount Hope Bay | 1-2 weeks |
| Cable Pull-In Each Landfall | Less than 1 week (per landfall) |
| Post-Lay Protection (Mattress/Rock Installation) | Less than 1-week (4-6 days) |

## 2.3 OFFSHORE EXPORT CABLE DESIGN AND CONSTRUCTION

### 2.3.1 Engineering Design and Micro-Routing

SouthCoast Wind collected geophysical, geotechnical, and benthic/habitat field survey data within the entire ECC, which is 1,640 ft (500 m) to 2,300 ft (700 m) wide. Based on this survey data, sensitive environmental and cultural resources and geohazards were mapped to guide cable routing within the ECC with the objectives (to the extent practicable) of meeting the cable burial target depth, minimizing the impacts to sensitive habitat and avoiding surficial geologic and anthropogenic features as informed by data collected in the Geophysical & Geotechnical (G&G) surveys.

A Cable Burial Risk Assessment (CBRA; "Confidential" – provided under separate cover, Attachment D) was completed to evaluate risk that cables could be damaged or compromised by vessel anchoring or scour, based on specific uses and physical characteristics at any one location along the cable route. The output of the CBRA is used to identify specific target burial depths, which will vary along the cable route based on assessment of the local soil conditions and risk to the buried cables from external risk factors. In general, the anticipated cable burial depth range is 3.2 to 13.1 ft (1.0 to 4.0 m) with a target cable burial depth of approximately 6.0 ft (1.8 m).

Two power cables and associated communication cabling will be installed in a bundled configuration where practicable, resulting in an estimated 20-ft (6-m) wide area of disturbance. The width of the surveyed ECC is designed to allow for micro-routing to avoid sensitive resources and obstacles, and to provide for maneuverability during construction and maintenance. The ECC provides sufficient area at landfall locations, at pipeline/cable crossings, or for anchoring. Cable design parameters are provided in Table 2-3. Charts depicting ECC mapping and preliminary cable micro-routing are included in Attachment C-1, Offshore Export Cable Engineering Drawings.

**TABLE 2-3. OFFSHORE EXPORT CABLE DESIGN PARAMETERS**

| Cable Characteristics | Design Parameters |
|---|---|
| Number of Cables | Two offshore export power cables plus associated communications cabling [a] |
| Cable Diameter (per cable) | 6.9 in (175.0 mm) |
| Nominal Cable Voltage | ±320 kilovolt (kV) |
| Length of Cable Corridor (RI State Waters) | 20.4 mi (32.8 km) |
| Cable Corridor Width | 1,640 ft to 2,300 ft (500 m to 700 m) |
| Typical Width of Seabed Disturbance During Construction | 6.0 m (19.7 ft) |
| Number of Cable / Pipeline Crossings Anticipated | 3 pipeline crossings |
| Anticipated Cable Burial Depth (below level seabed) | 3.2 to 13.1 ft (1.0 to 4.0 m) |
| Approximate Cable Load Current | 2,000 A |

Notes:
[a] The cables will be installed in a bundled configuration, consisting of two power cables plus associated communications cabling installed together, where practicable, to minimize seabed impacts from installation. Maximum cable bundle width is twice the maximum cable diameter.

Each HVDC offshore export power cable will be a single-core (one power core) armored submarine cable. A typical cross-sectional view of an offshore trench is provided in the Submarine Details in Attachment C-1 Offshore Export Cable Engineering Drawings. The power core will be either aluminum or copper stranded conductor, with cross-linked polyethylene insulation, a lead sheath, and a polyethylene over sheath. The cable will be covered with galvanized, stainless-steel wire armor, and an outer serving of polypropylene yarns soaked in bitumen. The layers of protective armoring and sheathing are to protect the cable from external damage and keep it watertight. Fiber optic wires may be embedded within the armor layer of the cable. The HVDC cables will be installed in a bundled configuration where practicable, with each cable bundle consisting of two offshore export power cables and associated communications cabling.

### 2.3.2 Offshore Export Cable Construction Sequence

The general sequence of construction activities for the offshore export cables are listed and explained in Table 2-4. Additional details for construction activities are provided in subsections following the below table.

**TABLE 2-4. TYPICAL OFFSHORE EXPORT CABLE CONSTRUCTION SEQUENCE**

| Construction Activity | Construction Summary |
| --- | --- |
| Pre-lay Cable Surveys and Route Engineering | Extensive geophysical, geotechnical, and benthic surveys have been completed to characterize seabed conditions within the export cable corridor. Based on the survey data, route engineering was completed including Cable Burial Risk Assessments, burial tool suitability assessments, and preliminary micro-routing of cables within the ECC. Micro-routing is the primary strategy for avoiding geohazards, obstructions, and sensitive habitat. Micro-routing may also help to support achievement of target cable burial depth and to minimize the need for secondary cable protection.<br><br>Prior to installation, additional surveys will be performed to check for debris and obstructions that may affect cable installation and confirm the details of seabed preparation that may be required. These pre-installation surveys will be performed closer to the date of the cable installation and will inform the final cable micro-routing within the ECC. |
| Seabed Preparation | Pre-installation seabed preparation will be completed as needed, and may include debris and boulder clearance, relocation of moorings and removal of any other obstructions. Boulder clearance trials may be performed prior to wide-scale seabed preparation activities to evaluate efficacy of boulder clearing techniques. The boulder clearance trials will take place in a selected location (location TBD) that will allow the vendor to facilitate trials in an equivalent area. The preferred method for boulder clearance is a boulder grab to locally remove and re-locate individual boulders, though the use of a boulder plow for denser boulder fields is also under consideration (if needed).<br><br>A pre-lay grapnel run will be conducted to clear the cable route of buried hazards along the installation route to remove obstacles that could impact cable installation, such as abandoned mooring lines, wires, or derelict fishing gear. SouthCoast Wind will work with fishermen actively working in the area to notify them of pre-lay grapnel activities as a way to minimize gear entanglement. SouthCoast Wind will develop a gear-clearance plan, in consultation with the RI DMF, which will include advance notification to fishermen allowing them the opportunity to relocate or remove their gear. Cleared ghost gear and/or fishing lines will be disposed of responsibly during the pre-lay grapnel run, if brought aboard the vessel. SouthCoast Wind and its contractor will clear the ECC to make it safe for cable-lay operations and for overall safety to marine navigation, however, a salvage operation is not intended nor considered safe for the marine contractor. Otherwise ghost gear will be moved outside of the cable corridor. SouthCoast Wind will however, |

| Construction Activity | Construction Summary |
|---|---|
| | consider providing details of identified gear to programs designed to remove the ghost gear. SouthCoast Wind will coordinate with the RI DMF in addition to SouthCoast Wind's other outreach efforts (i.e., direct outreach, outreach via Fisheries Representatives) to notify commercial and recreational fishermen prior to initiation of the pre-lay grapnel run. In addition, SouthCoast Wind expects to have Project Execution Plans before installation activities begin, then final reports (including as-builts) after the completion of the work. |
| Pipeline Crossing Preparation | Prior to installation of the cables, protective material (rock and/or mattresses) will be installed over the three existing pipelines to be crossed in the Sakonnet River, in accordance with industry-standard practice and requirements and as agreed with the owners of the existing pipelines. The purpose will be to achieve suitable vertical separation between the existing pipelines and the planned cables, and to ensure protection of the existing pipelines both during construction and long-term. |
| Cable Installation and Burial | Based on the seabed conditions in the Sakonnet River and Mount Hope Bay, it is expected that a simultaneous lay and burial method (using a jet-plow or jet-sled type burial tool) will be utilized, though multiple options will be maintained for flexibility to achieve suitable cable burial in the encountered seabed conditions. Alternatively, cable may be laid on the seabed and trenched post-lay or a trench may be pre-cut prior to cable installation.<br><br>Cable lay and burial trials may be performed within the ECC prior to main cable installation activities to test equipment for suitability for the site-specific seabed conditions and ensure successful cable burial. |
| Offshore Joint Construction | It is anticipated that one or more offshore cable joints ("field joints") will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The specific joint quantities and locations are still to be determined and will depend on the final cable sizing and cable lay vessel/barge details. |
| Post-Installation Surveys | Post-installation surveys will be performed to determine the cable burial depth and other as-left conditions. The survey may be completed from a vessel and/or remotely operated vehicle. |
| Secondary Cable Protection | After the cable has been installed, secondary cable protection in the form of rock berms, rock bags, and/or mattresses will be installed as determined necessary in areas where sufficient cable burial in the seabed cannot be achieved. Additionally, secondary cable protection will be installed over the cables at crossing locations, where burial is not possible due to the presence of the third-party asset to be crossed. |

### 2.3.3 Pipeline Crossings

The ECC crosses three pipelines at two locations in the Sakonnet River, as explained in Table 2-5 and shown in Figure 2-1 Cable Areas in Attachment A- Project Figures and in Attachment C-1 Offshore Export Cable Engineering Drawings. SouthCoast Wind will coordinate with the owners of the pipelines listed below, and any other unanticipated cable or pipeline crossings not identified, to agree on detailed cable crossing design, installation, protection measures and maintenance requirements. Crossing designs will be determined by the crossing's water depth, seabed conditions and the third-party crossing agreement requirements. Minimum separation distances will be determined so that both assets (subsea cable and submarine pipelines) can be safely operated with risk of damage to either asset mitigated to the extent practicable.

**TABLE 2-5. PROPOSED CABLE/PIPELINE CROSSINGS**

| Cable Description | Number of Cables / Pipelines to be Crossed | Location |
| --- | --- | --- |
| Potential Crossing Area 1 | 1 existing pipeline [a] | Sakonnet River (charted Pipeline Area) |
| Potential Crossing Area 2 | 2 existing pipelines [b] | Sakonnet River (charted Pipeline Area) |

[a] Gas pipeline owned by Enbridge as part of the Algonquin Gas Transmission system.
[b] Water pipelines (20-inch and 24-inch) owned by the City of Newport Department of Utilities.

### 2.3.4 Pre-Installation Seabed Preparation

The seabed will be prepared prior to cable installation by the following steps:

1. Boulder removal to remove boulders that cannot be avoided by micro-routing.
2. Grapnel run to clear seabed debris.
3. Pre-lay survey including multi-beam and/or visual inspection using either vessel-mounted or remote operated vehicle (ROV)-mounted cameras.

Details on seabed preparation are provided in Table 2-4. A boulder relocation plan will be developed upon selection of a cable installation contractor, who will also clear debris and boulders from the export cable route, as necessary. If it is determined that a boulder cannot be avoided with micro-routing, a zone (or zones) will be identified for where cleared boulders/debris can be deposited. The boulder relocation areas will be determined by evaluating the benthic survey data, in order to relocate boulders to other boulder fields, if feasible, and to avoid introducing new obstacles on the seafloor that may be encountered by fishermen.

Additional survey data will likely be collected closer to installation to identify any anomalies or changes from prior surveys (such as fishing gear, debris, unexploded ordnance, or boulders) for the vessels and installation team to ensure safe vessel operations and successful cable burial. These surveys assist in building a framework for the seafloor and subsurface along the export cable route and highlight areas requiring pre-lay route preparation.

SouthCoast Wind is committed to clear communication with the fishing industry, fisheries representatives, management agencies, and with individual fishermen, on boulder relocation activities including notification of precise locations of moved boulders to proactively avoid potential issues with gear hangs. In addition to direct contact with fishermen through SouthCoast Wind's Fisheries Manager, maps and precise coordinates of relocated boulders will be broadcast through Local Notices to Mariners and shared with the RI DMF.

### 2.3.5 Offshore Cable Installation Methods

Export cables will be transported and installed from a carousel-equipped cable-lay vessel, cable-lay barge, dedicated cable transportation vessel, or a combination of these options. The number of campaigns will depend on vessel size, type, and capacity, and the cable type, length, and number of cable joints required. It is anticipated that one or more cable joints will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The Project has already conducted some surveys along the export cable corridor, with more planned in 2023-2024. Once complete, those data will be provided to the yet to be selected contractor who will propose the installation methodology based on the anticipated soil conditions and potential hazards. Once a determination is made, the official installation methods will be provided to RIDEM. The CBRA has been provided with the application filed by SouthCoast Wind (Attachment D).

Depending on the survey findings and seabed conditions encountered, one or more of several preparation and installation methods may be utilized. These methods are listed in Table 2-6 and described below. These cable laying techniques can involve cable pre-installation followed by burial and/or simultaneous cable installation and burial. The list is exhaustive, to ensure that the appropriate flexibility is maintained to consider alternative burial techniques to achieve burial in the seabed. One or more burial techniques among those listed and Table 2-6 will be considered to attempt cable burial, until cable burial in the seabed is deemed to be not possible or practicable. Only then, secondary cable protection material (as described below) will be considered and employed to ensure that sections of the cable that have not been sufficiently buried are suitably protected.

Based on current understanding of the seabed conditions in the ECC, the burial of the bundled offshore export cable in Rhode Island State Waters will primarily use a type of jet-plow or jet-sled technology. This involves the use of a skid-mounted burial tool that is towed by the cable-lay barge or Dynamically Positioned (DP) vessel. As the cable is laid on the seabed from the vessel, a narrow trench of the seabed surrounding the cable will be fluidized, lowering the cable to the target burial depth. By using this method of cable burial, the export cables are simultaneously laid and buried beneath the seafloor, which minimizes post-lay exposure of cables the seabed. Additionally, this method reduces sediment displacement (compared to mechanical trenching / plowing) and employs natural backfill as cover for the buried cable.

**TABLE 2-6. TYPICAL OFFSHORE EXPORT CABLE INSTALLATION AND BURIAL EQUIPMENT**

| Equipment | Typical Use |
|---|---|
| Jetting sled / plow | Typically used in shallower water, in areas of prepared/benign seabed surfaces (i.e., areas without large sand waves or slopes). |
| Jetting ROV | Typically used in deeper water and can be used for unconsolidated soft beds. |
| Pre-cut plow | Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays). |
| Mechanical plowing | Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays). |
| Mechanical cutting ROV system | Any depth, used for hard, consolidated substrate. |
| Vertical injector | Vessel mounted burial solution for shallow water use that allows deep burial and does not require seabed/sand wave sea leveling. |

***Jetting Sled / Plow*** A jetting sled / plow is towed from a vessel and can be launched either during post-lay trench mode or fitted with the cable to simultaneously create a trench through soft seabed material and lay the cable. The trench is created by water jetting through unconsolidated, softer seabed material. As such, jetting is optimal in unconsolidated soils and sands with low shear strengths. The trenching systems offers sufficient maneuverability for any curves that the proposed offshore export cables may be laid in.

***Jetting ROV*** This jet trencher is an ROV based system that can be launched from cable installation vessels or from a dedicated support vessel. This self-propelled jetting method is typically used in non-consolidated soils, in deeper water depths.

***Pre-Cut Plow*** This method is deployed when surface and sub-surface boulders are present. A basic mechanical plow will pre-cut a V-shaped trench ahead of cable installation. This allows for the boulders and soils to be lifted to the edges of the trench for backfill purposes later. Once the cable is laid into the trench, the plow is re-configured into backfill mode where the boulders and soils that were previously relocated are then re-deposited.

***Mechanical Plowing*** A mechanical plow is towed from the back of a vessel and simultaneously cuts a narrow trench in the seafloor, while also simultaneously laying and burying cable. Plowing capability can increase from firm unconsolidated soils/sands to more consolidated soils and clays with medium shear strengths.

***Mechanical Cutting ROV System*** A mechanical cutting ROV cable burial system is a self-propelled system most suitable for soil with increased strength. This system can be utilized at any water depth. The mechanical cutting ROV system utilizes a cutting wheel or chain to break up and excavate any material. Used only in hard, consolidated soils, a rotating chain or cutting wheel with dedicated teeth will excavate the soil from beneath the cable and various systems will be required to displace this soil away for the trench allowing the cable to be lowered to depth.

***Vertical Injector*** A vertical injector is a deep burial jetting tool used for cable installation and burial. The vertical injector uses water propelled from jet nozzles to fluidize the seabed material to allow for lowering of the cable. In some instances, this technology may be referred to as controlled flow excavation. This tool is towed along the back of a vessel and acts as a trowel creating a space for the cable to be installed and subsequently buried. This burial solution does not generally require seabed leveling in areas of sand waves or similar mobile sediment features. Hanging from the cable installation vessel or barge, this trenching system is one of the few options that does not require a level seabed and is therefore capable of trenching in areas of large sand waves.

### 2.3.6 Confirmation of Installed Cable Depth

Post-installation surveys will be performed to remotely confirm the cable position and burial depth, assess the reconstitution of the trench, and other as-left conditions. The survey may be completed from a vessel and/or remotely operated vehicle.

Depending on the details of the cable burial tool, it may also be possible to directly determine the cable burial depth as it is being laid, via the mechanical interface between the cable and the tool allowing determination of how deep the cable has been lowered beneath the seabed as it is simultaneously laid and buried. In addition to remote verification of cable burial depth post-installation, this can provide an accurate record of as-laid cable burial depth.

### 2.3.7 Cable Joints

It is anticipated that one or more offshore cable joints ("field joints") will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The specific joint quantities and locations are still to be determined and will depend on the final cable sizing and cable lay vessel/barge details.

To construct an offshore cable joint, two cable ends (one or both of which will be pre-installed on the seabed) will be recovered to the deck of the cable lay vessel/barge. The ends of the cable will be prepared for jointing on the deck of the vessel/barge, then will be jointed to each other following a pre-established qualified procedure in a controlled environment. Once the joint is complete, the completed cable joint and adjoining cable will be laid on the seabed, either in an "in-line" configuration or an "omega" configuration. The completed cable joint will then be post-buried and/or protected using secondary cable protection, to ensure that the cable joint is adequately protected to the same standard as the remainder of the cable. SouthCoast Wind will provide information on where the jointing activities will occur prior to the work commencing.

### 2.3.8 Anchoring

Vessels will use DP during cable installation where water depths allow. Since water depths greater than 49.2 ft (15.0 m) are required for DP, this is not viable in Mount Hope Bay or the Sakonnet River, and use will be limited to Rhode Island Sound. Nearshore areas and areas with shallow water less than 49.2 ft (15.0 m) may necessitate a moored vessel solution using anchors; see Figure 2-2 (Attachment A) for potential anchoring areas along the ECC. The maximum anchor radius from the cable installation barge will be approximately 2,625 to 3,281 ft (800 to 1,000 m) based on the anchor line length. This maximum radius will be forward and aft of the barge and will not extend outside of the width of the ECC.

### 2.3.9 Secondary Cable Protection

A primary objective is to avoid the use of secondary cable protection by achieving a suitable target cable burial depth in the seabed along the entire cable route, by micro-routing (to the extent practicable) the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. Secondary cable protection material will be required at the three cable crossings in the Sakonnet River and for areas where cable burial cannot be achieved. For cable protection, methods will be determined based on the location, length, and extent of the non-burial, and when all remedial burial solutions have been ruled out (remedial burial techniques may include jet trenching or controlled flow excavation that fluidizes the surrounding sand to allow the cable to further settle into the trench). Methods employing secondary cable protection material may include the creation of a rock berm, concrete mattress placement, rock placement, and fronded mattresses. Half shells may be used as well, and they are typically used to protect cable ends at pull-in areas and where trenching is not possible.

As a conservative estimate for planning purposes, SouthCoast Wind estimates up to 15% of the ECC within Rhode Island state waters will require secondary cable protection. Secondary cable protection is expected to be required primarily at the identified cable/pipeline crossing locations in the Sakonnet River, and in Rhode Island Sound where areas of harder seabed have been identified. Generally, the seabed conditions in the remainder of the ECC in the Sakonnet River and Mount Hope Bay are comprised of softer sediments which are expected to be suitable for cable burial and not require substantial secondary cable protection.

Any required crossings of other third-party pipelines by the offshore export cables will utilize mutually agreeable crossing designs consistent with typical industry practices, in accordance with International Cable Protection Committee recommendations, which typically employ use of concrete mattresses (though other crossing methods may be assessed for use). Minimum separation distances will be determined so that both the Project cables and the third-party pipelines can be safely operated with risk of damage to either asset mitigated to the extent practicable. An example of a concrete cable protection mattress and an example of cable protection rock bags are provided in "Submarine Details" found in Attachment C-1 – Offshore Export Cable Engineering Drawings.

### 2.3.10 Bundling and Cable Separation

The offshore export cables will be installed in a bundled configuration where practicable. The cables will be transported separately (on the same installation vessel) and assembled into a bundle during the process of cable laying. Because the HVDC offshore export cables will be installed in a single bundle where possible, there will typically be no horizontal separation between cables within a bundle as installed along the route. Although not anticipated except at cable landings, the cables may be unbundled and installed separately for part of the cable route, which does not affect the cable functionality but may result in different installation considerations. If the cables are installed separately, the target horizontal separation between each proposed Project cable will be approximately 164 ft (50 m). Final cable spacing will depend on bathymetry and other detailed seabed characteristics and may be wider or narrower. Risk factors that will be considered and mitigated when considering cable spacing will include:

- Installation impacts (risk to adjacent cables)
- Operation and Maintenance (O&M) (including cable repair if needed)
- Thermal impacts to adjacent cables

## 2.4 SEA-TO-SHORE TRANSITION

The Project includes installation of four conduits via HDD at each end of the intermediate onshore crossing of Portsmouth (four from the Sakonnet River and four from Mount Hope Bay). Two of the conduits are to accommodate two power cables and communications cabling for delivery of approximately 1,200 MW. The remaining two conduits will be installed to accommodate potential future installation of an additional 1,200 MW.

HDD is a "trenchless" process for installing underground cables or pipes which enables the cables to remain buried below the coastal features, including coastal beaches and intertidal zone to limit environmental impacts during installation. Each HDD boring extends from an onshore construction area to an offshore construction area.

The routing and HDD locations are depicted on Figure 1-2 (Attachment A), Offshore Export Cable Engineering Drawings (Attachment C-1) and HDD Engineering Drawings (Attachment C-2). A "Typical HDD Detail" for offshore construction is provided in Attachment C-2, HDD Engineering Drawings.

The onshore HDD locations (not the subject of this application) being considered are the following:

- One landfall construction area on the northeast (Sakonnet River) side of Portsmouth will occupy the corner of Boyds Lane and Park Avenue.
- One landfall construction area on the northwest (Mount Hope Bay) side of Portsmouth, either:
    - Within the Montaup Country Club parking lot (preferred).
    - Within land owned by Roger Williams University on the northern side of Anthony Road (RWU North parcel, alternate).

Construction of the sea-to-shore transition will involve the following:

1. Excavation of four onshore HDD pits at each landing (northeast and northwest sides of Portsmouth).
2. Excavation of four offshore HDD pits at each landing (northeast and northwest sides of Portsmouth).
    - A gravity cell or other temporary structure may be used if required to support HDD construction.
3. HDD of the borehole between each of the onshore and offshore HDD pits and reaming of the bore hole to the necessary diameter.
4. Insertion of conduit, made of high-density polyethylene or similar material, into each bore hole.
5. Construction and installation of onshore, underground concrete transition joint bays (TJBs).
6. Splicing of offshore export cable (single core submarine cable) to onshore export cable (single core underground cable) will occur within the TJBs.

7. Installation of the offshore export cables (two power cables and associated communications cable) through the conduits, below the coastal features, coastal beaches and intertidal zone (note that extra conduits are for future use and will remain empty at this time).
8. Site restoration of disturbed onshore and offshore areas, including backfill of the dredged areas.

The vessel and equipment that will be used to support the HDD installation are depicted in Attachment C-1, Offshore Export Cable Engineering Drawings and Attachment C-2, HDD Engineering Drawings.

### 2.4.1 Onshore HDD Pits

To facilitate the HDD operations, pits need to be excavated at the landward and seaward ends of the proposed HDD trajectories to establish the cable landfalls in Portsmouth. The onshore HDD pits are not included in this application, but are described here for reference. SouthCoast Wind has filed a Joint Application for a Category B Assent and a Freshwater Wetlands Permit for Freshwater Wetlands in the Vicinity of the Coast for both the onshore and offshore components of the Project. Indicative dimensions of the onshore construction areas and equipment that will be used to support the HDD installation are depicted in Attachment C-2, HDD Engineering Drawings. Construction operations at each onshore landfall construction areas will require approximately 0.6 to 1.0 acre (ac), depending on the configuration of available land and the final trajectories of the borings. The drilling operation requires fresh water for the mixing of the drilling slurry, however, there will be no withdrawals of water from wetlands and waterways for this Project.

Soil and other materials generated during installation of the HDD onshore will be removed and re-used or properly disposed of at a suitable facility. Excavated soils onshore will be removed and hauled to an appropriate on-site or off-site disposal/re-use location or to a temporary construction laydown area for on-site re-use. Soils will be handled in compliance with applicable laws and regulations.

The construction contractor(s) working at the Project site will be required to submit emergency response plans detailing their methods for containment of oil and hazardous materials including spill response, containment, control, clean-up and reporting to applicable agencies, as appropriate. Example spill prevention and control measures are outlined in Attachment E – Emergency Response Plan.

### 2.4.2 Offshore HDD Pits

Offshore HDD pits will be required to facilitate the offshore HDD operations. Indicative dimensions of the onshore construction areas and equipment that will be used to support the HDD installation are depicted in Attachment C-2, HDD Engineering Drawings. Additional information is also provided in Attachment C-1, Offshore Export Cable Engineering Drawings. The estimated volume of sediment to be excavated/dredged at each of the eight offshore HDD pits is 1,867 cubic yards (1,427 cubic meters). Potential volumes of offshore excavated material in Rhode Island state waters could be up to 14,932 cubic yards (11,416 cubic meters) based on all eight HDD pits offshore.

SouthCoast Wind plans to side-cast sediments immediately adjacent to the offshore pits to allow a readily available means of backfilling the trench and subsea cables. The excavated material can also serve to temporarily contain the HDD construction area, including serving as a potential containment area for the recirculated drilling muds.

Multiple excavation methods are under consideration for the HDD offshore exit pits. These include use of trailing suction hopper dredge, water injection dredge, clamshell and/or controlled flow excavation. One of or a combination of these methods may be used by the Project. SouthCoast Wind has verified seabed conditions of primarily soft sediments in Mount Hope Bay and the Sakonnet River (expected to be suitable for cable burial) and will further evaluate and propose potential burial and suspended sediment mitigation options to RIDEM for further discussion.

As mentioned in the Project's CRMC Assent application [at 2-19, 3-22, Appendix A - Soil Erosion and Sediment Control (SESC) Plan, and Appendix G - HDD Inadvertent Release of Drilling Muds Contingency Plan], SouthCoast Wind will select and use Best Management Practices (BMPs) including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. Recently SouthCoast Wind has reestablished regular check in meeting with RIDEM and CRMC and the Project can make a point to add this as a primary discussion topic.

### 2.4.3 Horizontal Directional Drilling

The proposed Horizontal Directional Drilling (HDD) trajectories are anticipated to be approximately 0.3 – 0.6 mi (0.4 – 1.0 km) in length with a cable burial depth of up to approximately 40 ft (12.2 m) below the seabed. HDD bores will be separated by a distance of approximately 10 ft to 33 ft (3.0 m to 10 m). It is anticipated the HVDC cables will be unbundled at landfall. Each HVDC power cable is planned to require a separate HDD borehole and conduit. The dedicated communications cable may be installed within the same bore as a power cable, likely within a separate conduit.

HDD can be undertaken from either the onshore entry point, from the offshore exit point, or (likeliest) from a combination of the two. The HDD unit and associated equipment (temporary electric generators, water and slurry tanks, mud circulating system and support vehicles) will be staged onshore in Portsmouth. Appropriate construction BMPs will be implemented to protect adjacent coastal and freshwater wetlands. Construction operations at each onshore landfall construction area will require approximately 0.6 – 1.0 ac, depending on the configuration of available land and the final trajectories of the borings.

Additional laydown space will be needed behind the onshore HDD pit to fuse segments of conduit together into a continuous assembly. This laydown area is expected to be between one-half to the full length of the HDD trajectory. It is important to pre-fuse the conduit in preparation so that a continuous assembly of pipe can be pulled in the bore hole without the need for stopping during drill pull-back operations. Once the pull-back commences, it is a 24-hour operation until completed at that bore, to reduce the risk of the bore hole collapsing. The pull-back laydown area will likely follow the trajectory of the onshore underground export cable route, with conduit fusing occurring in the shoulder of public right-of-way (ROW). The ends of each conduit will be capped/sealed prior to the completion of the installation, in order to protect the conduits from ingress of sediment and debris between the conduit installation and the cable installation and pulling, which may take place several months after HDD construction.

The drill head will be advanced between the onshore and offshore HDD pits. The HDD borehole will be reamed to the necessary diameter. The diameter of the bore hole will be approximately 30 in (76 cm) to accept conduit with an outside diameter of approximately 16 in (41 cm). The HDD operations will be supported by offshore vessels (jack-up barge and/or anchored barge), and support crew transport vessel and tugboat.

### 2.4.4 Cable Pulling

Once the HDD conduits and onshore underground infrastructure have been constructed, cables can be installed. Cable installation and pulling may take place several months after HDD construction. A cable barge/vessel will be positioned offshore equipped with reels of cable. The seaward end of the HDD conduit will be located by the cable installation spread and excavated if needed. The caps/seals protecting the end of the HDD conduit will be removed. SouthCoast Wind acknowledges that RIDEM has requested for additional details on accessing capped ends. This information will become available during the development of the detailed engineering design. The offshore export cable will be lowered from the vessel to the seafloor, and a winch located onshore will be used to pull the cable from sea to shore through the conduit. Each of the two power cables comprising the cable bundle is planned to be pulled into a separate HDD conduit.

SouthCoast Wind's preliminary schedule has HDD construction occurring one to two years before cable pulling. SouthCoast Wind will include these activities in the detailed construction schedule, once specific date and timelines are more refined.

### 2.4.5 Operation and Maintenance

The offshore export cables will be buried and are not expected to require regular maintenance, except for manufacturer-recommended cable testing. Periodic visual inspections and preventative maintenance of the offshore export cables will be planned based on survey data and manufacturer recommendations based on the as-built drawings. Planned outages are not expected for the periodic inspections. Burial inspection visuals will occur periodically to be determined after final design and route are selected.

Once available, SouthCoast Wind will provide RIDEM with the applicable portions of their Operations and Maintenance Plan, which will include visual inspection and maintenance schedules that will be based on manufacturer recommendations. These inspections will occur at regular intervals and after major storm events as will be agreed upon by the permit and COP conditions.

## 2.5 DECOMMISSIONING

Offshore export cables may be retired in place or removed, as per the Rhode Island CRMP Regulations (650-RICR-20-00-01) and the Ocean SAMP (650-RICR-20-05), and 30 Code of Federal Regulations (C.F.R.) 585.909. Cable protection measures, such as concrete mattresses or rocks, could be removed before any cable recovery activities. Dredging vessels may be used to unearth the cables before the cable may be reeled onto barges or other transport vessels. At landfall, if the cables are removed, the ducts will remain in place. SouthCoast Wind is required to submit a decommissioning plan to BOEM for review and acceptance.

## 2.6 ENVIRONMENTAL COMPLIANCE, PROTECTIVE MEASURES, AND MONITORING

Prior to the commencement of construction, operation and maintenance, and decommissioning activities, a facility-specific environmental compliance manual will be prepared for the Project outlining specific construction and operating obligations. This manual, in conjunction with an Emergency Spill Prevention, Response and Prevention Plan, will serve as Project-specific environmental guidance documents for the construction and operation of the Project. The following subsections describe BMPs, applicant-proposed environmental protection measures, and monitoring that SouthCoast Wind will implement when appropriate.

### 2.6.1 Best Management Practices

BMPs are structural or non-structural measures, practices, techniques, or devices employed to avoid or minimize impact to sensitive resources. This section describes BMPs that SouthCoast Wind will employ during construction and include:

- Construction work hours
- Time-of-year restrictions, as necessary
- Emergency Spill Response
- Environmental compliance and monitoring
- Site restoration and stabilization

### 2.6.2 Project Construction Work Hours

Consistent with the Town of Portsmouth, Rhode Island noise ordinance, typical construction work hours for the Project will be within the hours of 7:00 a.m. and 9:00 p.m. each day.[1] SouthCoast Wind will comply with these standard hours except as described below. Some construction activities, such as HDD activity, cable pull-through operations, concrete pours, and cable splicing, once started, generally continue uninterrupted, meaning night-time work will occur for certain aspects of the construction.

### 2.6.3 Time of Year Restrictions

SouthCoast Wind has conducted stakeholder outreach including conversations and meetings with the Town of Portsmouth, Rhode Island, local businesses, residents, the commercial and recreational fishing industries and communities, and other stakeholders through public meetings as well as open houses held in Portsmouth, Rhode Island. Based on input received, times of year for construction activities, primarily from late fall through early spring, were identified to minimize impacts to local stakeholders. SouthCoast Wind will work to the considerations of these entities, as well as those of the Rhode Island Department of Transportation (RIDOT) and landfall site stakeholders, to the extent practicable.

SouthCoast Wind has also held meetings with regulatory agencies, including RIDEM, RI DMF, RI CRMC, USACE, USEPA and NMFS to receive input on time of year in-water work constraints regarding sensitive marine species. SouthCoast Wind will continue to coordinate with these agencies and local stakeholders to further define construction schedules and potential time of year restrictions for construction activities.

### 2.6.4 Emergency Spill Response

SouthCoast Wind has prepared Emergency Response Plan requirements (Attachment E) to avoid and/or minimize the risk of impacting the water column and benthic habitats from any accidental releases of oil and/or hazardous materials. Project contractors will be required to prepare emergency response plans applicable to each specific scope of work. The requirements for each of these plans are outlined in Attachment E – Emergency Response Plan requirements and will be included in the emergency response plans wherever relevant to the scope of work. The emergency response plans will be implemented along with the Project Oil Spill Response Plan (OSRP) (COP, Appendix AA). The OSRP includes provisions for responding to oil and fuel spills. Marine contractors conducting Project work within Rhode Island waters will be responsible for finalizing a task-specific OSRP consistent with SouthCoast Wind's OSRP and all applicable regulations.

### 2.6.5 HDD Inadvertent Release Response

SouthCoast Wind is utilizing HDD technology for sea-to-shore cable transitions to avoid impacts to sensitive coastal resources and inadvertent discharges into Rhode Island Sound, the Sakonnet River and Mount Hope Bay. An HDD Inadvertent Release of Drilling Muds Contingency Plan is included as Attachment F to describe best management practices to avoid an inadvertent release during HDD operations.

### 2.6.6 Marine Monitoring

SouthCoast Wind will implement avoidance, minimization, and mitigation measures during in-water operations to avoid interactions with marine protected species, as listed in Table 2-7 below, Section 3.4.1.2 and Section 3.5. Marine construction staff will be trained in species identification, monitoring and mitigation. Environmental Monitors, trained crew and/or Protected Species Observers (PSOs) will be assigned and identified on all vessels to perform monitoring and mitigation, as necessary and required.

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[1] Portsmouth General Legislation Chapter 257 Section 13.

## 2.6.7 Restoration

In addition to the reconstitution of the cable trench that is expected from the use of the jet-plow, the backfilling of the side-cast dredge material into the offshore HDD trench, the offshore cable trenches are anticipated to be fully reconstituted by the natural tidal and current cycles to reestablish pre-disturbance seafloor grades. If additional fill is necessary to backfill the temporary HDD pits, clean fill of similar geologic composition, grain size, and biological characteristics will be acquired.

## 2.6.8 Proposed Avoidance, Minimization, and Mitigation Measures

The Project was sited, planned, and designed so that the proposed Project avoids and minimizes potential impacts on physical, biological, and cultural resources to the extent practicable. Avoidance, minimization, and mitigation measures designed for each phase of construction will effectively minimize Project impacts on the natural environment. Potential impacts to resources from the Project are expected to be limited temporally and/or spatially. Resource characterizations and impact assessments are presented in Section 3 and are guided by input from appropriate federal and state agencies, municipal input, and numerous stakeholders (public and private) in the region.

To the extent there are potential impacts from the Project that cannot be avoided, SouthCoast Wind will seek to avoid or minimize such impacts. Potential impacts to resources from the offshore export cables and landfalls are expected to be limited in scope temporally and/or spatially. Post-construction monitoring plans will be developed, as needed, in coordination with the relevant agencies prior to construction.

Table 2-7 below summarizes the various avoidance, minimization, and mitigation measures that SouthCoast Wind intends to implement, as appropriate, to avoid, minimize, or mitigate environmental impacts.

**TABLE 2-7. AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES – NATURAL AND SOCIAL ENVIRONMENTS**

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| | | **Natural Environment** |
| Geology and Surficial Geology | Construction | • SouthCoast Wind will use BMPs to minimize sediment mobilization during offshore export cable installation.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• SouthCoast Wind, where practical and safe, will utilize dynamic positioning vessels.<br>• SouthCoast Wind will utilize HDD for sea-to-shore transition. Two "long-distance" HDD operations are proposed from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features.<br>• The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.<br>• The primary cable burial objective will be to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire ECC (where possible), by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions.<br>• SouthCoast Wind has specific burial performance criteria that the cable |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| | | installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.<br>• Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable. |
| Geologic Hazards | Design and Construction | • SouthCoast Wind performed geophysical and geotechnical surveys as part of the planning phase of the project to identify geologic hazards and anomalies.<br>• SouthCoast Wind is proactively routing the cables to avoid hazards, to the extent practicable.<br>• SouthCoast Wind will establish buffers, as necessary, to avoid anomalies during construction. |
| Marine Sediments and Soils | Construction | • SouthCoast Wind will select and use BMPs including the use of a Soil Erosion and Sediment Control Plan to minimize sediment mobilization during offshore construction and HDD operations.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.<br>• All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.<br>• SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's Emergency Spill Prevention, Response and Prevention Plan.<br>• SouthCoast Wind will have an HDD Contingency Plan (Attachment F) in place to mitigate, control, and avoid unplanned discharges related to HDD activities.<br>• SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook, and in accordance with approved plans and permit requirements.<br>• The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| Surface Waters | Construction | • SouthCoast Wind will select and use BMPs including the use of an SESC plan to minimize sediment mobilization during offshore construction and HDD operations.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.<br>• Sanitation will be provided on service vessels utilized by personnel for construction and transport. The transport vessels will hold sewage within holding tanks and dispose of all raw or treated sewage in accordance with all applicable discharge rules and regulations.<br>• All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.<br>• SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's OSRP.<br>• SouthCoast Wind will have an HDD Contingency Plan (Attachment F) in place to mitigate, control, and avoid unplanned discharges related to HDD activities. |
| Finfish | Construction | • SouthCoast Wind will design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., offshore cofferdam and/or gravity cell).<br>• SouthCoast Wind will incorporate use of HDD at landing(s) to minimize spatial and temporal effects to benthic organisms and avoid disturbance to finfish and invertebrate Essential Fish Habitat (EFH) to the extent practicable. |
| Shellfish | Construction | • SouthCoast Wind will use HDD at landfall locations, to avoid disturbance to nearshore productive shellfish beds to the extent practicable.<br>• SouthCoast Wind will select lower impact construction methods, where possible.<br>• SouthCoast Wind has designed the ECC, and will micro-route cables within the ECC, to avoid complex habitats, where possible.<br>• The ECC was designed to minimize length of cable (and associated seabed impacts) needed. SouthCoast Wind will bury cables, where possible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.<br>• The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| Marine Mammals and Sea Turtles | Construction | • Protected species observers will be employed, if required by National Marine Fisheries Service (NMFS), to monitor for whales, other marine mammals, and sea turtles.<br>• SouthCoast Wind will employ shut-down procedure when protected species are detected in their respective clearance zones in the Project area.<br>• SouthCoast Wind will implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan, as needed.<br>• All vessel operators will be required to reduce vessel speed to 10 knots or less when large assemblages of marine mammals are observed near an underway vessel or if vessel are in an area with an active vessel speed restriction. |
| Rare, Threatened and Endangered Species | Construction | • SouthCoast Wind will continue to consult with the Rhode Island Natural Heritage Program, RIDEM, USFWS, and NMFS.<br>• SouthCoast Wind will site Project components to avoid locating onshore facilities and landfall sites in or near sensitive fish and wildlife habitats to the greatest extent practicable.<br>• SouthCoast Wind will train construction staff on biodiversity management and environmental compliance requirements. |
| **Social/ Developed Environment** | | |
| Aquaculture | Construction | • SouthCoast Wind is currently working with commercial and recreational fishermen as well as Fisheries representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.<br>• SouthCoast Wind's ECC has been designed in a location and orientation such that it does not directly overlap with active aquaculture leases.<br>• SouthCoast Wind has conducted modeling to understand potential sedimentation impacts. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
| --- | --- | --- |
| Commercial and Recreational Fishing | Construction | • SouthCoast Wind is currently working with commercial and recreational fishermen as well as Fisheries Representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.<br>• Temporary safety zones associated with construction activities implemented in consultation with USCG will limit direct access to areas with active construction activities for the safety of mariners and Project employees, but these areas will be limited spatially and temporally.<br>• SouthCoast Wind will notify mariners via Legal Notice to Mariners (LNMs) of the presence and location of partially installed structures.<br>• The SouthCoast Wind Fisheries Liaison Officer will proactively contact fishermen known to fish in areas that will see construction activities in advance of the start of construction by utilizing Fisheries representatives and connections with relevant state agencies to alert the fishermen of planned construction activities and schedules.<br>• SouthCoast Wind will provide prompt updates to mariners and corresponding web updates as they become available – the frequency of these updates will be dictated by the type of activity, which could be as frequent as daily notifications during construction.<br>• SouthCoast Wind will proactively contact and compensate fishermen if their gear is entangled during construction.<br>• SouthCoast Wind will consider the use of fixed mooring buoys at various strategic locations in the Project area to avoid the need for anchoring.<br>• SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.<br>• Achieving target burial depth, minimizing secondary protection, selecting secondary protection methods that minimize interference with fishing activities, and making the location of secondary protection and relocated boulders available via methods most useful to the commercial fishing industry. |
| Electric and Magnetic Fields (EMF) (offshore export cables) | Post-Construction | • The Electric Fields (EFs) arising from the voltage on the export cables will be completely shielded by cable materials.<br>• Although the steady Magnetic Fields (MFs) emitted by DC submarine cables do not create induced EFs like those created by the time-varying MFs from 60-Hz AC submarine cables, motion-induced EFs are created by the movement of seawater or marine species through the steady MFs emitted by DC submarine cables. These motion-induced EFs have the same properties as the motion-induced EFs that are created by the movement of seawater or marine species through the earth's steady geomagnetic field. For the typical buried HVDC offshore cable installation case, the motion-induced EFs associated with movement through the steady MFs emitted by the Project HVDC submarine cables will be small relative to the motion-induced EFs associated with movement through the earth's steady geomagnetic field. The strength of these motion-induced EFs also similarly drops off with distance from the cables like the DC MFs associated with the current on the submarine cables. |

# 3. Nearshore and Offshore Environmental Setting, Potential Impacts, and Proposed Avoidance, Minimization, and Mitigation

This section describes the offshore affected environment, potential impacts associated with construction, operations, and maintenance, and decommissioning of the Project within Rhode Island waters, and proposed avoidance, minimization, and mitigation measures to address these potential impacts. Generally, decommissioning impacts are commensurate with construction phase impacts and are therefore discussed together.

The Project was sited, planned, and designed to avoid and minimize impacts and potential Project impacts are expected to be limited temporally and spatially. SouthCoast Wind plans to bundle the two export cables and associated communications cabling, where possible, to limit the footprint of the Project on the seabed. SouthCoast Wind has established and collected field data from an export cable corridor of nominal width between 1,640 ft (500 m) to 2,300 ft (700 m) to allow micrositing of the export cable to avoid sensitive resources where practicable. Cable landfalls at Portsmouth, Rhode Island will be accomplished using HDD technology to avoid impacts to sensitive coastal resources. Where potential impacts cannot be avoided, SouthCoast Wind proposes minimization and mitigation measures presented in Section 2 and Table 2-7.

SouthCoast Wind has collected detailed geophysical, geotechnical and benthic habitat data from the entire ECC. Information and assessments based on this data to support this impacts evaluation is included in the following attachments to this application and in the SouthCoast Wind Construction and Operations Plan which can be accessed at SouthCoast Wind COP on BOEM Website https://www.boem.gov/renewable-energy/state-activities/southcoast-wind-formerly-mayflower-wind.

Summaries are provided below based on technical studies and reports prepared for the Project, including:

- Marine Archaeological Resources Assessment[1]
- Geohazard Report for the Brayton Point Export Cable Corridor [2]
- Hydrodynamics and Sediment Transport Modeling Report for the Brayton Point Export Cable Burial Assessment[3] (Attachment G)
- Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for Rhode Island State Waters[4] (Attachment H)
- Commercial and Recreational Fisheries and Fishing Activity Report[5]
- Unexploded Ordnance (UXO) Risk Assessment- Confidential (Attachment L)

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[1] Mayflower Wind Energy LLC and Fugro USA Marine, Inc. 2022. *Marine Archaeological Resources Assessment (Mayflower Wind Construction and Operations Plan Appendix Q (Confidential) - Docket No. BOEM-2021-0062).* August 2022.

[2] Mayflower Wind Energy LLC and Fugro USA Marine, Inc. 2022. *Geohazard Report for the Brayton Point Export Cable Corridor (Mayflower Wind Construction and Operations Plan Appendix E.2 (Confidential) - Docket No. BOEM-2021-0062).* February 25, 2022.

[3] Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment, Mayflower Wind Energy LLC | USA, 01 March 2022 - Final Report, Daniel L. Mendelsohn, Innovative Environmental Science and J. Craig Swanson, Swanson Environmental

[4] INSPIRE Environmental. 2022. Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for RI State Waters. September 22, 2022.

[5] Mayflower Wind Energy LLC and Tetra Tech. 2021. *Commercial and Recreational Fisheries and Fishing Activity Technical Report (Mayflower Wind Construction and Operations Plan Appendix V - Docket No. BOEM-2021-0062).* August 30, 2021.

## 3.1. GEOLOGY AND PHYSIOGRAPHY

This section includes an overview of geologic conditions with the Project Study Area based primarily on data generated from G&G and benthic surveys completed by Fugro in 2021 and 2022,[6] and information in available literature.

Bathymetry in the Study Area is depicted in Figure 3-1. Depths in Mount Hope Bay and the Sakonnet River are generally less than 33 ft (10 m), with a deepening natural channel in Lower Mount Hope Bay. In Rhode Island Sound, water depths vary between approximately 66 ft (20 m) and 131 ft (40 m).

During the Quaternary period, glacial and post-glacial processes shaped the geology of Southern New England and the Study Area. Illinoian and Late Wisconsin glaciations are inferred from terminal moraines to have advanced as far south as Martha's Vineyard and Nantucket Islands.[7] As the Laurentide glaciers began to melt, glacial outwash formed a thick sequence of sandy deposits southward across Rhode Island Sound, the Sakonnet River, and into Mount Hope Bay. Pro-glacial lakes formed in front of the glaciers and behind the end moraines and deposited thick sequences of glacio-lacustrine deposits. Post glacial sediment deposition evolved as the sea level rose and transgressed across the continental shelf and inundated the area. As the sea transgressed across the study area, the depositional environment transitioned to a shallow marine environment similar to the shelf's current depositional setting. In general, sandy sediments were deposited in higher energy environments and fine grained deposits in low energy, deeper water areas.

### 3.1.1. Surficial Geology and Sediments

The description of surficial geology and sediments is primarily based on data from geophysical surveys and sediment grab samples collected by SouthCoast Wind's survey contractor, Fugro. Data analysis and mapping was conducted by Fugro (COP, Appendix E - Marine Site Investigation Report [MSIR]; COP, Appendix E.2 - Geohazard Report for Brayton Point ECC). Glacial Moraine areas indicated in the Ocean SAMP (RI CRMC 2010) were also considered.

The Benthic Habitat Mapping Report (Attachment H) integrates Fugro's analysis of survey data with benthic survey data to describe and map seabed sediments (substrate) and benthic habitat. Glacial Moraine comprised 2.7% (411 acres) of the ECC in federal waters and comprised 3.1% (185 acres) of the ECC in Rhode Island state waters, predominantly located in Rhode Island Sound (Attachment H - Benthic Habitat Mapping Assessment, Tables 3-2 and 3-4).

Glacial moraine areas identified in the Ocean SAMP intersect the ECC in two areas within federal waters: at Southwest Shoal; and where the ECC turned due west outside of Rhode Island State Waters (Attachment H, Figure 4-5). Glacial moraines defined in the Ocean SAMP were based on several sources interpreted by Boothroyd (2009).[8] Most of the data near the Southwest Shoal interpreted in the Ocean SAMP were collected by the USGS in 1980 over very widely spaced seismic lines and near the Rhode

[6] Mayflower Wind COP, Appendix M.2 *Benthic and Shellfish Resources Characterization Report Addendum #2* and Appendix M.3

[7] Foster et al., 2014

[8] Boothroyd. J.C. 2009. A Short Geological History of Block Island and Rhode Island Sounds. Ocean Special Area Management Plan.

Island State Waters boundary in 1975 (McMullen et al. 2009).[9,10] Because of the paucity of seismic data in the region of the Brayton Point ECC, the areas identified in the Ocean SAMP are general and do not reflect high-resolution distribution of moraine deposits and subsequent erosion and deposition of surficial sediments that affect benthic habitats.

The Ocean SAMP does not identify any moraines in Rhode Island state waters that overlap with the Brayton Point ECC (Attachment H, Figure 4-5); however, Glacial Moraine habitats were mapped in the Brayton Point ECC in Rhode Island Sound using data collected by SouthCoast Wind (Attachment H, Figure 4-5). Most of the moraine area identified in the Ocean SAMP at Southwest Shoal was also mapped as Glacial Moraine using data collected by SouthCoast Wind (Figure 3-2). In contrast, only a discrete area of the Ocean SAMP-identified moraine near the Rhode Island state waters boundary was mapped as Glacial Moraine using data collected by SouthCoast Wind (see Attachment H and Figure 4-5).

Attachment H - Benthic Habitat Mapping Report, integrates the geophysical, grain size and benthic biological data collected to provide detailed mapping and discussion of surface deposits in the Project Area. In general, sediments in Mount Hope Bay and the Sakonnet River were primarily fine grained (mud to muddy sand) typical of depositional estuarine environments. *Crepidula,* a colonizing limpit, was found overlying these muds in some areas in the upper Sakonnet River and in the lower Mount Hope Bay. Very small areas of Mud to Muddy Sand – with Boulder Field(s) typical of glacial moraine and Bedrock were mapped in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2). There is also evidence of anthropogenic debris such as rock and backfill over pipelines.

Sediments became coarser at the mouth of the Sakonnet River and in Rhode Island Sound where deposits included gravels, sand and mud with boulders. The distribution of these deposits is related to the offshore extension of the Buzzards Bay moraine, a terminal moraine that is perhaps an extension of the Point Judith moraine near the mouth of the Sakonnet River (as mapped by Baldwin et al. 2016; COP, Appendix E, MSIR).[11]

Clusters of individual surficial boulders with poorly sorted gravels, sands and muddy sands (Glacial Moraine, Mixed-Size Gravel in Muddy Sand to Sand – with Boulder Field(s)) and proximal areas were mapped in RI Sound from the RI State Waters Line to the mouth of the Sakonnet River, and in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2).

### 3.1.2. Sediment Grain Size Analysis

Sediment grab samples were collected for grain size analysis during the 2021 and 2022 benthic surveys from eight locations in Mount Hope Bay, 14 locations in the Sakonnet River, and seven locations in Rhode Island Sound for a total of 29 sample locations. Grain size data is presented in Attachment I - Sediment Sample Grain Size Analytical Results. Additional details on sample collection and analysis are included in Appendix M.2 and Appendix M.3 of the COP, and data is integrated into the benthic habitat assessment in Attachment H. Note that grain size data was generated by two methods: Wentworth and USCS.

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[9] McMullen, K. Y., L. J. Poppe, T. A. Haupt, and J. M. Crocker, 2009. Sidescan-sonar imagery and surficial geologic interpretations of the sea floor in western Rhode Island Sound. U.S. Geological Survey Open-File Report 2008-1181. Report and data available online at: http://woodshole.er.usgs.gov/pubs/of2008-1181/index.html

[10] McMullen, K. Y., L. J. Poppe, and N. K. Soderberg, 2009. Digital seismic-reflection data from western Rhode Island Sound, 1980. U.S. Geological Survey Open-File Report 2009-1002. Report and data available online at: http://pubs.usgs.gov/of/2009/1002/index.html

[11] Baldwin et al. 2016.

In Mount Hope Bay the sediments are primarily fine silts and clays with varying amounts of sand. Sediments in the Sakonnet River ranged from fine silts to sands with varying amounts of gravel. At the mouth of the Sakonnet River (southern end) and moving into Rhode Island Sound the predominant sediment fraction is fine sand mixed with coarse and medium sand.

## 3.1.3. Potential Project Impacts

### *3.1.3.1. Offshore Export Cables*

The routing of the ECC has been designed to avoid or minimize impacts to geologic resources in the marine environment. The G&G marine surveys completed by SouthCoast Wind were used to guide refinement of the cable placement within the ECC to avoid or minimize impacts in the marine environment.

The offshore export cables will be buried to a depth range from 3.2 to 13.1 ft (1.0 to 4.0 m) below the seabed, with a target burial depth of approximately 6 feet. Specific target burial depth will vary along the cable route and may be greater or less, based on assessment of the local soil conditions and risk to the buried cables from external risk factors. The primary cable burial objective will be to achieve a suitable target burial depth along the entire ECC as informed by the Cable Burial Risk Assessment (Attachment D - "Confidential", provided under separate cover). Cable routing within the ECC focused on micro-routing the cables to the extent practicable, in order to achieve target burial depth and to avoid surficial geologic and anthropogenic features informed by data collected in the G&G surveys.

Anchoring during cable installation will be limited to shallow water and thus only the Sakonnet River and Mount Hope Bay which are primarily soft bottom. Refer to Section 2.3 and Figure 2-2 for additional information about anchoring.

The cable burial methods are not expected to cause permanent seafloor impacts, and the shallow trench left after the cable-lay and burial is expected to naturally backfill with sediment. The sea-to-shore landfalls will be completed using HDD methodology and will avoid disturbance of the nearshore/ shoreline areas of the Sakonnet River and Mount Hope Bay. Once the cable is buried, the area above the cable, except for those areas with secondary cable protection, will recover through the natural and dynamic migration and deposition of marine sediments.

Permanent impacts to seabed conditions are limited to locations where secondary cable protection is required because conditions do not allow target cable burial or where other infrastructure (pipelines) are crossed. Sediment disturbance will be limited to a swath up to approximately 20 ft (6.0 m) wide within the ECC, and where cable protection is required, it will span approximately 20 ft (6.0 m) across the cable.

As a conservative estimate for planning purposes, SouthCoast Wind estimates up to 15% of the ECC within Rhode Island state waters will require secondary cable protection. Secondary cable protection is expected to be required primarily at the identified cable/pipeline crossing locations in the Sakonnet River, and in Rhode Island Sound where areas of harder seabed have been identified. Generally, the seabed conditions in the remainder of the ECC in the Sakonnet River and Mount Hope Bay are comprised of softer sediments which are expected to be suitable for cable burial and not require substantial secondary cable protection.

The offshore export cable installation and burial methods proposed by SouthCoast Wind will cause temporary disturbances to the seafloor within the ECC as outlined in Table 3-1 below. Sediment redeposition on the seabed following suspension during cable installation is evaluated in Attachment G - Hydrodynamics and Sediment Dispersion Modeling Technical Report; overall redeposition is localized.

Based on currently available information on the ECC, the percentage of the ECC that may require each type of seabed preparation method, cable installation method, and cable protection was estimated on a preliminary basis. This percentage was then used to estimate the total potential area of temporary seafloor disturbance during offshore export cable construction. These estimates are summarized in Table 3-1 with area of disturbance measured in acres and hectares.

**TABLE 3-1. ESTIMATED TEMPORARY SEABED DISTURBANCE AREAS IN RHODE ISLAND**

| Seabed Disturbance | Area [a,c] (hectare)[d] |
|---|---|
| Export Cable Corridor (ECC) | |
| Offshore Export Cables | |
| Seabed Preparation [a] | 25.3 (10.2) |
| Cable Installation [b] | 94.9 (38.4) |
| Cable Protection [c] | 15.2 (6.2) |
| **Total Seabed Disturbance Area (Temporary)** | **136.6 (54.8)** |

*Notes:*

*[a] Seabed preparation includes boulder field clearance over up to approximately 10% of the ECC in Rhode Island state waters, as well as local boulder removal via boulder grabs in other locations. It is also assumed that a grapnel run will be performed along the entire length of the ECC in Rhode Island state waters.*

*[b] Cable installation assumes cable burial along the ECC via one of the several methods under consideration, and conservatively assumes a width of surface impact of 19.7 ft (6.0 m) around each cable. Anchor impacts are considered as well—it is conservatively assumed that an anchored vessel will be used along the entire ECC in Rhode Island state waters. The area of impact due to anchoring assumes that an 8-point mooring spread is used, with an estimated impact diameter of 16.4 ft (5.0 m) per anchor. Where practical and safe, SouthCoast Wind will utilize dynamically positioned vessels, which will reduce anchoring impacts.*

*[c] The primary objective is to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire cable route, by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. Cable protection impact areas assume mattresses and/or rock placement will be used at cable/pipeline crossings (where burial in the seabed is not possible) and for additional cable protection along the ECC if needed. Based on preliminary understanding of site conditions from desktop studies of the offshore export route, SouthCoast Wind estimates that up to 15% of the ECC in Rhode Island state waters will require additional cable protection, including material used at cable/pipeline crossings. It is assumed that a 19.7 ft (6.0 m) wide rock berm will be constructed if required. At each of the three third-party pipelines expected to be crossed, rock berms and/or a number of 9.8 ft (3.0 m) width x 19.7 ft (6.0 m) length mattresses are assumed to be used for cable separation and protection.*

*[d] Seabed disturbance calculations conservatively assume that the cables are un-bundled along the entire ECC in Rhode Island state waters, so the impact numbers presented assume two separately installed submarine power cables (with one dedicated communications cable installed along with one of the power cables). Where practicable, SouthCoast Wind will install the offshore export cables in a bundled configuration, which will significantly reduce seabed disturbance impacts (seabed disturbance areas will be reduced by approximately half where cables are bundled offshore).*

### 3.1.4. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to surficial geology and sediments that SouthCoast Wind will adopt:

- SouthCoast Wind will use BMPs to minimize sediment mobilization during offshore export cable installation.
- SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations. This will include targeting to use cable burial methods (such as use of jet-sled cable burial tooling or other methods that employ sediment fluidization) that encourage natural backfill of the cable burial trench with the disturbed sediment during the trenching operation.
- SouthCoast Wind, where practical and safe, will utilize dynamically positioned vessels.
- SouthCoast Wind will utilize HDD for sea-to-shore transition to avoid disturbance to shoreline areas. Two "long-distance" HDD operations are proposed from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features.
- The offshore export cables will be installed in a bundled configuration, where practicable, to reduce installation impact area and post-installation occupied area.
- The primary cable burial objective will be to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire ECC (where possible), by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions.
- SouthCoast Wind has specific burial performance criteria that the cable installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.
- Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.

## 3.2. WATER QUALITY

This section discusses offshore surface water uses and water quality in the Project Area. Available data on the affected environment from several sources was reviewed, including the Center for Coastal Studies, the Northeast Fisheries Science Center, NOAA, USEPA, USGS, RIDEM, RI CRMC, and Massachusetts Department of Environmental Protection (MassDEP). Water temperature, salinity, chlorophyll *a*, nutrients, dissolved oxygen, and turbidity were evaluated. SouthCoast Wind has prepared a hydrodynamic model and sediment transport analysis for the Project to evaluate potential for turbidity impacts during construction that is discussed in the sections below and included as Attachment G.

### 3.2.1. Affected Environment

The affected environment is described in this section in terms of regulatory classifications and available water quality data.

#### *3.2.1.1. RI CRMC Water Use Categories*

RI CRMC assigns water use categories for marine and coastal waters in accordance with the State or Rhode Island CRMP, as amended (aka, *The Redbook*) Section 2.00 Tidal and Coastal Pond Waters A.[12] Rhode Island state waters the ECC goes through are depicted on Figure 1-5 and described as follows:

- The Sakonnet River is designated as a Type 2 water. Type 2 waters are defined by the RI CRMC as having high scenic qualities, high value for fish and wildlife habitat, and with some exceptions, good water quality. Densely developed residential areas abut much of the waters in this category, and docks and the activities and small-scale alterations associated with residential waterfronts may be suitable.
- The Cove at Island Park in Portsmouth, Rhode Island will not be crossed by the Project, but is in the vicinity of the Project and is included here for completeness. This water body is designated as a Type 2 water, low-intensity use.
- The ECC in Mount Hope Bay is located in Type 4 waters. Type 4 waters are categorized by: (1) large expanses of open water in Narragansett Bay and the Sounds which support a variety of commercial and recreational activities while maintaining good value as fish and wildlife habitat; and (2) open waters adjacent to shorelines that could support water-dependent commercial, industrial, and/or high-intensity recreational activities.

  A short segment of the ECC is located within the lower bay of Mount Hope Bay overlaps with Type 6 waters (see Figure 1-5). To establish the boundaries of Type 6 waters the CRMC established a buffer to federal navigation channels that measures three times the channel depth. Type 6 waters are categorized for: (1) industrial waterfronts; and (2) commercial navigation channels. SouthCoast Wind has consulted with the USACE and has committed to routing the cables to avoid the Mount Hope Bay main shipping channel, the Tiverton channel and the buffer to these federal navigation channels, thus will not place cables within the Type 6 waters.

RIDEM Water Quality Classifications

The RIDEM Surface Water Quality Standards (250-RICR-150-05-1) and Water Quality Certification Regulations further categorize water quality standards for each waterbody. The waters of the State of Rhode Island (meaning all surface water and groundwater of the State) are assigned a Use Classification which is defined by the most sensitive uses which it is intended to protect. Waters are classified according to specific physical, chemical, and biological criteria which establish parameters of minimum water quality necessary to support the water Use Classification.

A majority of the ECC including Rhode Island Sound, Sakonnet River, and lower and mid-bay of Mount Hope Bay is mapped as Class SA (see Figure 1-4), which are waters designated for shellfish harvesting, direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. A small portion of the ECC in Mount Hope Bay near the Massachusetts state line is mapped as

[12] 650-RICR-20-00-1

Class SB, which are waters designated for primary and secondary contact recreational activities, shellfish harvesting for controlled relay and depuration, and fish and wildlife habitat. Another small portion near the Massachusetts state line is mapped as Class SB1 which are waters designated for primary and secondary contact recreational activities and fish and wildlife habitat and suitable for aquacultural uses, navigation and industrial cooling. Class SA, SB and SB1 waters have good aesthetic value.

### Clean Water Act Assessments

The federal CWA, under Section 305(b) requires states to assess and report on the overall quality of waters in their state including the 303(d) List of Impaired Waters. The State of Rhode Island Impaired Waters Report[13] provides an Integrated List consisting of five categories of water quality assessment information, with the fifth category being the list of impaired waters needing a Total Maximum Daily Load (TMDL). Table 3-2 identifies the waterbodies, water use categories and types, water quality standards and impairment status designated by the RI CRMC and RIDEM. Areas of Mount Hope Bay (Waterbody IDs RI0007032E-01A, RI0007032E-01B, RI0007032E-01C, and RI0007032E-01D) are listed Category 5 impaired waterbodies due to dissolved oxygen, total nitrogen, and fecal coliform. Nearshore areas of the Sakonnet River (Waterbody ID RI0010031E-01A) near the landfall in Portsmouth, Rhode Island are listed as Category 4A, waterbody impairments having approved TMDLs, due to fecal coliform. The TMDL was completed by RIDEM and approved by USEPA on April 7, 2005 so it was removed from the Category 5 Impaired Waters List.

[13] RIDEM Office of Water Resources. 2022. State of Rhode Island 2022 Impaired Waters Report. February 2022. Accessed from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/2022%20RIDEM%20Impaired%20Waters%20Report%2012-01-2021.pdf.

**TABLE 3-2. SURFACE WATER CATEGORIES AND CLASSIFICATIONS**

| Waterbody | Water Use Category[a] | Water Quality Classification[b] | TMDL[c] | Impairment Category[d/e] | Special Resource | Other |
|---|---|---|---|---|---|---|
| Sakonnet River (offshore) | 2 | SA | No | No | Recreation, ecological habitat, federal park, critical habitat (rare & endangered species) | Type 1 waters surround Gould Island |
| Sakonnet River Nearshore at Aquidneck Island cable landing | 2 | SA | Fecal Coliform | 4A (fecal coliform) | No | TMDL completed 4/7/2005 |
| Mount Hope Bay (mid-bay & lower bay) | 4 | SA | Fecal Coliform | 5 (dissolved oxygen, total nitrogen, & fecal coliform) | No | TMDL for dissolved oxygen and total nitrogen scheduled for 2029. |
| Mount Hope Bay (upper bay) | 4 | SB/SB1 | Fecal Coliform | 5 (dissolved oxygen, total nitrogen, & fecal coliform) | No | TMDL for dissolved oxygen and total nitrogen scheduled for 2029. |
| Founder's Brook | N/A | A | No | 5 (enterococcus) | No | Warm water fishery |

*Notes:*

[a] *Water use categories are defined in accordance with the RI CRMC "Red Book" (650-RICR-20-00-1). The definitions of the water use categories can be found below.*

[b] *Water quality classifications are defined in accordance with 250-RICR-150-05-1. The definitions can be found below.*

[c] *TMDL is defined in accordance with 73 C.F.R. 41069 - Clean Water Act Section 303(d).*

[d] *The impairment categories for waterbodies in Rhode Island were identified in the State of Rhode Island 2018-2020 Impaired Waters Report.*

[e] *RIDEM Office of Water Resources. 2021. Final 2018-2020 Delisting Document - Waterbody Impairments Removed from the Impaired Waters Lists. January 2021.*

***Category 2:*** *Attaining some of the designated uses; and insufficient or no data and information is available to determine if the remaining uses are attained.*

***Subcategory 4A:*** *TMDL has been completed and approved by the USEPA.*

***Subcategory 4B:*** *-Other pollution control requirements are expected to result in attainment of the water quality standard associated with the impairment. Note: These waters will continue to be listed as impaired for aquatic life use with causes of total nitrogen and dissolved oxygen and impaired for shellfishing use and primary and secondary contact use with fecal coliform as the cause.*

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## Sakonnet River

Water quality data is available for the Sakonnet River collected in 2018 and 2019 by the USGS at Buoy monitoring station 413642071125701 located in the Sakonnet River near Gould Island, Rhode Island (USGS Sakonnet River Station Buoy).[14] Data collected for water temperature, salinity, dissolved oxygen, chlorophyll a, turbidity, total nitrogen, and total phosphorus are provided in Table 3-3.

The Sakonnet River remains saline throughout the year due to tidal influence. Water temperatures peak in the summer months when the river also reaches its lowest dissolved oxygen levels (Table 3-3).

A small area in the upper Sakonnet River north of a line extending from the southwestern-most corner of the stone bridge in Tiverton to the eastern-most extension of Morningside Lane in Portsmouth, and including the Project's cable landing area is listed in the *State of Rhode Island 2022 Impaired Waters Report* as impaired based on fecal coliform.[15] The area is identified as Category 4A – Waterbodies for which a TMDL has been developed. The 0.281-square mile area is impaired for shellfishing due to the presence of fecal coliform.[16]

**TABLE 3-3. WATER QUALITY PARAMETERS MEASURED IN THE SAKONNET RIVER NEAR GOULD ISLAND BY USGS (2018-2019)**

| Season | Water Temp. (°C)[1] | Salinity (psu)[1,2] | Dissolved Oxygen (mg/L)[1] | Chlorophyll *a* (µg/L)[1] | Turbidity (NTU)[1,2] | Total Nitrogen (mg/L)[1] | Total Phosphorus (mg/L)[1] |
|---|---|---|---|---|---|---|---|
| Spring (n=8)[3] | 15.9 ± 2.4 | 29 ± 0.8 | 7.3 ± 0.4 | 5.9 ± 3.1 | 1.7 ± 0.7 | 0.23 ± 0.04 | 0.04 ± 0.01 |
| Summer (n=28)[3] | 22.9 ± 1.7 | 30.9 ± 0.3 | 5.9 ± 0.8 | 6.5 ± 5.5 | 2.2 ± 0.5 | 0.29 ± 0.07 | 0.07 ±0.01 |
| Fall (n=14)[3] | 15 ± 4.4 | 29.3 ± 1.1 | 7.4 ± 0.9 | 2.7 ± 0.7 | 2.5 ± 0.7 | 0.34 ± 0.08 | 0.08 ± 0.01 |

*Notes:*

*[1] Results show mean ± 1 standard deviation. psu = Practical Salinity Units; mg/L = milligrams per liter; µg/L = micrograms per liter; NTU = Nephelometric Turbidity Units; °C = degrees Celsius.*

*[2] Values for turbidity and salinity were only measured in 2018.*

*[3] n= number of samples (not all samples were analyzed for all parameters).*

*Source: USGS 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.*

## Mount Hope Bay

Water quality data was not found for Rhode Island state waters in Mount Hope Bay in Rhode Island, but data from two monitoring buoys in Massachusetts state waters are available. Two fixed-location buoys in Mount Hope Bay maintained by the University of Rhode Island Graduate School of Oceanography and MassDEP in the Cole River and Taunton River collect data during the summer and early fall between May and November. Data collected from these stations are available for the 2017 and 2018 seasons and is presented in Table 3-4.[17] Mount Hope Bay Buoy Data Report: 2017 and 2018 Fixed-Site Continuous

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[14] USGS. 2019. *Water Quality Samples for USA: Sample Data*. https://nwis.waterdata.usgs.gov/nwis/qwdata.

[15] RIDEM Office of Water Resources. 2022. State of Rhode Island 2022 Impaired Waters Report. February 2022. Accessed from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/2022%20RIDEM%20Impaired%20Waters%20Report%2012-01-2021.pdf.

[16] USEPA. n.d.. How's My Waterway? EPA. Retrieved February 10, 2023, from https://mywaterway.epa.gov/waterbody-report/RIDEM/RI0010031E-01A/2022/.

[17] Narragansett Bay Fixed-Site Monitoring Network. 2018. *Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files].* https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

Monitoring is the most recently published summary report for the Cole River and Taunton River buoys.[18] Raw monitoring result data is available from 2019-2020, though summary statistics for these data sets have not yet been published.[19]

The four assessment units in the Rhode Island portion of Mount Hope Bay (RI0007032E-01A, RI0007032E01B, RI0007032E-01C, RI0007032E-01D) were previously listed as impaired for aquatic life use due to fish bioassessments in 1996, following a sharp decline in the number and diversity of fish associated with operations of the Brayton Point Power Station in Somerset.[20] These segments were also listed for water temperature impairment in 2000 due to the Brayton Point Power Station's thermal inputs. The TMDL for the water temperature impairment has been completed and approved by USEPA and the mid-bay and lower bay of Mount Hope Bay were reclassified from Category 5 (303d list) to Subcategory 4B (other pollution control requirements are reasonably expected to result in attainment of the water quality standard associated with the impairment) for fish bioassessments and water temperature.[21] Current monitoring data from this waterbody indicates that water quality standards for the once impaired Bay are now being met. Mount Hope Bay is still listed as an impaired water for dissolved oxygen, total nitrogen, and fecal coliform (see Table 3-3 above).

**TABLE 3-4. MEAN AND STANDARD DEVIATION FOR WATER QUALITY PARAMETERS MEASURED IN MOUNT HOPE BAY (2017-2018)**

| Year | Site | Water Temp. (°C)[1] | Salinity (psu)[1] | Dissolved Oxygen (mg/L)[1] | Chlorophyll (RFU)[1] | Nitrate-N (mg/L)[1] |
|---|---|---|---|---|---|---|
| 2017 | Taunton River | 20.3 ± 3.2 | 27.4 ± 1.2 | 7.4 ± 1.3 | 2.5 ± 2.2 | 0.12 ± 0.06 |
| | Cole River | 20.5 ± 3.3 | 27.9 ± 1.9 | 7.9 ± 1.3 | 4.3 ± 3.7 | 0.13 ± 0.06 |
| 2018 | Taunton River | 21.3 ± 4.3 | 27.2 ± 2.6 | 7.1 ± 1.2 | 2.7 ± 2.2 | 0.18 ± 0.08 |
| | Cole River | 21.4 ± 4.4 | 27.5 ± 2.1 | 7.5 ±1.2 | 2.7 ± 2.0 | 0.16 ± 0.06 |

*Note:*

*[1] Results show mean ± 1 standard deviation. psu = Practical Salinity Units; mg/L = milligrams per liter; RFU = relative fluorescence units; °C = degrees Celsius.*

*Source: Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files].* https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

### 3.2.1.2. *Summary of Water Quality Parameters*

This section provides a discussion of available water quality data for each parameter including context within the hydrologic system.

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[18] MassDEP. 2020. Mount Hope Bay Buoy Data Report: 2017 and 2018 Fixed-Site Continuous Monitoring. June 2020. https://www.mass.gov/doc/technical-memorandum-cn-5300-mount-hope-bay-buoy-data-report/download.

[19] Narragansett Bay Fixed-Site Monitoring Network. 2018.

[20] State of Rhode Island. 2021. Press Release: RI's List of Impaired Waters Approved by USEPA. February 26, 2021.

[21] RIDEM Office of Water Resources. 2021. Final 2018-2020 Delisting Document - Waterbody Impairments Removed from the Impaired Waters Lists. January 2021.

## Temperature and Salinity

In tidal estuaries, temperature and salinity are affected by seasonal temperatures, tidal mixing and seasonal fresh water inflows from tributaries. Generally, temperature and salinity are higher in the summer and fall, and lower in the winter and spring. These general trends are illustrated in data presented in Tables 3-3 and 3-4. The Sakonnet River is a tidal straight with most influence coming from the Rhode Island Sound and Atlantic Ocean. Further upstream in Mount Hope Bay, mean salinity (Table 3-4) is slightly lower due to the freshwater influence from the Taunton and Cole rivers as well as the surrounding Narragansett watershed.[22]

## Chlorophyll *a*

Chlorophyll *a* is a photosynthetic green pigment found in most phytoplankton and plant cells. Measuring chlorophyll *a* in the surface water is an indication of how much primary production is occurring in the surface of the ocean. Chlorophyll *a* is used as an indicator for eutrophication and levels will increase with increased phytoplankton production, which is often related to increased nutrient inputs.

The USGS reported Chlorophyll *a* in the Sakonnet River in 2018 and 2019 and there was some seasonal variability (Table 3-3).[23] During the summer, median concentrations of Chlorophyll *a* were 6.5 micrograms per liter (µg/L) while during the fall median concentrations were 2.7 µg/L. Upstream in Mount Hope Bay, the Chlorophyll *a* concentrations were slightly lower (Table 3-4).[24]

## Nutrients

Nitrogen and phosphorus are two of the primary nutrients measured in coastal and marine waters. These nutrients are required for the growth of algae and phytoplankton, but excessive levels of these nutrients can lead to eutrophication, reduced water clarity, and lower levels of dissolved oxygen.

The USGS reported total nitrogen and total phosphorus concentrations for the Sakonnet River (Table 3-3), and the Narragansett Bay Fixed-Site Monitoring Network reported nitrate-N concentrations for Mount Hope Bay were much higher than in the Rhode Island Sound (Table 3-4). While both studies reported nutrients differently than the Center for Coastal Studies and USEPA National Coastal Condition Assessment studies, they indicated that nutrients were higher in the Sakonnet River and Mount Hope Bay. The Sakonnet River experienced its highest amount of nutrients, both nitrogen and phosphorus, in the fall season. Nutrient inputs are expected to come from the surrounding Narragansett Bay watershed, consisting of mostly developed land.

## Dissolved Oxygen

Dissolved oxygen is essential for maintaining present conditions for aquatic life. Concentrations below 2.0 mg/L can lead to hypoxia, which is detrimental to most organisms. Dissolved oxygen level can be influenced by physical factors (e.g., water temperature) and biological factors (e.g., respiration, photosynthesis, and bacterial decomposition).

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[22] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.
[23] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.
[24] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

In the USGS data, the Sakonnet River dissolved oxygen levels were lowest in the summer months. During the summer the mean dissolved oxygen was about 5.9 mg/L (Table 3-3).[25] The Cole River and Taunton River buoys report healthy mean dissolved oxygen levels for Mount Hope Bay of around 7.5 mg/L (Table 3-4).[26]

#### Turbidity

Turbidity is a measure of water clarity or how much the material suspended in the water column decreases light penetration. Excessively turbid water can be detrimental to water quality if suspended sediments settle out and bury benthic communities, adversely affect filter feeders, or block sunlight needed by submerged vegetation.

Turbidity in the Sakonnet River reported by USGS (Table 3-3) was highest in the summer and fall seasons but overall, relatively low (less than 3 Nephelometric Turbidity Units).[27]

Ambient total suspended solids (TSS) load and concentrations have been monitored in Mount Hope Bay for many years, related to concerns for impacts of the three waste water treatment plants that discharge into the bay and rivers feeding the bay.[28,29] Ambient TSS concentrations were observed ranging regularly from 2 mg/L to 15 mg/L, with a mean of in the range of 11 mg/L from a combination of the analysis of the river water used in the elutriate analyses (C2D 2003) and past dry and wet weather TSS measurements.[30]

## 3.2.2. Potential Project Impacts

### *3.2.2.1. Construction and Decommissioning*

Sediment suspension and effects on water turbidity during cable installation and HDD construction area excavation are the primary concerns for water quality impacts. To evaluate this impact, SouthCoast Wind contracted with Swanson Environmental to complete a hydrodynamic and sediment transport modeling study for cable installation and HDD construction area excavation, which is included as Attachment G.

The model was used to estimate the highest concentration of sediment suspended in the water column (measured as TSS) and the areal extent at any one point during cable installation and HDD construction area excavation. The duration that sediment was suspended in the water as the sediment resettled to the seabed was also estimated.

The water column concentrations presented are the maximum TSS concentration above background anywhere in the water column at each 20 m x 20 m (65 ft x 65 ft) concentration grid cell over the total duration of the cable installation. Ambient TSS load and concentrations have been monitored in Mount

[25] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.
[26] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.
[27] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.
[28] Desbonnet, A., D. Lazinsky, S. Codi, C.Baisden, and L. Cleary, 1992. An Action Plan for the Taunton River Watershed: Assessment and Recommendations. Report of the U. Mass. Boston to the National Oceanic and Atmospheric Administration. Funded by grant NOAA Award No.- NA90AA-H-CZ842.
[29] USEPA. 2016. Modeling Total Suspended Solids (TSS) Concentrations in Narragansett Bay, by Mohamed A. Abdelrhman. U.S. Environmental Protection Agency Atlantic Ecology Division NHEERL ORD, 27 Tarzwell Drive Narragansett, RI 02882 USA National Health and Environmental Effects Research Laboratory Office of Research and Development Narragansett, RI 02882 USA. EPA/600/R-16/195, August 2016.
[30] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.

Hope Bay for many years, related to concerns for impacts of the three waste-water treatment plants that discharge into the bay and rivers feeding the bay (USEPA 2016; Abdelrhman 2016; Desbonnet et al. 1992).[31] Ambient TSS concentrations were observed ranging regularly from 2 mg/L to 15 mg/L, with a mean of in the range of 11 mg/L from a combination of the analysis of the river water used in the elutriate analyses (C2D 2003) and past dry and wet weather TSS measurements.[32]

An overview of the distance from the cable installation point where TSS may be elevated by 100 mg/L and the duration of that concentration as sediment resettles to the seabed is provided in Table 3-5. The 100 mg/L increase is typically used as a biological threshold in water quality evaluations. In the Sakonnet River, suspended sediment concentrations fell below 100 mg/L 20 minutes or less after the cable was installed at a given location. The duration of the elevated water column concentrations in Mount Hope Bay was longer (up to 4.6 hours) apparently due to higher currents in the bay. In Rhode Island Sound, the duration was generally less than 20 minutes, except for an area near the RI state line where the duration was longer (up to 3.0 hours).

**TABLE 3-5. TURBIDITY INCREASE DURING CABLE INSTALLATION– EXTENT AND DISSIPATION OF 100 MG/L TSS**

| | Maximum Distance from Indicative ECC Centerline (km) | Time for TSS to Drop Below 100 mg/L (min) |
|---|---|---|
| Sakonnet River | 0.61 | 20 |
| Mount Hope Bay | 1.16 | 280 |
| RI Sound | 0.37 | 175 |

The HDD construction area excavation impacts were smaller compared with the impact resulting from cable installation (Table 3-6). The 100 mg/L threshold TSS concentration was contained within 0.32 km (0.2 mi) and was within the ECC boundaries in all cases. The modeling approach was highly conservative, as the source was assumed to be at a single point and continuous over a 1-hour period, releasing 100% of the dredged material into the water column. The area coverage of the 100 mg/L or greater level was contained within an average of 5.0 ha (12 ac).

**TABLE 3-6. TURBIDITY INCREASE DURING OFFSHORE HDD CONSTRUCTION EXCAVATION – EXTENT AND DISSIPATION OF 100 MG/L TSS**

| HDD Construction Area | Maximum Distance from Release (km) | Time for TSS to Drop Below 100 mg/L (min) |
|---|---|---|
| Mount Hope Bay HDD | 0.14 | 100 |
| Sakonnet River HDD | 0.25 | 100 |

Water quality effects from vessel operations are not anticipated. All operations will be compliant with relevant and applicable state and federal regulations for management, storage and disposal of equipment, fuels, maintenance materials and waste products. Procedures outlined in the Emergency Response Plan (ERP) Requirements (Attachment E) and the Oil Spill Response Plan (OSRP) (COP,

[31] USEPA. 2016. Modeling Total Suspended Solids (TSS) Concentrations in Narragansett Bay, by Mohamed A. Abdelrhman. U.S. Environmental Protection Agency Atlantic Ecology Division NHEERL ORD, 27 Tarzwell Drive Narragansett, RI 02882 USA National Health and Environmental Effects Research Laboratory Office of Research and Development Narragansett, RI 02882 USA. EPA/600/R-16/195, August 2016.

[32] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.

Appendix AA) will be followed, and contractors will develop task specific procedures where necessary prior to in-water construction activities to include spill response, solid waste management, hazardous material management and sanitary waste management.

Water quality impairment issues in the Project Area include coliform bacteria, total nitrogen and dissolved oxygen in Mount Hope Bay and nearshore areas of the Sakonnet River. The Project will not result in any discharges related to these parameters and will not contribute to these water quality impairments.

Increased turbidity during cable installation and HDD excavation will dissipate quickly and will be short term, with no long term effects on water quality.

### 3.2.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to water quality that SouthCoast Wind will adopt:

- SouthCoast Wind will select and use BMPs to minimize sediment mobilization during construction.
- SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations. This will include targeting to use cable burial methods (such as use of jet-sled cable burial tooling or other methods that employ sediment fluidization) that encourage natural backfill of the cable burial trench with the disturbed sediment during the trenching operation.
- Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.
- All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.
- SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's ERP (Attachment E).
- SouthCoast Wind has developed an HDD Inadvertent Release of Drilling Muds Contingency Plan (Attachment F) to mitigate, control, and avoid unplanned discharges related to HDD activities.

## 3.3. BENTHIC AND SHELLFISH RESOURCES

### 3.3.1. Affected Environment

This section includes and evaluation of benthic and shellfish resources within the ECC. Additional information about shellfish is discussed in the context of essential fish habitat of invertebrate species in Section 3.3.1.3 below.

SouthCoast Wind has collected extensive geophysical data (COP, Appendix E, MSIR) and benthic survey ground-truth data (COP, Appendices M and M.2, M.3 Benthic Resources) to support the mapping and characterization of benthic habitats within the Project Area.

SouthCoast Wind conducted two benthic surveys of the ECC in Fall 2021 and Spring 2022; sediment grab samples (analyzed for grain size, total organic carbon and biological communities) and images of the seabed were collected and analyzed. A total of 180 benthic stations were sampled within the ECC in Rhode Island state waters. Geophysical surveys were also conducted for the entire ECC and resulting datasets on sediment type, boulders, geoforms, and bedforms were also used in to characterize benthic resources in the Study Area. These multiple data streams were integrated to prepare detailed benthic habitat assessment and mapping which is presented in Attachment H.

Approximately 6,036 acres were mapped in the ECC in Rhode Island state waters (Table 3-6), with distinct differences in habitat composition in the estuarine (Mount Hope Bay and Sakonnet River) and offshore (Rhode Island Sound) areas (Figure 3-2). Forty-one percent of the ECC in Rhode Island state waters was comprised of Mud to Muddy Sand habitat, and 21% was Sand habitat, which was primarily mapped at the mouth of the Sakonnet River and in Rhode Island Sound.

Mud to Muddy Sand habitats were the primary habitat types mapped throughout the Sakonnet River and Mount Hope Bay (Figure 3-2), which are both depositional estuarine environments. *Crepidula* Substrate was found overlying these muds in some areas of the upper Sakonnet River and in the lower Mount Hope Bay (Figure 3-2). Very small areas of Mud to Muddy Sand – with Boulder Field(s), Glacial Moraine, and Bedrock habitat types were mapped in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2).

The benthic habitat assessment prepared by Inspire Environmental (Attachment H), makes a distinction between Glacial Moraine A and Glacial Moraine B habitats to distinguish between areas of unconsolidated geological debris: (A) and consolidated geological debris (B); Glacial Moraine B was not mapped within the Project Area. Glacial Moraine B deposits are characteristically poorly sorted and dense with very high boulder densities resulting in greater structural complexity and permanence. By comparison, the surface of Glacial Moraine A units found in the Project Area were reworked with sand and gravel deposits resulting in less structural complexity and permanence.

Glacial Moraine A was mapped in Rhode Island Sound near the Rhode Island state waters line; intermixed with these habitats and extending further north were Mixed-Size Gravel in Muddy Sand to Sand habitats interspersed with Sand habitats (Figure 3-2). The distribution of these habitats is related to the offshore extension of the Buzzards Bay moraine, a terminal moraine that is perhaps an extension of the Point Judith moraine near the mouth of the Sakonnet River.[33] Clusters of individual surficial boulders generally with gravel components (Glacial Moraine, Mixed-Size Gravel in Muddy Sand to Sand – with Boulder Field(s)) and proximal areas were mapped in Rhode Island Sound and in the lower portion of Mount Hope Bay near Aquidneck Island. The sensitive taxa of the northern star coral *Astrangia poculata* was observed at 80% of the glacial moraine stations along the ECC.

### *3.3.1.1. Submerged Aquatic Vegetation*

Submerged Aquatic Vegetation (SAV) beds, dominated by *Zostera marina*, represent unique habitats in shallow coastal waters. SAV extent varies over time and these aquatic plants experience peak growth during late summer months. SAV are found in mud and muddy sand sediments. SAV distribution is periodically mapped across Narragansett Bay using aerial imagery and field verification by the URI Environmental Data Center on behalf of the state of Rhode Island (URI Environmental Data Center and RIGIS; Figure 4-3, Attachment H). SAV beds were not mapped by URI within the ECC. The closest SAV

[33] As mapped by Baldwin et al., 2016; COP Appendix E, MSIR.

mapped by URI is near the mouth of the Sakonnet River, located over 1.0 km from the edges of the ECC (Figure 4-3, Attachment H). However, based on distinct side-scan sonar signatures in the geophysical data collected by SouthCoast Wind, SAV and/or macroalgae may be present in the vicinity of the ECC in the Sakonnet River south of the onshore Aquidneck Island crossing, but this area has not yet been field-verified (Figure 4-4, Attachment H). The area will be re-surveyed for SAV prior to construction, as necessary, during the appropriate time period outlined in the CRMC regulations to guide HDD placement to avoid impacts to SAV. If necessary and applicable based on final cable routing and agency discussions, SouthCoast Wind would conduct the SAV survey during the appropriate and agreed upon time frame, and use the Colarusso & Verkade methodology as reference.

### *3.3.1.2. Consistency with Previous Studies*

Several recently published studies are available in the peer-reviewed and gray literature related to benthic habitats and fauna within Narragansett Bay, which include the Sakonnet River and/or Mount Hope Bay (e.g., LaFrance et al. 2019; Hale et al. 2018[34]; Shumchenia and King 2019; Shumchenia et al. 2016[35]).[36] The benthic habitats and their characterizing sediments and benthic biological communities as mapped for this SouthCoast Wind assessment generally agree with these recent publications. Surficial sediment and benthic habitat maps compiled from a suite of geophysical data and sediment grab samples show Mount Hope Bay as composed primarily of Sandy Mud and Mud (LaFrance et al. 2019). The Sakonnet River was not mapped in this study.

Recent biotopes mapped from a SPI survey conducted throughout Narragansett Bay in 2018 (Shumchenia and King 2019)[37] provide further support for the habitat types mapped in the Sakonnet River and Mount Hope Bay by SouthCoast Wind. For example, "Mud with Crepidula Beds" was the biotope identified at the sampling station in that study coincident with the Mud and Sandy Mud with *Crepidula* Substrate habitat type mapped by SouthCoast Wind (Tables 3-7 and 3-8) at the northern end of the Sakonnet River. Similarly, "Mud with Shell Hash and burrowers" was documented at two stations sampled in that study at the southwestern end of Mount Hope Bay coinciding with and in the vicinity of Mud and Sandy Mud with Shell/*Crepidula* Substrate habitats where Soft Sediment Fauna and Mollusk Reef Biota Coastal and Marine Ecological Classification System (CMECS) Biotic Subclasses were documented by SouthCoast Wind. There was similar concordance to the northeast in Mount Hope Bay near the Rhode Island-Massachusetts state waters boundary where biotopes of "Mud with burrowers" and "Mud or Organic-rich Mus with small tube-builders" mapped by that study corresponded to Mud to Muddy Sand habitats with Soft Sediment Fauna CMECS Biotic Subclasses mapped by SouthCoast Wind.

Northern star coral (*Astrangia poculata)* were observed in locations within the ECC sampled by SouthCoast Wind in Rhode Island Sound only, outside of the Sakonnet River and well removed from

[34] Hale, S.S., Hughes, M.M., & Buffum, H.W., (2018). Historical trends of benthic invertebrate biodiversity spanning 182 Years in a southern New England estuary. Estuaries and Coasts. http://link.springer.com/article/10.1007/s12237-018-0378-7.

[35] Shumchenia, E.J., Guarinello, M.L., & King, J.W. (2016). A re-assessment of Narragansett Bay Benthic Habitat Quality Between 1988 and 2008. Estuaries and Coasts 39: 1463-1477.

[36] LaFrance., M., Shumchenia. E., King. J., Pockalny. R., Oakley. B., Pratt. S., and Boothroyd. 2010. Benthic Habitat Distribution and Subsurface Geology Selected Sites from the Rhode Island Ocean Special Area Management Study Area. Ocean Special Area Management Plan.

[37] Shumchenia. E.J. and King. J.W. 2010.Comparison of Methods for Integrating Biological and Physical Data for Marine Habitat Mapping and Classification. Continental Shelf Research. Volume 30, Issue 16, 30 September 2010, ppg. 1717-1729.

proposed dredge area. The sensitive taxa of the northern star coral were observed in the SouthCoast Wind ECC in federal waters (20% of stations) and in Rhode Island State waters (80% of stations).

Northern star coral were observed in SouthCoast Wind ECC in federal waters, corresponding with Glacial Moraine A and Sand – with Boulder Field(s) habitats at Southwest Shoal and in Rhode Island State waters in Rhode Island Sound, seaward of the Sakonnet River, corresponding with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats. See Figure 3-19 from the Benthic Habitat Mapping Report (Attachment H). SouthCoast Winds continues to evaluate micro-routing options for the offshore export cable to avoid and/or minimize impacts to habitats.

**TABLE 3-7. COMPOSITION AND CHARACTERISTICS OF MAPPED BENTHIC HABITAT TYPES WITHIN THE BRAYTON POINT ECC IN RHODE ISLAND STATE WATERS**

| Brayton Point ECC - Rhode Island State Waters *(~6,036 acres mapped)* | | Presence in Brayton Point ECC – RI State Waters | |
|---|---|---|---|
| | | Area (acres) | Percentage |
| Glacial Moraine A | Predominantly in Rhode Island Sound | 185 | 3.1% |
| Mixed-Size Gravel in Muddy Sand to Sand | Only in Rhode Island Sound | 510 | 8.5% |
| Coarse Sediment - with Boulder Field(s) | Only in Rhode Island Sound | 0.004 | 0.0001% |
| Coarse Sediment | Only in Rhode Island Sound | 0.1 | 0.001% |
| Sand - with Boulder Field(s) | Only in Rhode Island Sound | 61 | 1.0% |
| Sand - Mobile with Boulder Field(s) | Only in Rhode Island Sound | 33 | 0.6% |
| Sand – Mobile | Only in Rhode Island Sound | 121 | 2.0% |
| Sand | In Rhode Island Sound & the Sakonnet River | 1,263 | 20.9% |
| Mud to Muddy Sand - with SAV | Only in the Sakonnet River | 3.6 | 0.06% |
| Mud to Muddy Sand - *Crepidula* Substrate with Boulder Field(s) | Only in Mount Hope Bay | 4.4 | 0.07% |
| Mud to Muddy Sand - (Likely) *Crepidula* Substrate with Boulder Field(s) | Only in Mount Hope Bay | 86 | 1.4% |
| Mud to Muddy Sand - Shell / *Crepidula* Substrate | Only in Mount Hope Bay | 511 | 8.5% |
| Mud to Muddy Sand - *Crepidula* Substrate | In the Sakonnet River & Mount Hope Bay | 704 | 11.7% |
| Mud to Muddy Sand - (Likely) *Crepidula* Substrate | Only in the Sakonnet River | 37 | 0.62% |
| Mud to Muddy Sand - Mobile | Only in the Sakonnet River | 29 | 0.48% |
| Mud to Muddy Sand | In the Sakonnet River & Mount Hope Bay | 2,476 | 41.0% |
| Bedrock | In the Sakonnet River & Mount Hope Bay | 3.3 | 0.06% |
| Anthropogenic | In the Sakonnet River & Mount Hope Bay | 6.7 | 0.11% |

*SAV = Submerged Aquatic Vegetation*

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### TABLE 3-8. CHARACTERISTICS OF MAPPED BENTHIC HABITAT TYPES AS INFORMED BY BENTHIC GROUND-TRUTH DATA WITHIN THE BRAYTON POINT ECC IN RI STATE WATERS

| Brayton Point ECC - RI State Waters *(~6,036 acres mapped)* | | Glacial Moraine A *Predominantly in RI Sound* | Mixed-Size Gravel in Muddy Sand to Sand *Only in RI Sound* | Sand - with Boulder Field(s) *Only in RI Sound* | Sand – Mobile *Only in RI Sound* | Sand *In RI Sound & the Sakonnet River* | Mud to Muddy Sand – with Boulder Field(s) *Only in Mount Hope Bay* | Mud to Muddy Sand - *Crepidula* Substrate *In the Sakonnet River & Mount* | Mud to Muddy Sand *In the Sakonnet River & Mount Hope Bay* |
|---|---|---|---|---|---|---|---|---|---|
| **SPI/PV Ground-truth Values** | Number of benthic stations[1] | 10 | 25 | 4 | 4 | 20 | 1 | 40 | 64 |
| | CMECS Substrate Subgroups Observed in Ground-truth Data[2] | Gravel Pavement, Sandy Gravel, Muddy Sand Gravel, Muddy Gravel, Very Coarse/Coarse Sand | Gravel Pavement, Sandy Gravel, Muddy Gravel, Gravelly Sand, Gravelly Muddy Sand, Medium Sand, Fine/Very Fine Sand | Sandy Gravel, Medium Sand, Fine/Very Fine Sand | Gravelly Sand, Medium Sand | Medium Sand, Fine/Very Fine Sand | N/A | Pebble/Granule, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, Gravelly Mud | Muddy Gravel, Gravelly Muddy Sand, Muddy Sand, Fine/Very Fine Sand, Gravelly Mud |
| | CMECS Biotic Subclasses Observed in Ground-truth Data | Attached Fauna, Soft Sediment Fauna | Attached Fauna, Inferred Fauna, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna | Attached Fauna, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna | None | Attached Fauna, Inferred Fauna, Mollusk Reef Biota, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna |

| Brayton Point ECC - RI State Waters *(~6,036 acres mapped)* | | Glacial Moraine A *Predominantly in RI Sound* | Mixed-Size Gravel in Muddy Sand to Sand *Only in RI Sound* | Sand - with Boulder Field(s) *Only in RI Sound* | Sand – Mobile *Only in RI Sound* | Sand *In RI Sound & the Sakonnet River* | Mud to Muddy Sand – with Boulder Field(s) *Only in Mount Hope Bay* | Mud to Muddy Sand - *Crepidula* Substrate *In the Sakonnet River & Mount* | Mud to Muddy Sand *In the Sakonnet River & Mount Hope Bay* |
|---|---|---|---|---|---|---|---|---|---|
| | Presence of Attached Fauna Observed in Ground-truth Data (% of stations) | Yes (90.0%) | Yes (28.0%) | No | Yes (25.0%) | No | No | Yes (40.0%) | Yes (1.6%) |
| | Sensitive Taxa Observed in Ground-truth Data (% of stations)[3] | Northern Star Coral (80.0%) | Northern Star Coral (12.0%) | None | None | None | None | None | None |
| | Non-Native Taxa Observed in Ground-truth Data (% of stations)[3] | None | None | None | None | None | None | None | None |

*Notes:*
*N/A = Not Applicable*
*Of the 18 total habitat types mapped (Table 3-6), 8 intersect with ground-truth stations.*
*[1] Benthic sampling includes SPI/PV, grab, and GrabCam stations.*
*[2] Substrate Subgroup determined from combined SPI/PV analysis.*
*[3] Sensitive and Non-Native Taxa determined from PV analysis.*

### 3.3.1.3. *Shellfish*

According to the Rhode Island Shellfish Management Plan, the Sakonnet River portion of the ECC is home to several commercially valuable shellfish, including the bay scallop (*Agropected irradians*), ocean quahog (*Arctica islandica)*, and soft-shelled clam (*Mya arenaria).*[38] Ocean quahogs have also been observed in Mount Hope Bay, alongside channeled and knobbed whelks. Historic abundances of these species have been reduced by water quality degradation and habitat loss. Currently, the Sakonnet River is protected as a Shellfish Management Area by RIDEM (R.I.G.L. § 20-3-4) for the purposes of shellfish conservation and stock rebuilding. Management strategies employed by RIDEM to achieve these goals include reduced daily harvest limits, no harvest, limited access time, and rotational harvest.[39]

Shellfishing is currently prohibited in the vicinity of the Project Area in portions of Rhode Island state waters in Mount Hope Bay (Area GA-3) and in portions of the upper Sakonnet River (GA4).[40]

The ECC does not overlap with any current aquaculture areas, although there are some in the vicinity. There are several approved aquaculture areas (see Figure 3-3) within The Cove on Aquidneck Island and adjacent to Hog Island, both areas are located within the Town of Portsmouth. The aquaculture areas within The Cove and along the east and west banks of the Sakonnet River primarily culture Eastern oysters (*Crassostrea virginica*) and soft-shelled clams (*Mya arenaria*).

SouthCoast Wind will be conducting a whelk pot survey within the Sakonnet River as part of a Fisheries Monitoring Plan (FMP), which RIDEM reviewed and provided comments on July 27, 2023. The whelk survey component of the FMP focuses on parts of the ECC that are known whelk fishing grounds. SouthCoast Wind believes the sampling locations for the whelk survey are appropriately located to understand the potential impacts from cable installation.

## 3.3.2. Potential Project Impacts

SouthCoast Wind is siting the marine cable based on field data collection, analysis and mapping of the physical and biological characteristics of the seabed and engineering the cable route to minimize bottom disturbance, avoid sensitive resources and to reach target burial depths to the extent practicable. The cable route engineering drawings in Attachment C-1 are a product of a multi-year effort to carefully site the marine cables. The potential impacts to benthic habitat are discussed in the following subsections.

### 3.3.2.1. *Impacts to Glacial Moraine*

As discussed above, 185 acres of the ECC (3.1% of the ECC in RI waters) was mapped as moraine habitat, mostly in RI Sound with small area of moraine in lower Mount Hope Bay near the Portsmouth cable landing. Cable route engineering used seabed mapping to avoid moraine and boulders wherever practicable, and to minimize the need to move boulders during pre-installation seabed preparation. Where moving boulders is required, the boulders will be moved a minimum distance and within a similar habitat as practicable. During O&M, disturbance to the seafloor could result from temporarily anchored maintenance vessels and secondary cable protection along the export cables where needed. Decommissioning activities will have similar impacts to the seafloor as construction. Because the area of

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[38] URI Coastal Resources Center. 2014. *Rhode Island Shellfish Management Plan Version II: November 2014.* Available online at: http://www.rismp.org/wp-content/uploads/2014/04/smp_version_2_11.18.pdf.
[39] URI Coastal Resources Center, 2014
[40] RIDEM Office of Water Resources. 2022. Notice of Polluted Shellfishing Grounds May 2022 Amended September 2022. Accessed January 4, 2023. https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/shellfish_0.pdf

moraine crossed by the cable laying is relatively minimal, cable crossing of moraine within the ECC is minimized through microrouting where practicable, movement of boulders during seabed preparation is mitigated by BMPs, impacts of cable installation are short-term and localized, and no impacts are anticipated during operation, the overall impacts to moraine habitat from the Project are anticipated to be minimal.

SouthCoast Wind acknowledges that side-casting may not be the best methodology for the area due to other soft sediment taxa, such as polychaetes, Ampelisca amphipods, etc., present in Mount Hope Bay. SouthCoast Wind will conduct further studies to propose options for the dredging material, such as backfill in the HDD construction areas, and will propose these options to RIDEM. A benthic monitoring plan, developed in accordance with BOEM recommendations, is being submitted as an attachment to the WQC/Marine Dredge Application (Attachment N).

#### *3.3.2.2. Impacts to Benthos at HDD Locations*

All the potential HDD construction area locations under consideration in RI State Waters are located within Mud to Muddy Sand – *Crepidula* Substrate or Shell / *Crepidula* Substrate (Figure 4-2, Attachment H). It is expected that *Crepidula* gastropods would recolonize areas disturbed by the offshore HDD area construction relatively quickly for several reasons. First, in this region, *Crepidula* are present and extend over a much broader area than the specific areas that would be disturbed at the offshore HDD construction area. This regional population will be a source of larvae to aid in recolonization of the disturbed seafloor. Timing for recolonization will depend on larval recruitment; the gregarious settlement of their larvae on conspecifics[41] generally leads to very dense accumulations with a flat, reef-like texture as live shells build over dead shells. *Crepidula* have relatively high fecundity, typically reproducing in the spring and/or summer, and often females will reproduce twice per year.[42,43,44] These life cycle characteristics aid in the proliferation of *Crepidula* populations and allow for the recovery of populations following disturbance given a source of larvae is maintained. *Crepidula* are native to the United States Atlantic coast but have been successful at quickly spreading in the United States Pacific Northwest and in Europe where they are not native.[45] This indicates that Crepidula are capable of recolonizing an area relatively easily following a disturbance such as HDD construction area excavation.

#### *3.3.2.3. Impacts from Sediment Suspension and Resettlement on the Seabed*

During installation of the cable and excavation of the offshore HDD construction areas, disturbed sediments will become suspended in the water column and redeposited on the seabed. According to the results of the Hydrodynamics and Sediment Transport Modelling Report (Attachment G), the sediment deposition footprint resulting from cable installation will be localized along the ECC where the mass settles out quickly. Deposition thicknesses of 1.0 mm (0.04 inch) and greater are generally limited to a

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[41] Zhao, B., Qian, P. (2002) Larval settlement and metamorphosis in the slipper limpet Crepidula onyx (Sowerby) in response to conspecific cues and the cues from biofilm. Journal of Experimental Marine Biology and Ecology, 269 (1): 39-51.
[42] Proestou, D.A., Goldsmith, M.E., & Twombly S. (2008). Patterns of Male Reproductive Success in *Crepidula fornicata* Provide New Insight for Sex Allocation and Optimal Sex Change. *Biological Bulletin*, 214: 184-202.
[43] Richard, J., Huet, M., Thouzeau, G., & Paulet, Y. (2006). Reproduction of the invasive slipper limpet, *Crepidula fornicata*,in the Bay of Brest, France.
[44] Pechenik, J.A., Diederick, C.M., Chaparro, O.R., Montory, J.A., Paraedes, F.J., & Franklin, A.M. (2017). Differences in resource allocation to reproduction across the intertidal-subtidal gradient for two suspension-feeding marine gastropods: Crepidula fornicata and Crepipatella peruviana. Marine Ecology Progress Series, 572: 165-178.
[45] Smithsonian Environmental Research Center (SERC) National Estuarine and Marine Exotic Species Information System (NEMESIS). (2022). *Crepidula fornicata* species profile. Accessed September 11, 2022 https://invasions.si.edu/nemesis/species_summary/72623.

corridor with a maximum width of 30 - 35 m (100 – 115 ft) around the cable centerline. In the areas where there are finer grain sediments, the 1.0 mm (0.04 inch) thickness contour distance can increase locally to 165 m (540 ft) from the ECC indicative centerline. Following construction, currents and tidal action will likely redistribute sediment to pre-construction conditions.

The sedimentation footprint for HDD sites is calculated to be very small with a maximum coverage of the 1.0 mm (0.04 inch) thickness contour of only 0.5 ha (1.2 ac), extending a maximum distance of 95 m (312 ft) and 1.0 ha (2.5 ac) for the 0.5 mm (0.02 inch) thickness contour, extending a maximum distance of 158 m (518 ft) from the HDD site. Deposition thicknesses are greater if the location of the release is fixed. Cable burial operations are mobile, and thus will produce smaller maximum deposit thicknesses. The total coverage of the 1.0 mm (0.04 inch) and 0.5 mm (0.02 inch) thickness levels along the entire ECC was 361 ha (892 ac) and 531 ha (1,312 ac), respectively.

Some benthic species exhibit mechanical and possibly physiological adaptations that allow them to survive deposition events of the magnitude commonly encountered in estuarine environments, which can be similar to sediment deposition caused by cable installation.[46] Burrowing bivalve clams, burrow-forming amphipods, and juvenile oysters were highly tolerant, while a tube-dwelling (*Stresblospio benedicti*) was relatively unsuccessful at moving through the sediment to regain the sediment-water interface.[47] Benthic substrates that shift constantly due to waves and currents could experience lower potential burial effects.

Sediment redistribution and deposition on the seabed during construction is expected to be localized. Given the naturally occurring tidal currents within the Project Area, local species are expected to have some level of tolerance to sediment redistribution. Following construction, currents and tidal action will likely redistribute sediment to pre-construction conditions.

#### 3.3.2.4. Displacement of Benthic Communities during Construction Activities

The benthic habitat will also be impacted by short-term displacement during cable installation and anchoring. Benthic communities are expected to recolonize the impact area following construction activities. Recolonization rates of benthic habitats are driven by the benthic communities inhabiting the area surrounding the impacted region. Habitats that can be easily colonized from neighboring areas and communities well adapted to disturbance within their habitats (e.g., sand sheets) are expected to recover quickly. For communities not well adapted to frequent disturbance (e.g., deep boulder communities), recovery depends on a range of factors, such as seasonal larval abundance, and are assumed to generally take longer to become established - upwards of a year to begin recolonization. Depending on the type(s) of cable and scour protection used by SouthCoast Wind, these introduced hard bottom substrates may lead to habitat gain in localized areas for benthic communities and may cause an artificial reef effect, turning biodiversity-poor, soft-sediment habitat into hardbottom, biodiverse communities.

Impacts are not anticipated to SAV during construction and decommissioning. HDD will be used at cable landings to avoid shallow areas with potential for SAV. Potential SAV identified at the Sakonnet River landing at Portsmouth will be field inspected as needed prior to construction. SouthCoast wind acknowledges RIDEM's shellfish resources comments. The potential SAV bed in the vicinity of the HDD at Portsmouth is approximately 656 ft (200 m) northeast of the indicative HDD pit location. Given

[46] Hinchey, E.K., L.C. Schaffner, C.C. Hoar, B.W. Vogt, and L.P. Batte. 2006. Responses of Estuarine Benthic Invertebrates to Sediment Burial : The Importance of Mobility and Adaptation. *Hydrobiologia* 556, 85-98. February 2006.
[47] Hinchey et al. 2006

the short-term suspension and redeposition of sediment during the offshore HDD construction area excavation as discussed above, impacts to SAV are not anticipated.

Shellfish resources within the ECC and the offshore HDD construction areas will be disturbed during cable installation. SouthCoast Wind will use HDD at landings to avoid disturbance to nearshore productive shellfish beds to the extent practicable. SouthCoast Wind will select lower impact construction methods where possible and will micro-route cables within the selected ECC to avoid complex habitats to the extent practicable. To further decrease impacts, SouthCoast Wind's ECC was selected with consideration to minimize the length of cable needed.

SouthCoast Wind will, to the greatest extent practicable, bury cables to a target burial depth and use proper burial methods to allow for benthic recolonization after construction is complete.

### *3.3.2.5. Changes in Ambient EMF*

SouthCoast Wind conducted an EMF analysis including several different modeled offshore export cable burial and cable spacing scenarios to represent both likely (typical) submarine cable conditions and worst-case (atypical) conditions following cable installation (Attachment J).

The highest modeled magnetic field (MF) levels for the typical case (bundled HVDC cables) and atypical (conservative) cases would occur directly above the cables (peaking at 123 mG for the typical installation case, and ranging from 1,909 to 3,785 mG across the two other possible installation cases), with a rapid reduction in MF levels with increasing lateral and vertical distance from the cables. For example, MF cancellation is increased by the bundling of two cables with current in equal but opposite polarity, the analysis shows 93 > 99% reductions in MF levels. At lateral distances of ±25 ft (±7.6 m) from the cable bundle centerlines and at lateral distances of ±25 ft, there is little difference in MF levels for the buried versus the surface-laid cables.

The conservative modeling analysis showed that DC MF levels will be increased only for small areas along the seafloor around certain localized cable locations where conservative (and atypical/worst case) installation conditions are present, contributing to highly localized deviations from the earth's DC geomagnetic field. As discussed in Attachment J, the weight of the currently available scientific evidence does not provide support for concluding there would be population-level harm to marine species from EMFs associated with HVDC submarine transmission.

The offshore export cables will be shielded/armored and buried beneath the seafloor, which is expected to substantially decrease EMF detection by EMF-sensitive marine species. Potential exposure to EMFs will be short- or long-term, depending on the proximity of the species to the cables. Sessile benthic species are expected to be exposed to potential EMFs more than mobile benthic species, which are expected to move in and out of the cable area.

There is limited research indicating that some invertebrate species are able to detect changes in EMF, and that EMF effects from undersea cables could cause disorientation in invertebrate species and may redirect locomotion in response to the changes in the magnetic environment. [48,49] However, given that the target burial depth and the cable shielding/armoring will dampen the EMF effects, EMFs from the proposed export cables are not expected to affect benthic communities.

The steady MFs associated with DC submarine cables do not directly induce electric fields, but weak DC electric fields will be induced by water flow or marine animal movement through the DC MFs associated with DC submarine cables, similar to the induced electric fields associated with water movement and marine animal movement through the earth's geomagnetic field. These motion-induced electric fields are generally weak in nature, including for the typical buried HVDC offshore cable installation case, being small as compared to the motion-induced electric fields associated with movement through the earth's steady geomagnetic field. CSA Ocean Sciences Inc. and Exponent[50] referred to DC electric field strengths of approximately 0.075 mV/m (0.000075 V/m) or less for the movement of ocean currents through the earth's geomagnetic field. There is a lack of evidence demonstrating a likelihood of significant impacts/effects from the motion-induced electric fields associated with DC submarine cables. CSA Ocean Sciences Inc. and Exponent[51] discussed how electrosensitive marine species can distinguish natural bioelectric fields used locate prey, mates, and predators from naturally occurring motion-induced electric fields. The 2022 Brief titled *Electromagnetic Field Effects on Marine Life* that was authored by researchers at the U.S. Department of Energy's Wind Energy Technologies Office, National Renewable Energy Laboratory, and Pacific Northwest National Laboratory as part of the U.S. Offshore Wind SEER effort considered these motion-induced electric fields in its assessment of the state of the knowledge of the potential impacts of EMFs from submarine cables on marine life. The Brief included the following summary of the overall state of the knowledge: "Overall, there is no conclusive evidence that EMFs from a subsea cable creates any negative environmental effect on individuals or populations. To date, no impacts interpreted as substantially negative have been observed on electrosensitive or magnetosensitive species after exposure to EMFs from a subsea cable. Behavioral responses to subsea cables have been observed in some species, but a reaction to EMFs does not necessarily translate into negative impacts. Continued research and monitoring are required to understand the ecological context within which short-term effects are observed and if species experience long-term or cumulative effects resulting from underwater exposure to EMFs."[52]

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[48] Hutchison, Z., Sigray, P., He, H., Gill, A.B., King, J., & Gibson, C. 2018. Electromagnetic Field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. OCS Study BOEM 2018-003. https://espis.boem.gov/final%20reports/5659.pdf.; Love, M.S., M.M. Nishimoto, L. Snook, D.M. Schroeder & A.S Bull. 2017. A Comparison of Fishes and Invertebrates Living in the Vicinity of Energized and Unenergized Submarine Power Cables and Natural Sea Floor off Southern California, USA. Journal of Renewable Energy, 2017, Article ID 8727164. 13 pages. https://doi.org/10.1155/2017/8727164.; Normandeau (Normandeau Associates, Inc.). 2014. Understanding the Habitat Value and Function of Shoal/Ridge/Trough Complexes to Fish and Fisheries on the Atlantic and Gulf of Mexico Outer Continental Shelf: Draft Literature Synthesis pursuant to BOEM Contract No. M12PS00031. https://www.boem.gov/sites/default/files/non-energy-minerals/Final-Draft-Report.pdf.

[49] Gill, A.B., Gloyne-Phillips, I., Neal, K.J., & Kimber J.A. 2005. The potential effects of electromagnetic fields generated by sub-sea power cables associated with offshore wind farm developments on electrically and magnetically sensitive marine organisms – a review. Collaborative Offshore Wind Research into the Environment (COWRIE), Ltd, UK. 128 pp. https://tethys.pnnl.gov/sites/default/files/publications/The_Potential_Effects_of_Electromagnetic_Fields_Generated_by_Sub_Sea_Power_Cables.pdf.

[50] CSA Ocean Sciences Inc and. Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England*. Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

[51] *Id.*

[52] US Offshore Wind Synthesis of Environmental Effects Research (SEER). 2022. *Electromagnetic Field Effects on Marine Life*. 13p. Accessed on September 28, 2022 at https://tethys.pnnl.gov/sites/default/files/summaries/SEER-Educational-Research-Brief-Electromagnetic-Field-Effects-on-Marine-Life.pdf.

### 3.3.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to benthic and shellfish resources that SouthCoast Wind will adopt:

- SouthCoast Wind will use HDD at landfall locations to avoid disturbance to nearshore productive shellfish beds to the extent practicable.
- SouthCoast Wind has developed an HDD Inadvertent Release of Drilling Muds Contingency Plan (Attachment F), which outlines the measures to be implement should there be a pressure loss and release of drillings muds during the HDD operations.
- Design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., cofferdam and/or gravity cell).
- Use HDD at landings to avoid disturbance to nearshore finfish, invertebrates, EFH, and sensitive habitats (e.g., SAV beds) to the extent practicable and to minimize spatial and temporal effects to benthic organisms.
- Select export cable corridors and micro-route cables within selected corridors to avoid complex habitats, where possible (see Offshore Export Cable Engineering Drawings in Attachment C-1).
- Design the cable burial layout to minimize length of cable needed and bury cables, where possible, to allow for benthic recolonization after construction is complete.
- Use industry standard cable burial and cable shielding methods to reduce potential effects/change in ambient EMF during operations and maintenance. In addition, SouthCoast Wind's Project cable burial layout was designed to minimize length of cable needed to reduce potential effects from EMF.
- Install offshore export cables to target burial depths and use cable shielding materials to minimize effects of EMF.
- SouthCoast Wind has developed a benthic monitoring plan, in accordance with BOEM recommendation, which is included herein as Attachment N.
- Incorporate lower-impact construction and decommissioning methods, where possible, to reduce introduced sound into the environment and to reduce actions that may displace biological resources.
- SouthCoast Wind will select lower impact construction methods, where possible.
- The ECC was designed to minimize length of cable (and associated seabed impacts) needed. SouthCoast Wind will bury cables, where possible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable, but are expected, at a minimum, to be installed at crossings of existing submarine cables and pipelines in accordance with the International Cable Protection Committee protocols.
- The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.

## 3.4. FINFISH AND ESSENTIAL FISH HABITAT

This section describes finfish and associated Essential Fish Habitat (EFH) with a focus on species of particular concern in the Rhode Island ECC. Detailed information on EFH in the Project Area is available in the COP, Appendix M3 and Attachment H - Benthic Habitat Mapping Report. Information from both of those sources, along with publicly available data and reports, is integrated into the following section.

### 3.4.1. Affected Environment

Commercially valuable species that have been observed along the ECC include red and silver hake (*Merluccius bilinearis*), summer and winter flounder, and scup.[53, 54] Demersal residents in these nearshore areas include winter flounder, American eel (*Anguilla rostrata*), Atlantic tomcod (*Microgadus tomcod*), and white perch (*Morone americana*).[55] In recent years, there has been a community shift from year-round resident species to summer migrants (such as summer flounder (*Paralichthys dentatus)*, black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops)*, and butterfish (*Peprilus triacanthus*).[56,57]

Rhode Island Sound provides important linkages between the estuarine, nearshore and offshore systems, including nutrient fluxes, larval transport, and juvenile and adult migrations.[58] A total of 101 species were recorded in a multiyear fishery-independent survey (2009 to 2012) in Rhode Island and Block Island Sounds.[59] Biodiversity decreased in Rhode Island Sound during the winter and increased during summer and fall, with an influx of anadromous species, including alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass (*Morone saxatilis*).[60,61]

#### *3.4.1.1. Designated Essential Fish Habitat*

There are 38 species of finfish, skate, and shark species with mapped EFH in the ECC. Table 3-9 provides an overview of the fishery status and preferred habitats of the species with known EFH in the ECC based on NOAA's *Essential Fish Habitat Mapper* and the SouthCoast Wind Essential Fish Habitat Assessment and Protected Fish Species Assessment (COP Appendix N).

The Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended in 1996 by the Sustainable Fisheries Act, sets forth a mandate for NMFS, regional Fishery Management Councils, and other federal agencies to identify and protect important marine and anadromous fisheries habitat, referred to as EFH, and further requires that EFH consultation be conducted for any activity that may adversely affect important habitats of federally managed marine and anadromous fish species. EFH has been defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]).

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[53] Malek et al. 2014
[54] Stokesbury. 2012 and 2014
[55] Evans et al. 2015
[56] Rhode Island Sea Grant. 2018. The Murder Mystery of Narragansett Bay's Winter Flounder. Available online at: http://seagrant.gso.uri.edu/murder-mystery-narragansett-bays-winter-flounder/.
[57] Evans et al., 2015
[58] Malek, A.J., J.S. Collie, and J. Gartland. 2014. Fine-scale spatial patterns in the demersal fish and invertebrate community in a northwest Atlantic ecosystem. *Estuarine and Coastal Shelf Science* 147:1-10.
[59] Malek et al., 2014
[60] Evans, N.T., K.H. Ford, B.C. Chase, & J.J. Sheppard. 2015. *Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts*. Report by the Massachusetts Division of Marine Fisheries.
[61] Malek et al., 2014

## TABLE 3-9. FINFISH, SKATE, AND SHARK SPECIES WITH MAPPED EFH IN THE BRAYTON POINT ECC

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| **Finfish** | | |
| Albacore tuna | *Thunnus alalunga* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Butterfish | *Peprilus triacanthus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic cod | *Gadus morhua* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic herring | *Clupea harengus* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic mackerel | *Scomber scombrus* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for egg, larval, and juvenile life stages only in the offshore portion of the ECC. |
| Atlantic wolffish | *Anarhichas lupus* | • EFH for all life stages in the offshore portion of the ECC. |
| Black sea bass | *Centropristis striata* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Bluefin tuna | *Thunnus thynnus* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Bluefish | *Pomatomus saltatrix* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Haddock | *Melanogrammus aeglefinus* | • EFH for egg, larval, and juvenile life stages only in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Monkfish | *Lophius americanus* | • EFH for all life stages in the offshore portion of the ECC. |
| Ocean pout | *Macrozoarces americanus* | • EFH for egg, juvenile, and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Offshore hake | *Merluccius albidus* | • Larval life stage EFH in the offshore portion of the ECC. |
| Pollock | *Pollachius and P. virens* | • EFH for egg, larval, and juvenile life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Red hake | *Urophycis chuss* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Scup | *Stenotomus chrysops* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for juvenile and adult life stages only in the offshore portion of the ECC. |
| Silver hake | *Merluccius bilinearis* | • EFH for egg, larval, and adult life stages only in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Skipjack tuna | *Katsuwonus pelamis* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for adult life stage only at the Sakonnet River/Mount Hope Bay portion of the ECC. |

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| Summer flounder | *Paralichthys dentatus* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| White hake | *Urophycis tenuis* | • EFH for larval and juvenile life stages only in the offshore portion of the ECC. |
| Windowpane flounder | *Scophthalmus aquosus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Winter flounder | *Pseudopleuronectes americanus* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in the offshore portion of the ECC. |
| Witch flounder | *Glyptocephalus cynoglossus* | • EFH for egg, larval, and adult life stages only in the offshore portion of the ECC. |
| Yellowfin tuna | *Thunnus albacares* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Yellowtail flounder | *Pleuronectes ferruginea* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| **Skates** | | |
| Little skate | *Leucoraja erinacea* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Winter skate | *Leucoraja ocellata* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| **Sharks** | | |
| Basking shark | *Cetorhinus maximus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Blue shark | *Prionace glauca* | • Neonate, juvenile, and adult life stage EFH in the offshore portion of the ECC. |
| Common thresher shark | *Alopias vulpinus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Dusky shark | *Carcharhinus obscurus* | • EFH for all life stages in the offshore portion of the ECC. |
| Great white shark | *Carcharodon carcharias* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for neonate life stage only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Sand tiger shark | *Carcharias taurus* | • Neonate and juvenile life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Sandbar shark | *Carcharhinus plumbeus* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Shortfin mako shark | *Isurus oxyrinchus* | • Neonate, juvenile, and adult life stage EFH in the offshore portion of the ECC. |
| Smoothhound shark (Atlantic Stock) | *Mustelus canis* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| Spiny dogfish | *Squalus acanthias* | • Male and female sub-adult and adult life stage EFH in the offshore portion of the ECC.<br>• EFH for sub-adult female and adult male life stages only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Tiger shark | *Galeocerdo cuvier* | • Juvenile and adult life stage EFH in the portion of the ECC. |

### 3.4.1.2. *Endangered and Threatened Finfish Species*

There are two federally and state-listed finfish species that may occur in the ECC: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)* and shortnose sturgeon (*Acipenser brevirostrum*).[62]

The Atlantic sturgeon is listed as endangered under the ESA.[63] It is also a Species of Greatest Conservation Need under the Rhode Island Wildlife Action Plan.[64] Due to its preference for inshore coastal water depths and gravelly and sand substrates.[65] Atlantic sturgeon may be present within the ECC and near the landfall locations throughout the year. This species is likely to be more prevalent in the warmer months of the year, when individual adult Atlantic sturgeon migrate to coastal rivers and streams for spawning.[66]

The shortnose sturgeon is listed as endangered under the ESA and as a Species of Greatest Conservation Need under the Rhode Island Wildlife Action Plan.[67, 68] It is an anadromous finfish species found mainly in large freshwater rivers and coastal estuaries located along the east coast of North America, from New Brunswick to Florida. Based on its habitat preferences, shortnose sturgeon may occur in the nearshore areas of the ECC and landfall locations.

### 3.4.1.3. *Essential Fish Habitat and Habitat Areas of Particular Concern*

EFH and Habitat Areas of Particular Concern (HAPC) are designated by the New England Fishery Management Council for certain species and life stages of fish and invertebrates in the nearshore and offshore waters of New England, including the area covered by the Study Area. These designations are comprised of two components: (1) broad geographic areas (e.g., nearshore waters and seafloor shallower than 20 m; mapped 10-min squares) and (2) text documentation that describes the habitat characteristics that constitute EFH and/or HAPC within the designated geographic areas. Therefore, spatial data on the distribution of those habitat characteristics are needed to refine the specific location of EFH and/or HAPC.

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[62] Greater Atlantic Regional Fisheries Office (GARFO). 2019. The Greater Atlantic Region ESA Section 7 Mapper (vers. 2.0). Retrieved October 2020 from: https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27.

[63] National Oceanic and Atmospheric Administration. NOAA. 2020. Species directory: Atlantic Sturgeon. Available on-line at: https://www.fisheries.noaa.gov/species/atlantic-sturgeon.

[64] RIDEM. 2015. 2015 Rhode Island Wildlife Action Plan. http://www.dem.ri.gov/programs/bnatres/fishwild/swap/sgcncomm.pdf.

[65] Stein, A.B., Friedland, K.D., & Sutherland, M. 2004. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*, 133(3), 527-537.

[66] Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. U.S. *National Marine Fisheries Service Fishery Bulletin*, 108, 450–464.

[67] NOAA 2020.

[68] RIDEM 2015.

HAPC designated by the New England Fishery Management Council for juvenile cod include structurally complex rocky-bottom or vegetated habitat in inshore areas at depths less than 65 ft (20 m) that provide juvenile cod with protection from predation and support a wide variety of prey items (NEFMC 2017)[69]. Cobble habitats are essential for the survival of juvenile cod in that they may assist with avoiding predation by older year classes[70] and recent studies suggest that rocky, hard bottom habitats may be important for reproduction.[71] Additional studies suggest that structures such as boulders and SAV, which provide vertical relief for predator avoidance and feeding, may be the primary drivers of cod settlement and nursery habitat use in Narragansett Bay and coastal Rhode Island rather than complex cobble substrates given that these waters are largely characterized by fine-grained sediments.[72] The entire seafloor of both the Sakonnet River and Mount Hope Bay is shallower than 20 m, but only very limited areas contain complex rocky-bottom habitat consistent with characteristics that match the HAPC description for juvenile cod. The majority of the ECC shallower than 20 m was mapped as Sand and Mud to Muddy Sand which are habitats less likely to be used by juvenile cod (Figure 4-6, Attachment H). The majority of the 361 acres (6% of the ECC in Rhode Island state waters), mapped with HAPC characteristics, is located in Rhode Island Sound.

Winter flounder are a demersal species likely to occur year-round within the Study Area. Adult winter flounder prefer soft bottom muddy and sandy substrates, but also utilize hard bottoms on offshore banks.[73] Adult winter flounder migrate to nearshore/estuarine waters in the late fall and early winter to spawn and then may migrate to cooler, offshore waters in the summer. Winter flounder lay benthic eggs in shallow (<16 ft [5.0 m]) nearshore waters, bays, and estuaries in mud, muddy sand, gravel, macroalgae, and submerged aquatic vegetation.[74] EFH designated by the New England Fishery Management Council for winter flounder eggs, young-of-the-year (YOY) juveniles, and spawning adults in the Study Area are likely to be found from January through June[75] in Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats, as well as any benthic substrate with SAV. The characteristic of these mapped habitats match the EFH description and have been mapped to encompass 731 acres of the ECC (12.1% of the portion in Rhode Island state waters; Figure 4-7, Attachment H). Non-spawning winter flounder adults and older juveniles are more frequently found in continental shelf benthic habitats and deeper coastal waters than in the shallower habitats utilized by eggs and YOY.[74,76] Therefore, juveniles and non-spawning adults are likely to utilize Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats in the Study Area.

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[69] New England Fishery Management Council (NEFMC). (2017). *Omnibus essential fish habitat amendment 2. Volume 2: EFH and HAPC designation alternatives and environmental impacts.* October 25, 2017.

[70] Gotceitas, V. & Brown, J.A. (1993). Substrate selection by juvenile Atlantic cod (Gadus morhua): effects of predation risk. Oecologia 93: 31-37

[71] DeCelles, G. R., Martins, D., Zemeckis, D. R., & Cadrin, S. X. (2017). Using Fishermen's Ecological Knowledge to map Atlantic cod spawning ground on Georges Bank. ICES Journal of Marine Science, 74: 1587–1601.

[72] Langan, J.A., M.C. McManus, D.R. Zemeckis, and J.S. Collie. (2020). Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. *Fishery Bulletin* 120:187–189.

[73] Pereira, J. J., Goldberg, R., Ziskowski, J. J., Berrien, P. L., Morse, W. W., & Johnson, D. L. (1999). Essential fish habitat source document: winter flounder, Pseudopleuronectes americanus, life history and habitat characteristics. NOAA Tech Memo NMFS-NE-138; 48 pp.

[74] New England Fishery Management Council (NEFMC). (2017). Omnibus essential fish habitat amendment 2. Volume 2: EFH and HAPC designation alternatives and environmental impacts. October 25, 2017.

[75] Massie, F. D. (1998). The Uncommon Guide to Common Life on Narragansett Bay. Providence, Rhode Island: Save The Bay.

[76] Phelan, B. A. (1992). Winter flounder movements in the inner New York Bight. Trans. Am. Fish. Soc., 121: 777-784.

## 3.4.2. Potential Project Impacts

### *3.4.2.1. Construction Impacts Assessment - Finfish*

Most of the potential Project impacts to finfish and EFH would be temporary and reversible in nature. Finfish communities and EFH are expected to return to pre-construction conditions following the Project's construction. Construction activities may temporarily illicit avoidance or attraction behaviors and/or a stress response in finfish. Introduced sound and/or a change in ambient lighting during construction activities may cause this behavioral disturbance. Changes in ambient lighting will occur on a limited, highly localized basis as necessary for safe construction and are not expected to significantly affect finfish.

The actual footprint of Project activities will be smaller than the Study Area (i.e., the entire corridor for which habitats were mapped). Where juvenile cod benthic habitats are found, these habitats would experience some impacts from Project activities that permanently or temporarily disturb the seafloor, such as the burying of export cables and long-term presence of secondary cable protection measures in hard bottom areas where target cable burial depth is not possible. Given their preference for hard bottom/complex habitat, cable mattresses, rock berms, or frond mattresses used as secondary cable protection may provide increased habitat availability for both adult and juvenile cod (Reubens et al. 2013).[77] Depending on the material used, secondary protection may be colonized by barnacles, tube-forming species, hydroids, and other fouling species found on existing hard bottom habitat in the region. Other Project activities are not expected to result in long term adverse impacts to either adult or juvenile cod EFH.

Impacts from Project activities related to installation of the export cable in shallow nearshore (<16 ft [5.0 m]) waters may temporarily directly affect winter flounder eggs, YOY, and spawning adults. Eggs could be entrained within the jet plow or experience increased mortality due to sediment suspension (Berry et al. 2011).[78] These impacts are expected to be minor because they will disturb a small portion of available EFH in the area and temporary because the substrates within nearshore portions of the ECC are expected to return to essentially the same as pre-existing conditions, allowing for continued use by spawning winter flounder, YOY, and eggs. Juveniles and adult flounder may also be temporarily displaced by seafloor disturbing activities. Winter flounder are expected to recolonize most areas once construction is complete, however similar to other species that utilize sandy habitats, they may experience small amounts of permanent habitat loss in areas that are converted from sandy sediments to hard bottom habitats should secondary cable protection be needed.

Loss of habitat due to conversion to hard bottom where cable protection is required is not expected to have a significant impact on these species due to the large area of alternate suitable habitat available. See Section 2.3.9 for additional details on the potential need for secondary cable protection.

The concentrations of suspended sediment in the water column (measured as turbidity) will increase for a short period during and following cable installation in the seabed; see Section 3.2.2 of this application and the Hydrodynamics and Sediment Dispersion Modeling Report in Attachment G. Elevated turbidity

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[77] Reubens, J., Braeckman, U., Vanaverbeke, J., Van Colen, C., Degraer, S., & Vincx, M. (2013). Aggregation at windmill artificial reefs: CPUE of Atlantic cod (Gadus morhua) and pouting (Trisopterus luscus) at different habitat in the Belgian part of the North Sea. Fish. Res. 139: 28-34.

[78] Berry, W. J., Rubinstein, N. I., Hinchey, E. K., Klein-MacPhee, K. G., & Clarke, D. G. (2011). Assessment of DredgingInduced Sedimentation Effects on Winter Flounder (Pseudopleuronectes americanus) Hatching Success: Results of Laboratory Investigations. Proceedings of the Western Dredging Association Technical Conference and Texas A&M Dredging Seminar. Nashville, TN.

levels are expected to decrease quickly following cable installation, dropping to under 100 mg/L over ambient concentrations within five hours. Given the short duration and relatively low levels of increase, impacts to fish and fishing activities are not anticipated.

Potential harassment or mortality could occur due to seabed disturbance, planned and unplanned discharges, and other accidental events. The Emergency Spill Response Plan will be followed to prevent and respond to unplanned discharges and accidental events. Reduced prey availability and habitat loss may occur during Project construction. The seabed surface is expected to return to pre-construction conditions due to natural infill from tidal motion, except where secondary cable protection is necessary. In these areas, habitat modification will occur through the addition of cable and scour protection.

#### *3.4.2.2. EMF Impacts Assessment - Finfish*

EMFs are created anywhere there is a flow of electricity, and their strength diminishes within a short distance from the source. Thus, a change in ambient EMF may occur around the submarine power cables. The strength of electric fields depends on voltage, which is the pressure behind the flow of electricity. Magnetic fields are produced by current, which is the flow of electricity. A Magnetic Field Analysis study was conducted by POWER and Gradient, Inc. to model the magnetic fields produced by typical offshore cable configurations for the Project and contextualize them to the latest research and guidelines for the marine environment (Attachment J). The modeling analysis focuses on magnetic fields because the electric fields arising from the voltage on the export cables will be shielded by cable materials.

Three configurations of offshore HVDC cables were modeled, including the typical installation case where the two direct current conductors are bundled together as well as two atypical, worst-case installation scenarios.[79] Only for the two atypical installation cases will magnetic field levels above the offshore export cables appreciably differ from the earth's steady (DC) geomagnetic field, and only within short distances from the cables. The weight of the currently available evidence does not provide support for concluding there would be population-level harms to marine species from EMF associated with HVDC submarine transmission. This conclusion regarding a lack of evidence of population-level harm to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews.

No regulatory thresholds or guidelines for allowable EMF levels in marine environments have been established for either HVDC or HVAC transmission. There is a growing body of evidence suggesting that EMFs from HVDC cables may be perceptible to some electromagnetic-sensitive marine species, but there remains a lack of evidence indicating potential harmful impacts at the population- or community-level for the various types of marine species which may experience exposure to DC EMFs from submarine export cables.[80] Additional details can be found in Attachment J – Magnetic Field Modeling

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[79] One worst-case installation case assumes the bundled conductors are laid directly on the seafloor surface and covered by a concrete mattress, such as at a cable crossing location. The other is an unbundled installation case where the two DC conductors are separately buried approximately 164 ft (50 m) apart at a target depth of 2.0 m to be used as needed to ensure safe installation and repair of the separate cables, as well as to minimize risk of damage to both cables from threats such as anchor strike.

[80] CSA Ocean Sciences Inc.; Exponent. 2019. "Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England." Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM). OCS Study BOEM 2019-049, 62p., August.; Gill, AB; Desender, M. 2020. "Risk to Animals from Electromagnetic Fields Emitted by Electric Cables and Marine Renewable Energy Devices." Report to Ocean Energy Systems (OES), in OES-Environmental 2020 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World (Eds: Copping, AE; Hemery, LG), p. 87-103. doi: 10.2172/1633088.; US Offshore Wind Synthesis of Environmental Effects Research (SEER). 2022. "SEER Webinar #4: Electromagnetic Fields & Vessel Collision: Effects on Marine Life from Offshore Wind Energy." February 22, 32p. Accessed on March 7, 2022 at https://tethys.pnnl.gov/sites/default/files/events/SEER-EMFVessels-Webinar-Slides.pdf.; Taormina, B; Bald, J; Want, A; Thouzeau, G; Lejart, M;

Report. This conclusion regarding a lack of evidence of population-level harms to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews. A BOEM sponsored study in 2019 concluded, based on its review of the state of the knowledge regarding potential EMF-related impacts on marine life, "The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes within the southern New England area. Negligible effects, if any, on bottom-dwelling species are anticipated. No negative effects on pelagic [i.e., in upper layers of the open sea] species are expected due to their distance from the power cables buried in the seafloor."

Two recent reports commissioned by BOEM[81,82] have discussed the scientific evidence bearing on the potential impacts of EMFs from submarine power cables on the European eel and the American eel. While acknowledging the evidence indicating that multiple eel species can potentially detect the earth's steady (DC) geomagnetic field and the "mixed evidence" that eel species can detect electric fields, the 2019 report highlighted findings from two studies of European eels supporting a lack of significant effects of AC magnetic fields on eel species. In particular, this report described one laboratory study as reporting no effect of a 950 mG magnetic field from a 50-Hz AC power source on the swim behavior or orientation of European eels, and a field study as reporting findings that migration of European eels was not prevented by an unburied AC power cable. The 2021 report also discussed findings from these two studies of European eels, concluding that they provide "insufficient evidence to confidently decipher the behavioral response to cable EMFs in the context of AC or DC cables."

Importantly, the 2021 Hutchison et al. report[82] described findings from a field investigation of the EMF impacts on American eel movement and migration from a buried DC power cable, specifically the 330-MW bipolar Cross Sound Cable (CSC) that transects Long Island Sound between New Haven, CT, and Shoreham, NY. For the range of DC MFs encountered by American eels in this study (-17.0 to 86.9 nT, or -0.17 to 0.869 mG).[82] reported some evidence using highly sensitive tracking metrics that the HVDC cable MFs may have resulted in faster and more directed movement of eels, but these findings did not provide evidence of a barrier to migration. Hutchison et al.[82] highlighted the need for further work to better understand the implications of their findings for migratory behavior of American eels.

The 2019 report[81] concluded overall that the impact consequence of any exposure of American eels to EMFs from buried submarine power cables was "negligible." This conclusion was based on the small and localized portion of the pelagic habitat that would experience detectable EMFs from buried submarine power cables, and the available scientific evidence supporting any biological effects as being either not detectable or small changes. This report highlighted how changes in the earth's magnetic field are potentially just one of many environmental cues (e.g., water temperature, light, salinity) that can guide the migratory behavior of eels.

### 3.4.3. Proposed Avoidance, Minimization, and Mitigation Measures

SouthCoast Wind will conduct activities in accordance with 30 C.F.R. § 585.621. Table 2-9 of the Project's RI CRMC Assent application and Table 16-1 of the COP Volume II summarizes the various avoidance,

Desroy, N; Carlier, A. 2018. "A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions." Renew. Sustain. Energy Rev. 96 :380-391. doi: 10.1016/j.rser.2018.07.026.

[81] CSA Ocean Sciences Inc and Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England*. Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

[82] Hutchison, ZL; Sigray, P; Gill, AB; Michelot, T; King, J. 2021. "Electromagnetic Field Impacts on American Eel Movement and Migration from Direct Current Cables." Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2021-83. 150p., December.

minimization and mitigation measures the Project intends to abide by to minimize impact during all phases of construction and operations. These tables also illustrate that the Project intends to apply Best Management Practices (BMPs) that are included in Attachment A of BOEM's Information Guidelines for a Renewable Energy COP.

As indicated in Table 16-1 of the COP, SouthCoast Wind will select and use BMPs including the use of a Stormwater Pollution Prevention Plan (SWPPP) to minimize sediment mobilization during offshore construction of WTGs and OSPs, scour protection placement, and HDD operations. SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.

As indicated in Table 2-9 of the Assent application, SouthCoast Wind will select and use BMPs including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. SouthCoast Wind will have an HDD Contingency Plan in place to mitigate, control, and avoid unplanned discharges related to HDD activities. SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook*, and in accordance with approved plans and permit requirements. The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas.

Impacts associated with the installation of a cofferdam or casing pipe with goal posts (if necessary) would be similar to those discussed for seafloor preparation, but on a smaller scale. The cofferdam or casing pipe with goal posts will be a temporary structure used during construction only. Therefore, no conversion of habitat is expected, and the cofferdam will be removed prior to the operations phase. Proposed avoidance, minimization, and mitigation measures applicable to the potential impacts from construction and operations to finfish and EFH are presented below.

- SouthCoast Wind will design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., offshore cofferdam and/or gravity cell).
- Cable route engineering is being completed to achieve target burial depth of 6.0 ft where practicable, to avoid use of surface cable protection and to minimize the potential for EMF effects.
- The Project will use HDD at landfall locations to avoid disturbance to finfish and invertebrate EFH to the extent practicable.
- SouthCoast Wind will coordinate with RIDEM Division of Fish and Wildlife (RI DFW), RIDEM Division of Marine Fisheries (RI DMF), RI CRMC, RIDEM, the USFWS and the NMFS to identify appropriate mitigation measures, including seasonal construction constraints, if required.
- SouthCoast Wind will select lower impact construction methods, where possible.
- SouthCoast Wind has engineered the cable route to avoid EFH and sensitive benthic habitats, where possible.
- The ECC was designed to minimize length of cable (and associated seabed impacts). SouthCoast Wind will bury cables, where feasible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.
- The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.

# 3.5. Marine Mammals and Sea Turtles

## 3.5.1. Affected Environment

This section includes and evaluation of whales, other marine mammals and sea turtles within the ECC.

### *3.5.1.1. Marine Mammals*

SouthCoast Wind evaluated available literature and government databases, marine mammal-specific surveys conducted for the proposed Project, as well as local and regional information regarding habitat use, abundance, and distribution of marine mammal species known to occur in the waters surrounding the ECC.

Sightings of whales and dolphins in the Sakonnet River, Mount Hope Bay, and nearshore Rhode Island are rare, and there have only been a few reported sightings of marine mammal species, besides seals, within Narragansett Bay.[83] Harbor seals (*Phoca vitulina)* are routinely sited from fall through spring and several haul-out sites exist at Rome Point, Brenton Point, Citing Rock, Cold Spring Rock, Seal Rock, and Cormorant Cove with the size of the region harbor seal population and number of haul-out sites increasing in recent years.[84] Since the majority of the Rhode Island ECC is within the Sakonnet River and Mount Hope Bay, the risk of impact to marine mammals in Rhode Island waters is very low given the low overall densities of animals and the avoidance and mitigation measures that SouthCoast Wind vessels are required to implement, such as assigning protected species and environmental observers to operating vessels and implementing strike avoidance measures.

Additional marine mammal species can be found in the Rhode Island Sound, as listed in Table 3-10 Fifteen species are considered common or uncommon in terms of their likely occurrence within the ECC in Rhode Island Sound. The remaining sixteen species are considered rare within the ECC. The marine mammal species listed in Table 3-10 have been previously observed and/or recorded during surveys specific to offshore wind development for BOEM-specific assessments, surveys conducted in and around the Rhode Island/Massachusetts Wind Energy Area and the ECC as part of long-term population assessments, and/or in NOAA Marine Mammal Stock Assessment reports of the Rhode Island/ Massachusetts Wind Energy Area.

**TABLE 3-10. MARINE MAMMAL SPECIES WITH POTENTIAL TO OCCUR IN RHODE ISLAND SOUND**

| Common Name | Scientific Name | Stock | RI SGCN[a] | Likely Occurrence within Project Area |
|---|---|---|---|---|
| Baleen whales | | | | |
| Blue whale | *Balaenoptera musculus* | Western North Atlantic | - | Rare |
| Fin whale | *Balaenoptera physalus* | Western North Atlantic | SGCN | Common |
| Humpback whale | *Megaptera novaeangliae* | Gulf of Maine | SGCN | Common |
| Minke whale | *Balaenoptera acutorostrata* | Canadian East Coast | - | Common |

[83] Raposa, K.B., and M.L. Schwartz. 2009. *An Ecological Profile of the Narragansett Bay National Estuarine Research Reserve*. 2009.
[84] Schwartz, 2021

| Common Name | Scientific Name | Stock | RI SGCN[a] | Likely Occurrence within Project Area |
|---|---|---|---|---|
| North Atlantic right whale | *Eubalaena glacialis* | Western North Atlantic | SGCN | Common |
| Sei whale | *Balaenoptera borealis* | Nova Scotia | - | Common |
| Toothed whales | | | | |
| Atlantic white-sided dolphin | *Lagenohynchus acutus* | Western North Atlantic | - | Common |
| Atlantic spotted dolphin | *Stenella frontalis* | Western North Atlantic | - | Rare |
| Blainville's beaked whale | *Mesoplodon densirostris* | Western North Atlantic | - | Rare |
| Common bottlenose dolphin[b] | *Tursiops truncatus* | Western North Atlantic | - | Common |
| Cuvier's beaked whale | *Ziphius cavirostris* | Western North Atlantic | - | Rare |
| Dwarf sperm whale | *Kogia sima* | Western North Atlantic | - | Rare |
| Gervais' beaked whale | *Mesoplodon europaeus* | Western North Atlantic | - | Rare |
| Killer whale | *Orcinus orca* | Western North Atlantic | - | Rare |
| Long-finned pilot whale | *Globicephala melas* | Western North Atlantic | - | Uncommon |
| Pantropical spotted dolphin | *Stenella attenuata* | Western North Atlantic | - | Rare |
| Pygmy sperm whale | *Kogia breviceps* | Western North Atlantic | - | Rare |
| Risso's dolphin | *Grampus griseus* | Western North Atlantic | - | Uncommon |
| Short-beaked common dolphin | *Delphinus delphis* | Western North Atlantic | - | Common |
| Short-finned pilot whale | *Globicephala macrorhynchus* | Western North Atlantic | - | Rare |
| Sowerby's beaked whale | *Mesoplodon bidens* | Western North Atlantic | - | Rare |
| Sperm whale | *Physeter macrocephalus* | North Atlantic | - | Uncommon |
| Striped dolphin | *Stenella coeruleoalba* | Western North Atlantic | - | Rare |
| True's beaked whale | *Mesoplodon mirus* | Western North Atlantic | - | Rare |
| White-beaked dolphin | *Lagenorhynchus albirostris* | Western North Atlantic | - | Rare |
| Porpoises | | | | |
| Harbor porpoise | *Phocoena phocoena* | Gulf of Maine/Bay of Fundy Stock | SGCN | Common |

| Common Name | Scientific Name | Stock | RI SGCN[a] | Likely Occurrence within Project Area |
|---|---|---|---|---|
| Pinnipeds | | | | |
| Gray seal | *Halichoerus grypus* | Western North Atlantic | - | Common |
| Harp seal | *Pagophilus groenlandicus* | Western North Atlantic | - | Uncommon |
| Harbor seal | *Phoca vitulina* | Western North Atlantic | SGCN | Common |
| Hooded seal | *Crysophora cristata* | Western North Atlantic | - | Rare |
| West Indian Manatee | *Trichechus manatus* | Florida | - | Rare |

*Notes:[a] Species of Greatest Conservation Need (SGCN) are identified by RIDEM and the Rhode Island Chapter of The Nature Conservancy in the Rhode Island Wildlife Action Plan.*

### 3.5.1.2. Sea Turtles

Four species of sea turtles have the potential to occur in the ECC, all of which are federally listed and listed as a Species of Greatest Conservation Need (SGCN) in Rhode Island (Table 3-10). Sea turtle species that have the potential to occur in and in the vicinity of the ECC include the loggerhead sea turtle (*Caretta caretta*), leatherback sea turtle (*Dermochelys coriacea*), Kemp's ridley sea turtle (*Lepidochelys kempii*) and green sea turtle (*Chelonia mydas*). Federally endangered hawksbill sea turtles (*Eretmochelys imbricata)* generally prefer tropical and subtropical waters and are very rarely seen in Massachusetts and Rhode Island waters (observations are typically the result of cold-stun strandings), and therefore, will not be evaluated further in this assessment.[85, 86, 87] The sea turtle species listed in Table 3-11 have been previously observed and recorded during surveys for BOEM-specific offshore wind development assessments and/or surveys conducted near and within the ECC as part of long-term population assessments. Although sea turtles could occur in the Sakonnet River and Mount Hope Bay, they are more apt to be in the Rhode Island Sound waters of the ECC.

**TABLE 3-11. SEA TURTLE SPECIES WITH POTENTIAL TO OCCUR IN THE ECC**

| Common Name | Scientific Name | ESA Status[a] | RI Status[a] | Occurrence within Project Area |
|---|---|---|---|---|
| Green sea turtle | *Chelonia mydas* | T | SGCN | Uncommon |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | E | SGCN | Uncommon |
| Atlantic Hawksbill sea turtle | *Eretmochelys imbricata* | E | - | Rare |
| Leatherback sea turtle | *Dermochelys coriacea* | E | SGCN | Common |
| Loggerhead sea turtle | *Caretta caretta* | T | SGCN | Common |

*Notes: [a] ESA = Endangered Species Act (16 U.S.C. §.1531 et seq.); Rhode Island Wildlife Action Plan Species Profiles, Species of Greatest Conservation Need (SGCN). SGCN species are identified by RIDEM and the Rhode Island Chapter of The Nature Conservancy in the Rhode Island Wildlife Action Plan. It should be noted that SGCN designation does not represent an equivalent to ESA species listings; rather, this represents a publicly available data source to identify species which Rhode Island considers to be of greatest concern, based on the threat affecting each (RIDEM 2015). E = Endangered; T = Threatened; NL = Not listed.*

[85] Lutz, P.L. &. Musick, J.A. 1997. *The Biology of Sea Turtles*. Boca Raton, Florida: CRC Press.

[86] National Marine Fisheries Service & United State Fish and Wildlife Service. 1993. Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico National Marine Fisheries Service, St. Petersburg, Florida.

[87] Lazell, J. 1980. New England Waters: Critical Habitat for Marine Turtles. *Copeia*, 2: 290-295. doi:10.2307/1444006.

Data on sea turtle abundance and distribution in Rhode Island state waters are limited. However, available studies suggest that all four species are generally found offshore during the summer and fall.[88, 89, 90] Loggerhead, leatherback, green, and Kemp's ridley sea turtles are highly migratory and are known to forage in nearby Cape Cod Bay during the summer months when sea surface temperatures range from 61 to 79 degrees Fahrenheit (16 to 26 degrees Celsius).[91]

### 3.5.2. Potential Project Impacts

The risk of impact to marine mammals in Rhode Island waters is very low given the low overall densities of animals and the avoidance and mitigation measures that SouthCoast Wind vessels are required to implement. Also, impact pile driving is not planned within Rhode Island waters, and sound sources will be non-impulsive, which is less of a concern than impulsive noise sources for marine mammals. Noise producing vessels within Rhode Island state waters will include the use of a DP vessel.

During the construction phase, marine mammals and sea turtles may co-occur with, and be affected by, Project activities in the ECC. During the operations phase, marine mammals and sea turtles may co-occur with the proposed ECC, including minimal vessel traffic for maintenance and associated effects. Marine mammal and sea turtle likelihood of co-occurrence with Project activities in specific Project locations is a function of overall occurrence levels that range from "rare" to "common" as listed in Tables 3-9 and 3-10, respectively.

To minimize the potential for vessel strikes, environmental monitoring, reporting, and vessel strike avoidance measures are required during in-water activities as outlined in SouthCoast Wind's COP Appendix O Marine Mammal and Sea Turtle Monitoring and Mitigation Plan. Given these strike avoidance measures and the low probability of marine mammal occurrence (with the possible exception of seals) in the Sakonnet River and Mount Hope Bay, risk of potential vessel strikes is low in Rhode Island waters. Unplanned discharges will be prevented through the use of best management practices and the Emergency Response Plan (Attachment E).

Pinnipeds that may be present along the ECC could also be susceptible to in-air noise disturbance at haul out sites or pupping grounds, and in-air thresholds have been established by the National Marine Fisheries Service. However, in-air noise producing activities, which do not include pile driving in Rhode Island waters or the Ocean SAMP area, are anticipated to produce relatively low levels of in-air noise and are expected to be short in duration.

During the construction phase of the Project, temporary displacement may occur due to disturbance and modification of habitat and/or temporary disturbance of prey species causing reduced prey availability. Following construction and during the operational phase, the seafloor is expected to return to pre-construction condition through natural movement (transport) and sorting by waves and currents and marine mammals, sea turtles, and their prey are expected to return.

Artificial lighting during construction will be associated with navigational and deck lighting on vessels from dusk to dawn. Only a limited area would be associated with the artificial lighting used on Project vessels relative to the surrounding unlit areas and the linear installation of the ECC will cause the lit area

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[88] Kraus, S.D., Leiter, S., Stone, K., Wikgren, B., Mayo, C., Hughes, P., Kenney, R.D., Clark, C.W., Rice, A.N., Estabrook, B. & Tielens, J. 2016. *Northeast Large Pelagic Survey Collaborative Aerial and Acoustic Surveys for Large Whales and Sea Turtles*. U.S. Department of the Interior, Bureau of Ocean Energy Management, Sterling, Virginia. OCS Study BOEM 2016-054. 117 pp. + appendices.

[89] Lazell. 1980.

[90] Schwartz. 2021.

[91] Cetacean and Turtle Assessment Program. 1982. *A Characterization of Marine Mammals and Turtles in the Mid and North Atlantic Areas of the U.S. Outer Continental Shelf* (Report No. AA551-CT8-48). Report by University of Rhode Island. Report for U.S. Department of the Interior.

to constantly move along the cable route. Because of the relatively short duration of installation activities, impacts are considered short-term for marine mammals.

### 3.5.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to marine mammals and sea turtles that SouthCoast Wind will adopt:

- All relevant requirements of the BOEM *Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection* will be followed wherever applicable, including strike avoidance measures, vessel speed restrictions, monitoring, mitigation, and reporting.
- Adhere to NMFS vessel speed restrictions and monitor relevant channels for alerts and updates, as appropriate.
- SouthCoast Wind will implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (COP, Appendix O) and the final Incidental Take Authorization to be authorized by NMFS.
- Marine construction staff will be trained in species identification, monitoring and mitigation.
- Environmental Monitors and/or Protected Species Observers will be identified on all vessels to perform monitoring and mitigation, as necessary and required.
- Adhere to the NMFS Guidelines for the Northern Right Whale Ship Strike Avoidance Rule.
- SouthCoast Wind will continue to consult with the RIDEM DFW, RIDEM DMF, RI CRMC, USFWS and NMFS to identify appropriate mitigation measures.
- SouthCoast Wind will train construction staff on biodiversity management and environmental compliance requirements.

## 3.6. COMMERCIAL AND RECREATIONAL FISHING

This section describes and analyzes commercial and recreational fisheries and fishing activity that has the potential to occur in the ECC, followed by an evaluation of potential Project-related effects and corresponding potential avoidance, minimization, and mitigation measures. Fishing activity is impacted by species abundance, market forces, regulations, and a large number of other variables.

### 3.6.1. Affected Environment

This section includes an evaluation of commercial and recreational fisheries within the ECC.

#### *3.6.1.1. Commercial Fishing*

<u>Aquaculture</u>

SouthCoast Wind will avoid or minimize adverse impact to aquaculture in Rhode Island and will work with RI CRMC, the RI DMF other relevant agencies, and the local aquaculture industry to achieve that end. RI CRMC is the regulatory body that manages aquaculture leasing and permits within Rhode Island waters. Much of the Rhode Island aquaculture activities occur within the State's several inland salt ponds, but aquaculture is also scattered nearshore in Narragansett Bay.[92] Although there are several approved aquaculture areas within The Cove on Aquidneck Island and adjacent to Hog Island, the export cable route is not directly adjacent or collocated with any of these sites. There are no aquaculture lease sites within the ECC within Rhode Island state waters, based on the RI DMF (2021) mapping of aquaculture lease areas in Rhode Island state waters (Figure 3-3).

SouthCoast Wind is continuing their routing assessment and inventory of marine resources to minimize impacts on recreational fishing and recreational boating with the intention to avoid important recreational fishing areas and established moorings. In the event that any moorings in the Sakonnet River and Mount Hope Bay are temporarily displaced, SouthCoast Wind will coordinate with the applicable Harbor Master and owner of the mooring(s).

#### Fish Traps

The floating fish trap fishery in Rhode Island is a gear type unique to Rhode Island. Essentially a hybrid of a fishing weir and a fish trap, this gear is predominantly fished in shallower, inshore areas close to shore. While this is a wild capture fishery, it is in some ways permitted and operated as an aquaculture activity. Permits to operate fish traps are tied to specific, permanent locations which offer certainty in the spatial extent of fishing effort, unlike other wild capture fisheries. However, while fish trap locations offer spatial certainty, the issuance of a permit or appearance of a fish trap on the RI DMF Map does not necessarily mean that that fish trap is being actively fished. Fish traps may become actively fished at any time, although there are requirements for the fisherman to provide the necessary notifications.[93] SouthCoast Wind has conducted outreach, including to the RI DMF, and performed scouting in advance of geophysical and geotechnical surveys to gain temporal knowledge of the location of fish traps in addition to the spatial certainty offered by permit location information. There are currently no licenses in Mount Hope Bay. Several licenses for fish traps have been issued for locations at the mouth of the Sakonnet River. SouthCoast Wind will coordinate with RI DMF prior to construction operations to confirm permitted locations of fish traps that may likely be fished during the period of Project impacts and will communicate directly with the operators of those fish traps.

### *3.6.1.2. Commercial Fishing Landings*

A diverse array of commercial fishing activity occurs in the region. Fisheries resources are targeted in the region and within the ECC by vessels of different sizes using different gear types and are dictated by seasons, quotas, environmental factors, market forces, and federal and state-led regulations.

Table 3-12 shows the landings for Rhode Island ports in 2019 and 2020 as reported by NMFS. Point Judith on the coast of Narragansett is the highest valued port in Rhode Island. In 2019, it was the 12th highest valued in the United States, and the 18th highest valued in 2020.

**TABLE 3-12. LANDINGS BY PORTS IN RHODE ISLAND (VIA NMFS)**

| Port | 2019 | | 2020 | |
|---|---|---|---|---|
| | Millions of Pounds | Millions of Dollars | Millions of Pounds | Millions of Dollars |
| Point Judith, RI | 48.1 | $65.9 | 42.6 | $46.7 |
| North Kingstown, RI | 19.2 | $14.1 | 19.6 | $14.4 |

[92] RIDEM. 2021. *RIDEM Marine Fisheries Maps.* https://ridemgis.maps.arcgis.com/apps/webappviewer/index.html?id=8beb98d758f14265a84d69758d96742f.

[93] J. Livermore. 2021. RIDEM Division of Marine Fisheries [COP], personal communication, July 22, 2021.

| Port | 2019 | | 2020 | |
|---|---|---|---|---|
| | Millions of Pounds | Millions of Dollars | Millions of Pounds | Millions of Dollars |
| Newport, RI | 4.9 | $7.8 | 5.2 | $7.0 |
| Little Compton, RI | 3.9 | $3.4 | 4.7 | $2.8 |
| **Total** | **76.1** | **$91.2** | **72.1** | **$70.9** |

*Source: NOAA Fisheries. (NMFS). 2021. NOAA Fisheries Landing Queries. Retrieved from: https://foss.nmfs.noaa.gov/apexfoss/f?p=215:200.*

In 2019, these ports landed 76.1 million pounds of fish valued at $91.2 million. The most commonly landed species in Rhode Island by weight were shortfin squid, longfin squid, and butterfish. The highest landed species by value were sea scallops, longfin squid, and American lobster. In 2020, these ports landed 72.1 million pounds of fish valued at $70.9 million. The most commonly landed species in Rhode Island by weight were shortfin squid, longfin squid, and skate. The highest landed species by value were longfin squid, sea scallops, and shortfin squid.

Table 3-13 shows the landings for Rhode Island ports in 2020 and 2021 as reported by RIDEM via the Standard Atlantic Fisheries Information System. In Table 3-13 a dash ("-") does not necessarily mean that no landings were reported but can instead mean that landings are confidential. Commercial fisheries landings data have confidentiality protections in place when disclosing landings could feasibly be tied back to an individual business.

*Note: Because of what is assumed to be rounding, the total field for the 'Percentage of State Landings by Value' column in Table 3-13 does not sum to exactly 100%. However, it is essentially 100% for both 2020 and 2021 when summing all fields in that column. Also, differences in port and total values for the same areas in the same time frame can be attributed to how source data was collected, packaged, and in some cases withheld to protect confidentiality.*

**TABLE 3-13. LANDINGS BY PORTS IN RHODE ISLAND (VIA RIDEM)**

| Port | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Pounds | Dollars | % of Total State Landings by Value | Pounds | Dollars | % of Total State Landings by Value |
| Barrington | - | - | - | - | - | - |
| Bristol | 1,767,460 | $1,065,623 | 2.26% | 1,532,789 | $1,003,387 | 0.98% |
| Bristol (County) | - | - | - | 3,572,204 | $1,098,001 | 1.07% |
| Charlestown | - | - | - | - | - | - |
| Davisville (community) | - | - | - | - | - | - |
| East Greenwich | - | - | - | - | - | - |
| Jamestown | 23,200 | $37,119 | 0.03% | 31,850 | $86,990 | 0.08% |
| Little Compton | 3,272,004 | $2,798,250 | 4.18% | 2,130,088 | $2,483,433 | 2.42% |
| Melville | - | - | - | - | - | - |

| Port | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Pounds | Dollars | % of Total State Landings by Value | Pounds | Dollars | % of Total State Landings by Value |
| Middletown | - | - | - | - | - | - |
| Narragansett (census name Narragansett Pier) | - | - | - | - | - | - |
| New Shoreham | 15,118 | $35,616 | 0.02% | 14,024 | $46,412 | 0.05% |
| Newport | 4,824,613 | $6,997,646 | 6.17% | 6,029,861 | $6,378,574 | 6.22% |
| Newport (County)(in PMSA 2480,6480) | - | - | - | 9,401 | $10,430 | 0.01% |
| North Kingstown (local name Wickford) | 20,613,405 | $13,597,762 | 26.34% | 18,884,680 | $14,131,846 | 13.77% |
| Point Judith | 42,240,850 | $45,537,030 | 53.98% | 43,916,203 | $71,079,310 | 69.27% |
| Portsmouth | 159,809 | $402,232 | 0.20% | 136,212 | $425,457 | 0.41% |
| Providence (County)(in PMSA 6060,6480) | - | - | - | - | - | - |
| Rhode Island (State) | 46,892 | $189,030 | 0.06% | 180,987 | $2,975,245 | 2.90% |
| South Kingstown (Town of) | 58,406 | $179,608 | 0.07% | 76,814 | $218,455 | 0.21% |
| Tiverton | 335,629 | $400,194 | 0.43% | 463,197 | $808,330 | 0.79% |
| Unknown | - | - | - | - | - | - |
| Wakefield | 600 | $512 | 0.00% | - | - | - |
| Warren | 33,107 | $140,131 | 0.04% | 12,109 | $66,966 | 0.07% |
| Warwick | - | - | - | - | - | - |
| Warwick (RR name Apponaug) | 4,837,338 | $1,324,468 | 6.18% | 5,609,852 | $1,695,417 | 1.65% |
| Westerly (census name Westerly Center) | 25,512 | $71,997 | 0.03% | - | - | - |
| **Total** | **78,253,942** | **$72,777,217** | **100.00%** | **82,600,271** | **$102,508,252** | **100.00%** |

*Source: RIDEM DMF. 2022. Rhode Island Annual Fisheries Report: 2020. March 2022. Retrieved from: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/AnnualRpt_2020.pdf. and RIDEM DMF. 2022. Rhode Island Annual Fisheries Report: 2021. May 2022. Retrieved from: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/AnnualRpt_2021.pdf.*

Year to year variations (e.g., a large decrease from 2019 to 2020 and then an increase from 2020 to 2021) seen in Tables 3-12 and 3-13 can largely be attributed to the COVID-19 pandemic and its severe impact on the fishing industry. Outreach to the commercial fishing industry in Rhode Island by SouthCoast Wind confirmed that there were differential impacts on fisheries (e.g., squid) because of the pandemic's differential impact on restaurant versus at-home seafood consumption and the species typically consumed in those different situations.

While the fishing activity in the ECC is relatively lower than in other areas of the region, there are commercial fishing vessels from Rhode Island, Massachusetts, and other states that fish in the ECC and fish caught in the ECC may be landed in other states besides Rhode Island and Massachusetts. The top 10 ports with the highest annual average landings based on annual totals from 2008 to 2018 in the ECC are presented in Table 3-14. When considering ports with sufficient dealers and unique permits,[94] the top three ports in the ECC were New Bedford, Massachusetts, Point Judith, Rhode Island, and Newport, Rhode Island.

**TABLE 3-14. ANNUAL AVERAGE LANDINGS AND VALUE FOR TOP 10 PORTS IN THE ECC**

| Port Landed | Average Yearly Landings (lbs.) | Average Yearly Value (dollars) |
|---|---|---|
| New Bedford, MA | 575,459 | $265,404 |
| Point Judith, RI | 264,544 | $248,449 |
| Newport, RI | 114,982 | $37,928 |
| Little Compton, RI | 91,258 | $120,977 |
| All Others | 85,044 | $40,282 |
| Fall River, MA | 56,161 | $13,358 |
| Gloucester, MA | 28,054 | $4,226 |
| Montauk, NY | 21,992 | $24,981 |
| Boston, MA | 19,966 | $3,646 |
| Barnstable, MA | 2,609 | $2,458 |
| Total for All Ports | 1,331,827 | $910,751 |

*Source: Source: B. Galuardi, personal communication, 2 July 202.1*

### *3.6.1.3. Vessel Trip Report Data Analysis*

National Marine Fisheries Service Vessel Trip Report (VTR) data was used to determine the average fish landings from 2008-2018 as presented below in Table 3-15. VTR is a self-reported data reporting system required for all federally permitted fishing vessels. There are some reasonable limitations to VTR data but it currently represents the best Offshore Project Area-specific data sets available and it is analyzed here to provide a sense of where, when, and how certain species are being caught. Full records of the VTR data analyzed by SouthCoast Wind can be found in Appendix V of the COP - Commercial and Recreational Fisheries and Fishing Activity Technical Report.

Within the ECC, the average annual fish landings were 1,331,827 pounds valued at $910,751. The most commonly landed species by weight were Atlantic herring, skate wings, and Loligo squid. The most

[94] Data for ports with an insufficient number of unique dealers and/or permit holders are anonymized and aggregated and fall under the "All Others" category.

commonly landed species by revenue were American lobster, Loligo squid, and summer flounder/fluke (Table 3-15). Bluefish also represented the highest percent exposure (0.05%) of total landings by weight caught within the ECC. Atlantic herring represented the highest average landings, but also the highest variability. In 2013, landings of Atlantic herring in the ECC totaled $238,472 and 2,000,563 pounds but did not exceed $90,492 and 1,081,204 pounds in any other year between 2008 and 2018 (B. Galuardi, personal communication, October 6, 2020).

**TABLE 3-15. AVERAGE VTR LANDINGS IN THE ECC FROM 2008-2018**

| Species | Average Annual Landings (lbs.)/Year | Average Annual Value ($)/Year | Species Landings (lbs.) Exposure (percent) | |
|---|---|---|---|---|
| | | | Minimum | Maximum |
| Atlantic herring | 441,022 | $ 50,638 | 0.0 | 0.01 |
| Skate Wings | 299,731 | $ 44,196 | 0.0 | 0.02 |
| Loligo Squid | 167,324 | $191,311 | 0.0 | 0.01 |
| All others | 113,148 | $72,783 | N/A | N/A |
| Scup/ Porgy | 59,187 | $39,147 | 0.0 | 0.01 |
| American lobster | 43,638 | $211,205 | 0.0 | 0 |
| Spiny dogfish | 31,903 | $7,026 | 0.0 | 0.01 |
| Silver Whiting/hake | 27,256 | $15,480 | 0.0 | 0 |
| Summer flounder/fluke | 25.457 | $85,426 | 0.0 | 0 |
| Bluefish | 21,344 | $10,859 | 0.0 | 0.05 |
| Jonah crab | 18,843 | $12,924 | 0.0 | 0.0 |
| Atlantic mackerel | 18,229 | $3,921 | 0.0 | 0.0 |
| Monk | 11,397 | $18,629 | 0.0 | 0.0 |
| Butterfish | 8,961 | $5,917 | 0.0 | 0.0 |
| Black sea bass | 8,021 | $30,510 | 0.0 | 0.0 |
| Channeled whelk (bushel) | 6,189 | $48,848 | 0.0 | 0.0 |
| **Total for All Species** | **1,331,827** | **$910,751** | **0.0** | **0.05** |

*Source: B. Galuardi, personal communication, 2 July 2021.*

### 3.6.1.4. Vessel Monitoring System Data Analysis

Vessel Monitoring System (VMS) data was used to supplement the VTR analysis above. Commercial vessels are required by law to carry mechanisms of monitoring on board to aid in management and regulatory enforcement. VMS utilize mobile transceiver units to record and transmit vessel locations at least once per hour (50 C.F.R. § 660.14).

A fishing vessel is required to carry a VMS and transmit a signal indicating its position when fishing for species in a method that triggers VMS requirements. Within the ECC, VMS is broadly required when fishing for Atlantic sea scallops, monkfish, Atlantic herring, Atlantic surf clam, ocean quahog, shortfin squid, longfin squid, butterfish and species managed under the Northeast Multispecies Management and Consolidated Atlantic Highly Migratory Species Management Plans. The results of the VMS data analysis (using data from 2011-2014 and 2015-2016) indicated a varied density of commercial fishing vessel activity within the applicable fisheries; squid, Northeast Multispecies, monkfish, Atlantic herring, Atlantic sea scallop, Atlantic surf clam, and Atlantic mackerel fisheries in the northeast and mid-Atlantic regions. Overall, there is a comparatively higher density of fishing activity in the ECC than the SouthCoast Wind Lease Area, due to the variety of favorable benthic habitat characteristics in the ECC. A characterization of the benthic habitat in the ECC can be found in Section 3.3.

#### 3.6.1.5. Automatic Identification System Data Analysis

Automatic Identification System (AIS) is an automated, continuous Global Positioning System (GPS) tracking system that provides a record of the operational history of a vessel. Federal regulations (33 C.F.R. § 164.46) mandate which vessels are required to carry AIS; this includes fishing vessels that are greater than 65 ft (20 m) in length and are self-propelled. The AIS data analysis showed that the ECC passes one area of high fishing vessel transit activity within Rhode Island waters, including vessels transiting to and from New Bedford.[95] As a caveat, not all fishing vessels carry AIS transponders or have them actively recording vessel locations outside of 12 nm (22 km) from the coastline.

#### 3.6.1.6. Common Commercial Gear Types in the ECC

Bottom Trawling

Bottom trawling (also referred to as otter trawling or dragging) is a common mobile gear type in the Northeast used for catching target species that live on the seafloor. Each trawl fishery utilizes unique gear designed specifically to capture the target species (i.e., various mesh sizes, often different within various panels of the same net, different panel configurations, various sizes, designs, and varied doors and door spreads). Modern trawling operations sometimes employ sensors that can be monitored from the wheelhouse in real-time to verify that the gear is properly deployed and fishing effectively as it is towed.

Common species commercially caught in southern New England and within the ECC using bottom trawls include butterfish, flounder species, scup, cod, silver hake, monkfish, and other species.

Pots and Traps

Pots and traps are submerged wire cages that attract target species (usually by bait) and allow them to enter but make it difficult to exit.[96] Fishermen haul the traps back onto their vessel typically using lines attached to the trap with a marker buoy or a high-flyer buoy at the surface to mark its location. Traps can be set individually or strung together in what are called "trawls." Target species for pots and traps include crabs, lobsters, whelk, scup, black sea bass, and eels.[97] In southern New England, lobsters are the primary species targeted by pots and traps, although whelk is becoming increasingly more common as lobster populations have been declining in recent decades in this area.[98, 99, 100] Engagement with individual vessels targeting whelk in the ECC has confirmed that gear configurations and deployment/

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[95] Northeast Regional Ocean Council (NROC). 2018. *Vessel Monitoring Systems (VMS) Commercial Fishing Density, Northeast and Mid-Atlantic Regions.* Data download: https://services.northeastoceandata.org/arcgis1/rest/services/OceanUses.
[96] NMFS. 2019. *Fishing Gear: Traps and Pots.* https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-traps-and-pots.
[97] NMFS 2019.
[98] Atlantic States Marine Fisheries Commission (ASMFC). 2019. *Jonah Crab.* Available at: http://www.asmfc.org/species/jonah-crab.
[99] Gomez-Chiarri, M. & J.S. Cobb. 2012. Shell Disease in the American Lobster, Homarus americanos: A Synthesis of Research from the New England Lobster Research Initiative: Lobster Shell Disease. *Journal of Shellfish Research*, 31(2) : 583-590. https://bioone.org/journals/journal-of-shellfish-research/volume-31/issue-2/035.031.0219/Shell-Disease-in-the-American-Lobster-iHomarus-americanus-i/10.2983/035.031.0219.pdf.
[100] Giannini, C. and P. Howell. 2010. *Connecticut Lobster (Homarus americanus) Population Studies.* NOAA - NMFS, Northeast Region, New London, Connecticut.

hauling methods are consistent with standards in the region, pot and trap gear being set in an approximately east-west orientation at regular intervals, although the whelk effort in the Sakonnet River is reported to currently be lower than it had been in recent years.[101]

Jonah crab is another species that has seen targeted increases in southern New England in recent years. The increase in Jonah crab landings is generally attributed to the decrease in the abundance of southern New England lobsters, resulting in a shift in fishing activity and an increase in the price of other crab species, creating a substitute market for Jonah crab meat.[102]

VTR data from 2008 to 2018 demonstrates that pot and trap fishermen in the ECC landed an annual average of 43,638 pounds of American lobster, 18,843 pounds of Jonah crab, and 6,440 pounds of whelk (channeled and knobbed).

### Gillnetting

Gillnets trap fish by their gills as they try to swim through the netting.[103] The size of the gaps in the net determine which species will get caught and which will be able to swim through freely. Gillnets can be configured in a variety of ways, but typically consist of floats along the top of the net and weights along the bottom to keep the panel aligned vertically in the water column.

Common gillnet target species include, but are not limited to: groundfish (cod, haddock, pollock, flounder, hake), herring, black sea bass, sharks, and other species, depending on the region.[104] In southern New England, gillnets are typically tended on a daily to semi-weekly basis for groundfish species, managed under the Northeast Multispecies Fisheries Management Plan. Anchored gillnets set very near the seabed are known as 'bottom gillnets or 'sink gillnets' and represent the most common type of gillnetting in the New England commercial fishing industry.[105, 106]

### Hydraulic Clam Dredge

Hydraulic clam dredges harvest bivalves from the soft bottom sediments in which they are buried. This technique of harvesting Atlantic surf clams and ocean quahogs is utilized where soft bottom conditions allow for the gear to penetrate the seafloor enough to make this method efficient for capturing clams. The hydraulic dredges are dragged slowly along the bottom by the fishing vessel as a large hydraulic pump on the fishing vessel pumps sea water through a hose to a manifold on the front of the dredge.

The manifold jets the water into the sand, temporarily fluidizing the sand and allowing the dredge to penetrate the sediment to a depth below the seafloor of approximately 1.0 ft (0.3 m), capturing bivalves (and similarly sized rocks, debris, or fish) in the process.

As this is a depletion fishery, these vessels will make repeated passes through an area until the clam numbers drop. In addition, clams are long-lived bivalves, and it has historically proven difficult to predict where commercially viable volumes may be found, resulting in a high degree of inter-annual variation in landings.

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[101] Atlantic Coastal Cooperative Statistics Program (ACCSP). 2021. *Comprehensive, species-specific landings database*. https://www.accsp.org.
[102] ASMFC. 2019. *American Lobster*. http://www.asmfc.org/species/american-lobster.
[103] NMFS. 2019. *Fishing Gear: Gillnets.* https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-gillnets.
[104] NMFS. 2019. *Fishing Gear: Gillnets.*
[105] NMFS. 2019. *Fishing Gear: Gillnets.*
[106] Pol, M. and H.A. Carr. 2000. Overview of Gear Developments and Trends in the New England Commercial Fishing Industry. *Northeastern Naturalist* 7(4): 329-336.

Atlantic surf clams and ocean quahogs are the most common species commercially targeted by this gear in southern New England, but fishing activity is more concentrated outside of the ECC than in it.

### *3.6.1.7. Summary of Commercial Fishing in the ECC*

VMS, AIS, and VTR data were used to evaluate fishing activity in the ECC. In addition to actively fishing in the ECC, commercial fishing vessels also transit through this area throughout the year. This is based on an analysis of charts of AIS tracks overlaid on the proposed ECC and discussions of relative fishing effort via VMS and VTR data analysis. Based on the time ranges of these datasets, SouthCoast Wind anticipates that fishing vessel transit and activity will continue in this area for the lifetime of the proposed Project.

VTR data shows bottom trawl and pots and trap fishing activity within the Sakonnet River near the cable landfall location in the ECC.

As shown above in Table 3-13, Point Judith, Rhode Island and New Bedford, Massachusetts received the highest revenue from commercial fish caught and landed from the ECC. The Port of New Bedford is identified as a potential port for Project construction, O&M, and decommissioning activities. SouthCoast Wind has validated fisheries landing data with field observations from geophysical surveys, consultation with fishing stakeholders, including Fisheries Representatives, fishing organizations, and individual vessels. Further consultation with stakeholders as well as fisheries economists will determine the level of exposure that exists for boats using the ports and their use of the ECC.

Fishing is considered exposed in the 2017 Kirkpatrick et al.[107] study if it occurs within 1.0 nm (1.9 km) of a Wind Energy Area, which, for the purposes of the proposed Project, is the Kirkpatrick Study Area (composed of both the Rhode Island/ Massachusetts Wind Energy Area and the Massachusetts Wind Energy Area).[108] For commercial fisheries, exposure does not measure economic impact or loss but is defined as the potential for a fishery to see an impact from offshore wind development. Based on the exposed fisheries within the Kirkpatrick Study Area[109] trawling, midwater trawling, gillnetting, and pots and traps are the most prominent gear types utilized in the area. Bottom trawlers in the Kirkpatrick Study Area target species within the Small Mesh Multispecies Fishery Management Plan (FMP) (silver hake, red hake, offshore hake) as well as Squid, Mackerel, Butterfish FMP (Atlantic mackerel, chub mackerel, longfin squid, shortfin squid, and butterfish).[110, 111, 112] Gillnetters in the Kirkpatrick Study Area primarily target monkfish, skates, and spiny dogfish, as well as summer flounder, scup, and black sea bass.[113] Pots and traps catch species in the ECC including Jonah crab,[114] American lobster,[115] whelks,[116] rock crabs,[117] and black sea bass.[118] A description of these gear types is provided above.

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107 Kirkpatrick, A.J., S. Benjamin, G.S. DePiper, T. Murphy, S. Steinback, and C. Demarest. 2017. SocioEconomic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic. Volume II—Appendices. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region, Washington, D.C. OCS Study BOEM 2017-012. 191 pp.
108 Kirkpatrick et al. 2017.
109 Kirkpatrick et al. 2017.
110 Kirkpatrick et al. 2017.
111 New England Fishery Management Council. 2021. *Small-mesh Multispecies FMP. Plan Overview.* https://www.nefmc.org/management-plans/small-mesh-multispecies
112 Mid-Atlantic Fishery Management Council. 2021. Overview. *Mackerel, Squid, and Butterfish.* https://www.mafmc.org/msb.
113 Kirkpatrick et al. 2017.
114 Atlantic States Marine Fisheries Commission. (ASFMC). 2021. *Jonah Crab.* http://www.asmfc.org/species/jonah-crab.
115 ASMFC. 2019. *American Lobster.* Available online: http://www.asmfc.org/species/american-lobster.
116 Massachusetts Division of Marine Fisheries. (MA DMF). 2021. *Whelks and Whelk Management.* https://www.mass.gov/service-details/whelks-and-whelk-management.
117 Maine Sea Grant. (n.d.). *Maine Seafood Guide – Crab.* https://seagrant.umaine.edu/maine-seafood-guide/crab/.
118 ASFMC. 2021. *Black Sea Bass.* http://www.asmfc.org/species/black-sea-bass.

## 3.6.2. Recreational Fishing

For the purposes of this section, recreational fishing is referred to as saltwater fishing for sport or pleasure, either by for-hire boats or by private anglers.[119] Saltwater recreational fishing takes place from shore, aboard private or rented boats, and on boats that take passengers for hire. For-hire recreational fishing can be assessed from either a boat level or angler level. Boat level recreational fishing activity is assessed in terms of the average annual number and percentage of exposed boats, trips, and revenues. Angler level recreational fishing activity is assessed in terms of average annual number and percentage of exposed angler trips and expenditures. Approximately 96 for-hire recreational fishing boats are ported in Rhode Island.[120] The intensity and locations of recreational fishing within Rhode Island state waters are not expected to be affected. In fact, the proposed Project may provide some positive effects to recreational fisheries by creating new fish-friendly habitats for certain species.[121] It has been recognized that the Project infrastructure may function as fish aggregating devices[122] and provide additional habitat for certain species.

Species targeted by this fishing community exist throughout the entire near-coastal region and within the Kirkpatrick Study Area. Commonly caught species for recreational fishing include striped bass, Atlantic mackerel, scup, black sea bass, and haddock (Table 3-16).

**TABLE 3-16. COMMONLY CAUGHT RECREATIONAL FISH SPECIES IN RHODE ISLAND (2019)**

| Rank | Species | Pounds (lbs.) |
|---|---|---|
| 1 | Scup | 2,856,492 |
| 2 | Striped bass | 2,299,617 |
| 3 | Tautog | 1,483,139 |
| 4 | Black sea bass | 1,225,072 |
| 5 | Bluefish | 932,001 |
| 6 | Summer flounder | 837,116 |
| 7 | Atlantic cod | 143,753 |
| 8 | Atlantic menhaden | 135,763 |
| 9 | Atlantic bonito | 102,213 |
| 10 | Striped sea robin | 53,819 |

*Source: NMFS. 2019. Recreational Fishing Data and Statistics Queries. Accessed from NOAA Fisheries Recreational Fishing Data: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-and-statistics-queries.*

Total expenditures of recreational fishing between 2007 and 2012 in Rhode Island were $1.1 million with 3.8% exposed to Wind Energy Areas.[123] Recreational fishing aboard and private boats is considered

[119] NMFS. 2020. *Saltwater Recreational Fishing in the Greater Atlantic Region.* Retrieved November 2020 from: https://www.fisheries.noaa.gov/new-england-mid-atlantic/recreational-fishing/saltwater-recreational-fishing-greater-atlantic.

[120] Steinback, S. & A. Brinson. 2013. *The Economics of the Recreational For-hire Fishing Industry in the Northeast United States,* 2nd ed. Northeast Fisheries Science Center Social Sciences Branch, NOAA Fisheries. Woods Hole, MA. https://www.savingseafood.org/images/recreational_econ.pdf.

[121] Kirkpatrick, A.J., S. Benjamin, G.S. DePiper, T. Murphy, S. Steinback, and C. Demarest. 2017. SocioEconomic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic. Volume I—Report Narrative. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region, Washington, D.C. OCS Study BOEM 2017-012. 150 pp. Retrieved from: https://espis.boem.gov/final%20reports/5580.pdf

[122] Kramer, S. H., C. D. Hamilton, G. C. Spencer, and H. D. Ogston. 2015. Evaluating the Potential for Marine and Hydrokinetic Devices to Act as Artificial Reefs or Fish Aggregating Devices, Based on Analysis of Surrogates in Tropical, Subtropical, and Temperate U.S. West Coast and Hawaiian Coastal Waters. OCS Study BOEM 2015-021. U.S. Department of Energy, Energy Efficiency and Renewable Energy, Golden, Colorado.

[123] Kirkpatrick et al. 2017.

exposed if it occurs within 1.0 nm (1.9 km) of the Offshore Project Area. In 2019, 3,739,018 angler trips via shore fishing, private/rental boats, charter boats, and party boats were estimated to occur in state and federal waters off the coast of [124] Rhode Island.

Recreational fishing locations occur throughout the Sakonnet River, Mount Hope Bay, and Rhode Island Sound. Recreational fishing boats may also transit through the ECC to reach a site, but their exact transit routes are not represented on commonly used, publicly available datasets, as these vessels do not have the VTR, VMS, or AIS requirements discussed previously for commercial fishing vessels. However, recreational fishing effort is known to exist in and around the ECC and much of the effort is clustered in several locations as these boats target these locations (Table 3-17).

**TABLE 3-17. FOR-HIRE RECREATIONAL FISHING LOCATIONS WITHIN OR NEAR THE ECC**

| Name of Fishing Location | Location | Fish species targeted a/ |
|---|---|---|
| Brown's Ledge | Offshore of Sakonnet Point | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Beavertail State Park | The opening of the West Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Brenton Point State Park | The opening of the West Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Sachuest Point National Wildlife Refuge | The opening of the East Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Breakwater at Sakonnet | Inshore of the East Passage, Sakonnet River | Scup, black sea bass, striped bass, summer flounder, bluefish |

*Sources: CRMC. 2010. Rhode Island Ocean SAMP. https://seagrant.gso.uri.edu/oceansamp/pdf/samp_crmc_revised/RI_Ocean_SAMP.pdf.*

For-hire recreational fishing typically occurs from spring through fall for summer flounder, black sea bass, and scup and in late summer/early fall for yellowfin, bluefin, and albacore tuna, sharks, bonito, and false albacore. Striped bass recreational fishing typically occurs in the spring, summer, and fall.

In the Sakonnet River, there are relatively low levels of recreational shellfishing, notably for hard clams. Rhode Island allows recreational harvesting of whelk and bay scallops by Rhode Island residents (with no license requirement), and for the recreational harvesting of lobster and crabs (with a license requirement.[125] In Rhode Island waters, oysters may be harvested with a state permit from September-May, and bay scallops may be harvested in November and December, depending on the gear type.[126]

## 3.6.3. Potential Project Impacts

This analysis includes potential impacts to commercial and recreational fishing (both for-hire and private anglers).

### *3.6.3.1. Aquaculture*

Although there are several approved aquaculture areas within The Cove on Aquidneck Island and adjacent to Hog Island, the export cable route is not directly adjacent or co-located with any of these

[124] NMFS. 2019. *Recreational Fishing Data and Statistics Queries*. Accessed from NOAA Fisheries Recreational Fishing Data: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-and-statistics-queries.
[125] RIDEM. 2021. *Recreational Fishing*. http://www.dem.ri.gov/programs/marine-fisheries/recreational-fishing.php.
[126] RIDEM. 2021.

sites. Further, the ECC is being engineered to select the most feasible and least impactful route centerline and therefore the entire width of the ECC will not be disturbed during cable installation. No impacts are anticipated on aquaculture facilities.

### *3.6.3.2. Commercial and Recreational Fishing*

Commercial and recreational fishermen may be temporarily excluded from actively fishing within or transiting through the localized construction areas and safety exclusion zones during construction of the Project. This may result in a temporary loss of access to fishing grounds. Short-term disturbance of species targeted by commercial or recreational fisheries may occur during the construction phase of the proposed Project, resulting from cable burying and disturbance to the seafloor. However, these impacts will be temporary and localized to discrete zones within the ECC.

Construction activities will cover discrete and localized portions of the offshore Project Area on a temporary basis, relative to the available open water to navigate through, or grounds to fish within. Once construction activities are completed within safety exclusion zones, marine activities, including commercial and recreational fishing, will be allowed to continue as they were prior to construction. SouthCoast Wind will provide the fishing community with advance notice, prior to formal LNMs being issued, describing the location, extent, and duration of construction activities. Should fixed gear become separated from marker buoys, set adrift inadvertently, or mobile gear becoming snagged on, or entangled in cables or other Project components, SouthCoast Wind will work with fishermen through a lost gear claims form process to determine if reimbursement is warranted. A process to compensate fishermen for entanglements of fishing gear by geophysical and geotechnical survey gear has already been developed jointly with other offshore wind developers and with input from the fishing industry via Fisheries Representatives. This joint developer gear loss compensation application form has been made publicly accessible and is available on SouthCoast Wind's website. Additionally, the SouthCoast Wind Fisheries Liaison Officer (FLO) proactively contacts fishermen if their gear is entangled by geophysical and geotechnical survey operations and will continue to do so in later phases of the proposed Project, including during construction.

Short-term disturbance of species targeted by commercial or recreational fisheries may also occur during the construction phase of the proposed Project, resulting from cable burying and disturbance to the seafloor. However, these impacts will be temporary and localized to discrete zones within the ECC. These commercially and recreationally targeted species are expected to disperse to other nearby locations accessible by commercial or recreational fishing vessels.

The concentrations of suspended sediment in the water column (measured as turbidity) will increase for a short period during and following cable installation in the seabed; see Section 3.2.2 of this application and the Hydrodynamics and Sediment Dispersion Modeling Report in Attachment G. Elevated turbidity levels are expected to decrease quickly following cable installation, dropping to under 100 mg/L over ambient concentrations within five hours. Given the short duration and relatively low levels of increase, impacts to fish and fishing activities are not anticipated.

As conveyed in Table 3-16, the ECC is more frequently used for vessels transiting through to their desired fishing locations than for active fishing. As construction begins, commercial and recreational fishermen may find their route extended at times to accommodate certain construction activities, which could temporarily increase their steam times to access fishing grounds.

SouthCoast Wind will coordinate with commercial and recreational fishermen and the RI DMF to provide advance notice of the pre-lay grapnel run/ gear clearance plan, which is performed to clear the centerline of the cable route to facilitate burial of the cable via the jet-plow. The advance notice is intended to allow fishermen the opportunity to remove their deployed fishing gear.

SouthCoast Wind will coordinate with fishermen and the USCG ahead of marine construction operations to review operational planning and schedules to identify areas where fishing operations may be temporarily displaced. These strategies include broad communication strategies (e.g., USCG LNMs and also targeted, direct outreach) to coordinate construction and fishing activities in order to minimize risks to the commercial and recreational fishing industries and deployed gear, as well as other mariners.

Vessel activity during the operational phase will typically involve single vessels transiting at far less frequent intervals than during construction (or decommissioning phases), and therefore is not expected to create measurable interference with commercial or recreational fisheries activities. Therefore, once the proposed Project is operational, fishing vessels will not be considerably impeded from accessing their home ports or their fishing grounds within or outside of the ECC. As part of the future decommissioning of the Project, should the buried export cables be retired in-place, effects on commercial and recreational fishing are not expected.

Secondary cable protection (e.g., mattresses, rock placement, fronded mattress) will be used at cable crossings and for additional cable protection along the ECC if needed where target burial depth is not achieved. Cable protection may result in that area of bottom being a snag concern for trawling or dredging (i.e., due to the potential for gear hangs). Cable protection areas will be marked appropriately on nautical charts, which will limit the likelihood of interaction with fixed or mobile gear. In some cases, areas of hardbottom may have already been known seabed obstructions (snags) prior to construction, as they often represent pre-existing surficial obstructions. Lobster, crabs, and other invertebrate species may also seek shelter within cable protection, resulting in localized, indirect changes in species assemblages and concentrations.

SouthCoast Wind has conducted a Cable Burial Risk Assessment (see Attachment D - "Confidential", provided under separate cover) to calculate the target cable lowering depth to minimize risks to the offshore export cables from damage, and to mitigate potential conflicts between commercial or recreational fishermen and the new structure. This also includes potential risks to the cable from trawling activity along the ECC. To minimize conflicts between fishing gear and the proposed Project's offshore export cables, the offshore export cables will be buried at depths of 3.2 to 13.1 ft (1.0 to 4.0 m), with a target burial depth of 6.0 ft.

For unplanned maintenance of the offshore export cables, a vessel may require anchoring within the ECC. If required, this would also be a low-frequency, short-term activity. In addition, SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.

Within the Brayton Point export cable corridor, the annual yearly landings for all species were valued at $910,751. Loligo squid and lobster represented the highest annual value per year in the ECC from 2008 to 2018. Once the proposed Project is operational, the gear types primarily used by these fisheries (e.g., midwater trawls for squid, pots for lobster) are not expected to be impacted by the presence of the buried offshore export cables within the ECC. Therefore, following installation of the proposed Project, these fisheries are expected to continue to account for landings within the ranges reported from 2008 to 2018, barring outside sources of variance (e.g., inter-annual variation of population abundance, geographic shifts, climate change, or other factors, such as market forces or regulations).

Impacts resulting from decommissioning of the proposed Project are expected to be similar to or less than those already described for construction. The proposed Project's offshore export cables may be left in place to minimize environmental impact, which will also result in a reduction in vessel traffic along the ECC. If cable removal is required, vessel activity for removing the offshore export cables will be limited temporally to the cable removal process, limited spatially to the offshore export cable route, and similar to those experienced during cable installation. Furthermore, decommissioning techniques are expected to advance during the lifetime of the proposed Project. Prior to the decommissioning phase, a full decommissioning plan will be provided to the appropriate regulatory agencies for approval, along with a re-evaluation of potential impacts within the context of the best available science to be considered at that time.

Overall, adverse effects to commercially and recreationally targeted species are expected to be negligible within the context and scale of the southern New England region.[127]

#### *3.6.3.3. Commercial Fishing Landings*

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 ECC; therefore, these fisheries are most likely to be affected during installation of the ECC. During O&M, commercial and recreational fisheries are expected to experience none to limited effects from the presence of the offshore export cables because they will be buried beneath the seabed. SouthCoast Wind has and will continue to work to limit the amount of protection associated with cable crossings and areas in which target burial depth is infeasible. Cable crossings are coordinated with pre-existing cable owners and areas in which target burial depth is infeasible are typically areas of hard bottom, so any added cable protection closely resembles the existing bottom type. SouthCoast Wind will make available the locations of cable protection and use design and installation methods for protection that minimize impacts to both fisheries resources and fishing activity.

The USCG's stated policy is that in the United States vessels will have the freedom to navigate through [wind farms], including export cable routes.[128] Commercial and recreational fishermen will have the ability to continue to fish along the ECC. SouthCoast Wind is currently working with a fisheries economist to prepare an economic exposure analysis to provide a more detailed estimation of impacts to commercial fishing landings (as well as impacts to recreational fisheries) from Project impacts.

### 3.6.4. Proposed Avoidance, Minimization, and Mitigation Measures

#### *3.6.4.1. Proposed Fisheries Monitoring Research and Activities*

SouthCoast Wind has prepared an FMP (included as Attachment K) for Rhode Island state waters. This plan is a product of engagement with RI DMF and outreach to the recreational and commercial fishing industry. In addition, in federal waters, SouthCoast Wind is working with the University of Massachusetts Dartmouth's School for Marine Science and Technology, the Anderson Cabot Center of Ocean Life at the New England Aquarium to conduct baseline surveys of existing fisheries information in and around the Offshore Project Area and establish monitoring plans for pre-construction, construction, post-construction. These fisheries monitoring plans will be designed to align with Bureau of Ocean

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[127] CRMC. 2010. *Rhode Island Ocean SAMP*. https://seagrant.gso.uri.edu/oceansamp/pdf/samp_crmc_revised/RI_Ocean_SAMP.pdf.
[128] See Coast Guard Navigation and Vessel Inspection Circular 01-19 dated 1 August 2019.

Energy Management guidelines (BOEM 2020a[129]), and additional recommendations provided by the Responsible Offshore Science Alliance (ROSA) Fisheries Monitoring Working Group. SouthCoast Wind began a regional monitoring study of Highly Migratory Species and recreational fishing in 2021; collaborating with the New England Aquarium, Inspire Environmental, and other Rhode Island/ Massachusetts Wind Energy Area developers. SouthCoast Wind is also actively participating in regional efforts with other developers, the fishing industry, and academic researchers to promote and standardize fisheries monitoring research and non-extractive survey methods.

The SouthCoast Wind Project will help fuel innovation, advance research, and build consistency across modeling, monitoring and research efforts.

### 3.6.4.2. *Proposed Fisheries Mitigation Measures*

Below is a list of measures applicable to commercial and recreational fisheries that SouthCoast Wind will adopt:

- SouthCoast Wind has developed a Fisheries Communication Plan (COP, Appendix W) with the aid of a FLO and multiple Fisheries Representatives.
- SouthCoast Wind has taken Input from the commercial fishing industry on Project siting, design, navigation, and access.
- SouthCoast Wind has developed a process for financial compensation to commercial fishermen for damages to or loss of fishing gear as well as lost revenue due to gear loss from Project activities.
- SouthCoast Wind has and will continue to add fishermen with local experience as Fisheries Onboard Representatives on geophysical survey vessels, when possible, to coordinate survey activities with fishing activities.
- SouthCoast Wind is currently not aware of any aquaculture lease sites that would be directly affected by the ECC, but will continue to coordinate with RIDEM, RI DMF, RI CRMC, the Habitat Advisory Board, and the Fishermen's Advisory Board.
- SouthCoast Wind is currently working with commercial and recreational fishermen as well as fisheries representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.
- Temporary safety zone restrictions associated with construction activities will limit direct access to areas with construction activity for the safety of mariners and Project employees, but these areas will be limited spatially and temporally.
- SouthCoast Wind will implement temporary safety zones around active construction areas in consultation with USCG and in communication with RIDEM.
- SouthCoast Wind will provide prompt updates to mariners and corresponding web updates as they become available – the frequency of these updates will be dictated by the type of activity, which could be as frequent as daily notifications during construction.
- SouthCoast Wind will notify mariners via LNMs of the presence and location of partially installed structures.

[129] Bureau of Ocean Energy Management (BOEM) Office of Renewable Energy Programs. 2019. Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585. June 2019 and 2020.

- The SouthCoast Wind FLO will proactively contact fishermen if their gear is entangled during construction.
- SouthCoast Wind will consider the use of fixed mooring buoys at various strategic locations in the Project Area to avoid the need for anchoring.
- SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.

SOUTHCOAST WIND

# SouthCoast Wind 1 Project

# Attachment N: WQC/Marine Dredge Application

# (CONFIDENTIAL)

New: October 2023

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SOUTHCOAST WIND

# Benthic Monitoring Plan – Lease Area and Brayton Point ECC

| | |
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| B | Annie Murphy | Erin Healy | Jennifer Flood | 7-June-23 | Final |

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## Glossary

| Acronym | Definition |
|---|---|
| aRPD | apparent redox potential discontinuity |
| BAG | Before-After Gradient |
| BIWF | Block Island Wind Farm |
| BOEM | Bureau of Ocean Energy Management |
| CRMC | Coastal Resources Management Council |
| CMECS | Coastal and Marine Ecological Classification Standard |
| COP | Construction and Operations Plan |
| CZM | Office of Coastal Zone Management |
| DMF | Division of Marine Fisheries |
| ECC | Export Cable Corridor |
| ft | feet |
| GAM | Generalized Additive Model |
| GLM | Generalized Linear Model |
| GLMM | Generalized Linear Mixed Model |
| HD | high definition |
| HDD | horizontal directional drilling |
| IAC | Inter-Array Cable |
| INSPIRE | INSPIRE Environmental |
| km | kilometer |
| LPIL | lowest possible taxonomic unit |
| m | meter |
| mm | millimeter |
| MA | Massachusetts |
| Mass DEP | Massachusetts Department of Environmental Protection |
| MA CZM | Massachusetts Office of Coastal Zone Management |
| MA/RI WEA | Massachusetts/Rhode Island Wind Energy Area |
| MEPA | Massachusetts Environmental Policy Act Office |
| mm | millimeter |
| nm | nautical mile |
| nMDS | non-metric Multidimensional Scaling |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| OCS | Outer Continental Shelf |
| OSP | Offshore Substation Platform |
| PV | Plan View |
| QA/QC | quality assurance/quality control |
| RI | Rhode Island |
| RIDEM | Rhode Island Department of Environmental Management |
| RI HAB | Rhode Island Habitat Advisory Board |
| ROSA | Responsible Offshore Science Alliance |

| Acronym | Definition |
|---|---|
| ROV | Remotely Operated Vehicle |
| SPI | Sediment Profile Imaging |
| UHD | ultra-high definition |
| USBL | Ultra-Short Baseline |
| WTG | Wind Turbine Generator |

# 1. Introduction

SouthCoast Wind Energy LLC proposes to construct and operate the SouthCoast Wind Project (Project) to generate renewable power off the coast of Massachusetts and Rhodes Island (SouthCoast Wind Energy LLC 2022). The wind farm portion of the Project is located in Federal Waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0521 (Lease Area). The Lease Area is 26 nautical miles (nm) (48 kilometers [km]) south of Martha's Vineyard, 20 nm (37 km) south of Nantucket, and 51 nm (94 km) southeast of the Rhode Island coast (Figure 1-1). The Lease Area encompasses 127,388 acres (51,552 hectares) and the Project includes the following components:

- up to 147 wind turbine generators (WTGs);
- up to five offshore substation platforms (OSPs);
- submarine inter-array cables (IACs) connecting WTGs and OSPs;
- offshore export cables within two offshore Export Cable Corridors (ECCs);
- two points of interconnection, with one at Brayton Point in Somerset, MA and one in Falmouth, MA;

The WTGs will occupy up to 147 of the 149 possible positions, which will conform to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout. The grid orients east-west and north-south and aligns with layouts across the entire Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA).

In addition to the Lease Area, this Benthic Monitoring Plan focuses on the Brayton Point ECC. The Brayton Point ECC extends from the Lease Area north and then west through Federal Waters, into Rhode Island State Waters through Rhode Island Sound to the Sakonnet River where it will head north, cross Aquidneck Island in Portsmouth, RI, continue northeast into Mount Hope Bay, and then into Massachusetts State Waters to Brayton Point in Somerset, MA (Figure 1-1). The nominal width of the Brayton Point ECC spans 1,640 feet (ft, 500 meters [m]) to 2,300 ft (700 m). A separate benthic monitoring plan will be developed for the Falmouth ECC route.

## 1.1 Overview of Monitoring

This benthic monitoring plan has been developed in accordance with recommendations set forth in "Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf" (BOEM, 2019), which states that a benthic habitat survey plan should aim to:

- Identify and confirm dominant macrofaunal and macrofloral communities and substrate present where development is proposed;
- Establish a pre-construction baseline that may be used to assess whether detectable changes occurred in post-construction benthic habitat associated with proposed operations;
- Collect additional information aimed at reducing the uncertainty associated with baseline estimates and/or to inform the interpretation of survey results; and

- Develop an approach to quantify any substantial changes in the benthic community composition associated with proposed operations.

This benthic monitoring plan begins with a brief overview of the existing conditions of the benthic environment associated with the Project as informed by previously conducted baseline surveys and the associated benthic habitat mapping. The benthic monitoring plan then provides specific objectives and hypotheses regarding the potential impacts and recovery of the existing benthic habitats as a result of the development and operations of the wind farm. The general approaches proposed to test each of these hypotheses through benthic monitoring are then described.

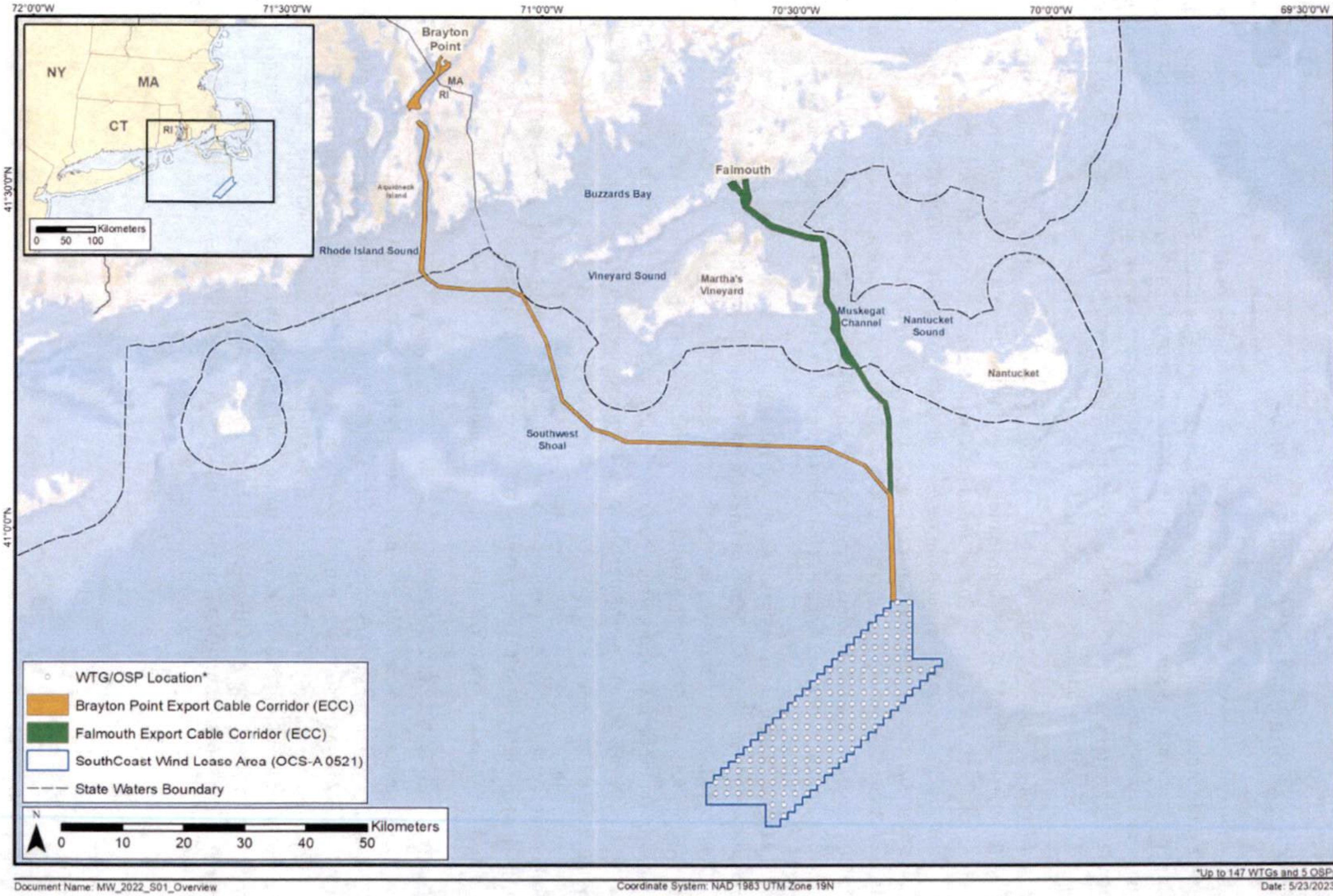



**Figure 1-1. Location of the SouthCoast Wind Lease Area with potential wind turbine generator (WTG) and offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs)**

# 2. SouthCoast Wind Benthic Habitat Overview

SouthCoast Wind collected extensive site-specific geophysical data and ground-truth data to map and characterize habitats within the Study Area (SouthCoast Wind Construction and Operations Plan [COP] Appendix M.3, Benthic Habitat Mapping to Support Essential Fish Habitat [EFH] Consultation, INSPIRE Environmental [INSPIRE], 2022). To collect these data, surveyors employed state-of-the-art equipment, yielding high-resolution data and meeting the recommended resolution specified in BOEM's Geophysical, Geotechnical, and Geohazard Guidelines (BOEM, 2020a) and NMFS' recommendations (NMFS, 2021).

The Habitat Mapping Report (COP Appendix M.3, INSPIRE, 2022) described two benthic habitat types within the Lease Area (Sand – Mobile, Mud to Muddy Sand), seven benthic habitat types within the offshore portion of Brayton Point ECC (Glacial Moraine A, Coarse Sediment, Coarse Sediment – Mobile, Sand, Sand – Mobile, Mud to Muddy Sand, Bedrock), and eight benthic habitat types within the nearshore portion of Brayton Point ECC (Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, Sand, Sand – Mobile, Mud to Muddy Sand, Mud to Muddy Sand – Mobile, Bedrock, Anthropogenic) (Figures 2-1 through 2-3). When habitats were updated with modifiers, mobile habitats characterized by ripples, discrete areas of boulder fields, discrete areas with extensive Crepidula (slipper shell) cover, and nearshore habitats characterized by submerged aquatic vegetation were identified.

The Habitat Mapping Report crosswalked benthic habitat types with modifiers to the NOAA Habitat Categories (COP Appendix M.3, INSPIRE, 2022). NMFS defines the following NOAA Habitat Categories for EFH consultation (NMFS, 2021): soft bottom, complex, heterogeneous complex, and large grained complex (large boulders). "Complex habitats" includes SAV, shell substrate, and sediments with >5 percent gravel of any size, according to these definitions for EFH consultation, while "heterogeneous complex" includes a combination of soft bottom and complex features (NMFS, 2021). The Habitat Mapping Report outlines the details of the crosswalk (COP Appendix M.3, INSPIRE, 2022).

A comprehensive description of the benthic habitats and their distribution in association with the Project is provided in the Benthic Habitat Mapping Report (COP Appendix M.3). Below, a brief overview of the benthic habitats present at the SouthCoast Wind Lease Area and along the Brayton Point ECC is provided.

## 2.1 SouthCoast Wind Lease Area

The SouthCoast Wind Lease Area seafloor is predominantly flat with low rugosity and slope (COP Appendix M.3, INSPIRE, 2022). The water depths range from about ~35 m (115 ft) in the northeastern portion of the Lease Area to about ~60 m (197 ft) in the southwestern portion of the Lease Area (Figure 2-1). A single habitat type dominates the Lease Area, representing 98.5 percent of the area: Mud to Muddy Sand habitat (Figure 2-1). Small, isolated areas of Sand – Mobile habitat characterized by ripple scour depressions comprised the remaining 1.5 percent of the area mapped at the Lease Area (Figure 2-1). This habitat is characterized by Soft Sediment Fauna (CMECS Biotic Subclass). The Soft Bottom NOAA Complexity Category comprised 100 percent of the habitat from the Lease Area.

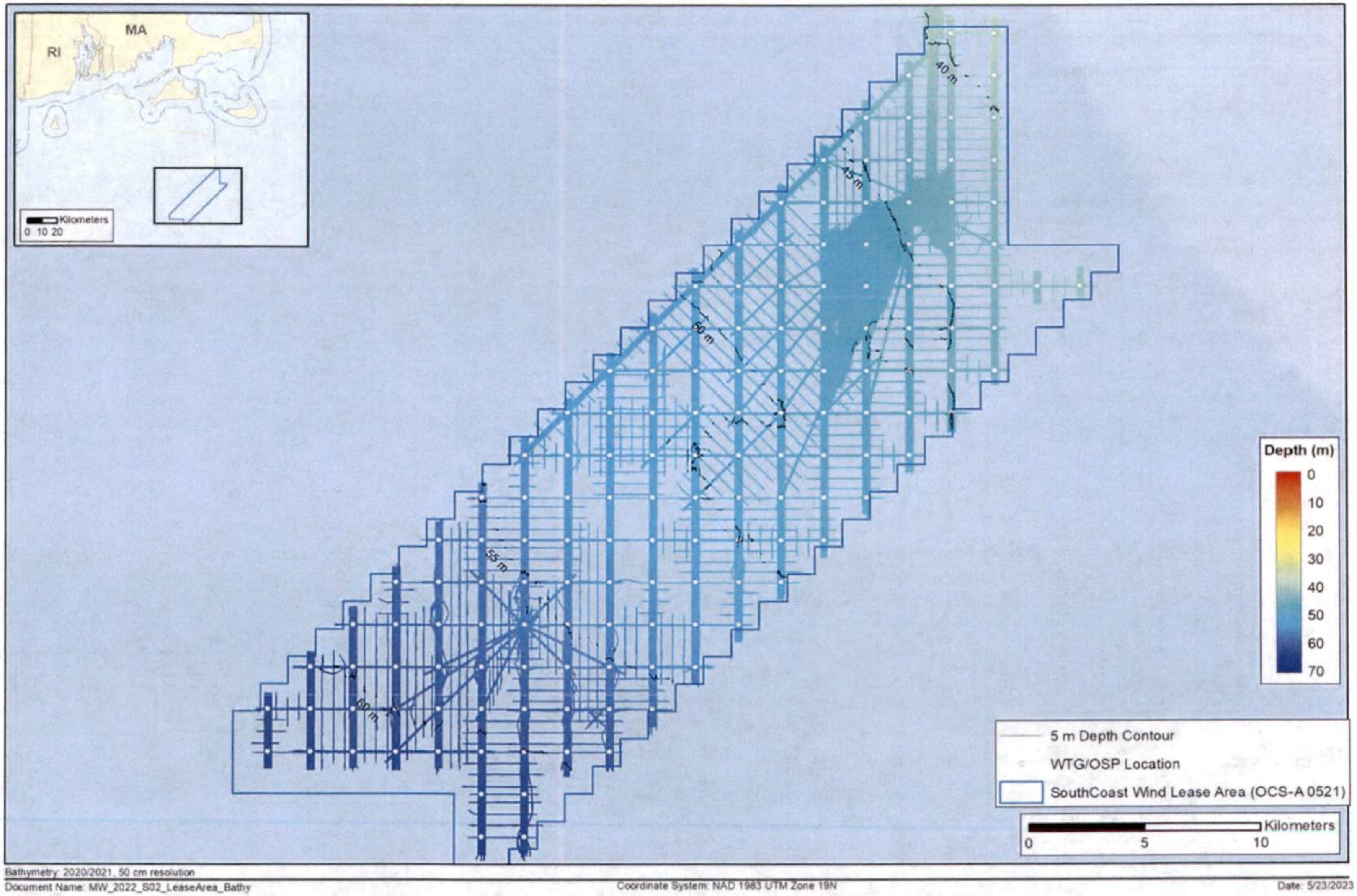



**Figure 2-1a.** **Bathymetry at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

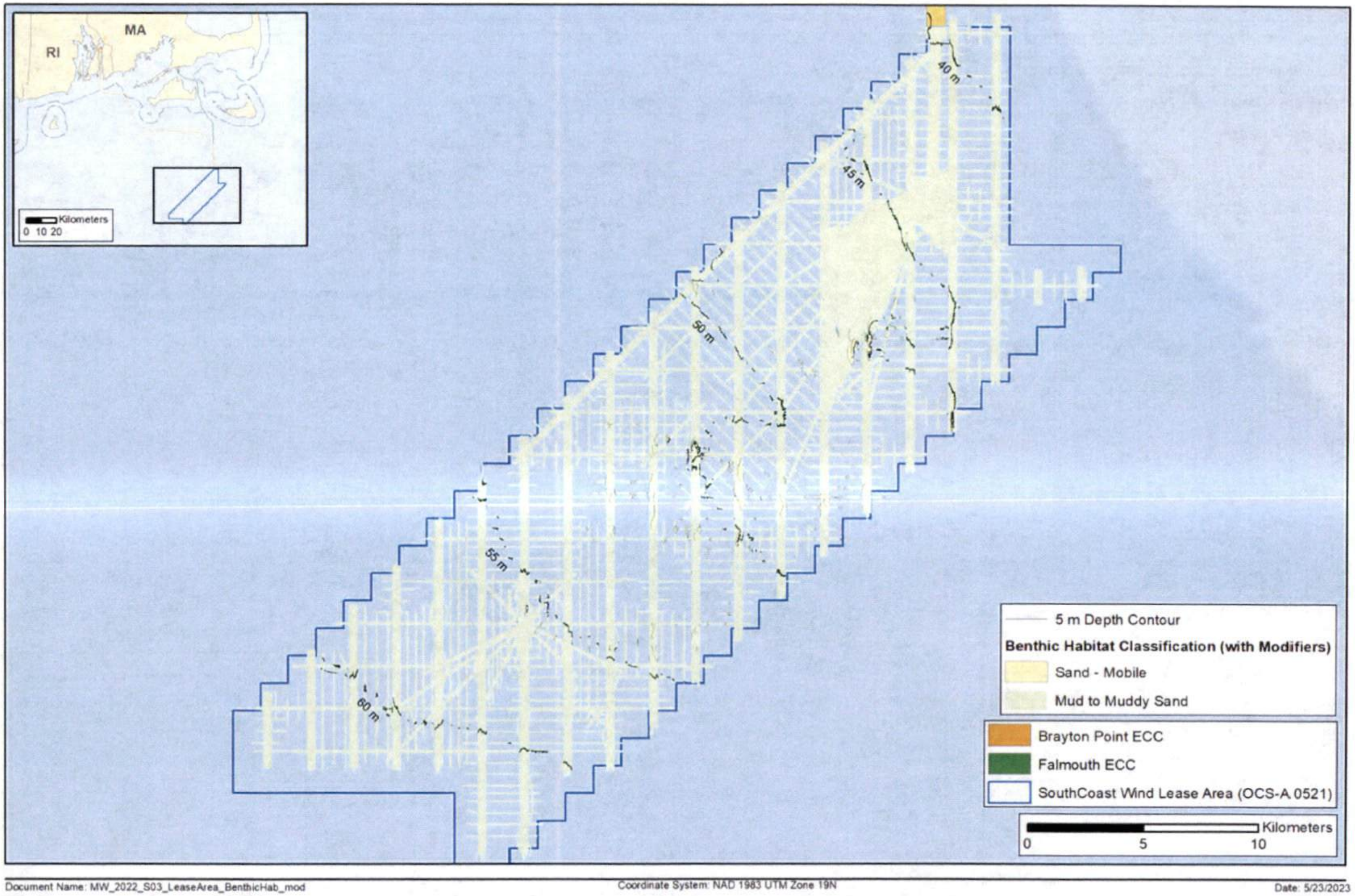



**Figure 2-1b. Benthic habitats at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

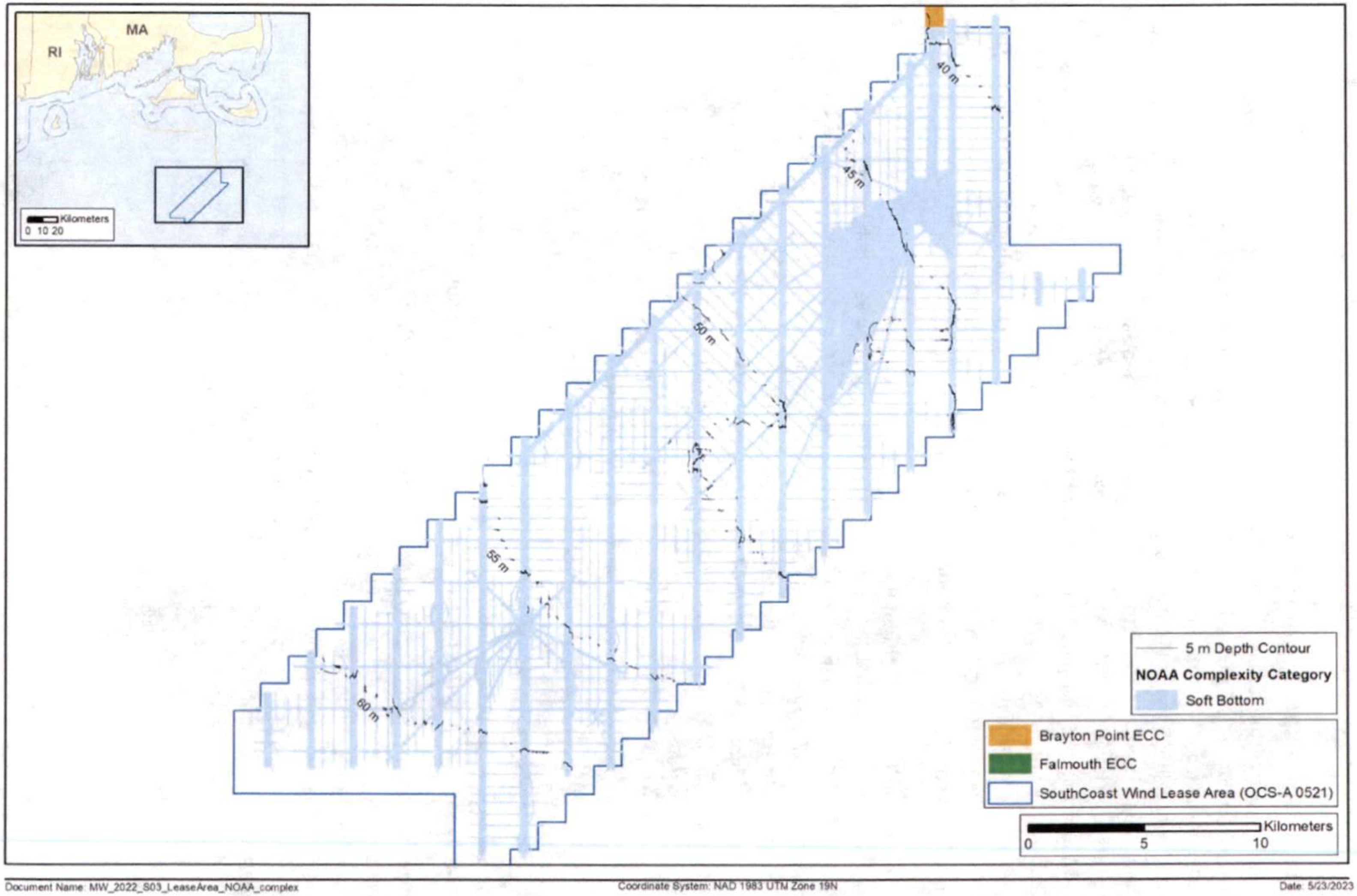



**Figure 2-1c.** **Benthic habitats classified using NOAA categories at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

## 2.2 Brayton Point Export Cable Corridor

The water depths range from about ~25 m (82 ft) to about ~40 m (131 ft) in the Federal Waters portion of the Brayton Point ECC (Figure 2-2). Several different benthic habitats occur along Brayton Point ECC in Federal Waters ranging in complexity from Mud to Muddy Sand and Glacial Moraine A (Figure 2-2; COP Appendix M.3, INSPIRE, 2022). The segment of the Brayton Point ECC corridor just north of the SouthCoast Wind Lease Area, is composed of Mud to Muddy Sand and transitions to a combination of Sand and Sand – Mobile as it transits west. These three benthic habitats are classified by the NOAA Complexity Category Soft Bottom (Figure 2-2). A stretch of Coarse Sediment – Mobile habitat, classified as Complex by the NOAA Complexity Category occurs east of where the route redirects to the northwest. A pocket of Glacial Moraine A, characterized by boulder fields (NOAA Complex and Large Grained Complex habitat) occurs along the portion of the Brayton Point ECC adjacent to the Southwest Shoal, where the route redirects north-northwest. From there, the benthic habitat transitions back to a combination of Sand and Sand-Mobile (NOAA Soft Bottom) until it enters Rhode Island State Waters.

In the State Waters portion of the Brayton Point ECC, the water depths range from about <5 m (<16 ft) to about 25 m (82 ft) (Figure 2-3). In Rhode Island State Waters, Mud to Muddy Sand habitat and Sand habitat comprised a total of ~62 percent of the Brayton Point ECC, both of which are classified as the NOAA Complexity Category Soft Bottom (Figure 2-3; COP Appendix M.3, INSPIRE, 2022). In Massachusetts State Waters, Mud to Muddy Sand habitat comprised ~87 percent of the Brayton Point ECC (COP Appendix M.3, INSPIRE, 2022). Where the Brayton Point ECC extends north of the Rhode Island State Waters boundary, the benthic habitat includes a combination of Glacial Moraine A, Gravel Pavement, Mixed-Size Gravel in Muddy Sand to Sand, and Sand (Figure 2-3). Along this stretch of cable corridor, these habitats translate to a mixture of NOAA Complexity Categories Complex, Large Grained Complex, and Soft Bottom (Figure 2-3). At the mouth of the Sakonnet River, the benthic habitat along the Brayton Point ECC is composed largely of Sand and transitions to Mud to Muddy Sand as the corridor extends north into the Sakonnet River and through Mount Hope Bay (NOAA Complexity Category Soft Bottom). Within these areas, pockets of *Crepidula* Substrate and Shell Substrate overlay muds, particularly near Aquidneck Island (NOAA Complexity Category Complex). Small clusters of individual surficial boulders occur in the lower portion of Mount Hope Bay near Aquidneck Island. In Massachusetts State Waters, the benthic habitat is composed mainly of Mud to Muddy Sand, with Anthropogenic features and Sand at the mouth of the Taunton River (Figure 2-3).

Soft Sediment Fauna dominated the portions of the Brayton Point ECC, in soft bottom sediments in sand and mud habitat types and in patches within gravel habitat types (COP Appendix M.3, INSPIRE, 2022). Attached Fauna occurred more frequently in habitats dominated by large gravels: Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, and those with Boulder Field(s) (COP Appendix M.3, INSPIRE, 2022). Northern star coral occurred in Brayton Point ECC in Federal Waters and in Rhode Island State Waters in Rhode Island Sound. The non-native tunicate *Didemnum* spp. potentially occurred in the Federal Waters portion of the Brayton Point ECC at Southwest Shoal.

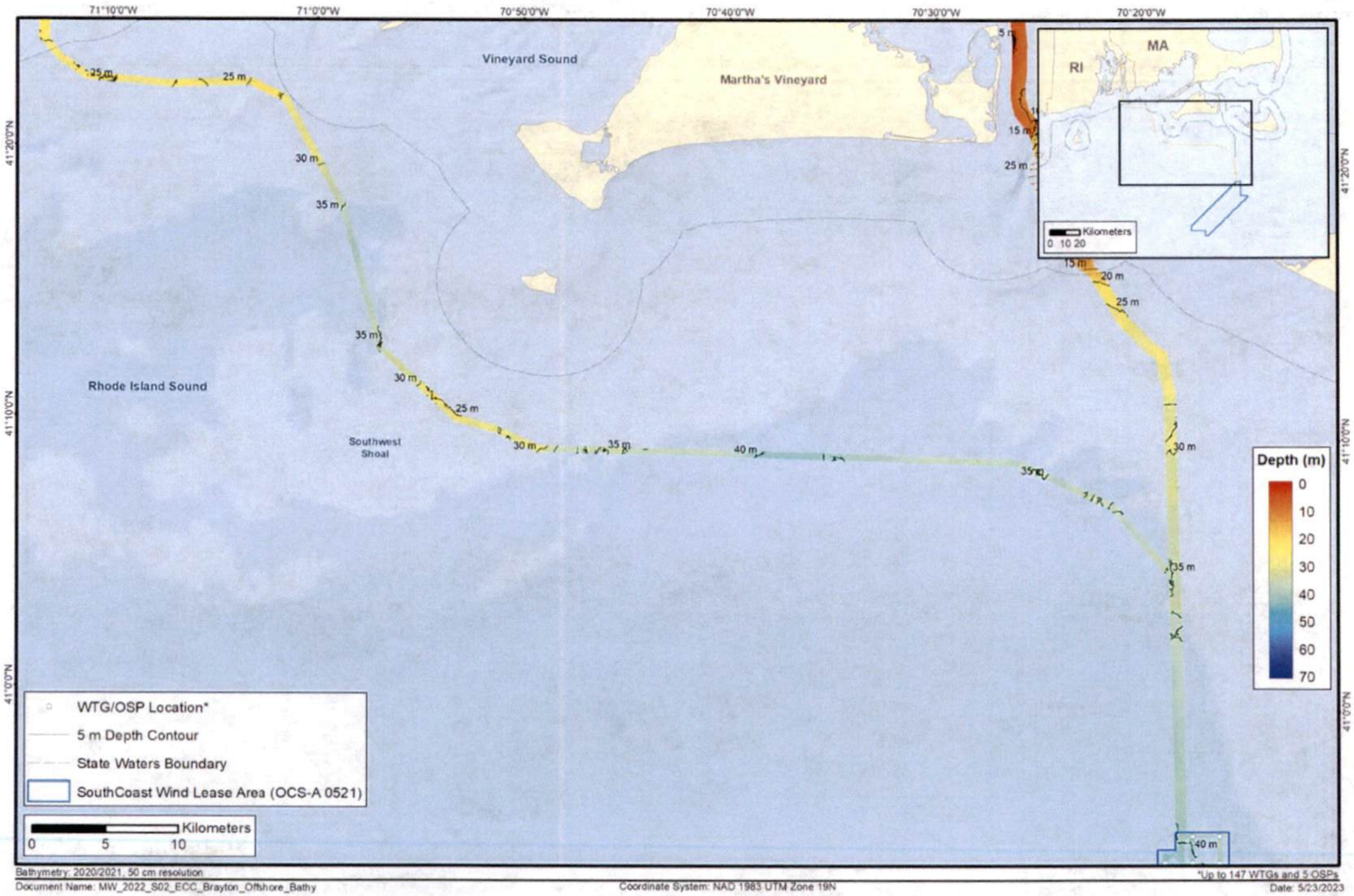



**Figure 2-2a.** **Bathymetry at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

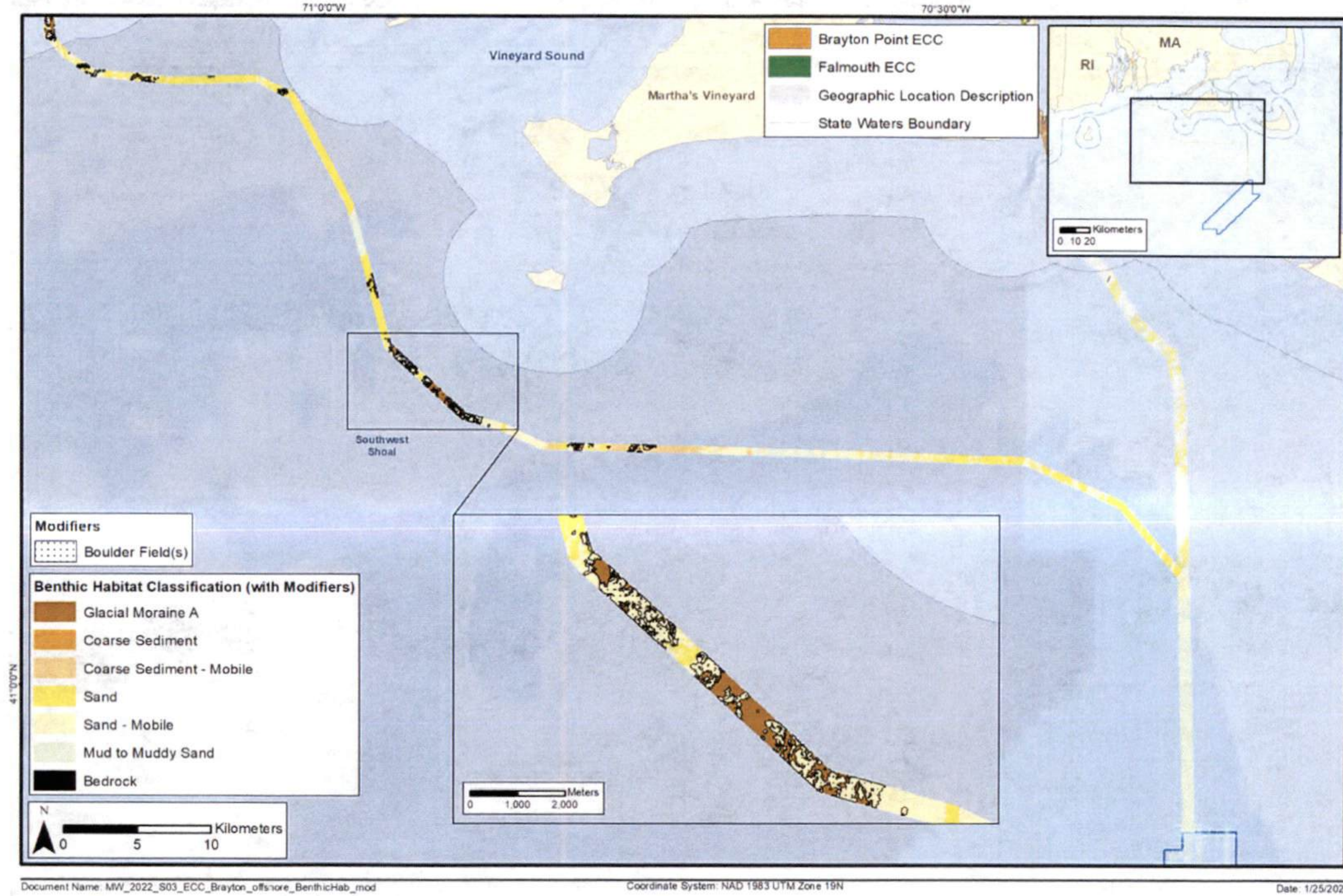



**Figure 2-2b.** **Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

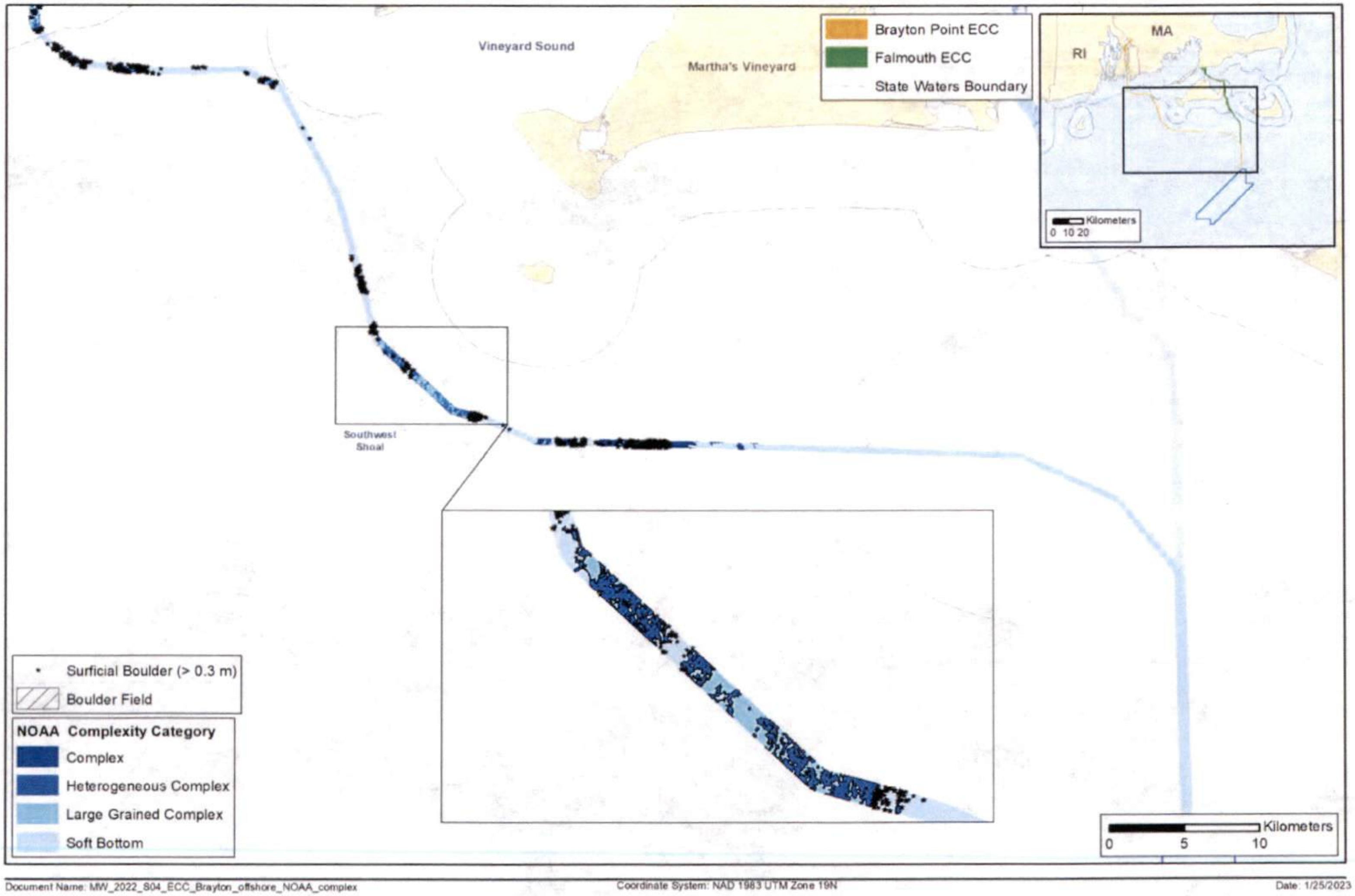



**Figure 2-2c.** **Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

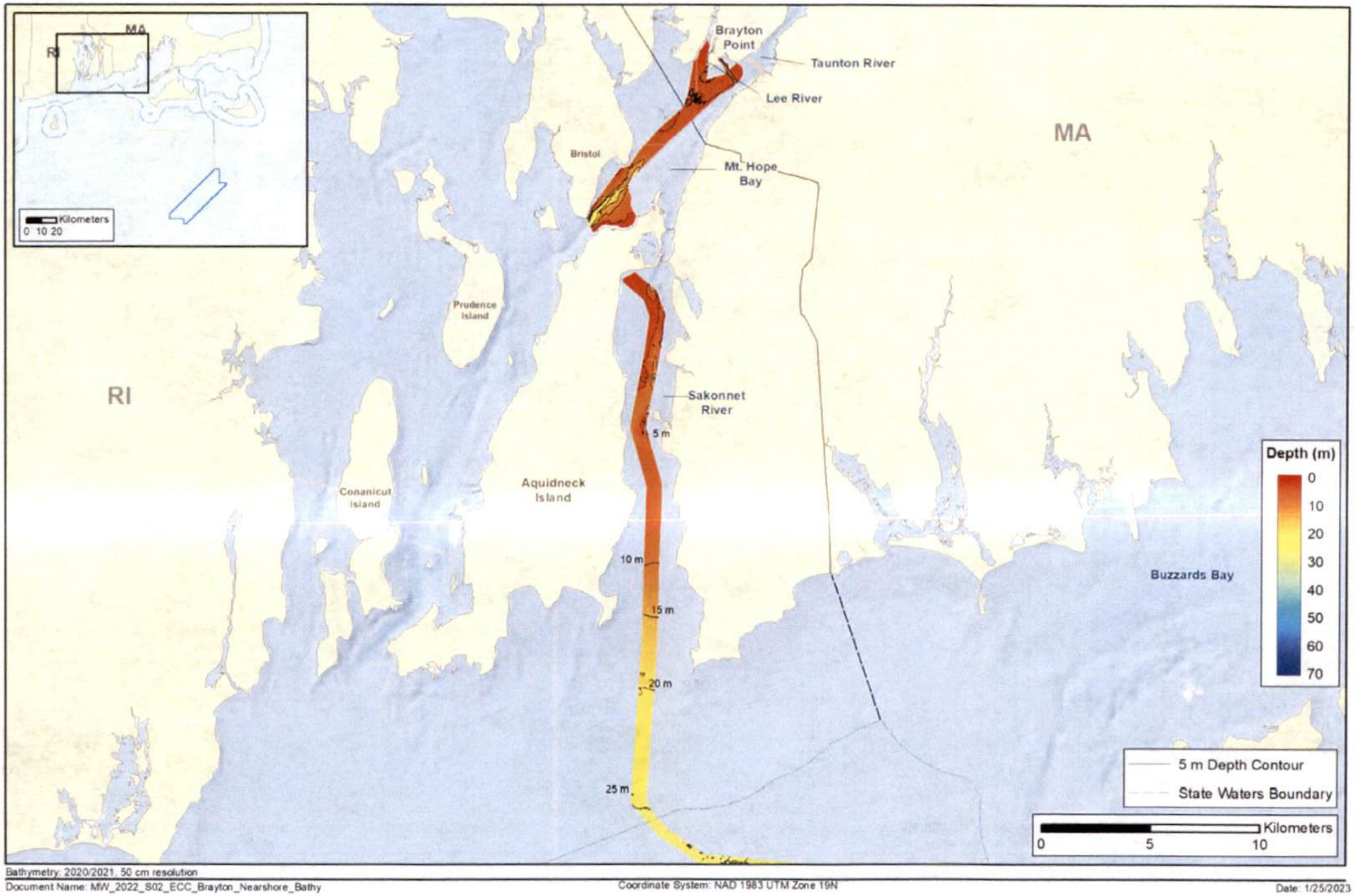



**Figure 2-3a.** **Bathymetry at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**

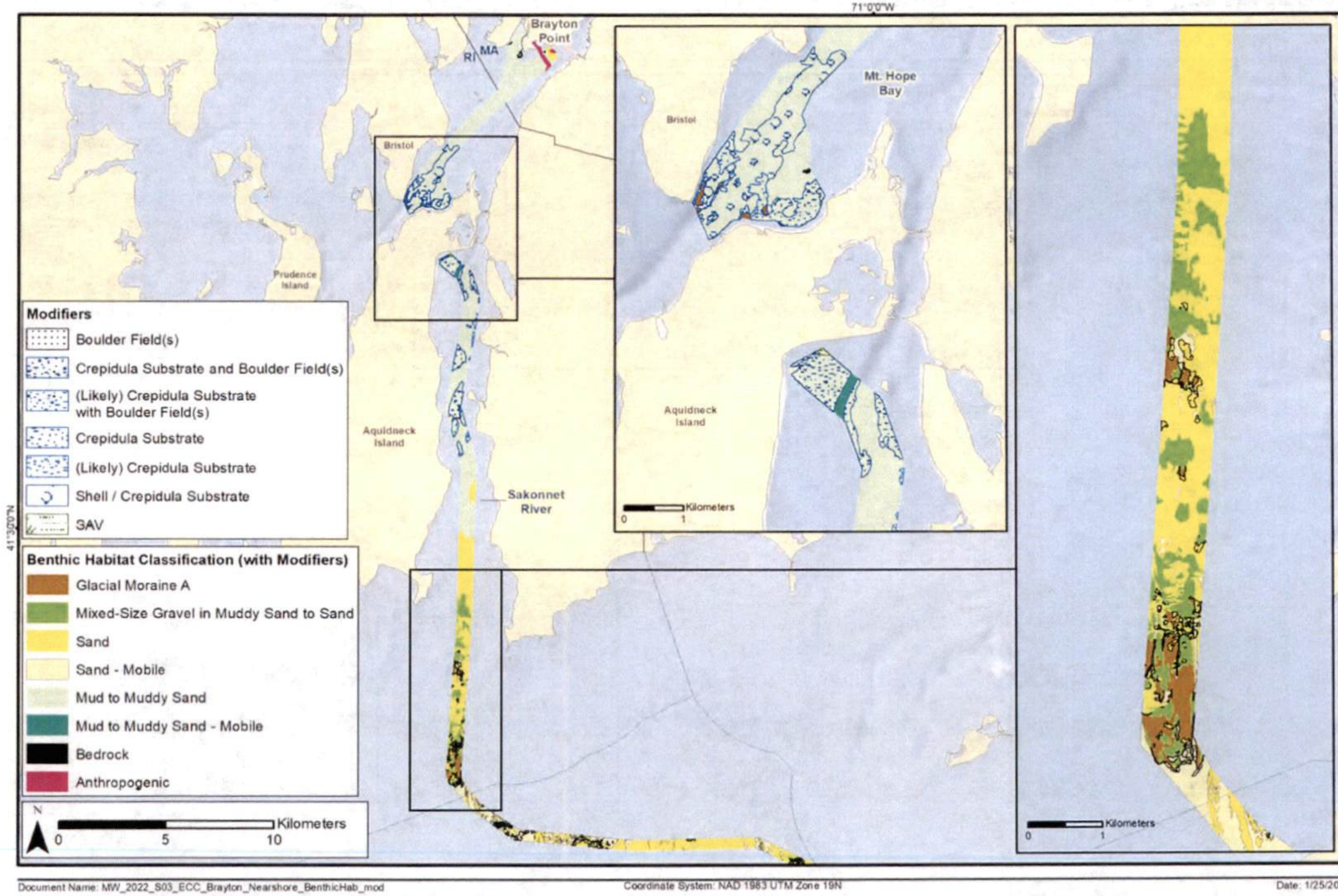
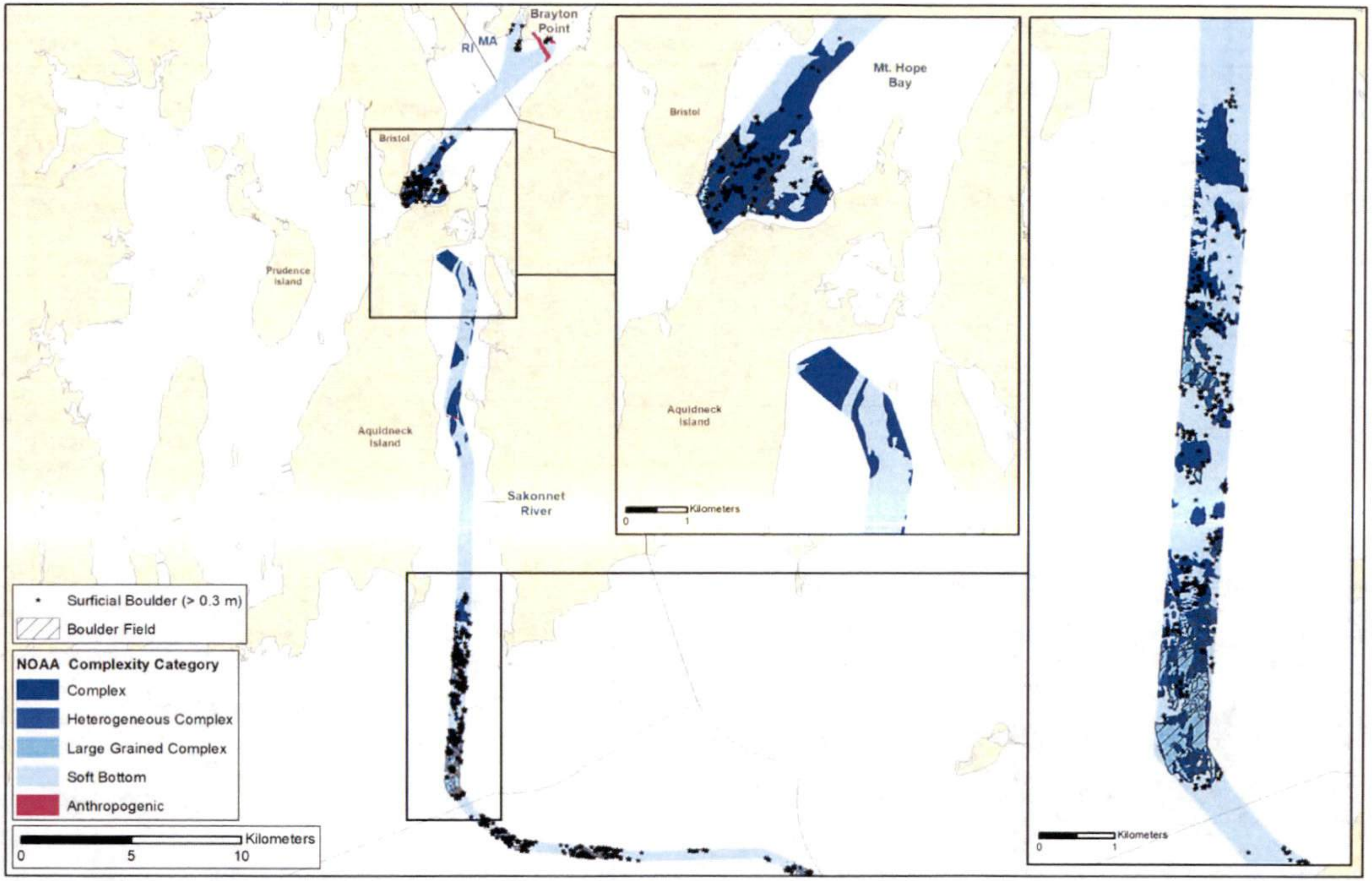



**Figure 2-3b.** **Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**




Document Name: MW_2022_S04_ECC_Brayton_Nearshore_NOAA_Complex Coordinate System: NAD 1983 UTM Zone 19N Date: 1/25/2023

**Figure 2-3c. Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**

## 3. Benthic Monitoring Objectives and Hypotheses

Installation and operation of offshore wind projects can temporarily disturb existing benthic habitats and introduce new habitats. The level of impact and recovery from disturbance can vary depending on existing habitats at the site (Wilhelmsson and Malm, 2008; HDR, 2020). Physical disturbance associated with cable and foundation installation can temporarily affect sediments, resulting in mortality or injury of existing fauna. The introduction of hard substrata (WTG foundations, scour protection layers, and cable protection layers) can lead to extensive biological growth on the introduced surfaces with complex patterns analogous to the depth zonation observed along shoreline intertidal to subtidal gradients (artificial reef effect, Petersen and Malm, 2009; Reubens et al., 2013; Degraer et al., 2020). Patterns of ecological zonation on these structures will be driven mainly by tides, water depth, light availability, and currents. Depending on the community composition and density, this biological epifaunal growth may lead to substantial shifts in the transfer of energy from the water column to other compartments of the ecosystem including the surrounding sediments and upper trophic levels.

Observations from existing offshore wind projects lead to three prevailing hypotheses related to benthic effects relevant to the proposed SouthCoast Wind Project:

> Hypothesis 1 *[Hard Bottom-Novel Surfaces]*: Introduction of novel surfaces (foundations, scour protection, and cable protection layers) act as an artificial reef that accumulates diverse epifauna, which vary with depth and change over time (as reviewed in Langhamer, 2012 and Degraer et al. 2020).
>
> Hypothesis 2 [*Structure-associated – Organic Enrichment*]: The artificial reef effect (epifaunal colonization) associated with the offshore wind structures will lead to enrichment (fining and higher organic content) of surrounding soft bottom habitats resulting in shifts in benthic function (increased organic matter processing) (e.g., Lefaible et al., 2019; Ivanov et al., 2021).
>
> Hypothesis 3 [*Cable-associated – Physical Disturbance*]: Physical disturbance of soft sediments during cable installation will temporarily disrupt the function of the infaunal community, community function is expected to return to pre-disturbance conditions (e.g., Kraus and Carter, 2018).

The consequences of these predicted effects may affect the role of these benthic habitats in providing food resources, refuge, and spawning habitat for fish and shellfish species (Reubens et al., 2014; Krone et al., 2017). Benthic monitoring will focus on determining if there are unexpected changes to the benthic ecosystem associated with the development of the wind farm. Specifically, the monitoring will focus on documenting potential adverse outcomes associated with each of the three hypotheses described above including:

- Relative abundance of non-native species relative to native species [*Hard Bottom-Novel Surfaces*],
- Evidence of impairment associated with organic enrichment on the seafloor surrounding the novel structures [*Structure-associated – Organic Enrichment*], and
- Delayed recovery from physical disturbance along the export cable routes [*Cable-associated Physical Disturbance*].

This benthic monitoring plan is organized according to these three hypotheses (and potential adverse outcomes) associated with the SouthCoast Wind Project. The plan describes the overall approach to tracking changes in benthic habitats associated with the Project development and operation. This monitoring plan is not designed to answer research questions about specific causes and effects on individual species but rather is aimed at monitoring potential changes associated with the benthic habitats of the SouthCoast Wind Project. A comprehensive outline of the benthic monitoring plan, including the hypotheses, sampling schedule, and general approach for each monitoring component is provided in Table 3-1. The planned statistical analyses are summarized by survey type in Table 3-2.

**Table 3-1. Summary of the Benthic Monitoring Plan Including Hypotheses, Approach, and Sampling Schedules for Each Component**

| Hard Bottom-Novel Surfaces | Structure-associated Organic Enrichment | Cable-associated Physical Disturbance |
|---|---|---|
| *WTG/OSPs, Scour/Cable Protection* | *Seafloor surrounding WTG/OSPs* | *Export Cable Segments* |
| Hypothesis: diverse epifaunal communities will accumulate on novel surfaces that act as an artificial reef. Community composition will vary with water depth (zonation with light and tide) and through time with successional development. | Hypothesis: epifaunal growth on foundations will result in sediment fining and higher organic content in surrounding soft bottom, this will support deposit feeding benthic invertebrates. Effects will decrease with increasing distance from structure foundation. | Hypothesis: After initial physical disturbance during construction, soft sediment community function is expected to return to pre-conditions; effects will decrease with increasing distance from cable |
| Approach: Use ROV/stereo camera to measure changes in % cover, identify key or dominant species, focus on documenting non-native species, estimate volume (biomass), compare across water depths | Approach: Use SPI/PV, sediment grab samples (organic matter characterization, grain size) to measure changes in benthic function over time and with distance from foundations, focus on documenting any evidence of impairment (Beggiatoa, methane, zero aRPD depth) | Approach: Use SPI/PV to measure changes in benthic function over time and with distance from cable centerline; focus on documenting any delayed recovery following disturbance. |
| Design: stratified random selection of WTG foundations within water depth contour strata; one OSP foundation sampled [same foundations as Structure-associated Organic Enrichment Surveys]; selection of export cable protection areas to be determined following construction | Design: stratified random selection of foundations within water depth contour strata [same foundations as Novel Hard Bottom surveys]; BAG design at each selected foundation:<br>2 radial transects at each foundation, distances are from edge of scour protection layer –<br>• 0-10m (SPI/PV + sediment samples)<br>• 15-25 m (SPI/PV)<br>• 40-50 m (SPI/PV + sediment samples)<br>• 90-100 m (SPI/PV)<br>• 900m (SPI/PV + sediment samples) | Design: stratified random selection of cable segments within benthic habitat; BAG at each selected cable segment, triplicate transects perpendicular from cable centerline – 10 stations along each transect (5 on each side) with varying distances from cable |
| Y0 – N/A no structures in place to monitor, yet<br>Y1 – during the first late summer/early fall after construction<br>Y3- three years post construction | Y0 – Pre seabed prep<br>Y1 – during the first late summer/early fall after construction<br>Y3 – three years post construction | Y0 – Pre seabed prep<br>Y1 – during the first late summer/early fall after construction<br>Y3 – three years post construction |

**Table 3-2. Summary of Planned Statistical Analyses for the Benthic Monitoring Surveys for SouthCoast Wind**

| Survey | Novel Hard Bottom Monitoring | Structure-associated Organic Enrichment | Cable-associated Physical Disturbance |
|---|---|---|---|
| **Monitoring Plan Section** | 4.0 | 5.0 | 6.0 |
| **Area** | SouthCoast Wind Lease Area and Export Cable Segments with Cable Protection | SouthCoast Wind Lease Area | Brayton Point Export Cable Corridor |
| **Design Type** | Stratified Random | BAG | BAG |
| **Design Overview** | WTG foundations: random samples (WTGs) stratified by depth range; single season. Substation foundations will also be sampled. Segments of export cable route where cable protection materials were used. | Impact only (no reference sites); stations at distances ranging from ~10 m to ~900 m from foundations; 2 directions from each foundation along prevailing current; single season. | Impact only (no reference sites); stations at distances ranging from ~5 m to ~1 km from cable; ≥3 transects within each habitat stratum. |
| **Number of Replicates** | 4 replicate WTGs per depth stratum; 1 offshore substation platform (OSP) foundation; 3 replicate export cable segments with protection (locations TBD)*. | 4 replicate WTGs per depth stratum; 1 OSP foundation. | 3 replicate transects per habitat type |
| **Sampling Effort** | 1 OSP foundation + [2 depth ranges x 4 WTGs] = **~9 structures**<br><br>3 segments of protected cable | ~ 9 structures x 2 transects x 5 stations = **90 Sediment Profile and Plan View Imaging (SPI/PV) stations.** | 3 habitat strata x 3 transects x 10 stations along each replicate transect = **90 SPI/PV stations.** |
| **Design details** | **Sampling frame** = WTG foundations<br>**Observational unit** = imaged quadrat (at systematically sampled depth intervals within frame).<br>**Response variable** = macrobiotic cover, relative abundance of native vs non-native, presence of sensitive taxa and species of concern.<br>**Error variance** = among image quadrats at the same depth- and distance-direction (WTGs provide replication). | **Sampling frame** = WTG foundations with mobile sediment classes up/down current.<br>**Observational unit** = SPI/PV station (WTGs randomized first survey event, then fixed throughout study; stations randomized every survey; replicate images are subsamples).<br>**Response variable** = mean or max per station depending on metric.<br>**Error variance** = among stations at the same distance-direction (WTGs provide replication). | **Sampling frame** = benthic areas of export cable route.<br>**Observational unit** = SPI/PV station (transects randomized first survey event, then fixed throughout study; stations randomized every survey; replicate images are subsamples).<br>**Response variable** = mean or max per station depending on metric.<br>**Error variance** = among stations at the same distance-direction (transects provide replication). |

| Survey | Novel Hard Bottom Monitoring | Structure-associated Organic Enrichment | Cable-associated Physical Disturbance |
|---|---|---|---|
| **Metrics of Interest** | **ROV/stereo-camera**: cover (macrobiota, relative abundance of native vs. invasive). **Photogrammetry**: Estimate of biomass/biovolume. | **SPI**: apparent redox potential discontinuity (aRPD), successional stage, penetration, methane, grain size major mode, *Beggiatoa*.<br><br>**PV**: cover (macrobiota, shells, cobble), presence/absence of sensitive or invasive species.<br><br>**Sediment Grab:** percent organic matter, total organic carbon, total nitrogen, C:N. | **SPI**: aRPD, successional stage, penetration<br><br>**PV**: cover (macrobiota, shells, cobble), presence/absence of sensitive or invasive species. |
| **Hypothesis framework** | Introduced novel surfaces will act as an artificial reef that accumulates diverse epifauna that vary with depth and change over time. | The artificial reef effect associated with novel structures will lead to enrichment (fining and organic matter content) of surrounding seafloor leading to shifts in benthic function (differences in aRPD depths, bioturbation depths, infaunal successional stage, grain size). | Physical disturbance during cable installation will disrupt benthic function, effects expected to decrease with distance from export cable and over time. |
| **Post-Construction Statistical Methods** | Fit a parametric generalized model (e.g., Generalized Linear Model [GLM], Generalized Linear Mixed Model [GLMM], or Generalized Additive Model [GAM]) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients.<br><br>Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with non-metric Multidimensional Scaling (nMDS). | Fit a parametric generalized model (e.g., GLM, GLMM or GAM) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients.<br><br>Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with nMDS. | Fit a parametric generalized model (e.g., GLM, GLMM or GAM) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients.<br><br>Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with nMDS. |

*for the novel hard bottom survey replication will be the WTG foundations (n=4 within each of the two depth ranges (>50 m, <50 m) and the sections of the cable protection (n=3).

# 4. Novel Hard Bottom Monitoring – WTG Foundations and Cable Protection

Hypothesis 1: Introduced novel surfaces will act as an artificial reef that accumulates diverse epifauna that vary with depth and change over time. *[Hard Bottom – Novel Surfaces]* (as reviewed in Langhamer, 2012).

The novel hard bottom monitoring will examine three types of novel surfaces: WTG foundations (including associated scour protection layers), export cable protection layers, and an OSP foundation. The novel hard bottom survey primarily aims to measure changes (over time and with water depth) to the nature and extent of macrobiotic cover of novel hard bottom associated with the SouthCoast Wind Project. The results of these surveys will provide insight into whether the accumulated epifauna can enhance ecosystem services including the abundance of species that may have economic value, increase habitat complexity, thereby promoting a diverse and productive reef system (e.g., emergent epifauna), may alter organic matter flow through the food web (with potential implications to carbon sequestration and nutrient dynamics), and/or are non-indigenous and could outcompete native species.

The surveys will document macrofaunal percent cover, identification of species (to the lowest possible taxonomic unit [LPIL]), and the relative abundance of native and non-native organisms using a Remotely Operated Vehicle (ROV) and stereo camera surveying approach. Distinguishing non-native organisms may require physical sampling for accurate identification, using a sampling arm attached to the ROV.

It is expected that the epifaunal community that colonizes the foundations will vary with water depth, dictated by the availability of light and tides, similar to zonation patterns commonly observed at coastal rocky intertidal habitats. Previous studies in Europe and at the Block Island Wind Farm (BIWF) found biological growth led to dense accumulations of filter feeding mussels on the WTG foundations, with amphipods, tunicates, sponges, and sea anemones on the deeper segments of the structures (De Mesel et al., 2015; Kerckhof et al. 2019; HDR, 2020; Wilber et al., 2021; Hutchison et al., 2020). Other studies have also tracked and documented vertical zonation of epibenthic communities along the surface of WTG structures (Bouma and Lengkeek, 2012; Hiscock et al., 2002; HDR, 2020). At any given depth of the WTG structure, the epifaunal species composition is expected to develop successionally, with rapid opportunistic organisms pioneering the site and being replaced by more long-lived established species.

## 4.1 Technical Approach – Stereo Camera Imagery

To accomplish the objectives of the novel hard bottom surveys, high-definition (HD) video camera and ultra-high-definition (UHD) stereo camera will collect imagery from a compact ROV. This imagery will document epifaunal community characteristics on the novel hard surfaces (WTG foundations and scour protection layers, OSP foundation, cable protection layers). Also, the imagery will be used to build 3D models from these static, stereo images captured from multiple perspectives using the Structure from Motion technique, i.e., photogrammetry. The compact ROV will be equipped with a surface differential positioning system, an Ultra Short Baseline (USBL), and motion and depth sensors. The ROV will host 1) one downward facing UHD stereo camera to observe and capture high-resolution images of the seafloor surface, 2) one forward facing UHD stereo camera to collect data on vertical surfaces and avoid collisions, and 3) one HD video camera.

The UHD stereo imagery analysis will focus on biological features (e.g., percent cover of encrusting epifauna), identifying any non-native organisms, sensitive taxa, species of concern, presence of refuge, and quantifying the biomass of the dominant members of the epifaunal communities. The 3D model will determine 1) habitat complexity, a component of essential fish habitat, and 2) the thickness and volume of epifauna growing on infrastructure. The HD video will focus on quantitative details of habitat characteristics and quality, including categorical levels for the presence of fish and decapods, and surrounding substrata (sediment type), and the percent cover of emergent fauna.

### 4.1.1 Justification

Images provide a data-rich record of benthic communities. However, images flatten the landscape, which can introduce bias, limit identification, and distort quantitative analyses. Three dimensional (3D) overcome these challenges and allow for site characterization with improved accuracy compared to traditional 2D methods (Kornder et al., 2021). Furthermore, stereo cameras collect paired images and this pairing enables scaled, 3D model building without scene preparation, which reduces costs, risks, and the need for site modifications. Stereo cameras do not require scene preparation because they are scaled by the specific manufacturer's calibration of the two cameras with each other. Stereo camera systems are not new. For example, Done reconstructed a habitat scale 3D model of a coral reef, using a stereo camera, over forty years ago (Done, 1981). Compared to single camera systems, few researchers use stereo cameras to monitor ecological change because, until recently, commercial vendors did not offer these types of systems for subtidal work. Now, commercial vendors manufacture stereo camera systems and support their use in offshore, subtidal habitats to monitor equipment and environmental impacts for multiple energy industries.

### 4.1.2 Survey and Data Products

Stereo camera surveys will be conducted to collect UHD images at depth intervals along the WTG foundations and discrete areas of the cable protection layers. The data will include the photographs, the calibrated 3D products, including a dense point cloud with color, a mesh, and a textured mesh. This analysis will generate a point cloud and mesh for quantitative analysis, and a textured mesh for visualization and communication.

By digitally reconstructing segments of the foundations and cable protection at predefined depth intervals, the resulting 3D model can be analyzed for quantitative variables including percent cover, standing biomass, and abundance of individual taxa of interest (as reviewed in Marre et al., 2019). Collecting imagery and constructing spatial photogrammetric models of the structures soon after construction will provide initial reference conditions that can be used to track biological changes over time following subsequent years of data collection (i.e., change analysis).

Habitat complexity, i.e., rugosity, will be estimated from the 3D model, which approximates the abundance of refugia for key species including fish. Traditionally, scuba divers estimate rugosity as the ratio of a straight line and a draped flexible chain over the reef (Risk 1972). Now, researchers (Kornder et al., 2021) estimate rugosity ($f_r$) from 3D models as

$$f_r = A_t/A_g$$

where $A_t$ is the true surface area of a complex object and $A_g$ is the geometric surface area of a 3D convex hull wrapping the complex object. Larger values of rugosity indicate more refugia and 3D complexity, and values closer to 1 indicate fewer refugia and 3D complexity. This analysis will calculate $A_t$ and $A_g$ from the reconstructed 3D models from 10 sub-sampled chunks for each replicate area, e.g., in python or meshlab. This analysis is comparable to the traditional field methods for rugosity using a transect tape and chain, however, using a virtual 3D model, this analysis can collect more and better data in 3D versus in 2D.

Biological data obtained from the 3D model can be used to estimate ecological functions including secondary production, and physiological rates such as biodeposition associated with the epifaunal community. These biological processes affect the transfer of energy and nutrients to higher trophic levels and to the sediments at the base of the novel structures. This approach will provide an estimate of the increase in standing stock biomass at the basal trophic levels where filter feeding epifauna (e.g., blue mussels, sea squirts) exist. This information can inform ecosystem models that seek to understand how these changes to the basal trophic level may alter food web dynamics, objectives that are beyond the scope of this monitoring plan.

The following parameters will be measured as part of the hard bottom analysis:

**UHD stereo images:**

- Community assemblages
- Percent cover of encrusting or colonial taxa
- Number of key solitary taxa
- Species identification to the lowest possible taxonomic level
- Non-native species
- Species of concern (Guida et al., 2017)
- Sensitive species (e.g., slow growing species)
- Ecologically valuable taxa (e.g., biogenic structure-forming taxa such as emergent fauna)

**HD video:**

- CMECS Substrate Group and Subgroup
- CMECS Biotic Subclass and Group
- Presence of fish, identified to the LPIL
- Presence of abandoned fishing gear

**3D model reconstructed from UHD stereo images:**

- Rugosity, to approximate habitat complexity and essential fish habitat
- Thickness and volume of epifauna on infrastructure

**Interpreted data, e.g., model products:**

- Potential to alter energy transfer, and therefore carbon sequestration
- Potential to alter nutrient regimes

## 4.2 Survey Design

ROV stereo camera surveys will monitor novel hard bottom habitats within subareas of the SouthCoast Wind Project, at structures selected using a stratified random design. The selected WTG and OSP foundations will be surveyed from the air-sea interface down to the seafloor and away from the structure to the edge of the scour protection layer using underwater image collection. For each selected foundation, the field team will collect UHD images with a stereo camera following vendor-specific protocols. For example, the field team will likely collect images with auxiliary lights, with at least 50 percent overlap for all survey lines, with ~1 m (3.3 ft) stand-off distance, in a lawnmower pattern. Furthermore, depending on the software employed, a live sparse point cloud may be rendered during collection to identify and fill gaps in the model by collecting additional images in real time.

The *Novel Hard Bottom Monitoring* program will include the following components:

- WTG foundations selected according to a stratified random design, with water depth ranges as strata (four replicate WTGs per stratum)
- One OSP foundation randomly selected
- Three segments of the export cable that are armored using cable protection material, information that is not yet known. These segments will be selected randomly considering environmental factors including water depth, natural benthic habitat of the surrounding seafloor, and distance from shore as explanatory variables.

The *Structure-associated Organic Enrichment* monitoring survey will include the same WTG foundations selected for this novel hard bottom survey (see Section 5). Using the same WTGs will facilitate synthesis between the degree of enrichment in the surrounding soft sediments and the epifaunal community composition and density colonizing the novel structures at any given time and location.

The WTG foundation monitoring program will be a stratified random design within the SouthCoast Wind Lease Area. Surveys will sample four replicate WTGs, randomly selected within each of two depth contour strata, <50 m (<164 ft) and >50 (>164 ft). Surveys will scan and sample these replicate WTGs during each survey event (Table 3-1). The hard bottom monitoring will occur in late summer/early fall for each survey. The initial baseline survey will occur during the first late summer/early fall following construction (Y1). The survey will then be repeated three years following construction (Y3). Results year 3 monitoring will be reviewed and an additional monitoring will be completed five years post construction (Y5), if needed. For each component of the monitoring program, the analysis will include selected images and sections of the 3D models.

## 4.3 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the Novel Hard Bottom Monitoring dataset collected at WTG foundations and scour protection layers, an OSP foundation, and cable protection layers, data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (community composition; relative abundance of sensitive taxa, species of concern, non-native species, and ecologically valuable taxa; rugosity, and volume) and predictors (e.g., depth; distance from the WTG; time since construction). Covariates in the model for the WTG foundation dataset will include direction (categorical); variability among WTGs will provide site-wide random error. For individual metrics that are consistently measured across WTGs, parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the community composition and relative abundance over time and as a function of depth, and distance and direction from the novel structures (e.g., WTG). These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat quality occur.

Novel hard bottom monitoring surveys will provide count statistics, which determine estimates of occupancy assuming a known detection probability. MacKenzie et al. (2002) developed a framework to estimate detection probabilities from replicate surveys based on a zero-inflated binomial model, thus making it possible to estimate occupancy from count statistics. This approach does not require additional, expensive sampling, so it is well-suited to large-scale monitoring. In these surveys, replicate images for each station or depth will determine the detection probabilities, yielding an occupancy estimate along the gradient (e.g., distance from monopile or depth). As suitable, the analysis will incorporate covariates and quantify goodness of fit. Covariates could include effort or dominant attached type; for example, detection could decrease when the site is colonized by many mussels that obstruct detection of other taxa. These analyses will be completed with the R Package 'unmarked' (Fisk and Chandler, 2011).

## 5. Structure-Associated Organic Enrichment

Hypothesis 2: The artificial reef effect (epifaunal colonization) associated with the offshore wind structures will lead to enrichment (fining and higher organic content) of surrounding benthic habitats resulting in shifts in benthic function (increased organic matter processing). [*Structure-associated Organic Enrichment*] (e.g., Lefaible et al., 2019; Ivanov et al., 2021).

The *Structure-associated Organic Enrichment* monitoring will include an examination of two offshore wind components: WTG foundations and OSP foundations. The overall objectives of this component of the benthic monitoring program are to measure potential changes in the benthic function of the benthic habitats surrounding these novel structures over time, and to assess whether benthic function changes with distance from the base of the foundations. The focus will be on monitoring for and documenting any evidence of impairment associated with organic enrichment on the seafloor surrounding the foundations (e.g., *Beggiatoa,* methane presence, zero aRPD depth [no oxygen penetrating into the sediment]).

It is expected that the epibenthic community that colonizes the novel structures will supply organic matter to the sediments below through filtration, biodeposition, and general deposition of detrital biomass. This organic material sourced from the biological activity of the epibenthic community on the novel structures will likely alter the infaunal community activity, increasing sediment oxygen demand, and promoting the activity of deep-burrowing infauna. Based on benthic monitoring results at other offshore wind farms, the effects of the foundation on the surrounding soft sediment habitat are expected to decrease with increasing distance from the foundation (as reviewed in Degraer et al., 2020 and modeled in De Borger et al., 2021).

Benthic functioning of the soft bottom habitats at the base of the novel foundations will be captured using SPI/PV imagery, sediment grain size analysis, and organic matter characterization. These approaches will be employed at varying frequencies and spatial resolution as described below. The SPI/PV imagery will provide an overall integrated assessment of the physical parameters (grain size major mode) and biological factors (bioturbation depths, aRPD depths, methane production). At a subset of stations, the SPI/PV imagery will be supplemented by sediment grab samples analyzed for grain size, percent bulk organic matter, and total organic carbon and nitrogen content, which will provide insight into shifts in the organic matter loading to the sediments and the quality of the organic matter in the sediments (carbon to nitrogen ratio).

## 5.1 Technical Approach – SPI/PV

SPI/PV will be used as the primary monitoring approach for the *Structure-associated Organic Enrichment* monitoring surveys. The SPI and PV cameras capture benthic ecological functioning within the context of physical factors. The PV system captures high-resolution imagery over several meters of the seafloor, while the SPI system captures the typically unseen, sediment–water interface in the shallow seabed. Coupled SPI/PV imagery provides an integrated, multi-dimensional view of the benthic and geological condition of seafloor sediments and can characterize the function of the benthic habitat, physical changes, and recovery from physical disturbance following the construction and during operation of the SouthCoast Wind Project. Additionally, PV data will be used to characterize surficial geological and biotic (epifaunal) features of hard bottom areas within the sampling area (e.g., scour protection layers at the base of the foundations) but will not replace the dedicated novel hard bottom monitoring survey (Section 4).

SPI/PV imagery provides spatial and contextual information, such as oxygen penetration depths (aRPD depth), infaunal bioturbation depths, and small-scale grain size vertical layering that are critical pieces to assessing the ecological functioning of soft sediment habitats. Specifically, ecological functions related to organic matter processing, secondary production, and the forage-value of the benthic community are of particular importance when assessing impacts of offshore wind structures on soft sediment habitats (see Attachment A for more details). Taxonomic analysis of sediment grab samples provides information on the benthic community composition and infaunal abundances, but without making substantial inferences to relate presence and counts to biological activity and further ecological value or function, the sediment grab approach is severely limited in its ability to assess impacts of offshore wind development on soft sediment functioning. Further, given the inherently dynamic and patchy nature of infaunal populations, benthic species count data generally requires extensive replication, substantial transformations for normalization, and overextending inferences to relate species composition to function. SPI/PV imagery provides an effective snapshot of the overall ecological health and condition of the sediments as reflected and integrated over time and space by the continuous activity of the communities present (Germano et al., 2011). It is this holistic community activity, not necessarily the identity of community members, that requires careful assessment to determine impacts of offshore wind development on benthic habitats. Attachment A provides detailed justification for the use of SPI/PV imagery approach to meet these monitoring objectives and more detailed descriptions of several of the parameters that will be obtained during SPI/PV image analysis.

### 5.1.1 Survey and Data Products

The SPI/PV system will collect quantitative data on measurements associated with physical and biological changes related to benthic function (bioturbation and utilization of organic material) that might result from construction and operation of the SouthCoast Wind Project. SPI/PV and the parameters derived from these images are standard tools for assessing the response to disturbance and enrichment (Germano et al., 2011). Seafloor geological and biogenic substrates captured in SPI/PV imagery will be described using the Coastal and Marine Ecological Classification Standard (CMECS; FGDC, 2012). Triplicate images will be collected and analyzed at each station.

The following parameters will be measured during SPI and PV image analysis:

- CMECS Substrate Group and Subgroup
- gravel size measurements (predominant, minimum, maximum), where applicable
- CMECS Biotic Class and Subclass
- aRPD depth (See Attachment A)
- maximum bioturbation depth
- infaunal successional stage (See Attachment A)
- methane presence/absence
- grain size major mode
- presence, frequency, size of surficial features such as bedforms (e.g., sand ripples)
- presence of sensitive taxa (e.g., slow growing species) and ecologically valuable taxa (e.g., biogenic structure-forming taxa such as emergent fauna) (see Attachment A)

Results from the three replicate images at each station will be aggregated to provide a summary value for each metric by station. Depending on the metric type, this will include mean, maximum, or predominant (categorical variables) (e.g., predominant CMECS Substrate Subgroup, maximum infaunal successional stage, maximum and median feeding void depth, and mean aRPD depths).

## 5.2 Technical Approach – Sediment Sampling

Sediment samples will be collected and analyzed for grain size distribution and organic matter characteristics. Sediments closer to the foundation structures are expected to become more organically enriched over time as detrital material originating from the epifaunal community activity (e.g., biodeposition) accumulates on the surrounding seafloor. The level of organic enrichment and organic matter loading will be assessed by analyzing sediment samples for bulk percent organic matter and total organic carbon and nitrogen content. The percent organic matter of the sediments (measured as loss-on-ignition) is expected to increase over time and decrease with distance from the structure. In addition to the quantity of organic matter in the sediments, the quality of sediment organic matter is important to consider when assessing shifts in benthic function. The quality of sediment organic matter will be assessed by analyzing sediment samples for organic carbon and total nitrogen content. The organic carbon to nitrogen ratio (C:N) of sediments provides insight into the quality or lability of the organic matter (i.e., how available it is to be decomposed or consumed). Finally, it is expected that the sediment grain size closer to the foundation structures will become finer over time. This will be measured using both SPI/PV imagery (grain size major mode) and physical sediment samples analyzed for grain size distribution.

## 5.3 Survey Design

The *Structure-associated Organic Enrichment* monitoring will be conducted using a Before-After Gradient (BAG) survey design to determine the spatial scale of potential impacts on benthic habitats at the SouthCoast Wind Lease Area. The same WTG foundations selected for the Novel Hard Bottom monitoring (Section 4.2) will be selected for the *Structure-associated Organic Enrichment* monitoring. The SouthCoast Wind Lease Area will be divided into two strata based on depth (<50 m [<164 ft] [shallow] and >50 m [>164 ft] [deep]). Four replicate WTGs will be randomly selected within each of the two depth strata for sampling. One OSP foundation will be randomly selected for monitoring. The surrounding seafloor of these replicate WTG and OSP foundations will be surveyed during each survey event (Table 3-1).

At each replicate WTG foundation and OSP foundation, a BAG survey design will be used for statistical evaluation of the spatial and temporal changes in the surrounding benthic habitat (Underwood, 1994; Methratta, 2020). Data will be collected before and after construction and operation at stations oriented along a gradient from the selected foundations (Figure 5-1). Each transect will include stations that sample the edge of the scour protection layer and the surrounding soft sediment. This BAG design is based on an understanding of the habitat distribution at the SouthCoast Wind Lease Area (COP Appendix M.3, INSPIRE, 2022), and an analysis of benthic monitoring results from European wind farms and the RODEO study at BIWF (HDR, 2020; Coates et al., 2014; Dannheim et al., 2019; Degraer et al., 2018; Lefaible et al., 2019; Lindeboom et al., 2011). The proposed BAG survey design eliminates the need for a reference area, as this design is focused on sampling along a spatial gradient within the area of interest rather than using a control location that may not be truly representative of the conditions within the area of interest (Methratta, 2020). This design also allows for the examination of spatial variation within the wind farm and does not assume homogeneity across sampling stations (Methratta, 2020).

The pre-construction benthic survey will be conducted in late summer or early fall (August to October) prior to the start of construction to document benthic habitats prior to disturbance (Y0, baseline). The next survey will occur during the first late summer/early fall following construction (Y1). The survey will then be repeated three years following construction (Y3). All surveys will be conducted in the same seasonal time frame, which will be during late summer or early fall to capture peak biomass and diversity of benthic organisms in alignment with previous studies (South Fork Wind LLC and INSPIRE, 2022; HDR ,2020; NYSERDA, 2017; Stokesbury, 2013, 2014; LaFrance et al., 2010, 2014). Benthic habitats in the northwest Atlantic are generally stable with little seasonality in the absence of physical disturbance or organic enrichment (Steimle, 1982; Reid et al., 1991; Theroux and Wigley, 1998; HDR, 2020).

Data on the mean currents near the SouthCoast Wind Lease Area will be used to establish up current and down current transects extending from each selected WTG foundation. Two transects of benthic stations will be established: one up current and the other down current of the selected WTG locations (Figure 5-1). Pre-construction transects will begin at the center point of the planned foundation with two stations at equal intervals up to the maximum planned extent of the scour protection area and then at intervals of 0-10 m, 15-25 m, 40-50 m, 90-100 m, and 900 m (0-32 ft, 49-82 ft, 131-164 ft, 295-328 ft, and 2,953 ft) extending outward from the edge of the scour protection area (Figure 5-1). Post-construction transects will repeat this design at the same WTGs and the same sampling distance intervals. These distances were chosen based on recent research indicating that effects of WTGs on the benthic environment occur on a local scale (e.g., Lindeboom et al., 2011; Coates et al., 2014; Degraer et al., 2018; HDR, 2019; Lefaible et al., 2019). SPI/PV imagery will be collected at every station. Physical sediment samples will be collected at the following stations beyond the scour protection layer (i.e., in soft sediments): 0-10 m, 40-50 m, and 900 m (0-32 ft, 131-164 ft, 2,953 ft). The lower sampling effort for the physical sediment samples relative to the SPI/PV stations is due to the fact that the sediment sample data (organic matter content) will be ground truthing the information obtained from the SPI/PV imagery.

## 5.4 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the *Structure-associated Organic Enrichment* dataset collected at the base of the selected WTG foundations (BAG design), data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (SPI/PV metrics, e.g., aRPD, successional stage, feeding voids, presence of methane or *Beggiatoa*) and predictors (e.g., quantitative or categorical epifaunal/epifloral cover estimates on the WTG foundations; and distance from the WTG). Covariates in the model for the WTG foundation dataset will include water depth (continuous) and direction (categorical); variability among WTGs will provide site-wide random error. For individual metrics that are consistently measured across stations (e.g., aRPD depth, sediment organic matter content), parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the SPI/PV metrics and sediment sample data over time and as a function of distance and direction from the novel structures (e.g., WTGs). These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat quality occur.

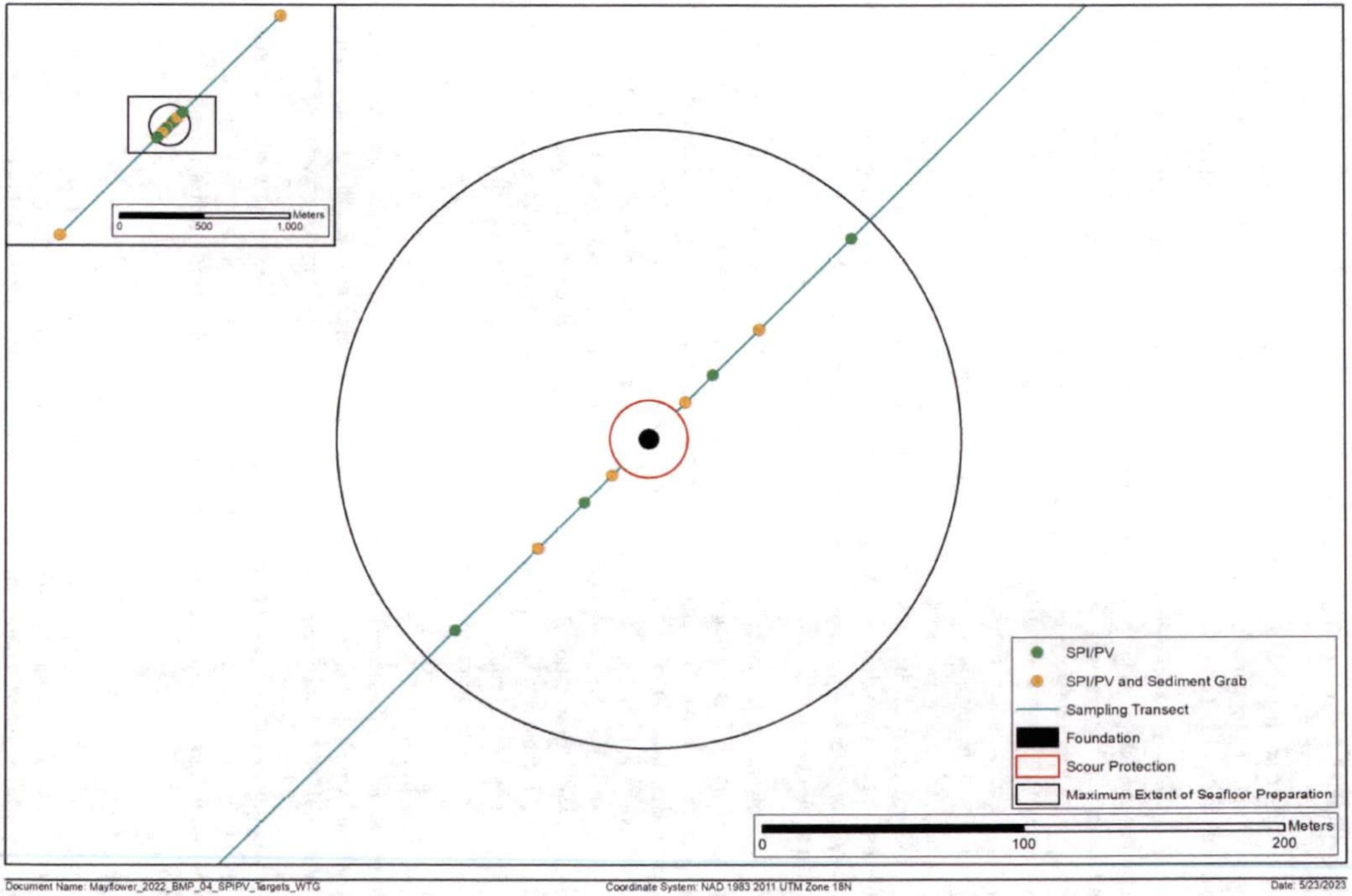



**Figure 5-1.** **Conceptual diagram illustrating the Before-After Gradient design of the Structure-associated Organic Enrichment survey design, SPI/PV and sediment grab station locations on the seafloor surrounding each selected foundation. The transect orientation will be based on prevailing water currents in the area, to capture upstream and downstream effects.**

# 6. Cable-Associated Physical Disturbance

Hypothesis 3: Physical disturbance of sediments from cable installation (including seafloor preparation) will temporarily disrupt the function of the infaunal community, community function is expected to return to pre-disturbance conditions. [*Cable-associated Physical Disturbance*] (e.g., Kraus and Carter, 2018).

The objective for the *Cable-associated Physical Disturbance* monitoring along the SouthCoast Wind export cables is to examine the effects of installation and operation of the export cables on the benthic habitat over time and along a spatial gradient with distance from the cable centerlines. This component of the benthic monitoring will include focused surveys along the export cable corridor. The focus of this monitoring will be on documenting any delayed recovery of the benthos following the physical disturbance associated with cable construction. Based on the review by Kraus and Carter, 2018, biological and physical recovery following cable installation is expected to take up to two years, with several studies reporting much faster rates of recovery (weeks to one year). Fishing activity may exert substantial physical disturbance in the soft sediment habitats along the cable route which may influence the recovery rate following cable installation. Note that monitoring epifaunal growth on any cable protection material along segments of the export cables is described within the novel hard bottom component of this monitoring plan (see Section 4). A separate monitoring plan will be developed that focuses on the Falmouth ECC.

The primary effect of cable installation is physical disturbance of the sediment resulting in sediment resuspension and temporary loss of infauna. Effects of installation and operation of the cable are expected to be roughly equivalent along the length of the cable within similar benthic habitat types. Other independent variables that may influence the benthic effects of and recovery from cable installation include levels of fishing activity (e.g., bottom trawling, clam dredging), installation methodology, and natural bottom sediment transport from tides, waves, and currents. These variables will be considered during data analysis and interpretation. The sampling design is intended to estimate effects along a spatial gradient away from the cable and will not estimate mean changes along the entire export cable routes. Any potential impacts of the cable on benthic habitats are expected to decrease over time after installation and with distance from the export cable centerline.

## 6.1 Technical Approach

SPI/PV will be the primary tool used to document any changes to the small-scale physical characteristics and benthic community function following cable installation. A general summary of the rationale and value of using SPI/PV is provided in Attachment A. Water temperature will be measured at each SPI/PV station.

In areas where the cable transits through complex habitat, underwater video imagery will be collected to assess recovery of the benthic habitat. A description of the technical approach for underwater video imagery is provided in Section 4.1. The same type of data will be collected for this component of the monitoring program.

## 6.2 Survey Design

A stratified random survey design will be used to select sampling frames along the export cables, stratified by predominant habitat types along the cable route. This monitoring plan provides a general overview of the design that can be adjusted when engineering and construction plans are finalized. Within each sampling frame, SPI/PV data will be collected using a BAG design in the areas where soft bottom habitat is predominant, like that proposed for the seafloor surrounding the foundations (Section 5) (Underwood, 1994; Methratta, 2020). Details describing the BAG design approach and its value in evaluating potential temporal and spatial changes following construction are provided in Section 5 above. In areas along the cable route where complex habitat occurs, underwater video imagery (as described in Section 4) will be used to assess benthic recovery.

The *Cable-Associated Physical Disturbance* monitoring sample design will focus on sampling at representative sections of the export cables based on benthic habitat types as informed by the benthic habitat mapping of the planned export cable corridor (COP Appendix M.3, INSPIRE, 2022). Sampling locations will be selected randomly, stratified by habitat types. At six locations within each habitat type sampling stratum, transects will be positioned perpendicular to the cable route (three replicate transects per habitat stratum and direction) (Figure 6-1). Along each transect, a total of five stations will be sampled. At each station, triplicate SPI/PV images will be collected and analyzed. Near the centerline these stations will be distributed roughly 10 m (32 ft) apart and the distance intervals between stations will increase with distance from the centerline (Figure 6-1). The extent of physical disturbance during cable installation for the majority of the cable route is expected to be an approximately 6 m (20 ft) wide corridor around the cable centerline. The selected sampling locations and sampling intervals relative to the cable will remain fixed for the duration of the survey. The exact locations of the sampling frames will be selected after cable installation is completed; Figure 6-1 provides conceptual diagrams of the planned sampling design along the export cable corridors within potential benthic habitat strata within Federal Waters and State Waters. Sampling along the export cables will occur prior to construction (Y0), within the first calendar year post installation (Y1), and three years post-installation (Y3).

## 6.3 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the *Cable-associated Physical Disturbance* dataset collected along the selected export cable segments (BAG design), data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (SPI/PV metrics, e.g., aRPD, successional stage, feeding voids, sediment grain size layering) and predictors (e.g., distance from the cable, water depth). Covariates in the model for the export cable dataset will include habitat type (categorical) and direction (categorical); variability among transects will provide site-wide random error. For individual metrics that are consistently measured across stations (e.g., aRPD), parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the SPI/PV metrics over time and as a function of distance and direction from the export cable centerline. These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat condition occur.

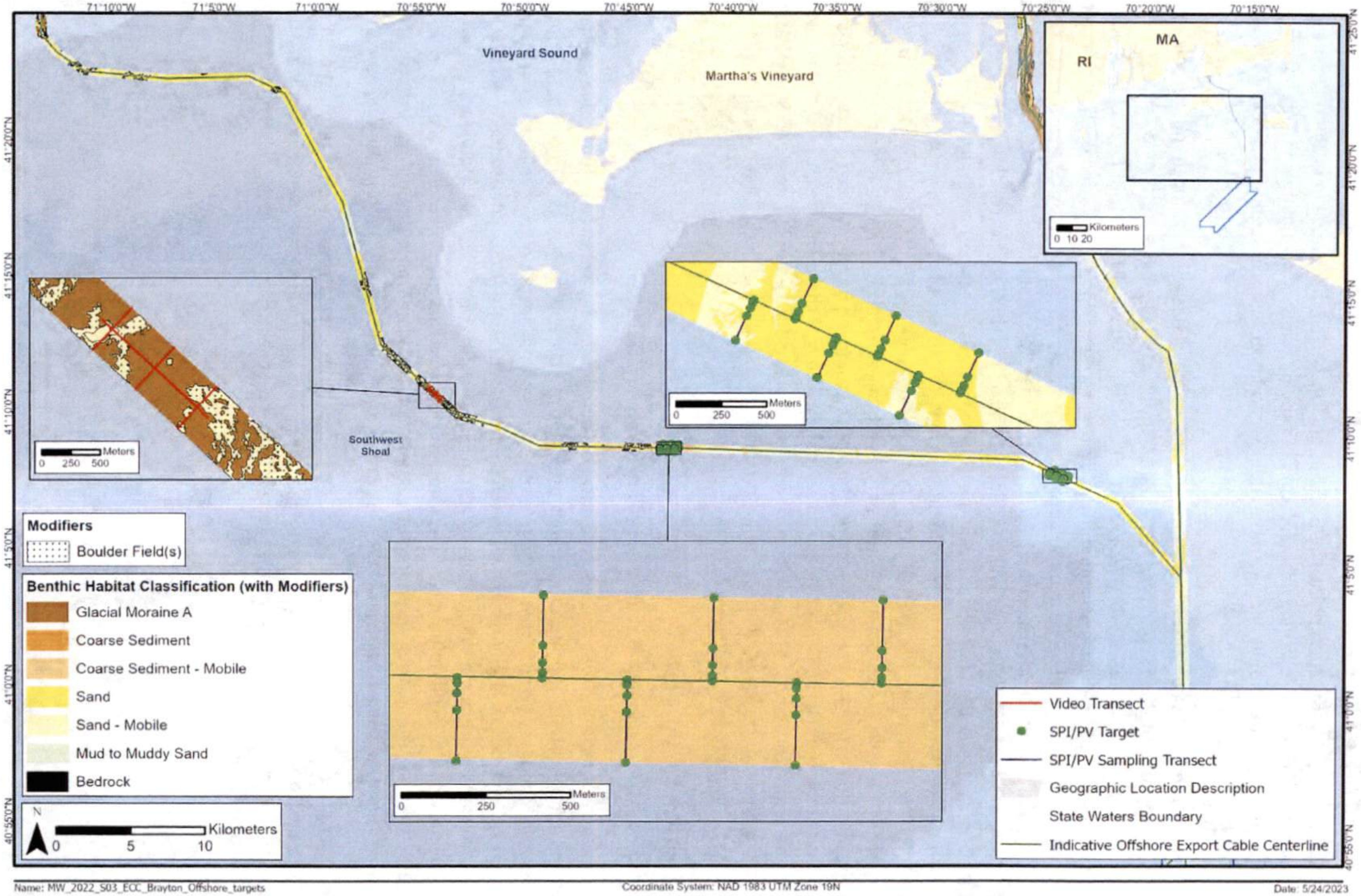



**Figure 6-1. Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in Federal Waters**

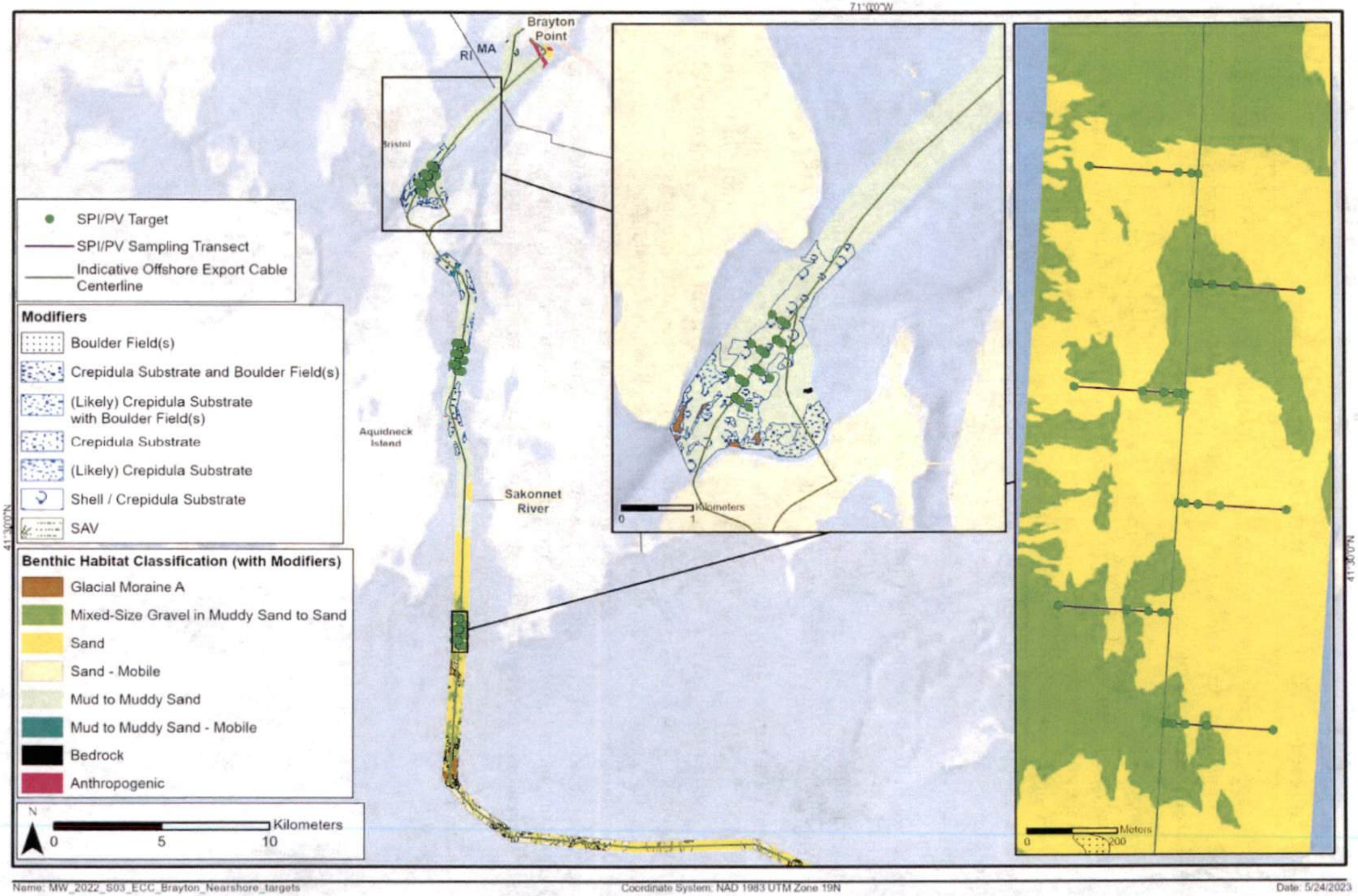



**Figure 6-2.** **Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in State Waters**

# 7. Data Management, Reporting, and Data Sharing

Data may be shared with State and Federal agencies and other stakeholders upon request. Data will be prepared and disseminated after each survey year and will undergo rigorous quality assurance/quality control (QA/QC) audits prior to release.

Proper data management and traceability are integral to analysis and accurate interpretation and reporting. The surveys described in this monitoring plan will follow a rigorous system to inspect data throughout all stages of collection, processing, and analysis. This data management system will provide a high level of confidence in the accuracy of the data being reported. Data management will include methods for data collection, data storage and archiving, QA/QC audits, distribution and dissemination protocols and best practices, and analyses. Metadata will be developed for each survey dataset which will include descriptions of data fields, data processing, QA/QC procedures, etc.

Annual reports will be prepared upon the conclusion of each year of sampling. These reports will be shared with State and Federal resource agencies upon request and as applicable. A final synthesis report will be prepared for each survey type after the final year of sampling has concluded. These synthesis reports will evaluate the survey findings during the pre- and post-construction survey time periods.

In order to obtain data derived from this monitoring plan, stakeholders must submit a formal request to SouthCoast Wind Energy LLC. A brief proposal will be required that states the purpose of the request, a description of the data requested (e.g., survey type, timeframe, species of interest), a list of collaborators and their affiliations, if applicable, and a description of the anticipated products of the work (e.g., manuscripts, fisheries stock assessments). Data access protocols will be developed to provide conditions for requesting monitoring data. Any data requested will be disseminated provided the criteria outlined in the data access protocols are met. Data will be sent to the requesting party electronically in most cases and any exceptions will be dealt with on a case-by-case basis with the party or parties seeking access. SouthCoast Wind will amend the above data sharing protocols, as necessary and applicable, in accordance with current data sharing efforts and guidance being developed through organizations such as the Regional Wildlife Science Collaborative (RWSC) and Responsible Offshore Science Alliance (ROSA).

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SOUTHCOAST WIND

# Benthic Monitoring Plan – Lease Area and Brayton Point ECC ATTACHMENTS

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## List of Attachments

# Attachment A - Sediment Profile and Plan View Imagery to Assess Shifts in Benthic Ecological Functions

## Sediment Profile and Plan View Imagery to Assess Shifts in Benthic Ecological Functions

SPI/PV is an effective tool in assessing changes in benthic function of soft sediments in response to offshore wind development. Ecologically important benthic functions of soft sediment communities on the outer continental shelf of the northwest Atlantic include (1) the provision of biogenic structures as habitat, (2) the facilitation of organic matter processing (carbon and nutrient cycling), and (3) the provision of food to upper trophic levels (secondary production). These ecosystem functions are detectable using data obtained from SPI/PV imagery as described in more detail below.

### Biogenic Habitats

SPI/PV is an effective means to assess the presence and relative distribution of biogenic structure-forming fauna in soft sediment environments. Common emergent fauna in this environment includes cerianthids (burrowing anemone). Other biogenic structure-forming organisms in this environmental context include mussels, tube-building amphipods and polychaetes including sabellid worms, that can serve to bind sediments and create reefs. Biogenic structure-forming organisms are often difficult to capture using traditional sediment grab sampling as they are able to effectively evade collection. Also, sediment grab collection is destructive sampling, which should be avoided in areas with sensitive benthic organisms. High-resolution SPI and PV imaging can non-invasively identify and quantify these emergent and structure-forming fauna. The presence and densities of these emergent and structure-forming fauna can be obtained using the SPI/PV approach, and any changes in spatial distributions in response to offshore wind development can be detected through this proposed monitoring survey design.

### Benthic Organic Matter Processing

SPI/PV is an effective means to assess the degree of, and changes to, organic matter processing and cycling in soft sediments. Benthic communities in soft sediments serve an important role in facilitating organic matter processing and cycling. The ability of soft sediment communities to process organic matter delivered from the water column is highly dependent on the benthic community activity, specifically bioturbation, bioirrigation, and sediment mixing by shallow and deep-burrowing organisms. These infaunal activities deliver oxygenated water to the sediment column, facilitating aerobic respiration of organic matter. The degree of organic matter processing can be assessed by measuring the depth of oxygen penetration into the sediment column, which can be done through SPI analysis (apparent redox discontinuity [aRPD] depth). Other indicators of benthic organic matter processing include infaunal succession stage, feeding voids, methane, and presence of *Beggiatoa*. Of these, the successional stage and aRPD depth have the strongest predictive power for benthic functional response to physical disturbance and organic enrichment (Germano et al. 2011) and will be the key metrics used during the soft bottom surveys. Because the epifaunal growth on the novel wind turbine structures is likely to increase the delivery of organic matter to the sediments below, organic matter processing and sediment respiration is likely to increase in these adjacent soft sediments, causing a decrease in the depth of oxygen penetration into the sediment column (aRPD depth). SPI is an effective approach in assessing this change in organic matter processing with distance from the turbine as SPI analysis can accurately assess and detect changes in aRPD depths and bioturbation depths.

The aRPD depth is a measure of the depth within the sediment column where dissolved oxygen concentrations are depleted. This depth is dependent on several factors but is largely determined by the amount of organic matter load to the sediments (organic matter decomposition consumes oxygen) and the amount of bioturbation by macrofaunal organisms (bioturbation mixes oxygen from surface waters deep into the sediments). With SPI analysis, the aRPD depth is described as "apparent" because of the potential discrepancy between where the sediment color shifts and the complete depletion of dissolved oxygen concentration occurs. In sandy sediments that have very low sediment oxygen demand (SOD), the sediment may lack a visibly reduced layer even if a redox potential discontinuity (RPD) is present. Because the determination of the aRPD requires distinction of optical contrast between oxidized and reduced particles, it is difficult, if not impossible, to determine the depth of the aRPD in well-sorted sands of any size that have little to no silt or organic matter in them. When using SPI technology on sand bottoms, estimates of the mean aRPD depths are often indeterminate with conventional white light photography. It is expected that as sediments surrounding the WTGs will increase in organic enrichment and fines, the aRPD will become more 'apparent' and provide a quantitative measure of enrichment. The aRPD has been shown to be a sensitive and specific indicator of hypoxic conditions experienced over the preceding 1 day to 4 weeks (Shumchenia and King 2010), and to be correlated to concurrent *in situ* dissolved oxygen concentrations (Sturdivant et al. 2012).

There has been considerable research conducted on the effects of bioturbation on sediment geotechnical and geochemical properties as well as on sediment diagenesis (Ekman et al. 1981; Nowell et al. 1981; Rhoads and Boyer 1982; Grant et al. 1982; Boudreau 1986, 1994, 1998; Sturdivant and Shimizu 2017). Additional research has focused on the rates of contaminant flux in sediments (Reible and Thibodeaux 1999; François et al. 2002; Gilbert et al. 2003) and the two parameters that primarily affect the rate of benthic fluxes: erosion and bioturbation (Reible and Thibodeaux 1999). The depth to which sediments are bioturbated, or the biological mixing depth, can be an important parameter for understanding and predicting nutrient or contaminant flux from the sediments to the water column (and vice versa). The biological mixing depth is also a useful indicator for the degree of organic enrichment in sediments. Burrow depth has been shown to be reduced under hypoxic conditions and burrowing fauna respond quickly (within an hour) to sediment accretion and erosion (Sturdivant et al. 2012; Sturdivant and Shimizu 2017). While the aRPD depth is one potential measure of biological mixing depth, it is quite common in sediment profile images to see evidence of biological activity (burrows, voids, or actual animals) well below the mean aRPD. Biogenic particle mixing depths can be estimated by measuring the maximum and minimum depths of imaged fauna, burrows, or feeding voids in the sediment column. In this study, the minimum and maximum linear distances from the sediment surface to feeding voids and the maximum linear distance to the deepest feature of biological activity will be measured. The latter parameter represents the maximum observed particle mixing depth of head-down feeders, mainly polychaetes.

**Benthic Secondary Production and Food Provisioning**

Soft sediment benthic communities can be important prey to upper trophic levels. Although SPI/PV imagery does not provide estimates of biomass or detailed taxonomic identification, these measurements do not necessarily relate to the value of any given benthic community as prey resource. Regional and interannual variability in biomass and species composition does not reflect changes in prey availability or value in the ecosystem. This natural variability is not likely to be ecologically meaningful. SPI/PV imagery can provide information on the level of succession of benthic community present after a physical (or chemical) disturbance. SPI/PV provides a more holistic assessment of benthic functioning that captures the relationship between infauna and sediments compared with infaunal abundance assessments using sediment grab sampling (Germano et al. 2011). Although infaunal abundance and density measurements are not generated from SPI/PV analysis, other metrics that will be collected as part of the benthic biological assessment include lists of infaunal and epifaunal species, the percent cover of attached biota visible in PV images, presence of sensitive and non-native species, and the infaunal successional stage (Pearson and Rosenberg 1978; Rhoads and Germano 1982; Rhoads and Boyer 1982). The successional stage has a strong predictive power for benthic functional response to physical disturbance (Germano et al. 2011) and will be the key metrics used during this set of soft bottom monitoring surveys.

Infaunal successional stage describes the biological status of a benthic community and is useful in quantifying the biological recovery after a disturbance (physical or organic enrichment-related). Organism–sediment interactions in fine-grained sediments follow a predictable sequence of development after a major disturbance (Pearson and Rosenberg 1978; Rhoads and Germano 1982; Rhoads and Boyer 1982). This continuum is divided subjectively into four stages: Stage 0, indicative of a sediment column that is largely devoid of macrofauna, occurs immediately following a physical disturbance or in close proximity to an organic enrichment source; Stage 1 is the initial recolonizing by tiny, densely populated polychaete assemblages; Stage 2 is the start of the transition to head-down deposit feeders; and Stage 3 is the mature, equilibrium community of deep-dwelling, head-down deposit feeders. The presence of feeding voids in the sediment column is evidence of an active Stage 3 community. If the frequency of physical disturbance is high, which is generally the case in naturally dynamic benthic habitats such as the sandy environment of the outer continental shelf, the benthic community successional stage will remain low at Stage 1 or 2 (Germano et al. 2011).

**Physical Benthic Characteristics and Dynamics**

Evidence of physical sediment characteristics and dynamics, important factors associated with benthic functioning, can be readily gleaned from paired SPI and PV imagery. Specifically, parameters such as sediment grain size, CMECS Substrate Group and Subgroup, gravel sizes and distributions, presence and characteristics of small-scale bedforms (e.g., ripples) are measurements that can be obtained from SPI/PV. This imagery provides concurrent information about the physical conditions of the benthic habitat that directly relate to the species inhabiting the area and the community ecological function.

Coupling SPI and PV paired imagery allows for the assessment of benthic functioning over a spatial scale of several square meters at each station. PV images provide a larger field-of-view than SPI images, or sediment grab samples, and provide valuable information about the landscape ecology and sediment topography in the area where the pinpoint "optical core" of the SPI is taken. Distinct surface sediment layers, textures, or structures detected in SPI can be interpreted considering the larger context of surface sediment features captured in the PV images. The scale information provided by the underwater lasers allows for accurate organismal density counts and/or percent cover of attached epifaunal colonies, sediment burrow openings, larger macrofauna and/or fish which are missed in the SPI cross section. A field of view is calculated for each PV image and measurements are taken of specific parameters outlined in the survey workplan.

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SOUTHCOAST WIND

SouthCoast Wind Energy LLC
101 Federal Street
Boston, MA 02110

October 16, 2023

Mr. Ronald Gagnon
Administrator
Rhode Island Department of Environmental Management
Office of Customer and Technical Assistance
235 Promenade Street
Providence, RI 02908-5767

RE: SouthCoast Wind WQC File Number 23-044/Dredge Permit File Number DP23-198

Dear Mr. Gagnon,

SouthCoast Wind Energy LLC (formerly known as Mayflower Wind Energy LLC) (SouthCoast Wind) is in receipt of a letter, dated August 11, 2023, received from the Rhode Island Department of Environmental Management (DEM) via email requesting clarification and additional information in support of the Joint Application for a State Water Quality Certification and Marine Dredging Application filed by SouthCoast Wind for the SouthCoast Wind 1 Project on March 16, 2023. Enclosed please find updated redlined and clean versions of the 401 WQC/Marine Dredging application Sections 1, 2, and 3 and Attachment N (Benthic Monitoring Plan) which serve to respond to the comments posed by the DEM. Section 4 and Attachments A through M have not been changed from the original filing.

**Comment 1:** ***Given that the SouthCoast PPA is currently terminated, section 1.2.2 Purpose and Need should be updated.***

**Response 1:** SouthCoast Wind was awarded power purchase agreements (PPAs) for a total of 1,209 megawatts (MW) through Massachusetts offshore wind generation competitive solicitations conducted pursuant to Rounds II and III of Section 83C of c. 169 of the Acts of 2008 et seq., as amended by the Energy Diversity Act, c. 188 of the Acts of 2016 and the Act Driving Clean Energy and Offshore Wind, c. 179 of the Acts of 2022 (Section 83C), and thus has demonstrated its ability to secure awarded PPAs. The Company terminated these existing PPAs because they have become uneconomic due to unforeseen macroeconomic developments affecting the offshore wind industry. As of September 29, 2023, the agreements to terminate Massachusetts PPAs were approved by the Massachusetts Department of Public Utilities (DPU), thereby enabling the Project to compete in the upcoming Rhode Island, Connecticut, and Massachusetts solicitations for up to six gigawatts of offshore wind power. SouthCoast Wind fully expects to have PPAs in place for the full amount of the Project's capacity before construction commences. See, Massachusetts, Rhode Island, and Connecticut Sign First-Time Agreement for Multi-State Offshore Wind Procurement | Mass.gov

SouthCoast Wind provided to the Rhode Island Energy Facility Siting Board (RI EFSB) an analysis of the governing statute in Rhode Island and explained why the Energy Facility Siting Act (EFSA; R.I.G.L. §§ 42-98- 1 et seq.) does not require a PPA, or any commercial offtake arrangement, as a prerequisite to a demonstration of need. Instead, the EFSA allows for a broad and flexible consideration of the need standard, and can take into account public policies, consideration of the need for the facilities in relation to the overall impact of the facilities upon public health and safety, the environment, and the economy of the state, as well as studies and forecasts showing a need for the type of energy to be delivered by the Project. SouthCoast Wind also explained to the RI EFSB the numerous indicators of Project progress and development commitment that demonstrate that in addition to being needed, the SouthCoast Wind Project is also viable. These indicators of Project progress and development commitment include, but are not limited to: (1) very significant permitting progress on the federal level; (2) well-advanced Massachusetts environmental review; (3) interconnection secured to the regional transmission grid at Brayton Point with a signed interconnection agreement with National Grid; (4) $100 million budget for development expenses for 2023; and (5) over 75 full-time employees dedicated 100% to working on the Project and associated Clean Energy Resource.

**Comment 2:** ***2.3.2 Offshore Export Cable Construction Sequence***

- ***At what stages in the construction sequence updated reports be provided on construction activities?***
- ***Where are boulder clearance trials planned to take place?***
- ***During the seabed preparation, what will be done with any cleared ghost gear, lines, wires that collected during the pre-lay grapnel run?***
    - ***Please note that actively fishing gear CANNOT be touched by unauthorized individuals.***

**Response 2:** SouthCoast Wind expects to have Project Execution Plans before installation activities begin, then final reports (including as-builts) after the completion of the work. The boulder clearance trials will take place in a selected location (location TBD) that will allow the cable installation contractor to facilitate trials in an equivalent area.

Additionally, SouthCoast Wind will work with fishermen actively working in the area to notify them of pre-lay grapnel activities as a way to minimize gear entanglement. SouthCoast Wind will develop a gear-clearance plan, in consultation with the RI DMF, which will include advance notification to fishermen allowing them the opportunity to relocate or remove their gear. Cleared ghost gear and(or) fishing lines will be disposed of responsibly during the pre-lay grapnel run, if brought aboard the vessel. SouthCoast Wind and its contractor will clear the ECC to make it safe for cable-lay operations and for overall safety to marine navigation, however, a salvage operation is not intended nor considered safe for the marine contractor. Otherwise ghost gear will be moved outside of the cable corridor. SouthCoast Wind will however consider providing details of identified gear to programs designed to remove the ghost gear.

**Comment 3:** ***2.3.4 Pre-Installation Seabed Preparation***

- ***Same question as in 2.3.2, what is planned for any "cleared" materials from the grapnel run?***
- ***Is there a boulder relocation plan?***

**Response 3:** A boulder relocation plan will be developed upon selection of a cable installation contractor, who will also clear debris and boulders from the export cable route, as necessary. If it is determined that a boulder cannot be avoided with micro-routing, a zone (or zones) will be identified for where cleared boulders/debris can be deposited. The boulder relocation areas will be determined by evaluating the benthic survey data, in order to relocate boulders to other boulder fields, if feasible, and to avoid introducing new obstacles on the seafloor that may be encountered by fishermen.

Additional survey data will likely be collected closer to installation to identify any anomalies or changes from prior surveys (such as fishing gear, debris, unexploded ordnance, or boulders) for the vessels and installation team to ensure safe vessel operations and successful cable burial. These surveys assist in building a framework for the seafloor and subsurface along the export cable route and highlight areas requiring pre-lay route preparation.

SouthCoast Wind is committed to clear communication with the fishing industry, fisheries representatives, management agencies, and with individual fishermen, on boulder relocation activities including notification of precise locations of moved boulders to proactively avoid potential issues with gear hangs. In addition to direct contact with fishermen through SouthCoast Wind's Fisheries Manager, maps and precise coordinates of relocated boulders will be broadcast through Local Notices to Mariners and shared with the Division of Marine Fisheries.

**Comment 4:** ***2.3.5 Offshore Cable Installation Methods***

- ***When is the survey expected to be completed?***
- ***Once complete, official installation methods should be submitted to the RIDEM.***

**Response 4:** The Project has already conducted some surveys along the export cable corridor, with more planned in 2023-2024. Once complete, those data will be provided to the yet to be selected contractor who will propose the installation methodology based on the anticipated soil conditions and potential hazards. Once a determination is made, the official installation methods will be provided to RIDEM. The Cable Burial Risk Assessment (CBRA) has been provided with the application filed by SouthCoast Wind (Attachment D).

**Comment 5:** ***2.3.6 Confirmation of Installed Cable Depth***

- ***Surveying of the cable route post-lay looking at reconstitution of the cable trench (e.g., side-scan sonar) should be conducted. The RIDEM will require this within the permit conditions.***

**Response 5:** As noted within the application, the Project will be conducting post-installation surveys to verify the position and burial depth of the cable and to assess the reconstitution of the trench.

**Comment 6**: ***2.3.7 Cable Joints***

- ***Will plans be provided to RIDEM in advance of the work?***

**Response 6:** SouthCoast Wind acknowledges RIDEM's comment, and the Project will provide information on where the jointing activities will occur prior to the works commencing.

**Comment 7:** ***2.4.2 Offshore HDD Pits***

- ***Sediment in the area is very fine so RIDEM does NOT recommend side casting HDD excavated materials. RIDEM recommends that materials be stored on a barge during construction and then used to refill the pits at the end.***
- ***The side casted sediment is not an appropriate barrier for suspended sediment. A silt screen or sheet pile may not be feasible in this location, but some form of mitigation should be implemented. RIDEM is happy to set up a meeting to discuss potential options.***

**Response 7:** SouthCoast Wind has verified seabed conditions of primarily soft sediments in Mount Hope Bay and the Sakonnet River (expected to be suitable for cable burial) and will further evaluate and propose potential burial and suspended sediment mitigation options to RIDEM for further discussion.

As mentioned in the Project's CRMC Assent application [at 2-19, 3-22, Appendix A Soil Erosion and Sediment Control (SESC) Plan, and Appendix G - HDD Inadvertent Release of Drilling Muds Contingency Plan], SouthCoast Wind will select and use Best Management Practices (BMPs) including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. Recently SouthCoast Wind has reestablished regular check in meeting with RIDEM and CRMC and the Project can make a point to add this as a primary discussion topic.

**Comment 8:** ***2.6.6 Marine Monitoring***

- ***Please state the NOAA requirements being followed within this section.***

**Response 8:** National Oceanic and Atmospheric Administration (NOAA) requirements to be followed include those approved in the final Incidental Take Authorization, Endangered Species Act consultation, and Essential Fish Habitat consultation, where applicable. The Marine Mammal Protection Act (MMPA) consultation, Endangered Species Act consultation, and Essential Fish Habitat consultation are all currently ongoing with the SouthCoast Wind federal NEPA process. Final NOAA requirements that are applicable to Project activities in Rhode Island state waters can be provided to RIDEM once available. SouthCoast Wind will also implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (see Appendix O of the Construction and Operations Plan [COP]).

**Comment 9:** ***2.4.4 Cable Pulling***

- ***Cable installation and pulling may occur several months post HDD construction. How many months post? Please include in detailed construction schedule.***
- ***Additional excavation may be required to access capped ends offshore. RIDEM will require additional details on timing, potential excavation volume, etc.***

**Response 9:** SouthCoast Wind's preliminary schedule has HDD work occurring one to two years before cable pull-in. SouthCoast Wind will include these activities in the detailed construction schedule, once specific date and timelines are more refined.

SouthCoast Wind acknowledges RIDEM's request for additional details on accessing capped ends. This information will become available during the development of the detailed engineering design.

**Comment 10:** ***2.4.5 Operation and Maintenance***

- ***This plan should be provided to RIDEM once developed.***

**Response 10:** Once available, SouthCoast Wind will provide RIDEM with the applicable portions of their Operations & Maintenance Plan, which will include visual inspection and maintenance schedules that will be based on manufacturer recommendations. These inspections will occur at regular intervals and after major storm events as will be agreed upon by the permit and COP conditions.

**Comment 11:** ***2.6.8 Proposed Avoidance, Minimization, and Mitigation Measures***

- ***Table 2-7 has some incomplete statements in it. Primarily, "The Electric Fields (EF) arising from the voltage on the export cables will be completely shielded by cable materials." While EF will be shielded, the unshielded magnetic field will induce a secondary EF.***
- ***How is SouthCoast striving to achieve target burial depth as mitigation?***

**Response 11:** As indicated in Table 2-7, the electric fields arising from the voltage on offshore export cables will be completely shielded by cable materials, such as metallic sheathing and steel armoring. Although the steady MFs emitted by DC submarine cables do not create induced electric fields like those created by the time-varying MFs from 60-Hz AC submarine cables, motion-induced electric fields are created by the movement of seawater or marine species through the steady MFs emitted by DC submarine cables. These motion-induced electric fields have the same properties as the motion-induced electric fields that are created by the movement of seawater or marine species through the earth's steady geomagnetic field. For the typical buried HVDC offshore cable installation case, the motion-induced electric fields associated with movement through the steady MFs emitted by the Project HVDC submarine cables will be small relative to the motion-induced electric fields associated with movement through the earth's steady geomagnetic field. The strength of these motion-induced electric fields also similarly drops off with distance from the cables like the DC MFs associated with the current on the submarine cables. See later comment for additional discussion of the limited impact/effect of these motion-induced electric fields.

SouthCoast Wind has specific burial performance criteria that the cable installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.

Further, SouthCoast Wind is proposing two "long-distance" Horizontal Directional Drill operations, HDD from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features. Achieving target burial depth at the HDD landfalls is expected, and will be the objective of the final engineering design.

**Comment 12:** ***3.3.2.1 Impacts to Benthos at HDD Locations***

- ***Staff have concerns with the side casting of some dredge materials with no silt-screens or collection/dewatering plans. Instead, the applicant proposes that the side-casted material is to "be used to backfill the HDD construction areas" (p27/RIDEM WQ Dredge Apps and Nrurntive Book 1). Given the unclear plan for using the dredge materials and large amount 11000 M3, this part of the Impacts section should be detailed more clearly.***
- ***Impacts to benthos are aimed primarily at Crepidula (p 90). Other benthic species are likely to be affected and should be addressed.***
- ***Plans in Attachment C-3 (Drawings and Dredge Calculations) do not show HDD work proposed within the Town Pond Restoration and Conservation Area. Please confirm that the Town Pond system is no longer being considered for HDD work.***

**Response 12:** SouthCoast Wind acknowledges that side-casting may not be the best methodology for the area due to other soft sediment taxa, such as polychaetes, Ampelisca amphipods, etc., present in Mount Hope Bay. SouthCoast Wind will conduct further studies to propose options for the dredging material, such as backfill in the HDD construction areas, and will propose these options to RIDEM (see response to Comment #7). A benthic monitoring plan, developed in accordance with BOEM recommendations, is being submitted as a new attachment to the WQC/Marine Dredge Application (Attachment N).

At this time the route near Town Pond is not the preferred route for SouthCoast Wind, however further geotechnical surveys occurring this fall will confirm.

**Comment 13:** ***3.3.1.1. Submerged Aquatic Vegetation***

- ***SAV beds were not mapped by URI within the ECC. The closest SAV mapped by URI is near the mouth of the Sakonnet River, located over 1.0 km from the edges of the ECC (Figure 4-3, Attachment H).***
  - ***The Sakonnet was not consistently included, and perhaps was not included in any year(s), in the aerial overflights.***
- ***Based on distinct side-scan sonar signatures in the geophysical data collected by South Coast Wind, SAV and/or macroalgae may be present in the vicinity of the ECC in the Sakonnet River south of the onshore Aquidneck Island crossing, but this area has not yet been field verified (Figure 4-4, Attachment H).***
- ***The area will be re-surveyed for SAV prior to construction, as necessary, to guide HDD placement to avoid impacts to SAV.***
  - ***This will need to be addressed and may influence the cable route. There is a window for SAV presence to be assessed (CRMC Reg 1.3.1.R.1.J).***
  - ***CRMC Reg 1.3.1.R.I.J: "It is the policy of the Council that SAV surveys shall be completed during peak biomass. SAV surveys shall be completed in Narragansett Bay between July 1 and September 15. SAV surveys shall be completed in the south shore coastal ponds and other shallow water embayments between July 1 and August 15."***

**Response 13:** SouthCoast Wind has previously proposed that, if necessary, it will conduct a SAV survey for field verification during the acceptable time period outlined in the CRMC regulations. If necessary and applicable based on final cable routing and agency discussions, SouthCoast Wind would conduct the SAV survey during the appropriate and agreed upon time frame, and use the Colarusso & Verkade methodology as reference.

**Comment 14:** ***3.3.1.2. Consistency with Previous Studies***

- ***Star Coral recorded is as sensitive taxa observed in ground truthing in table 3-8 but is never mentioned in text (Rhode Island Sound mixed cobble). There should be discussion regarding potential impacts to this species.***

**Response 14:** The only locations in the Project ECC sampled by SouthCoast Wind where northern star coral were observed were in RI Sound, outside of the Sakonnet River, and are well removed from the proposed dredge areas.

The sensitive taxa of the northern star coral (*Astrangia poculata)* were observed in the ECC in federal waters (20% of stations) and in Rhode Island State Waters (80% of stations).

Northern star coral were observed in the ECC in federal waters, corresponding with Glacial Moraine A and Sand – with Boulder Field(s) habitats at Southwest Shoal and in Rhode Island State Waters in Rhode Island Sound, seaward of the Sakonnet River, corresponding with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats. See Figure 3-19 from the Benthic Habitat Mapping Report (Attachment H). SouthCoast Winds continues to evaluate micro-routing options for the offshore export cable to avoid and/or minimize impacts to habitats.

SouthCoast Wind has added text to Section 3.3.1.2 of the application to detail this.

**Comment 15:** ***3.3.1.3. Shellfish***

- ***We will require shellfish surveying at least for the HDD landing/exit sites.***
- ***We will also recommend a whelk pot survey along the full extent of the route.***

**Response 15:** SouthCoast Wind acknowledges RIDEM's comment above. SouthCoast Wind will be conducting a whelk pot survey within the Sakonnet River as part of a Fisheries Monitoring Plan (FMP), which RIDEM reviewed and provided comments on July 27, 2023. The whelk survey component of the FMP focuses on parts of the ECC that are known whelk fishing grounds. SouthCoast Wind believes the sampling locations for the whelk survey are appropriately located to understand the potential impacts from cable installation.

**Comment 16:** ***3.3.2.4. Displacement of Benthic Communities during Construction Activities***

- ***Where are the SAV beds located relative to the proposed HDD work? RIDEM will require the distance of the SAV to estimate potential impacts from suspended sediment.***
- ***Shellfish resources will be impacted within the ECC and offshore HDD construction areas. As stated earlier, we will require that SouthCoast perform a shellfish survey and a shellfish transplant, if deemed necessary based upon survey results.***

**Response 16:** SouthCoast wind acknowledges RIDEM's shellfish resources comment above. The potential SAV bed in the vicinity of the HDD at Portsmouth is approximately 656 ft (200 m) northeast of the indicative HDD pit location.

**Comment 17:** ***3.3.2.5. Changes in Ambient EMF***

- ***No discussion is provided on a potential induced electric field from the unshielded magnetic field. While likely to be limited in impact/effect, it should be discussed.***

**Response 17:** As mentioned above in comment 11, the steady MFs associated with DC submarine cables do not directly induce electric fields, but weak DC electric fields will be induced by water flow or marine animal movement through the DC MFs associated with DC submarine cables. CSA Ocean Sciences Inc. and Exponent (2019) discussed that a typical buried HVDC offshore cable produces a DC electric field strengths of approximately 0.075 mV/m (0.000075 V/m) or less. There is a lack of evidence demonstrating a likelihood of significant impacts/effects from the motion-induced electric fields associated with DC submarine cables. CSA

Ocean Sciences Inc. and Exponent (2019) also discussed how electrosensitive marine species can distinguish natural bioelectric fields used locate prey, mates, and predators from naturally occurring motion-induced electric fields. This is discussed in greater detail in Section 3.3.2.5 of the Affected environments, potential impact, and proposed avoidance, minimization and mitigation (Section 3) of SouthCoast Wind's revised application.

**Comment 18:** ***3.4.2.2. EMF Impacts Assessment - Finfish***

- ***See comments on 3.3.2.5. EMF. Finfish are unlikely to have much interaction based on current literature, but American eel sensitivity and navigation should be discussed based on European eel studies.***

**Response 18:** The 2019 study as well as an additional BOEM sponsored study in 2021 have discussed the scientific evidence bearing on the potential impacts of EMFs from submarine power cables on the European eel and the American eel. While acknowledging the evidence indicating that multiple eel species can potentially detect the earth's steady (DC) geomagnetic field and the "mixed evidence" that eel species can detect electric fields, the 2019 report highlighted findings from two studies of European eels supporting a lack of significant effects of AC magnetic fields on eel species. In particular, this report described one laboratory study as reporting no effect of a 950 mG magnetic field from a 50-Hz AC power source on the swim behavior or orientation of European eels, and a field study as reporting findings that migration of European eels was not prevented by an unburied AC power cable. The 2021 report also discussed findings from these two studies of European eels, concluding that they provide "insufficient evidence to confidently decipher the behavioral response to cable EMFs in the context of AC or DC cables." The 2019 report concluded overall that the impact consequence of any exposure of American eels to EMFs from buried submarine power cables was "negligible." This conclusion was based on the small and localized portion of the pelagic habitat that would experience detectable EMFs from buried submarine power cables, and the available scientific evidence supporting any biological effects as being either not detectable or small changes. This report highlighted how changes in the earth's magnetic field are potentially just one of many environmental cues (e.g., water temperature, light, salinity) that can guide the migratory behavior of eels.

***References:***

CSA Ocean Sciences Inc.; Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England.* Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

Hutchison, ZL; Sigray, P; Gill, AB; Michelot, T; King, J. 2021. *Electromagnetic Field Impacts on American Eel Movement and Migration from Direct Current Cables.* Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2021-83. 150p., December.

**Comment 19:** ***3.4.3. Proposed Avoidance, Minimization, and Mitigation Measures***

- ***More detail is needed on these measures (e.g., explain how a coffer dam would reduce the dredging footprint; is the cable route selecting for sediments that are more likely to be successfully jet-plowed within).***

**Response 19:** SouthCoast Wind acknowledges RIDEM's comment. Table 2-9 of the Project's RI CRMC Assent application and Table 16-1 of the COP Volume II summarizes the various avoidance, minimization and mitigation measures the Project intends to abide by to minimize impact during all phases of construction, operations, and decommissioning. These tables also illustrate that the Project intends to apply Best Management Practices (BMPs) that are included in Attachment A of BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan.*

As indicated in Table 16-1 of the COP, SouthCoast Wind will select and use BMPs including the use of a Stormwater Pollution Prevention Plan to minimize sediment mobilization during offshore construction of WTGs and OSPs, scour protection placement, and HDD operations. SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.

As indicated in Table 2-9 of the Assent application, SouthCoast Wind will select and use BMPs including the use of a Soil Erosion and Sediment Control (SESC) plan to minimize sediment mobilization during offshore construction and HDD operations. SouthCoast Wind will have an HDD Contingency Plan in place to mitigate, control, and avoid unplanned discharges related to HDD activities. SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook, and in accordance with approved plans and permit requirements. The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas.

Impacts associated with the installation of a cofferdam or casing pipe with goal posts (if necessary) would be similar to those discussed for seafloor preparation, but on a smaller scale. The cofferdam or casing pipe with goal posts will be a temporary structure used during construction only. Therefore, no conversion of habitat is expected, and the cofferdam will be removed prior to the operations phase.

**Comment 20:** ***3.6.1.6. Common Commercial Gear Types in the ECC***

- ***Correction: midwater trawling is not legal in RI state waters.***

**Response 20:** SouthCoast Wind acknowledges RIDEM's comment referenced above and has deleted the incorrect reference in the Application.

**Comment 21:** ***3.6.4.2. Proposed Fisheries Mitigation Measures***

- ***"SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities." This is taking place in Massachusetts and is not relevant to this application.***
- ***It is suggested to add a frequency of mariner updates/web updates to the mitigation measures (e.g., daily or more during active construction.)***

**Response 21:** SouthCoast Wind acknowledges RIDEM's comments referenced above, and has deleted the irrelevant reference from the Application. Per RIDEM's suggestion, SouthCoast Wind has added an intended frequency of mariner updates/web updates to the mitigation measures. SouthCoast Wind will provide updates to mariners as they become available - the frequency will be dictated by the type of activity, which could be as frequent as daily notifications during construction. SouthCoast shared the final fisheries monitoring plan with RIDEM on September 15, 2023.

We very much appreciate the thorough review the RIDEM staff are performing for the SouthCoast Wind 1 Project, and we hope that the responses address your comments.

SouthCoast Wind makes the following statement, in accordance with 40 C.F.R. § 121.5(8): *The project proponent hereby certifies that all information contained herein is true, accurate, and complete to the best of my knowledge and belief.*

SouthCoast Wind makes the following statement, in accordance with 40 C.F.R. § 121.5(9): *The project proponent hereby requests that the certifying authority review and take action on the CWA 401 certification request within the applicable reasonable period of time.*

SouthCoast Wind appreciates your continued consideration of this submittal. We look forward to continuing to work with the DEM to support your review of the SouthCoast Wind 401 WQC/Dredge Permit application.

Sincerely,

Jennifer Flood
Permitting Director
SouthCoast Wind Energy LLC

SOUTHCOAST WIND

REDLINE VERSION

# SouthCoast Wind 1 Project

## Joint Application for a State Water Quality Certificate and Marine Dredging Permit

**Amended October 2023**

### AMENDED NARRATIVE – Sections 1, 2, and 3

**Submitted to: Rhode Island Department of Environmental Management**

**Location: Rhode Island State Waters and Portsmouth, Rhode Island**

**Project Proponent: SouthCoast Wind Energy LLC**

**Preparer: POWER Engineers, Inc.**

## TABLE OF CONTENTS

**TABLES:**

**NEW ATTACHMENT:**

# 1. INTRODUCTION

SouthCoast Wind Energy LLC (SouthCoast Wind) is a 50:50 joint venture between Shell New Energies US LLC (Shell New Energies) and Ocean Winds North America LLC (Ocean Winds). The combined experience brings a depth of real-world experience in designing, permitting, financing, constructing, and operating wind projects. SouthCoast Wind is registered to do business in Rhode Island.

SouthCoast Wind is developing an offshore wind renewable energy generation facility in federal waters in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0521 (Lease Area) located approximately 51 nautical miles (nm) (94 kilometers [km]) southeast of the Rhode Island coast. The Lease Area is not within Rhode Island jurisdictional areas, and specifically, it is not within the Geographic Location Descriptions (GLDs) defined in the Rhode Island Ocean Special Area Management Plan (Ocean SAMP).

Up to 147 wind turbine generators (WTGs) are planned within the Lease Area with the potential to generate an estimated 2,400 megawatts (MW) of clean renewable energy. SouthCoast Wind is developing two interconnection projects to connect export cables from the Lease Area to the regional power grid. The SouthCoast Wind 1 Project will connect at Brayton Point in Somerset, Massachusetts and the Falmouth Connector Project will connect in Falmouth, Massachusetts (see Figure 1-1 in Attachment A). The Brayton Point interconnection location was selected for the Project due to its robust capacity for energy injection into the existing electrical grid and the opportunity to redevelop a previously disturbed brownfield site formerly occupied by a coal burning power generation plant, which makes it situated in a prime location for an interconnection to the grid. This connector system is necessary to deliver the renewable clean energy generated by SouthCoast Wind's offshore energy generation facility to the New England region via the Independent System Operator - New England (ISO-NE) administered regional transmission system.

For purposes of this application, the Project includes export cables with 1,200 MW of capacity running through Rhode Island - specifically through Rhode Island Sound, the Sakonnet River, onshore underground crossing at Aquidneck Island in Portsmouth, Rhode Island (see Figure 1-2, Attachment A), then into Mount Hope Bay. At the onshore underground crossing of Aquidneck Island, the Project includes additional conduits (not additional cables) to accommodate 1,200 MW of additional transmission capacity if needed in the future. In the filing with the Rhode Island Energy Facility Siting Board (RI EFSB), this option is referred to as the "Noticed Variation." The *Project Concept Schematic* illustrating the regulatory jurisdictional areas of the SouthCoast Wind 1 Project is presented below.

SouthCoast Wind is submitting this application to the Rhode Island Department of Environmental Management (RIDEM) for the following permits:

- State Water Quality Certification (WQC) pursuant to the Rhode Island state Water Quality Regulations (250-Rhode Island Code of Regulations [RICR]-150-05-1.15(A)(3)) and Section 401 of the federal Clean Water Act (CWA).
- Marine Dredging Permit pursuant to the Marine Infrastructure Maintenance Act of 1996 and the Marine Waterways and Boating Facilities Act of 2001, Chapter 46-6.1 of the Rhode Island General Laws (R.I.G.L.); and § 2.4.13 in the Rules and Regulations for Dredging and the Management of Dredged Materials ("Dredging Regulations") (250 RICR-150-05-2).

SouthCoast Wind is also submitting this package to the United States Army Corps of Engineers (USACE) - New England District in compliance with the 2020 CWA Section 401 Rule.

SouthCoast Wind will be filing a separate permit application with the RIDEM for coverage under the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program General Permit for Stormwater Discharge Associated with Construction Activity (Construction General Permit or ~~CPG~~CGP), in compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended and regulations for the RIPDES Program (250-RICR-150-10-1).

SouthCoast Wind filed a Joint Category B Assent application (650-RICR-20-00-1) and Freshwater Wetlands Permit application under the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9) with the Rhode Island Coastal Resources Management Council (RI CRMC) on February 24, 2023. Please see Figure 1-3 for an illustration of RIDEM and RI CRMC regulatory jurisdiction. SouthCoast Wind anticipates that the RIDEM and RI CRMC will continue their joint consultations and reviews of SouthCoast Wind's filings for the SouthCoast Wind 1 Project.

## 1.1 Regulatory Requirements

SouthCoast Wind is seeking the following permits from the RIDEM for the SouthCoast Wind 1 Project in Rhode Island state waters.

### 1.1.1 State Water Quality Certification

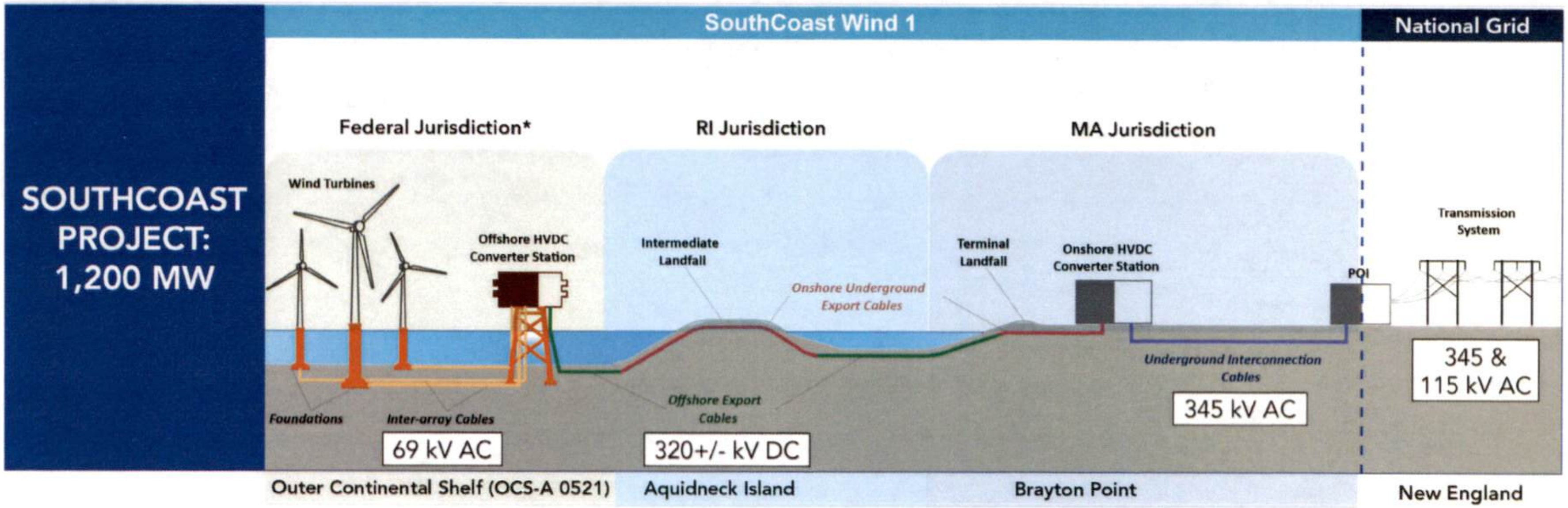
The Project includes the following proposed activities in Rhode Island state waters extending seaward to the three-nautical mile limit and subject to the jurisdiction of RIDEM pursuant to the RIDEM Water Quality Regulations (WQR) (250-RICR-150-05-1) and will require a WQC pursuant to WQR Section 1.15(A)(3):

- Installation, operation, and maintenance of two underwater power export cables and associated communications cabling, each approximately 20.4 miles (mi) (32.8 km) long.
- Possible placement of fill (i.e., secondary cable protection) in state waters over the proposed underwater export cables to protect segments of the submarine export cables and existing utilities.
- Installation of the underwater export cables at the Project's proposed landfall construction areas utilizing horizontal directional drilling (HDD) with work including temporary excavation / dredging at eight offshore HDD pits.

The RIDEM and the RI CRMC regulate waterbodies within Rhode Island jurisdiction through the RIDEM Surface Water Quality Standards and the Rhode Island Coastal Resources Management Plan (CRMP), respectively. The RIDEM Surface Water Quality Standards and Section 401 WQC Regulations categorize water quality standards for each waterbody. The waters of the state of Rhode Island are assigned a Use Classification which is defined by the most sensitive uses that it is intended to protect (see Section 3.2 of this Application for additional information).[1]

[1] 250-RICR-150-05-1

# Overview of SouthCoast Project Components
## Offshore to Onshore




**Key**

* BOEM review covers entire project

**AC:** Alternating current
**DC:** Direct current
**kV:** Kilovolt (measures voltage)
**MW:** Megawatt (measures bulk power)
**POI:** Point of interconnection to the regional grid

**SOUTHCOAST WIND 1 PROJECT CONCEPT SCHEMATIC**

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The RI CRMC assigns water use categories for marine and coastal waters in accordance with the CRMP as amended (aka, "The Redbook") Section 1.2.1 Tidal and Coastal Pond Waters A.[2] The ECC crosses the following water use categories (see Figure 1-5 Attachment A):

- Open waters in Rhode Island Sound that support a variety of commercial and recreational activities while maintaining good value as a fish and wildlife habitat and open waters in Mount Hope Bay that could support water dependent commercial, industrial, and/or high intensity recreational activities are classified as Type 4 Multipurpose Waters.
- The Sakonnet River is classified as Type 2 Low Intensity Use Waters characterized by high scenic value that support low intensity recreational and residential uses. These waters include seasonal mooring areas where good water quality and fish and wildlife habitat are maintained.
- A short segment of the Brayton Point ECC in lower Mount Hope Bay overlaps with Type 6 waters (see Figure 1-5, Attachment A). However, SouthCoast Wind has committed to routing the cable to avoid the Type 6 water area. To establish the boundaries of Type 6 waters, the CRMC established a buffer to federal navigation channels that measures three times the channel depth. Type 6 waters are categorized for (i) industrial waterfronts, and (ii) commercial navigation channels. SouthCoast Wind has committed to the USACE and the United States Coast Guard (USCG) to routing the offshore export cables outside of Type 6 waters including the Mount Hope Bay main shipping channel, the Tiverton channel, and outside of the buffers to these federal navigation channels.

Compliance of the Project with the RIDEM regulatory standards is addressed in Section 4 of this Application.

### 1.1.2 Marine Dredging and Associated Activities Permit

A Marine Dredging Permit from RIDEM is required for the offshore HDD pits in the Sakonnet River and in Mount Hope Bay pursuant to the Marine Infrastructure Maintenance Act of 1996 and the Marine Waterways and Boating Facilities Act of 2001, Chapter 46-6.1 of the R.I.G.L.; and §2.4.13 in the Dredging Regulations (250 RICR-150-05-2). The estimated volume of sediment to be temporarily excavated / dredged at each of the eight offshore HDD pits is 1,867 cubic yards (1,427 cubic meters). SouthCoast Wind plans to side-cast sediments adjacent to the offshore construction areas within the ECC to allow a readily available means of backfilling the trench and underwater cables. No offsite disposal of excavated sediment is planned.

### 1.1.3 Wetlands

The onshore Project components lie on or cross the jurisdictional boundary between RI CRMC and RIDEM review of wetlands. RI CRMC will be the sole freshwater wetland review agency in accordance with 650-RICR-20-00-9.5.4. Any Project impacts to freshwater wetlands within RIDEM jurisdiction or their contiguous areas is addressed in the Joint Application for a Category B Assent and Freshwater Wetlands Permit in the Vicinity of the Coast filed with the RI CRMC. No components of the Project are located within biological freshwater wetlands or biological coastal features as defined by Rhode Island regulations; nor is there any proposed discharge of fill or dredged material into freshwater wetlands. However, portions of the Aquidneck Island intermediate underground cable crossing route fall within contiguous areas of freshwater wetlands and river/stream pursuant to the CRMC Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast.[3]

[2] 650-RICR-20-00-1
[3] 650-RICR-20-00-9

## 1.2 PURPOSE AND NEED

The SouthCoast Wind 1 Project will help meet Rhode Island's important public policy requirements regarding clean energy, climate change, energy security and economic advancement for the benefit of the region. The overall purpose of the Project is to deliver approximately 1,200 MW of renewable clean energy to the New England regional electric grid. The SouthCoast Wind 1 Project is necessary to meet the needs of the state and region for substantial reductions in Greenhouse Gas (GHG) emissions and substantial increase to the renewable clean energy supply, delivered safely and reliably to the region from offshore wind. By enabling delivery of the offshore wind energy, the Project will provide the region with substantial benefits, including environmental and economic benefits and strengthening of energy system reliability and energy security. The policies and legislative directives of the New England states, including Rhode Island, express a clear need for additional renewable clean energy generation from offshore wind.

The key public policy requirements in Rhode Island that drive the need for the Project are highlighted below.

### 1.2.1 Rhode Island Climate Change Legislation and Policies

Energy 2035: Energy 2035 identified offshore wind as Rhode Island's "most significant renewable energy resource."[4] Significantly, Energy 2035 established the goals to "increase sector fuel diversity, produce net economic benefits, and reduce greenhouse gas emissions by 45 percent by the year 2035."[5] To achieve these goals, Energy 2035 recommended numerous policy actions, including the promotion of local and regional renewable energy.[6] To achieve this goal, Energy 2035 specifically prescribed procuring additional renewable energy "through support for state and federal offshore wind projects."[7]

Rhode Island 2030 Vision Plan: While only 19% of the State's electricity consumption currently comes from renewable resources, Rhode Island has a roadmap to source 100% of its electricity from renewable resources by 2030. In October 2021, Governor Dan McKee released a working draft of a vision plan for the next decade in Rhode Island, *Rhode Island 2030: Charting a Course for the Future of the Ocean State* (Rhode Island 2030).[8] Rhode Island 2030 focuses on harnessing the State's "Blue Economy" as well as the "Green Economy." An industry that perfectly fits in both of these categories is the offshore wind industry. As an Infrastructure and Transportation Objective, Rhode Island 2030 states, "Infrastructure that supports the Blue Economy and life sciences, including ports that support offshore wind activity and site readiness work that enables future industrial and commercial development."[9] The plan notes that the State will continue to invest in needed infrastructure for offshore wind in pursuit of the State's renewable energy goals.

Executive Order No. 20-01, Advancing a 100% Renewable Energy Future for Rhode Island by 2030: In January 2020, then Governor Gina Raimondo issued an Executive Order committing Rhode Island to be powered by 100% renewable electricity by 2030.[10] This Executive Order committed Rhode Island "to mitigating economy-wide greenhouse gas emissions and their effect on climate change, while spurring new and innovative opportunities for investment and job growth throughout the state's clean energy economy."[11] The Executive Order further found that "a clean and affordable future electric grid will require a diverse combination of

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[4] Energy 2035 at 15.
[5] *Id.* at 34.
[6] *Id.* at 62-63.
[7] *Id.* at 63.
[8] Rhode Island 2030: Charting a Course for the Future of the Ocean State, Working Document (2021) https://www.ri2030.com/_files/public/RI%202030_final.pdf.
[9] *Id.* at 50.
[10] Rhode Island Executive Order No. 20-01, Advancing a 100% Renewable Energy Future for Rhode Island by 2030 (Jan. 17, 2020) https://governor.ri.gov/executive-orders/executive-order-20-01 .
[11] *Id.*

responsibly- developed resources to power our economy while maintaining reliability, including, but not limited to, offshore wind, solar, on-shore wind, and storage."[12]

Resilient Rhode Island Act and Rhode Island Greenhouse Gas Emissions Reduction Plan: In 2014, the General Assembly passed the *Resilient Rhode Island Act*. That act created the Rhode Island Executive Climate Change Coordinating Council (RIEC4), which is charged with working to achieve ~~Greenhouse Gas (~~GHG~~)~~ reduction targets: 10% by 2020, 45% by 2035, and 80% by 2050.[13] In 2016, RIEC4 released the *Rhode Island Greenhouse Gas Emissions Reduction Plan*, which identified strategies and actions to meet the GHG reduction targets.[14] The 2016 Plan specifically emphasized the importance of renewable and clean energy, specifically offshore wind, to aid Rhode Island in meeting its GHG reduction goals.[15]

2021 Act on Climate: In 2021, the General Assembly amended the *Resilient Rhode Island Act* through the passage of the *2021 Act on Climate* with the intent of increasing Rhode Island's efficiency and effectiveness in responding to climate change. The *2021 Act on Climate* sets mandatory and enforceable targets for reducing greenhouse-gas emissions and transitioning to a low carbon economy.[16] The *2021 Act on Climate* requires that the RIEC4 update the *Greenhouse Gas Emissions Reduction Plan* to develop a plan to reduce climate emissions to net zero by 2050. This plan is required to be delivered to the General Assembly by December 31, 2025.

Affordable Clean Energy Security Act of 2022: On July 6, 2022, Governor Dan McKee signed into law the *Relating to Public Utilities and Carriers – Affordable Clean Energy Security Act* that seeks to expand Rhode Island's offshore energy resources. In issuing the legislation, Governor McKee stated: "Adding offshore wind clean energy capacity is essential to meeting our new 100 percent renewable energy by 2033 goal and our Act on Climate emissions reduction target."[17]

### 1.2.2 Regional Energy Supply and Transmission System Reliability

States in the New England region have conducted procurements of offshore wind energy through competitive solicitations.[18] SouthCoast Wind ~~has participated in some of these and has been~~was awarded ~~two~~ power purchase agreements (~~PPAs). SouthCoast Wind plans to develop the full capacity of the Lease Area (an estimated 2,400 MW) and obtain power purchase commitments~~PPA) for ~~the full output of its~~ a total of 1,209 MW through Massachusetts offshore wind ~~renewable energy~~ generation ~~facility. SouthCoast Wind currently intends to participate in future~~ competitive solicitations ~~for offshore wind procurement. In Massachusetts, SouthCoast Wind has participated in two offshore wind procurements~~ conducted pursuant to ~~legislation, the 2019 and 2021 Offshore Wind Solicitations, in accordance with Section 83C~~ Rounds II and ~~Section 83C~~ III of ~~the *Massachusetts*~~ Section 83C of c. 169 of the Acts of 2008 et seq., as amended by the Energy Diversity Act ~~*of 2018*. SouthCoast Wind's current~~, c. 188 of the Acts of 2016 and the Act Driving Clean Energy and Offshore Wind, c. 179 of the Acts of 2022 (Section 83C), and thus has demonstrated its ability to secure awarded PPAs. The Company terminated these existing PPAs because they have become uneconomic due to unforeseen macroeconomic developments affecting the offshore wind industry. As of September 29, 2023, the agreements to terminate Massachusetts PPAs were approved by the Massachusetts Department of Public Utilities (DPU), thereby enabling the Project to compete in the upcoming Rhode Island, Connecticut, and Massachusetts solicitations for up to six gigawatts of offshore wind power. SouthCoast Wind fully expects to have PPAs in place

[12] *Id.*
[13] R.I.G.L. § 42-6.2 et seq.
[14] RIEC4, Rhode Island Greenhouse Gas Emissions Reduction Plan (December 2016). http://climatechange.ri.gov/documents/ec4-ghg-emissions-reduction-plan-final-draft-2016-12-29-clean.pdf.
[15] *Id.* at 18, 27, 30, 36.
[16] R.I.G.L. § 42-6.2 et seq.
[17] State of Rhode Island Office of Energy Resources. 2022. Governor McKee Signs Legislation Requiring Offshore Wind Procurement for 600 to 1,000 Megawatts. July 6, 2022. https://energy.ri.gov/press-releases/governor-mckee-signs-legislation-requiring-offshore-wind-procurement-600-1000.
[18] *See* CT Public Act 19-71 (directing DEEP to procure 2,000 MW of offshore wind energy).

for the ~~Project total 1,204 MW from the offshore wind energy facility.~~full amount of the Project's capacity before construction commences. See, Massachusetts, Rhode Island, and Connecticut Sign First-Time Agreement for Multi-State Offshore Wind Procurement | Mass.gov

The Project is necessary to connect the SouthCoast Wind offshore wind renewable energy generation facility to the ISO-NE grid. The offshore wind generation will help meet the need for GHG emissions reductions and increase in clean energy supply, including from offshore wind, in the region, as expressed in the state policies and legislative directives listed above.

SouthCoast Wind's offshore energy generation facility is approximately 51 nm (94 km) southeast of the coast of Rhode Island and requires new transmission infrastructure to connect to the onshore electric grid. Both the offshore and the onshore Project components are integral to the Project being able to deliver its energy to the New England grid and to facilitate a safe and reliable interconnection.[19]

Therefore, the existing transmission system is inadequate to interconnect SouthCoast Wind's offshore wind renewable energy generation facility and the proposed new transmission is needed to interconnect it to the regional electrical grid safely and reliably.

In developing this new transmission in the Project, SouthCoast Wind has engaged in an extensive analysis of offshore and onshore routing alternatives to avoid, minimize and/or mitigate impacts in the Town of Portsmouth, Rhode Island and surrounding communities including those on the Sakonnet River and Mount Hope Bay. See Attachment B Route Alternatives Assessment. The SouthCoast Wind 1 proposed ~~point~~Point of Interconnection (POI) at Brayton Point will provide the offshore wind renewable energy generation facility with a strong interconnection to the regional transmission system for the reliable delivery of renewable clean energy.

## 1.3 OTHER PROJECT APPROVALS AND PERMITS

In addition to a state water quality certification and a marine dredging permit, the Project requires permits and approvals from other state and federal regulatory agencies. Notably, SouthCoast Wind will also apply for several environmental permits and approvals at the state level through the RI CRMC.

### 1.3.1 Rhode Island Coastal Resources Management Council

**Category B Assent.** SouthCoast Wind filed a joint Category B Assent and Freshwater Wetlands Permit Application with the RI CRMC on February 24, 2023. The Project falls under the jurisdiction of the CRMC as it is located in areas regulated by the RI CRMC's CRMP (650-RICR-20-00-01) under Sections 1.2.1 - Tidal and Coastal Pond Waters and Section 1.2.2 - Shoreline Features.

**Freshwater Wetlands Permit**. The Project will require a Freshwater Wetlands Permit from the RI CRMC for work activities located within the 200-foot contiguous area to a coastal wetland pursuant to the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast. Updated RI CRMC regulations relating to Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-9 et seq.) went into effect on July 1, 2022. Under these new regulations, RI CRMC no longer regulates "Riverbank Area" and "Perimeter Wetland" portions of freshwater wetlands in the vicinity of the coast. Under the new regulations, RI CRMC regulates a Jurisdictional Area which includes the resource (i.e., wetland or stream) and a contiguous area extending 200 feet (ft) outward from a river / stream and 100 ft outward from a freshwater wetland. The

[19] *See In re: the Issuance of an Advisory Opinion to the Energy Facility Siting Board Regarding Revolution Wind, LLC's Application to Construct and Alter Major Energy Facilities*, RI EFSB Docket No. 5151 (August 26, 2021) http://www.ripuc.ri.gov/efsb/2021_SB-01/PUC%20Advisory%20Opinion%20-%20Revolution%20Wind%20(8-26-2021).pdf.

contiguous area includes the resource's Buffer Zone and Buffer.

**Submerged Lands Lease**. The Project, namely the offshore underwater export cables extending between the mean high-water mark seaward to the limit of the Rhode Island territorial waters, is under the purview of the Rhode Island Coastal Zone Management Act G.L. 46-23-1 et seq. authorizing the RI CRMC to review and issue Submerged Lands Lease. The regulations set forth in the Rhode Island Ocean Special Area Management Plan allow the RI CRMC to issue a Submerged Lands License for Renewable Energy Development, such as the offshore underwater export cables proposed by SouthCoast Wind.

**Construction General Permit**. The RIDEM Office of Water Resources implements the RIPDES program. The purpose of this program is to restore, preserve, and enhance the quality of the surface waters and to protect the waters from discharges of pollutants so that the waters will remain available for all beneficial uses and thus protect the public health, welfare, and the environment. A CPG will be required to authorize discharges pursuant to R.I.G.L. § 46-12 as amended and regulations for the RIPDES Program (250-RICR-150-10-1).

**Federal Consistency Concurrence.** The Project will require concurrence from RI CRMC with SouthCoast Wind's Federal Consistency Certification pursuant to Section 307 of the Coastal Zone Management Act, Coastal Zone Management Act regulations and § 11.10 of Rhode Island Ocean SAMP. SouthCoast Wind filed the Rhode Island Coastal Zone Management Act Consistency Certification with the RI CRMC in March 2022.

### 1.3.2 Rhode Island Natural Heritage Program

**RIDEM Natural Heritage Area Review.** Pursuant to the Rhode Island Endangered Species Act, SouthCoast Wind has consulted with the Rhode Island Natural Heritage Program. SouthCoast Wind reviewed the RIDEM Natural Heritage Area overlays available on the RIDEM Environmental Resource Mapping website and determined that there are three natural heritage areas that overlap the Project Study Area, indicating potential state-listed species. SouthCoast Wind contacted RIDEM on April 8, 2022, to inquire about the species listing for these areas. RIDEM responded on April 11, 2022, with a list of species of concern identified near the Project Area. SouthCoast Wind followed up with RIDEM on February 10, 2023, for an updated list of species of concern near the Project Area.

### 1.3.3 Summary of Other Permits, Reviews, and Approvals

Table 1-1 provides a summary of the other required approvals and permits along with dates of approval or estimated dates of approvals for those permits that have not been issued.

**TABLE 1-1. SUMMARY OF THE PROJECT'S FEDERAL AND STATE PERMITS, REVIEWS, AND APPROVALS**

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| Federal | | |
| **BOEM**[20]* | Site Assessment Plan (SAP) | Approved by BOEM May 26, 2020-. |
| | Certified Verification Agent (CVA) Nomination | Approved by BOEM November 4, 2020-. |
| | Departure request for the early fabrication of SouthCoast Wind's Offshore Substation Platform(s) (OSP) and inter-array cables. | Approved by BOEM December 1, 2020. |
| | Construction and Operations Plan (COP) | COP filed February 15, 2021. BOEM published a Notice of Intent to Prepare an Environmental Impact Statement for the review of the COP on November 1, 2021. Draft Environmental Impact Statement issued on February 13, 2023. |
| | National Environmental Policy Act (NEPA) Review | Initiated by BOEM on November 1, 2021. |
| | Facilities Design Report and Fabrication & Installation Report | Filing planned for Q1 2024. |
| **U.S. Department of Defense Clearing House** | Informal Project Notification Form | Submitted May 11, 2020 . |
| **U.S. Army Corps of Engineers (USACE)** | Individual Clean Water Act (CWA) Section 404 Permit.<br>Rivers and Harbors Act of 1899 Section 10 Permit. | Submitted December 2, 2022. Application deemed complete by USACE on February 2, 2022. |
| **U.S. Coast Guard (USCG)** | Private Aids to Navigation Authorization | To be filed 3- to 6 months prior to offshore construction. |
| | Local Notice to Mariners | To be filed prior to offshore construction. |
| **U.S. Environmental Protection Agency (USEPA)** | National Pollutant Discharge Elimination System General Permit for Construction Activities | Submitted October 31, 2022. |
| | Outer Continental Shelf Permit Clean Air Act | Submitted November 23, 2022. |
| **U.S. Fish and Wildlife Service (USFWS)** | Endangered Species Act Section 7 consultation<br>Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA) compliance. | No take authorization is expected to be requested and coordination with USFWS has been initiated and will continue. Basic site evaluation and characterization studies completed and detailed studies ongoing. |

[20] ~~In its review of the COP, BOEM must comply with its obligations under the NEPA, the National Historic Preservation Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Migratory Bird Treaty Act, the Clean Air Act, and the ESA. Thus, BOEM coordinates and consults with numerous other federal agencies including the National Marine Fisheries Service, United States Fish and Wildlife Service, the Environmental Protection Agency, and the United States Coast Guard during the review process. BOEM also coordinates with the states under the Coastal Zone Management Act to ensure that the project is consistent with the state's coastal zone management program.~~

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **National Oceanic and Atmospheric Administration (NOAA)**<br>**U.S. National Marine Fisheries Service (NMFS)** | Marine Mammal Protection Act (MMPA) Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) | Pre-construction: Concurrence for 2019 Geophysical and Geotechnical (G&G) surveys was issued by NMFS on July 26, 2019.<br>IHA for 2020 G&G surveys issued on July 23, 2020.<br>IHA for 2021 G&G surveys issued on July 1, 2021.<br>LOA Application for offshore construction and operations filed March 18, 2022 and deemed complete by NMFS September 19, 2022.<br>IHA for 2023 G&G surveys submitted on November 16, 2022. Submitted request for IHA Abbreviated Notice per NMFS guidance on January 13, 2023. Application deemed Adequate and Complete on January 24, 2023. |
| **Federal Aviation Administration (FAA)** | Determination of No Hazard to Air Navigation | It is not currently anticipated that a Determination of No Hazard will be required for offshore structures in the Lease Area due to their location outside of 12 nm (22 km); nor will this be required for the onshore substation or converter station due to the maximum height of these structures.<br>SouthCoast Wind continues to engage with the Federal Aviation Administration with regards to whether any review and/or authorization is required for offshore equipment deployed to support horizontal directional drilling installation of the export cables. |
| State/Rhode Island | | |
| **Rhode Island Coastal Resources Management Council (RI CRMC)** | Coastal Zone Management Consistency Determination under the Federal Coastal Zone Management Act (16 United States Code [U.S.C.] §§ 1451-1464) and in accordance with the Rhode Island Coastal Resources Management Program and Special Area Management Plans. | Filed March 15, 2022. |
| | Category B Assent and Submerged Lands License pursuant to R.I.G.L. § | Filed February 24, 2023. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| | 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2. | |
| | Submerged Lands License pursuant to R.I.G.L. § 46-23 and 650-RICR-20-00-1 and 650-RICR-20-00-2. | Filing TBD based on consultation with CRMC. |
| | Freshwater Wetlands Permit pursuant to the Rules and Regulations Governing the Protection and Management of Freshwater Wetlands in the Vicinity of the Coast (650-RICR-20-00-2.1 et seq.) (R.I.G.L. § 46-23-6). | Filed February 24, 2023. |
| | LOA/Survey Permit, if needed, in accordance with the R.I.G.L. § 46-23 and 650-RICR-20-00-1. | Approved July 7, 2021 for Summer 2021 benthic surveys; Approved February 4, 2022 for Spring 2022 benthic surveys. |
| **Rhode Island Energy Facility Siting Board (RI EFSB) and Rhode Island Public Utilities Commission (RI PUC)** | Certificate of necessity/public utility. | Application for a License to Construct Major Energy Facilities filed May 31, 2022, and docketed as of June 24, 2022 (Docket Number SB-2022-02). |
| **Rhode Island Historical Preservation and Heritage Commission (RIHPHC)** | Permission to conduct archaeological field investigations (pursuant to the Antiquities Act of R.I.G.L. 42-45 and the Rhode Island Procedures for Registration and Protection of Historic Properties). | Marine Survey approved on July 2, 2021.<br>Phase 1 Permit (No. 21-32) issued on December 17, 2021; Terrestrial Archaeological Resources Assessment (Phase 1A/1B Report) filed March 14, 2022.<br>Marine Archaeological Resources Assessment (MARA) submitted March 16, 2022. |
| | Section 106 Consultation | Initiated November 1, 2021 |
| **Rhode Island Department of Environmental Management (RIDEM)** | Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife | Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022. |
| | Water Quality Certification pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1251 et seq. and R.I.G.L. § 46-12-3 and Dredging Permit pursuant to the Marine Infrastructure Maintenance Act of 1996 and RI Rules and Regulations for Dredging and the Management of Dredged Materials (R.I.G.L. §§ 46-6.1 et seq.) and Rhode Island Water Quality Regulations (R.I.G.L. §§ 46.12 et seq.); (Dredging permit is issued | ~~Filing planned for Q1~~Filed March 16, 2023. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| | jointly by RIDEM and RI CRMC under RIDEM dredging regulations). | |
| | Rhode Island Pollution Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity pursuant to R.I.G.L. § 42-12 as amended. Authorization under the RIPDES CGP. | Filing anticipated on or about Q3 2023 - prior to construction by SouthCoast Wind. |
| **RIDEM Division of Fish and Wildlife (RI DFW)** | Letter of Authorization and/or Scientific Collector's Permit (for surveys and pre-lay grapnel run), if needed. | TBD based on consultations with RIDEM Division of Fish & Wildlife. |
| | Consultation with the Rhode Island Natural Heritage Program and Division of Fish and Wildlife | Information provided by RIDEM on June 24, 2021. Updated information provided by RIDEM on April 11, 2022.<br>RI Natural Heritage Program confirmed state listed species data again on February 10, 2023. |
| **Rhode Island Department of Transportation (RIDOT)** | Utility Permit/Physical Alteration Permit pursuant to R.I.G.L. Chapter 24-8. | Filing planned for Q4 2023 (if applicable). |
| **Local (for portions of the SouthCoast Wind Project within local Rhode Island jurisdiction)** | | |
| **Portsmouth Department of Public Works** | Street Excavation and Curb Cuts Permit | Filing planned 2023. TBD based on consultation with Town and Portsmouth and Director of Public Works. |
| **Portsmouth Zoning and Planning Boards** | Special Use Permit/Variances and Consistency with Comprehensive Community Plan | Filing planned 2023. TBD based on consultation with Town and Portsmouth Planning Director. |
| **Portsmouth Town Council** | Noise Variance | Filing planned 2023. TBD based on consultation with Town and Town Council. |
| **State/Massachusetts** | | |
| **Massachusetts Executive Office of Energy and Environmental Affairs (EEA)** | MEPA Environmental Notification Form (ENF) and Environmental Impact Report (EIR)<br>Certificate of Secretary of EEA. | Advanced notice of MEPA ENF Filing was sent to all relevant Community-Based Organizations and tribes on June 22, 2022. ENF filed on August 12, 2022. ENF Certificate of EEA Secretary issued on October 11, 2022.<br>Filed SouthCoast Wind 1 Draft Environmental Impact Report (DEIR) on February 1, 2023. Final EIR (FEIR) anticipated in Q2/Q3 2023. |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Massachusetts Energy Facilities Siting Board (MA EFSB)** | Approval to construct the proposed Project, pursuant to G.L. c. 164, § 69J (Siting Petition).<br>Certificate of Environmental and Public Need (Section 72 Approval Consolidated with MA EFSB). | Filed May 27, 2022. Public Comment Hearing held on October 11, 2022. |
| **Massachusetts Department of Public Utilities (MA DPU)** | Approval to construct and use proposed Project pursuant to G.L. c. 164, § 72 (Section 72 Petition) consolidated with MA EFSB proceeding.<br>Individual and comprehensive exemptions from the zoning bylaws of Somerset for the proposed Project pursuant to G.L. c. 40A § 3 (Zoning Petition) consolidated with MA EFSB proceeding. | Filed concurrently with the MA EFSB Petition and Analysis on May 27, 2022. |
| **Massachusetts Department of Environmental Protection (MassDEP)** | Chapter 91 Waterways License/Permit for dredge, fill, or structures in waterways or tidelands.<br>Section 401 Water Quality Certification. | Joint application filing planned for Q2 2023. |
| **Massachusetts Office of Coastal Zone Management (MA CZM)** | MA CZM Consistency Determination | Filed with COP on February 15, 2021 (Appendix D1). Revised version filed January 13, 2022. Executed one-year stay with MA CZM beginning on December 30, 2021, with MA CZM's review re-starting on December 30, 2022, and anticipated completion by May 31, 2023. |
| **Massachusetts Department of Transportation (MassDOT)** | State Highway Access Permit(s) (if needed) | Filing planned for Q3 2023, if needed. |
| **Massachusetts Board of Underwater Archaeological Resources (MA BUAR)** | Special Use Permit (SUP) | SouthCoast Wind 1 Provisional SUP issued on June 25, 2021. Filed MA BUAR SUP application for SouthCoast Wind 1 on August 26, 2021. SUP approved on September 30, 2021. SUP renewal approved on September 29, 2022. |
| **Massachusetts Historical Commission (MHC)** | Project Notification Form/Field Investigation Permits (980 CMR § 70.00) | Project Notification Form (PNF) submitted July 26, 2021.Terrestrial Archaeological Resources Assessment (Brayton Point Phase 1A Report) filed on March 14, 2022. |
| | Section 106 Consultation | Initiated November 1, 2021 |

| Agency/Regulatory Authority | Permit/Approval | Status |
|---|---|---|
| **Massachusetts Fisheries and Wildlife (MassWildlife) - Natural Heritage and Endangered Species Program (NHESP)** | MA Endangered Species Act Checklist<br>Conservation and Management Permit (if needed) or No-Take Determination. | Submitted Information Request for state-listed rare species on June 17, 2021. Massachusetts' NHESP issued a letter identifying state-listed protected species in proposed Brayton Point Project Area on July 23, 2021.<br>Request for updated list filed with NHESP on March 31, 2022. NHESP issued letter regarding the SouthCoast Wind 1 Project Area on April 28, 2022; determined that the site is not mapped as Priority or Estimated Habitat.<br>Endangered Species Act Checklist filing planned for Q3 2023, if applicable (upon Final Environmental Impact Report certificate). |
| **Massachusetts Division of Marine Fisheries (MA DMF)** | Letter of Authorization and/or Scientific Permit (for surveys and pre-lay grapnel run). | To be determined based on consultations with MA DMF. |
| Local (for portions of the SouthCoast Wind 1 Project within local Massachusetts jurisdiction) | | |
| **Somerset Planning & Zoning Board** | Local Planning/Zoning Approval(s) (if needed) | Filing of application(s) tentatively anticipated for Q2 2024.<br>Request for individual and comprehensive zoning exemptions filed [pursuant to G.L. c. 40A § 3 filed concurrently with the MA EFSB Petition and Analysis]. |
| **Somerset Conservation Commission** | Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws), as applicable. | Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA). |
| **Somerset Department of Public Works, Board of Selectmen, and/or Town Council** | Street Operating Permits/Grants of Location. | Filing of application(s) planned for Q4 2023 (if applicable). |
| **Swansea Conservation Commission** | Notice(s) of Intent and Order(s) of Conditions (Massachusetts Wetlands Protection Act and municipal wetland non-zoning bylaws). | Filing of Notice(s) of Intent planned for Q2 2023 (around conclusion of MEPA), if applicable. |

* In its review of the COP, BOEM must comply with its obligations under the NEPA, the National Historic Preservation Act, the Magnuson-Stevens Fishery Conservation and Management Act, the Migratory Bird Treaty Act, the Clean Air Act, and the ESA. Thus, BOEM coordinates and consults with numerous other federal agencies including the National Marine Fisheries Service, United States Fish and Wildlife Service, the United States Environmental Protection Agency, and the United States Coast Guard during the review process. BOEM also coordinates with the states under the Coastal Zone Management Act to ensure that the project is consistent with the state's coastal zone management program

# 2. SITING AND PROJECT DESCRIPTION

This section includes a description of the Project and an overview of the siting process used by SouthCoast Wind. Referenced Project figures are included in Attachment A, Offshore Export Cable Engineering Drawings (Attachment C -1) and HDD Engineering Drawings (Attachment C-2).

SouthCoast Wind is developing an offshore wind energy generation facility capable of generating an estimated 2,400 MW of renewable clean energy. Export cables connecting the energy generation facility with the regional transmission system at Brayton Point in Somerset, Massachusetts, will run through Rhode Island state waters (specifically Rhode Island Sound, the Sakonnet River and Mount Hope Bay) and overland at Portsmouth, Rhode Island. For purposes of this application, the Project is defined as the transmission components located within Rhode Island-jurisdictional areas listed below and shown on the Project overview maps (Figures 1-2 and 1-3 in Attachment A). The Project includes the following components proposed in Rhode Island state waters:

- Two HVDC submarine power cables and associated communications cabling located within the ECC. The cables will be installed in a bundled configuration where practicable (see cable bundle cross-sectional view in Attachment A). Approximate cable route lengths within Rhode Island state waters are as follows:
  - 5.3 mi (8.6 km) in Rhode Island Sound
  - 11.0 mi (17.7 km) in the Sakonnet River
  - 4.0 mi (6.4 km) in Mount Hope Bay (portion in Rhode Island state waters)
- Eight HDD offshore pits in total; four HDD pits at each of two landfalls on either side of Aquidneck Island at Portsmouth, Rhode Island, in the Sakonnet River and in Mount Hope Bay. These eight pits will require dredging/excavation to facilitate HDD of the cable landfalls. Each offshore HDD pit will be located approximately 1,000 ft (300 meters [m]) from the Portsmouth shoreline.

The Project also includes the following onshore components, which are not subject to this Application, in Portsmouth, Rhode Island:

- Two landfall construction areas on Aquidneck Island in Portsmouth, Rhode Island for HDD construction activities (subject to obtaining the necessary easements):
  - One landfall construction area on the northeast (Sakonnet River) side of Portsmouth will occupy the corner of Boyds Lane and Park Avenue.
  - One landfall construction area on the northwest (Mount Hope Bay) side of Portsmouth, either:
    - Within the Montaup Country Club parking lot (preferred)
    - Within land owned by Roger Williams University on the northern side of Anthony Road (RWU North parcel alternate)
- Two new underground onshore HVDC export power cables and associated communications cabling co-located within a single underground duct bank and manhole system through the proposed onshore export cable route in the Town of Portsmouth.

## 2.1 PROJECT SITING

The Project was sited based on a thorough assessment of alternative points of interconnection (POIs) to the electric grid and cable routing to connect to the selected POI. A detailed analysis of alternative routes considered for interconnection to the selected POI at Brayton Point is included in Attachment B and an overview is provided below.

Transmission and interconnection facilities are necessary to deliver electricity from the SouthCoast Wind Offshore Generation Facility to the regional electric grid. SouthCoast Wind considered and evaluated alternative potential POIs to the grid, offshore ECCs, landfall site alternatives, onshore export cable routes, and transmission technologies. Some of these alternatives were eliminated based on technical or commercial feasibility assessments, or the inability of the alternative to address the identified interconnection need. Other alternatives that were found to be feasible and capable of addressing the identified need were further examined on the basis of constructability, operability, environmental impacts, estimated costs and reliability assessments.

Delivery of an estimated 2,400 MW of clean power will likely necessitate multiple POIs for several reasons, most notably that individual connections to the regional transmission system are limited by ISO-NE to 1,200 MW maximum for reliability reasons. SouthCoast Wind considered multiple coastal interconnection points with suitable electrical characteristics, accessibility, and potential nearby land for the required substation/converter station facilities. Two POIs were selected: one at Brayton Point in Somerset, Massachusetts and one in Falmouth, Massachusetts.

Brayton Point was selected as the POI for 1,200 MW of clean renewable energy because SouthCoast Wind has a PPA to deliver energy to a POI to Brayton Point in Massachusetts. Brayton Point is a previously disturbed brownfield site and the site of a former coal burning power generation plant which makes it situated in a prime location for an interconnection to the grid.

Fourteen onshore and offshore export cable route combinations to connect to the Brayton Point POI were considered by SouthCoast Wind. The list captures a representative array of overland and in-water routes to the Brayton Point POI. Please refer to Attachment B for the SouthCoast Wind 1 Project Route Alternatives Assessment.

SouthCoast Wind evaluated the following cable landing and onshore route alternatives that would avoid cable installation in Narragansett Bay and the Sakonnet River:

- Three routes landing in Middletown, Rhode Island.
- Two routes landing in Little Compton, Rhode Island.
- One route landing in Westport, Massachusetts.

Key evaluation factors for the onshore routes included:

- Environmental resources and conservation areas.
- Archaeological resources and cultural resource areas.
- Conflicts with residential uses.
- Potential socioeconomic effects due to use and space conflicts in heavily developed commercial and tourism areas, including Environmental Justice (EJ) populations.
- Avoidance of existing infrastructure and potential for effects on local communities.

- Space limitation for construction adjacent to small, 2-lane roads.
- Duration of construction activities and increased impacts with longer duration construction periods.

Most of the routes were down-selected by the alternatives analysis screening process. The selected alternative is the route in the Sakonnet River with an approximately 2.0-mi (3.2-km) intermediate onshore underground crossing in Portsmouth. The HVDC export cables will make intermediate landfall on Aquidneck Island in Portsmouth, Rhode Island to avoid a narrow and highly constrained area of the Sakonnet River at the old Stone Bridge and Sakonnet River Bridge (an area referred to as "The Hummocks"). This reach of the Sakonnet River poses a significant risk and challenge to (i) maneuvering survey vessels and cable-lay vessels, (ii) achieving target burial depth of the cables, and (iii) minimizing impacts to the marine environment.

## 2.2 Construction Schedule in Rhode Island

The construction schedule is being developed based on seasonal constraints including minimization of activities during months of peak recreational onshore and offshore uses, commercial and recreational fishing, and life cycles of sensitive species. To discuss seasonal constraints on in-water work schedules, SouthCoast Wind has met with staff from the Rhode Island Division of Marine Fisheries (RI DMF), Massachusetts Division of Marine Fisheries (MA DMF), the Rhode Island Coastal Resources Management Council (RI CRMC), the United States Army Corps of Engineers (USACE), the United States Environmental Protection Agency (USEPA), and National Marine Fisheries Service (NMFS); discussions are continuing to finalize a schedule. Tables 2-1 and 2-2 provide an overview of expected durations for both onshore and offshore construction activities.

**TABLE 2-1. PLANNED HDD CONSTRUCTION SCHEDULE IN PORTSMOUTH, RHODE ISLAND**

| Activity | Expected Duration |
|---|---|
| HDD – Exit Pit Excavation / Prep at Each Landfall | Less than 1 week (per landfall) |
| HDD – Drilling Operation at Aquidneck – Boyds Lane Landfall | 2-4 months |
| HDD – Drilling Operation at Aquidneck – Montaup Country Club Landfall/RWU North parcel Alternate | 2-4 months |

*HDD drilling may be conducted simultaneously

**TABLE 2-2. PLANNED CONSTRUCTION SCHEDULE IN RHODE ISLAND STATE WATERS**

| Activity | Expected Duration (In-Water) |
|---|---|
| Boulder Re-Location | Less than 1 week (1-4 days) |
| Crossing Preparation (Mattress/Rock Installation) | Less than 1 week (2-3 days) |
| Pre-Lay Grapnel Run (PLGR) | Less than 1 week (3-4 days) |
| Cable Lay & Burial: Rhode Island Sound & Sakonnet | 3-6 weeks |
| Cable Lay & Burial: Mount Hope Bay | 1-2 weeks |
| Cable Pull-In Each Landfall | Less than 1 week (per landfall) |
| Post-Lay Protection (Mattress/Rock Installation) | Less than 1-week (4-6 days) |

## 2.3 OFFSHORE EXPORT CABLE DESIGN AND CONSTRUCTION

### 2.3.1 Engineering Design and Micro-Routing

SouthCoast Wind collected geophysical, geotechnical, and benthic/habitat field survey data within the entire ECC, which is 1,640 ft (500 m) to 2,300 ft (700 m) wide. Based on this survey data, sensitive environmental and cultural resources and geohazards were mapped to guide cable routing within the ECC with the objectives (to the extent practicable) of meeting the cable burial target depth, minimizing the impacts to sensitive habitat and avoiding surficial geologic and anthropogenic features as informed by data collected in the Geophysical & Geotechnical (G&G) surveys.

A Cable Burial Risk Assessment (CBRA; "Confidential" – provided under separate cover, Attachment D) was completed to evaluate risk that cables could be damaged or compromised by vessel anchoring or scour, based on specific uses and physical characteristics at any one location along the cable route. The output of the CBRA is used to identify specific target burial depths, which will vary along the cable route based on assessment of the local soil conditions and risk to the buried cables from external risk factors. In general, the anticipated cable burial depth range is 3.2 to 13.1 ft (1.0 to 4.0 m) with a target cable burial depth of approximately 6.0 ft (1.8 m).

Two power cables and associated communication cabling will be installed in a bundled configuration where practicable, resulting in an estimated 20-ft (6-m) wide area of disturbance. The width of the surveyed ECC is designed to allow for micro-routing to avoid sensitive resources and obstacles, and to provide for maneuverability during construction and maintenance. The ECC provides sufficient area at landfall locations, at pipeline/cable crossings, or for anchoring. Cable design parameters are provided in Table 2-3. Charts depicting ECC mapping and preliminary cable micro-routing are included in Attachment C-1, Offshore Export Cable Engineering Drawings.

**TABLE 2-3. OFFSHORE EXPORT CABLE DESIGN PARAMETERS**

| Cable Characteristics | Design Parameters |
|---|---|
| Number of Cables | Two offshore export power cables plus associated communications cabling [a] |
| Cable Diameter (per cable) | 6.9 in (175.0 mm) |
| Nominal Cable Voltage | ±320 kilovolt (kV) |
| Length of Cable Corridor (RI State Waters) | 20.4 mi (32.8 km) |
| Cable Corridor Width | 1,640 ft to 2,300 ft (500 m to 700 m) |
| Typical Width of Seabed Disturbance During Construction | 6.0 m (19.7 ft) |
| Number of Cable / Pipeline Crossings Anticipated | 3 pipeline crossings |
| Anticipated Cable Burial Depth (below level seabed) | 3.2 to 13.1 ft (1.0 to 4.0 m) |
| Approximate Cable Load Current | 2,000 A |

Notes:
[a] The cables will be installed in a bundled configuration, consisting of two power cables plus associated communications cabling installed together, where practicable, to minimize seabed impacts from installation. Maximum cable bundle width is twice the maximum cable diameter.

Each HVDC offshore export power cable will be a single-core (one power core) armored submarine cable. A typical cross-sectional view of an offshore trench is provided in the Submarine Details in Attachment C-1 Offshore Export Cable Engineering Drawings. The power core will be either aluminum or copper stranded conductor, with cross-linked polyethylene insulation, a lead sheath, and a polyethylene over sheath. The cable will be covered with galvanized, stainless-steel wire armor, and an outer serving of polypropylene yarns soaked in bitumen. The layers of protective armoring and sheathing are to protect the cable from external damage and keep it watertight. Fiber optic wires may be embedded within the armor layer of the cable. The HVDC cables will be installed in a bundled configuration where practicable, with each cable bundle consisting of two offshore export power cables and associated communications cabling.

### 2.3.2 Offshore Export Cable Construction Sequence

The general sequence of construction activities for the offshore export cables are listed and explained in Table 2-4. Additional details for construction activities are provided in subsections following the below table.

**TABLE 2-4. TYPICAL OFFSHORE EXPORT CABLE CONSTRUCTION SEQUENCE**

| Construction Activity | Construction Summary |
|---|---|
| Pre-lay Cable Surveys and Route Engineering | Extensive geophysical, geotechnical, and benthic surveys have been completed to characterize seabed conditions within the export cable corridor. Based on the survey data, route engineering was completed including Cable Burial Risk Assessments, burial tool suitability assessments, and preliminary micro-routing of cables within the ECC. Micro-routing is the primary strategy for avoiding geohazards, obstructions, and sensitive habitat. Micro-routing may also help to support achievement of target cable burial depth and to minimize the need for secondary cable protection.<br><br>Prior to installation, additional surveys will be performed to check for debris and obstructions that may affect cable installation and confirm the details of seabed preparation that may be required. These pre-installation surveys will be performed closer to the date of the cable installation and will inform the final cable micro-routing within the ECC. |
| Seabed Preparation | Pre-installation seabed preparation will be completed as needed, and may include debris and boulder clearance, relocation of moorings and removal of any other obstructions. Boulder clearance trials may be performed prior to wide-scale seabed preparation activities to evaluate efficacy of boulder clearing techniques. The boulder clearance trials will take place in a selected location (location TBD) that will allow the vendor to facilitate trials in an equivalent area. The preferred method for boulder clearance is a boulder grab to locally remove and re-locate individual boulders, though the use of a boulder plow for denser boulder fields is also under consideration (if needed).<br><br>A pre-lay grapnel run will be conducted to clear the cable route of buried hazards along the installation route to remove obstacles that could impact cable installation, such as abandoned mooring lines, wires, or derelict fishing gear. SouthCoast Wind will work with fishermen actively working in the area to notify them of pre-lay grapnel activities as a way to minimize gear entanglement. SouthCoast Wind will develop a gear-clearance plan, in consultation with the RI DMF, which will include advance notification to fishermen allowing them the opportunity to relocate or remove their gear. Cleared ghost gear and/or fishing lines will be disposed of responsibly during the pre-lay grapnel run, if brought aboard the vessel. SouthCoast Wind and its contractor will clear the ECC to make it safe for cable-lay operations and for overall safety to marine navigation, however, a salvage operation is not intended nor considered safe for the marine contractor. Otherwise ghost gear will be moved outside of the cable corridor. SouthCoast Wind will however, |

| Construction Activity | Construction Summary |
|---|---|
| | consider providing details of identified gear to programs designed to remove the ghost gear. SouthCoast Wind will coordinate with the RI DMF in addition to SouthCoast Wind's other outreach efforts (i.e., direct outreach, outreach via Fisheries Representatives) to notify commercial and recreational fishermen prior to initiation of the pre-lay grapnel run. In addition, SouthCoast Wind expects to have Project Execution Plans before installation activities begin, then final reports (including as-builts) after the completion of the work. |
| Pipeline Crossing Preparation | Prior to installation of the cables, protective material (rock and/or mattresses) will be installed over the three existing pipelines to be crossed in the Sakonnet River, in accordance with industry-standard practice and requirements and as agreed with the owners of the existing pipelines. The purpose will be to achieve suitable vertical separation between the existing pipelines and the planned cables, and to ensure protection of the existing pipelines both during construction and long-term. |
| Cable Installation and Burial | Based on the seabed conditions in the Sakonnet River and Mount Hope Bay, it is expected that a simultaneous lay and burial method (using a jet-plow or jet-sled type burial tool) will be utilized, though multiple options will be maintained for flexibility to achieve suitable cable burial in the encountered seabed conditions. Alternatively, cable may be laid on the seabed and trenched post-lay or a trench may be pre-cut prior to cable installation.<br><br>Cable lay and burial trials may be performed within the ECC prior to main cable installation activities to test equipment for suitability for the site-specific seabed conditions and ensure successful cable burial. |
| Offshore Joint Construction | It is anticipated that one or more offshore cable joints ("field joints") will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The specific joint quantities and locations are still to be determined and will depend on the final cable sizing and cable lay vessel/barge details. |
| Post-Installation Surveys | Post-installation surveys will be performed to determine the cable burial depth and other as-left conditions. The survey may be completed from a vessel and/or remotely operated vehicle. |
| Secondary Cable Protection | After the cable has been installed, secondary cable protection in the form of rock berms, rock bags, and/or mattresses will be installed as determined necessary in areas where sufficient cable burial in the seabed cannot be achieved. Additionally, secondary cable protection will be installed over the cables at crossing locations, where burial is not possible due to the presence of the third-party asset to be crossed. |

### 2.3.3 Pipeline Crossings

The ECC crosses three pipelines at two locations in the Sakonnet River, as explained in Table 2-5 and shown in Figure 2-1 Cable Areas in Attachment A- Project Figures and in Attachment C-1 Offshore Export Cable Engineering Drawings. SouthCoast Wind will coordinate with the owners of the pipelines listed below, and any other unanticipated cable or pipeline crossings not identified, to agree on detailed cable crossing design, installation, protection measures and maintenance requirements. Crossing designs will be determined by the crossing's water depth, seabed conditions and the third-party crossing agreement requirements. Minimum separation distances will be determined so that both assets (subsea cable and submarine pipelines) can be safely operated with risk of damage to either asset mitigated to the extent practicable.

**TABLE 2-5. PROPOSED CABLE/PIPELINE CROSSINGS**

| Cable Description | Number of Cables / Pipelines to be Crossed | Location |
|---|---|---|
| Potential Crossing Area 1 | 1 existing pipeline [a] | Sakonnet River (charted Pipeline Area) |
| Potential Crossing Area 2 | 2 existing pipelines [b] | Sakonnet River (charted Pipeline Area) |

[a] Gas pipeline owned by Enbridge as part of the Algonquin Gas Transmission system.

[b] Water pipelines (20-inch and 24-inch) owned by the City of Newport Department of Utilities.

### 2.3.4 Pre-Installation Seabed Preparation

The seabed will be prepared prior to cable installation by the following steps:

1. Boulder removal to remove boulders that cannot be avoided by micro-routing.
2. Grapnel run to clear seabed debris.
3. Pre-lay survey including multi-beam and/or visual inspection using either vessel-mounted or remote operated vehicle (ROV)-mounted cameras.

Details on seabed preparation are provided in Table 2-4. A boulder relocation plan will be developed upon selection of a cable installation contractor, who will also clear debris and boulders from the export cable route, as necessary. If it is determined that a boulder cannot be avoided with micro-routing, a zone (or zones) will be identified for where cleared boulders/debris can be deposited. The boulder relocation areas will be determined by evaluating the benthic survey data, in order to relocate boulders to other boulder fields, if feasible, and to avoid introducing new obstacles on the seafloor that may be encountered by fishermen.

Additional survey data will likely be collected closer to installation to identify any anomalies or changes from prior surveys (such as fishing gear, debris, unexploded ordnance, or boulders) for the vessels and installation team to ensure safe vessel operations and successful cable burial. These surveys assist in building a framework for the seafloor and subsurface along the export cable route and highlight areas requiring pre-lay route preparation.

SouthCoast Wind is committed to clear communication with the fishing industry, fisheries representatives, management agencies, and with individual fishermen, on boulder relocation activities including notification of precise locations of moved boulders to proactively avoid potential issues with gear hangs. In addition to direct contact with fishermen through SouthCoast Wind's Fisheries Manager, maps and precise coordinates of relocated boulders will be broadcast through Local Notices to Mariners and shared with the RI DMF.

### 2.3.5 Offshore Cable Installation Methods

Export cables will be transported and installed from a carousel-equipped cable-lay vessel, cable-lay barge, dedicated cable transportation vessel, or a combination of these options. The number of campaigns will depend on vessel size, type, and capacity, and the cable type, length, and number of cable joints required. It is anticipated that one or more cable joints will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The Project has already conducted some surveys along the export cable corridor, with more planned in 2023-2024. Once complete, those data will be provided to the yet to be selected contractor who will propose the installation methodology based on the anticipated soil conditions and potential hazards. Once a determination is made, the official installation methods will be provided to RIDEM. The CBRA has been provided with the application filed by SouthCoast Wind (Attachment D).

Depending on the survey findings and seabed conditions encountered, one or more of several preparation and installation methods may be utilized. These methods are listed in Table 2-6 and described below. These cable laying techniques can involve cable pre-installation followed by burial and/or simultaneous cable installation and burial. The list is exhaustive, to ensure that the appropriate flexibility is maintained to consider alternative burial techniques to achieve burial in the seabed. One or more burial techniques among those listed and Table 2-6 will be considered to attempt cable burial, until cable burial in the seabed is deemed to be not possible or practicable. Only then, secondary cable protection material (as described below) will be considered and employed to ensure that sections of the cable that have not been sufficiently buried are suitably protected.

Based on current understanding of the seabed conditions in the ECC, the burial of the bundled offshore export cable in Rhode Island State Waters will primarily use a type of jet-plow or jet-sled technology. This involves the use of a skid-mounted burial tool that is towed by the cable-lay barge or Dynamically Positioned (DP) vessel. As the cable is laid on the seabed from the vessel, a narrow trench of the seabed surrounding the cable will be fluidized, lowering the cable to the target burial depth. By using this method of cable burial, the export cables are simultaneously laid and buried beneath the seafloor, which minimizes post-lay exposure of cables the seabed. Additionally, this method reduces sediment displacement (compared to mechanical trenching / plowing) and employs natural backfill as cover for the buried cable.

**TABLE 2-6. TYPICAL OFFSHORE EXPORT CABLE INSTALLATION AND BURIAL EQUIPMENT**

| Equipment | Typical Use |
|---|---|
| Jetting sled / plow | Typically used in shallower water, in areas of prepared/benign seabed surfaces (i.e., areas without large sand waves or slopes). |
| Jetting ROV | Typically used in deeper water and can be used for unconsolidated soft beds. |
| Pre-cut plow | Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays). |
| Mechanical plowing | Any depth and can be used for hard bottoms (plows can be used for a wide range of soils from unconsolidated sands to stiff clays). |
| Mechanical cutting ROV system | Any depth, used for hard, consolidated substrate. |
| Vertical injector | Vessel mounted burial solution for shallow water use that allows deep burial and does not require seabed/sand wave sea leveling. |

***Jetting Sled / Plow*** A jetting sled / plow is towed from a vessel and can be launched either during post-lay trench mode or fitted with the cable to simultaneously create a trench through soft seabed material and lay the cable. The trench is created by water jetting through unconsolidated, softer seabed material. As such, jetting is optimal in unconsolidated soils and sands with low shear strengths. The trenching systems offers sufficient maneuverability for any curves that the proposed offshore export cables may be laid in.

***Jetting ROV*** This jet trencher is an ROV based system that can be launched from cable installation vessels or from a dedicated support vessel. This self-propelled jetting method is typically used in non-consolidated soils, in deeper water depths.

***Pre-Cut Plow*** This method is deployed when surface and sub-surface boulders are present. A basic mechanical plow will pre-cut a V-shaped trench ahead of cable installation. This allows for the boulders and soils to be lifted to the edges of the trench for backfill purposes later. Once the cable is laid into the trench, the plow is re-configured into backfill mode where the boulders and soils that were previously relocated are then re-deposited.

***Mechanical Plowing*** A mechanical plow is towed from the back of a vessel and simultaneously cuts a narrow trench in the seafloor, while also simultaneously laying and burying cable. Plowing capability can increase from firm unconsolidated soils/sands to more consolidated soils and clays with medium shear strengths.

***Mechanical Cutting ROV System*** A mechanical cutting ROV cable burial system is a self-propelled system most suitable for soil with increased strength. This system can be utilized at any water depth. The mechanical cutting ROV system utilizes a cutting wheel or chain to break up and excavate any material. Used only in hard, consolidated soils, a rotating chain or cutting wheel with dedicated teeth will excavate the soil from beneath the cable and various systems will be required to displace this soil away for the trench allowing the cable to be lowered to depth.

***Vertical Injector*** A vertical injector is a deep burial jetting tool used for cable installation and burial. The vertical injector uses water propelled from jet nozzles to fluidize the seabed material to allow for lowering of the cable. In some instances, this technology may be referred to as controlled flow excavation. This tool is towed along the back of a vessel and acts as a trowel creating a space for the cable to be installed and subsequently buried. This burial solution does not generally require seabed leveling in areas of sand waves or similar mobile sediment features. Hanging from the cable installation vessel or barge, this trenching system is one of the few options that does not require a level seabed and is therefore capable of trenching in areas of large sand waves.

### 2.3.6 Confirmation of Installed Cable Depth

Post-installation surveys will be performed to remotely confirm the cable position and burial depth, assess the reconstitution of the trench, and other as-left conditions. The survey may be completed from a vessel and/or remotely operated vehicle.

Depending on the details of the cable burial tool, it may also be possible to directly determine the cable burial depth as it is being laid, via the mechanical interface between the cable and the tool allowing determination of how deep the cable has been lowered beneath the seabed as it is simultaneously laid and buried. In addition to remote verification of cable burial depth post-installation, this can provide an accurate record of as-laid cable burial depth.

### 2.3.7 Cable Joints

It is anticipated that one or more offshore cable joints ("field joints") will be required, likely in the Sakonnet River, and possibly in Mount Hope Bay, due to the overall export cable route length. The specific joint quantities and locations are still to be determined and will depend on the final cable sizing and cable lay vessel/barge details.

To construct an offshore cable joint, two cable ends (one or both of which will be pre-installed on the seabed) will be recovered to the deck of the cable lay vessel/barge. The ends of the cable will be prepared for jointing on the deck of the vessel/barge, then will be jointed to each other following a pre-established qualified procedure in a controlled environment. Once the joint is complete, the completed cable joint and adjoining cable will be laid on the seabed, either in an "in-line" configuration or an "omega" configuration. The completed cable joint will then be post-buried and/or protected using secondary cable protection, to ensure that the cable joint is adequately protected to the same standard as the remainder of the cable. SouthCoast Wind will provide information on where the jointing activities will occur prior to the work commencing.

### 2.3.8 Anchoring

Vessels will use DP during cable installation where water depths allow. Since water depths greater than 49.2 ft (15.0 m) are required for DP, this is not viable in Mount Hope Bay or the Sakonnet River, and use will be limited to Rhode Island Sound. Nearshore areas and areas with shallow water less than 49.2 ft (15.0 m) may necessitate a moored vessel solution using anchors; see Figure 2-2 (Attachment A) for potential anchoring areas along the ECC. The maximum anchor radius from the cable installation barge will be approximately 2,625 to 3,281 ft (800 to 1,000 m) based on the anchor line length. This maximum radius will be forward and aft of the barge and will not extend outside of the width of the ECC.

### 2.3.9 Secondary Cable Protection

A primary objective is to avoid the use of secondary cable protection by achieving a suitable target cable burial depth in the seabed along the entire cable route, by micro-routing (to the extent practicable) the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. Secondary cable protection material will be required at the three cable crossings in the Sakonnet River and for areas where cable burial cannot be achieved. For cable protection, methods will be determined based on the location, length, and extent of the non-burial, and when all remedial burial solutions have been ruled out (remedial burial techniques may include jet trenching or controlled flow excavation that fluidizes the surrounding sand to allow the cable to further settle into the trench). Methods employing secondary cable protection material may include the creation of a rock berm, concrete mattress placement, rock placement, and fronded mattresses. Half shells may be used as well, and they are typically used to protect cable ends at pull-in areas and where trenching is not possible.

As a conservative estimate for planning purposes, SouthCoast Wind estimates up to 15% of the ECC within Rhode Island state waters will require secondary cable protection. Secondary cable protection is expected to be required primarily at the identified cable/pipeline crossing locations in the Sakonnet River, and in Rhode Island Sound where areas of harder seabed have been identified. Generally, the seabed conditions in the remainder of the ECC in the Sakonnet River and Mount Hope Bay are comprised of softer sediments which are expected to be suitable for cable burial and not require substantial secondary cable protection.

Any required crossings of other third-party pipelines by the offshore export cables will utilize mutually agreeable crossing designs consistent with typical industry practices, in accordance with International Cable Protection Committee recommendations, which typically employ use of concrete mattresses (though other crossing methods may be assessed for use). Minimum separation distances will be determined so that both the Project cables and the third-party pipelines can be safely operated with risk of damage to either asset mitigated to the extent practicable. An example of a concrete cable protection mattress and an example of cable protection rock bags are provided in "Submarine Details" found in Attachment C-1 – Offshore Export Cable Engineering Drawings.

### 2.3.10 Bundling and Cable Separation

The offshore export cables will be installed in a bundled configuration where practicable. The cables will be transported separately (on the same installation vessel) and assembled into a bundle during the process of cable laying. Because the HVDC offshore export cables will be installed in a single bundle where possible, there will typically be no horizontal separation between cables within a bundle as installed along the route. Although not anticipated except at cable landings, the cables may be unbundled and installed separately for part of the cable route, which does not affect the cable functionality but may result in different installation considerations. If the cables are installed separately, the target horizontal separation between each proposed Project cable will be approximately 164 ft (50 m). Final cable spacing will depend on bathymetry and other detailed seabed characteristics and may be wider or narrower. Risk factors that will be considered and mitigated when considering cable spacing will include:

- Installation impacts (risk to adjacent cables)
- Operation and Maintenance (O&M) (including cable repair if needed)
- Thermal impacts to adjacent cables

## 2.4 SEA-TO-SHORE TRANSITION

The Project includes installation of four conduits via HDD at each end of the intermediate onshore crossing of Portsmouth (four from the Sakonnet River and four from Mount Hope Bay). Two of the conduits are to accommodate two power cables and communications cabling for delivery of approximately 1,200 MW. The remaining two conduits will be installed to accommodate potential future installation of an additional 1,200 MW.

HDD is a "trenchless" process for installing underground cables or pipes which enables the cables to remain buried below the coastal features, including coastal beaches and intertidal zone to limit environmental impacts during installation. Each HDD boring extends from an onshore construction area to an offshore construction area.

The routing and HDD locations are depicted on Figure 1-2 (Attachment A), Offshore Export Cable Engineering Drawings (Attachment C-1) and HDD Engineering Drawings (Attachment C-2). A "Typical HDD Detail" for offshore construction is provided in Attachment C-2, HDD Engineering Drawings.

The onshore HDD locations (not the subject of this application) being considered are the following:

- One landfall construction area on the northeast (Sakonnet River) side of Portsmouth will occupy the corner of Boyds Lane and Park Avenue.
- One landfall construction area on the northwest (Mount Hope Bay) side of Portsmouth, either:
    - Within the Montaup Country Club parking lot (preferred).
    - Within land owned by Roger Williams University on the northern side of Anthony Road (RWU North parcel, alternate).

Construction of the sea-to-shore transition will involve the following:

1. Excavation of four onshore HDD pits at each landing (northeast and northwest sides of Portsmouth).
2. Excavation of four offshore HDD pits at each landing (northeast and northwest sides of Portsmouth).
    - A gravity cell or other temporary structure may be used if required to support HDD construction.
3. HDD of the borehole between each of the onshore and offshore HDD pits and reaming of the bore hole to the necessary diameter.
4. Insertion of conduit, made of high-density polyethylene or similar material, into each bore hole.
5. Construction and installation of onshore, underground concrete transition joint bays (TJBs).
6. Splicing of offshore export cable (single core submarine cable) to onshore export cable (single core underground cable) will occur within the TJBs.

7. Installation of the offshore export cables (two power cables and associated communications cable) through the conduits, below the coastal features, coastal beaches and intertidal zone (note that extra conduits are for future use and will remain empty at this time).
8. Site restoration of disturbed onshore and offshore areas, including backfill of the dredged areas.

The vessel and equipment that will be used to support the HDD installation are depicted in Attachment C-1, Offshore Export Cable Engineering Drawings and Attachment C-2, HDD Engineering Drawings.

### 2.4.1 Onshore HDD Pits

To facilitate the HDD operations, pits need to be excavated at the landward and seaward ends of the proposed HDD trajectories to establish the cable landfalls in Portsmouth. The onshore HDD pits are not included in this application, but are described here for reference. SouthCoast Wind has filed a Joint Application for a Category B Assent and a Freshwater Wetlands Permit for Freshwater Wetlands in the Vicinity of the Coast for both the onshore and offshore components of the Project. Indicative dimensions of the onshore construction areas and equipment that will be used to support the HDD installation are depicted in Attachment C-2, HDD Engineering Drawings. Construction operations at each onshore landfall construction areas will require approximately 0.6 to 1.0 acre (ac), depending on the configuration of available land and the final trajectories of the borings. The drilling operation requires fresh water for the mixing of the drilling slurry, however, there will be no withdrawals of water from wetlands and waterways for this Project.

Soil and other materials generated during installation of the HDD onshore will be removed and re-used or properly disposed of at a suitable facility. Excavated soils onshore will be removed and hauled to an appropriate on-site or off-site disposal/re-use location or to a temporary construction laydown area for on-site re-use. Soils will be handled in compliance with applicable laws and regulations.

The construction contractor(s) working at the Project site will be required to submit emergency response plans detailing their methods for containment of oil and hazardous materials including spill response, containment, control, clean-up and reporting to applicable agencies, as appropriate. Example spill prevention and control measures are outlined in Attachment E – Emergency Response Plan.

### 2.4.2 Offshore HDD Pits

Offshore HDD pits will be required to facilitate the offshore HDD operations. Indicative dimensions of the onshore construction areas and equipment that will be used to support the HDD installation are depicted in Attachment C-2, HDD Engineering Drawings. Additional information is also provided in Attachment C-1, Offshore Export Cable Engineering Drawings. The estimated volume of sediment to be excavated/dredged at each of the eight offshore HDD pits is 1,867 cubic yards (1,427 cubic meters). Potential volumes of offshore excavated material in Rhode Island state waters could be up to 14,932 cubic yards (11,416 cubic meters) based on all eight HDD pits offshore.

SouthCoast Wind plans to side-cast sediments immediately adjacent to the offshore pits to allow a readily available means of backfilling the trench and subsea cables. The excavated material can also serve to temporarily contain the HDD construction area, including serving as a potential containment area for the recirculated drilling muds.

Multiple excavation methods are under consideration for the HDD offshore exit pits. These include use of trailing suction hopper dredge, water injection dredge, clamshell and/or controlled flow excavation. One of or a combination of these methods may be used by the Project. SouthCoast Wind has verified seabed conditions of primarily soft sediments in Mount Hope Bay and the Sakonnet River (expected to be suitable for cable burial) and will further evaluate and propose potential burial and suspended sediment mitigation options to RIDEM for further discussion.

As mentioned in the Project's CRMC Assent application [at 2-19, 3-22, Appendix A - Soil Erosion and Sediment Control (SESC) Plan, and Appendix G - HDD Inadvertent Release of Drilling Muds Contingency Plan], SouthCoast Wind will select and use Best Management Practices (BMPs) including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. Recently SouthCoast Wind has reestablished regular check in meeting with RIDEM and CRMC and the Project can make a point to add this as a primary discussion topic.

### 2.4.3 Horizontal Directional Drilling

The proposed Horizontal Directional Drilling (HDD) trajectories are anticipated to be approximately 0.3 – 0.6 mi (0.4 – 1.0 km) in length with a cable burial depth of up to approximately 40 ft (12.2 m) below the seabed. HDD bores will be separated by a distance of approximately 10 ft to 33 ft (3.0 m to 10 m). It is anticipated the HVDC cables will be unbundled at landfall. Each HVDC power cable is planned to require a separate HDD borehole and conduit. The dedicated communications cable may be installed within the same bore as a power cable, likely within a separate conduit.

HDD can be undertaken from either the onshore entry point, from the offshore exit point, or (likeliest) from a combination of the two. The HDD unit and associated equipment (temporary electric generators, water and slurry tanks, mud circulating system and support vehicles) will be staged onshore in Portsmouth. Appropriate construction ~~best management practices (~~BMPs~~)~~ will be implemented to protect adjacent coastal and freshwater wetlands. Construction operations at each onshore landfall construction area will require approximately 0.6 – 1.0 ac, depending on the configuration of available land and the final trajectories of the borings.

Additional laydown space will be needed behind the onshore HDD pit to fuse segments of conduit together into a continuous assembly. This laydown area is expected to be between one-half to the full length of the HDD trajectory. It is important to pre-fuse the conduit in preparation so that a continuous assembly of pipe can be pulled in the bore hole without the need for stopping during drill pull-back operations. Once the pull-back commences, it is a 24-hour operation until completed at that bore, to reduce the risk of the bore hole collapsing. The pull-back laydown area will likely follow the trajectory of the onshore underground export cable route, with conduit fusing occurring in the shoulder of public right-of-way (ROW). The ends of each conduit will be capped/sealed prior to the completion of the installation, in order to protect the conduits from ingress of sediment and debris between the conduit installation and the cable installation and pulling, which may take place several months after HDD construction.

The drill head will be advanced between the onshore and offshore HDD pits. The HDD borehole will be reamed to the necessary diameter. The diameter of the bore hole will be approximately 30 in (76 cm) to accept conduit with an outside diameter of approximately 16 in (41 cm). The HDD operations will be supported by offshore vessels (jack-up barge and/or anchored barge), and support crew transport vessel and tugboat.

### 2.4.4 Cable Pulling

Once the HDD conduits and onshore underground infrastructure have been constructed, cables can be installed. Cable installation and pulling may take place several months after HDD construction. A cable barge/vessel will be positioned offshore equipped with reels of cable. The seaward end of the HDD conduit will be located by the cable installation spread and excavated if needed. The caps/seals protecting the end of the HDD conduit will be removed. SouthCoast Wind acknowledges that RIDEM has requested for additional details on accessing capped ends. This information will become available during the development of the detailed engineering design. The offshore export cable will be lowered from the vessel to the seafloor, and a winch located onshore will be used to pull the cable from sea to shore through the conduit. Each of the two power cables comprising the cable bundle is planned to be pulled into a separate HDD conduit.

SouthCoast Wind's preliminary schedule has HDD construction occurring one to two years before cable pulling. SouthCoast Wind will include these activities in the detailed construction schedule, once specific date and timelines are more refined.

### 2.4.5 Operation and Maintenance

The offshore export cables will be buried and are not expected to require regular maintenance, except for manufacturer-recommended cable testing. Periodic visual inspections and preventative maintenance of the offshore export cables will be planned based on survey data and manufacturer recommendations based on the as-built drawings. Planned outages are not expected for the periodic inspections. Burial inspection visuals will occur periodically to be determined after final design and route are selected.

Once available, SouthCoast Wind will provide RIDEM with the applicable portions of their Operations and Maintenance Plan, which will include visual inspection and maintenance schedules that will be based on manufacturer recommendations. These inspections will occur at regular intervals and after major storm events as will be agreed upon by the permit and COP conditions.

## 2.5 Decommissioning

Offshore export cables may be retired in place or removed, as per the Rhode Island CRMP Regulations (650-RICR-20-00-01) and the Ocean SAMP (650-RICR-20-05), and 30 Code of Federal Regulations (C.F.R.) 585.909. Cable protection measures, such as concrete mattresses or rocks, could be removed before any cable recovery activities. Dredging vessels may be used to unearth the cables before the cable may be reeled onto barges or other transport vessels. At landfall, if the cables are removed, the ducts will remain in place. SouthCoast Wind is required to submit a decommissioning plan to BOEM for review and acceptance.

## 2.6 Environmental Compliance, Protective Measures, and Monitoring

Prior to the commencement of construction, operation and maintenance, and decommissioning activities, a facility-specific environmental compliance manual will be prepared for the Project outlining specific construction and operating obligations. This manual, in conjunction with an Emergency Spill Prevention, Response and Prevention Plan, will serve as Project-specific environmental guidance documents for the construction and operation of the Project. The following subsections describe BMPs, applicant-proposed environmental protection measures, and monitoring that SouthCoast Wind will implement when appropriate.

### 2.6.1 Best Management Practices

BMPs are structural or non-structural measures, practices, techniques, or devices employed to avoid or minimize impact to sensitive resources. This section describes BMPs that SouthCoast Wind will employ during construction and include:

- Construction work hours
- Time-of-year restrictions, as necessary
- Emergency Spill Response
- Environmental compliance and monitoring

- Site restoration and stabilization

### 2.6.2 Project Construction Work Hours

Consistent with the Town of Portsmouth, Rhode Island noise ordinance, typical construction work hours for the Project will be within the hours of 7:00 a.m. and 9:00 p.m. each day.[1] SouthCoast Wind will comply with these standard hours except as described below. Some construction activities, such as HDD activity, cable pull-through operations, concrete pours, and cable splicing, once started, generally continue uninterrupted, meaning night-time work will occur for certain aspects of the construction.

### 2.6.3 Time of Year Restrictions

SouthCoast Wind has conducted stakeholder outreach including conversations and meetings with the Town of Portsmouth, Rhode Island, local businesses, residents, the commercial and recreational fishing industries and communities, and other stakeholders through public meetings as well as open houses held in Portsmouth, Rhode Island. Based on input received, times of year for construction activities, primarily from late fall through early spring, were identified to minimize impacts to local stakeholders. SouthCoast Wind will work to the considerations of these entities, as well as those of the Rhode Island Department of Transportation (RIDOT) and landfall site stakeholders, to the extent practicable.

SouthCoast Wind has also held meetings with regulatory agencies, including RIDEM, RI DMF, RI CRMC, USACE, USEPA and NMFS to receive input on time of year in-water work constraints regarding sensitive marine species. SouthCoast Wind will continue to coordinate with these agencies and local stakeholders to further define construction schedules and potential time of year restrictions for construction activities.

### 2.6.4 Emergency Spill Response

SouthCoast Wind has prepared Emergency Response Plan requirements (Attachment E) to avoid and/or minimize the risk of impacting the water column and benthic habitats from any accidental releases of oil and/or hazardous materials. Project contractors will be required to prepare emergency response plans applicable to each specific scope of work. The requirements for each of these plans are outlined in Attachment E – Emergency Response Plan requirements and will be included in the emergency response plans wherever relevant to the scope of work. The emergency response plans will be implemented along with the Project Oil Spill Response Plan (OSRP) (COP, Appendix AA). The OSRP includes provisions for responding to oil and fuel spills. Marine contractors conducting Project work within Rhode Island waters will be responsible for finalizing a task-specific OSRP consistent with SouthCoast Wind's OSRP and all applicable regulations.

### 2.6.5 HDD Inadvertent Release Response

SouthCoast Wind is utilizing HDD technology for sea-to-shore cable transitions to avoid impacts to sensitive coastal resources and inadvertent discharges into Rhode Island Sound, the Sakonnet River and Mount Hope Bay. An HDD Inadvertent Release of Drilling Muds Contingency Plan is included as Attachment F to describe best management practices to avoid an inadvertent release during HDD operations.

### 2.6.6 Marine Monitoring

SouthCoast Wind will implement avoidance, minimization, and mitigation measures during in-water operations to avoid interactions with marine protected species, as listed in Table 2-7 below, Section 3.4.1.2 and Section 3.5. Marine construction staff will be trained in species identification, monitoring and mitigation. Environmental Monitors, trained crew and/or Protected Species Observers (PSOs) will be assigned and identified on all vessels

[1] Portsmouth General Legislation Chapter 257 Section 13.

to perform monitoring and mitigation, as necessary and required.

### 2.6.7 Restoration

In addition to the reconstitution of the cable trench that is expected from the use of the jet-plow, the backfilling of the side-cast dredge material into the offshore HDD trench, the offshore cable trenches are anticipated to be fully reconstituted by the natural tidal and current cycles to reestablish pre-disturbance seafloor grades. If additional fill is necessary to backfill the temporary HDD pits, clean fill of similar geologic composition, grain size, and biological characteristics will be acquired.

### 2.6.8 Proposed Avoidance, Minimization, and Mitigation Measures

The Project was sited, planned, and designed so that the proposed Project avoids and minimizes potential impacts on physical, biological, and cultural resources to the extent practicable. Avoidance, minimization, and mitigation measures designed for each phase of construction will effectively minimize Project impacts on the natural environment. Potential impacts to resources from the Project are expected to be limited temporally and/or spatially. Resource characterizations and impact assessments are presented in Section 3 and are guided by input from appropriate federal and state agencies, municipal input, and numerous stakeholders (public and private) in the region.

To the extent there are potential impacts from the Project that cannot be avoided, SouthCoast Wind will seek to avoid or minimize such impacts. Potential impacts to resources from the offshore export cables and landfalls are expected to be limited in scope temporally and/or spatially. Post-construction monitoring plans will be developed, as needed, in coordination with the relevant agencies prior to construction.

Table 2-7 below summarizes the various avoidance, minimization, and mitigation measures that SouthCoast Wind intends to implement, as appropriate, to avoid, minimize, or mitigate environmental impacts.

**TABLE 2-7. AVOIDANCE, MINIMIZATION AND MITIGATION MEASURES – NATURAL AND SOCIAL ENVIRONMENTS**

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| **Natural Environment** | | |
| Geology and Surficial Geology | Construction | • SouthCoast Wind will use BMPs to minimize sediment mobilization during offshore export cable installation.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• SouthCoast Wind, where practical and safe, will utilize dynamic positioning vessels.<br>• SouthCoast Wind will utilize HDD for sea-to-shore transition. Two "long-distance" HDD operations are proposed from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features.<br>• The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.<br>• The primary cable burial objective will be to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire ECC (where possible), by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
| --- | --- | --- |
| | | conditions.<br>• SouthCoast Wind has specific burial performance criteria that the cable installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.<br>• Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable. |
| Geologic Hazards | Design and Construction | • SouthCoast Wind performed geophysical and geotechnical surveys as part of the planning phase of the project to identify geologic hazards and anomalies.<br>• SouthCoast Wind is proactively routing the cables to avoid hazards, to the extent practicable.<br>• SouthCoast Wind will establish buffers, as necessary, to avoid anomalies during construction. |
| Marine Sediments and Soils | Construction | • SouthCoast Wind will select and use BMPs including the use of a Soil Erosion and Sediment Control Plan to minimize sediment mobilization during offshore construction and HDD operations.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.<br>• All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.<br>• SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's Emergency Spill Prevention, Response and Prevention Plan.<br>• SouthCoast Wind will have an HDD Contingency Plan (Attachment F) in place to mitigate, control, and avoid unplanned discharges related to HDD activities.<br>• SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook, and in accordance with approved plans and permit requirements.<br>• The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| Surface Waters | Construction | • SouthCoast Wind will select and use BMPs including the use of an SESC plan to minimize sediment mobilization during offshore construction and HDD operations.<br>• SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.<br>• Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.<br>• Sanitation will be provided on service vessels utilized by personnel for construction and transport. The transport vessels will hold sewage within holding tanks and dispose of all raw or treated sewage in accordance with all applicable discharge rules and regulations.<br>• All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.<br>• SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's OSRP.<br>• SouthCoast Wind will have an HDD Contingency Plan (Attachment F) in place to mitigate, control, and avoid unplanned discharges related to HDD activities. |
| Finfish | Construction | • SouthCoast Wind will design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., offshore cofferdam and/or gravity cell).<br>• SouthCoast Wind will incorporate use of HDD at landing(s) to minimize spatial and temporal effects to benthic organisms and avoid disturbance to finfish and invertebrate Essential Fish Habitat (EFH) to the extent practicable. |
| Shellfish | Construction | • SouthCoast Wind will use HDD at landfall locations, to avoid disturbance to nearshore productive shellfish beds to the extent practicable.<br>• SouthCoast Wind will select lower impact construction methods, where possible.<br>• SouthCoast Wind has designed the ECC, and will micro-route cables within the ECC, to avoid complex habitats, where possible.<br>• The ECC was designed to minimize length of cable (and associated seabed impacts) needed. SouthCoast Wind will bury cables, where possible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.<br>• The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| Marine Mammals and Sea Turtles | Construction | • Protected species observers will be employed, if required by National Marine Fisheries Service (NMFS), to monitor for whales, other marine mammals, and sea turtles.<br>• SouthCoast Wind will employ shut-down procedure when protected species are detected in their respective clearance zones in the Project area.<br>• SouthCoast Wind will implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan, as needed.<br>• All vessel operators will be required to reduce vessel speed to 10 knots or less when large assemblages of marine mammals are observed near an underway vessel or if vessel are in an area with an active vessel speed restriction. |
| Rare, Threatened and Endangered Species | Construction | • SouthCoast Wind will continue to consult with the Rhode Island Natural Heritage Program, RIDEM, USFWS, and NMFS.<br>• SouthCoast Wind will site Project components to avoid locating onshore facilities and landfall sites in or near sensitive fish and wildlife habitats to the greatest extent practicable.<br>• SouthCoast Wind will train construction staff on biodiversity management and environmental compliance requirements. |
| **Social/ Developed Environment** | | |
| Aquaculture | Construction | • ~~SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities.~~<br>• SouthCoast Wind is currently working with commercial and recreational fishermen as well as Fisheries representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.<br>• SouthCoast Wind's ECC has been designed in a location and orientation such that it does not directly overlap with active aquaculture leases.<br>• SouthCoast Wind has conducted modeling to understand potential sedimentation impacts. |

| Resource | Project Phase | Avoidance, Minimization, and Mitigation Measures |
|---|---|---|
| Commercial and Recreational Fishing | Construction | • SouthCoast Wind is currently working with commercial and recreational fishermen as well as Fisheries Representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.<br>• Temporary safety zones associated with construction activities implemented in consultation with USCG will limit direct access to areas with active construction activities for the safety of mariners and Project employees, but these areas will be limited spatially and temporally.<br>• SouthCoast Wind will notify mariners via Legal Notice to Mariners (LNMs) of the presence and location of partially installed structures.<br>• The SouthCoast Wind Fisheries Liaison Officer will proactively contact fishermen known to fish in areas that will see construction activities in advance of the start of construction by utilizing Fisheries representatives and connections with relevant state agencies to alert the fishermen of planned construction activities and schedules.<br>• SouthCoast Wind will provide prompt updates to mariners and corresponding web updates as they become available – the frequency of these updates will be dictated by the type of activity, which could be as frequent as daily notifications during construction.<br>• SouthCoast Wind will proactively contact and compensate fishermen if their gear is entangled during construction.<br>• SouthCoast Wind will consider the use of fixed mooring buoys at various strategic locations in the Project area to avoid the need for anchoring.<br>• SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.<br>• Achieving target burial depth, minimizing secondary protection, selecting secondary protection methods that minimize interference with fishing activities, and making the location of secondary protection and relocated boulders available via methods most useful to the commercial fishing industry. |
| Electric and Magnetic Fields (EMF) (offshore export cables) | Post-Construction | • The Electric Fields (~~EF~~EFs) arising from the voltage on the export cables will be completely shielded by cable materials.<br>• Although the steady Magnetic Fields (MFs) emitted by DC submarine cables do not create induced EFs like those created by the time-varying MFs from 60-Hz AC submarine cables, motion-induced EFs are created by the movement of seawater or marine species through the steady MFs emitted by DC submarine cables. These motion-induced EFs have the same properties as the motion-induced EFs that are created by the movement of seawater or marine species through the earth's steady geomagnetic field. For the typical buried HVDC offshore cable installation case, the motion-induced EFs associated with movement through the steady MFs emitted by the Project HVDC submarine cables will be small relative to the motion-induced EFs associated with movement through the earth's steady geomagnetic field. The strength of these motion-induced EFs also similarly drops off with distance from the cables like the DC MFs associated with the current on the submarine cables. |

# 3. Nearshore and Offshore Environmental Setting, Potential Impacts, and Proposed Avoidance, Minimization, and Mitigation

This section describes the offshore affected environment, potential impacts associated with construction, operations, and maintenance, and decommissioning of the Project within Rhode Island waters, and proposed avoidance, minimization, and mitigation measures to address these potential impacts. Generally, decommissioning impacts are commensurate with construction phase impacts and are therefore discussed together.

The Project was sited, planned, and designed to avoid and minimize impacts and potential Project impacts are expected to be limited temporally and spatially. SouthCoast Wind plans to bundle the two export cables and associated communications cabling, where possible, to limit the footprint of the Project on the seabed. SouthCoast Wind has established and collected field data from an export cable corridor of nominal width between 1,640 ft (500 m) to 2,300 ft (700 m) to allow micrositing of the export cable to avoid sensitive resources where practicable. Cable landfalls at Portsmouth, Rhode Island will be accomplished using HDD technology to avoid impacts to sensitive coastal resources. Where potential impacts cannot be avoided, SouthCoast Wind proposes minimization and mitigation measures presented in Section 2 and Table 2-7.

SouthCoast Wind has collected detailed geophysical, geotechnical and benthic habitat data from the entire ECC. Information and assessments based on this data to support this impacts evaluation is included in the following attachments to this application and in the SouthCoast Wind Construction and Operations Plan which can be accessed at SouthCoast Wind COP on BOEM Website https://www.boem.gov/renewable-energy/state-activities/southcoast-wind-formerly-mayflower-wind.

Summaries are provided below based on technical studies and reports prepared for the Project, including:

- Marine Archaeological Resources Assessment[1]
- Geohazard Report for the Brayton Point Export Cable Corridor [2]
- Hydrodynamics and Sediment Transport Modeling Report for the Brayton Point Export Cable Burial Assessment[3] (Attachment G)
- Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for Rhode Island State Waters[4] (Attachment H)
- Commercial and Recreational Fisheries and Fishing Activity Report[5]
- Unexploded Ordnance (UXO) Risk Assessment- Confidential (Attachment L)

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[1] Mayflower Wind Energy LLC and Fugro USA Marine, Inc. 2022. *Marine Archaeological Resources Assessment (Mayflower Wind Construction and Operations Plan Appendix Q (Confidential) - Docket No. BOEM-2021-0062).* August 2022.

[2] Mayflower Wind Energy LLC and Fugro USA Marine, Inc. 2022. *Geohazard Report for the Brayton Point Export Cable Corridor (Mayflower Wind Construction and Operations Plan Appendix E.2 (Confidential) - Docket No. BOEM-2021-0062).* February 25, 2022.

[3] Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment, Mayflower Wind Energy LLC | USA, 01 March 2022 - Final Report, Daniel L. Mendelsohn, Innovative Environmental Science and J. Craig Swanson, Swanson Environmental

[4] INSPIRE Environmental. 2022. Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for RI State Waters. September 22, 2022.

[5] Mayflower Wind Energy LLC and Tetra Tech. 2021. *Commercial and Recreational Fisheries and Fishing Activity Technical Report (Mayflower Wind Construction and Operations Plan Appendix V - Docket No. BOEM-2021-0062).* August 30, 2021.

## 3.1. GEOLOGY AND PHYSIOGRAPHY

This section includes an overview of geologic conditions with the Project Study Area based primarily on data generated from G&G and benthic surveys completed by Fugro in 2021 and 2022,[6] and information in available literature.

Bathymetry in the Study Area is depicted in Figure 3-1. Depths in Mount Hope Bay and the Sakonnet River are generally less than 33 ft (10 m), with a deepening natural channel in Lower Mount Hope Bay. In Rhode Island Sound, water depths vary between approximately 66 ft (20 m) and 131 ft (40 m).

During the Quaternary period, glacial and post-glacial processes shaped the geology of Southern New England and the Study Area. Illinoian and Late Wisconsin glaciations are inferred from terminal moraines to have advanced as far south as Martha's Vineyard and Nantucket Islands.[7] As the Laurentide glaciers began to melt, glacial outwash formed a thick sequence of sandy deposits southward across Rhode Island Sound, the Sakonnet River, and into Mount Hope Bay. Pro-glacial lakes formed in front of the glaciers and behind the end moraines and deposited thick sequences of glacio-lacustrine deposits. Post glacial sediment deposition evolved as the sea level rose and transgressed across the continental shelf and inundated the area. As the sea transgressed across the study area, the depositional environment transitioned to a shallow marine environment similar to the shelf's current depositional setting. In general, sandy sediments were deposited in higher energy environments and fine grained deposits in low energy, deeper water areas.

### 3.1.1. Surficial Geology and Sediments

The description of surficial geology and sediments is primarily based on data from geophysical surveys and sediment grab samples collected by SouthCoast Wind's survey contractor, Fugro. Data analysis and mapping was conducted by Fugro (COP, Appendix E - Marine Site Investigation Report [MSIR]; COP, Appendix E.2 - Geohazard Report for Brayton Point ECC). Glacial Moraine areas indicated in the Ocean SAMP (RI CRMC 2010) were also considered.

The Benthic Habitat Mapping Report (Attachment H) integrates Fugro's analysis of survey data with benthic survey data to describe and map seabed sediments (substrate) and benthic habitat. Glacial Moraine comprised 2.7% (411 acres) of the ECC in federal waters and comprised 3.1% (185 acres) of the ECC in Rhode Island state waters, predominantly located in Rhode Island Sound (Attachment H - Benthic Habitat Mapping Assessment, Tables 3-2 and 3-4).

Glacial moraine areas identified in the Ocean SAMP intersect the ECC in two areas within federal waters: at Southwest Shoal; and where the ECC turned due west outside of Rhode Island State Waters (Attachment H, Figure 4-5). Glacial moraines defined in the Ocean SAMP were based on several sources interpreted by Boothroyd (2009).[8] Most of the data near the Southwest Shoal interpreted in the Ocean SAMP were collected by the USGS in 1980 over very widely spaced seismic lines and near the Rhode

[6] Mayflower Wind COP, Appendix M.2 *Benthic and Shellfish Resources Characterization Report Addendum #2* and Appendix M.3
[7] Foster et al., 2014
[8] Boothroyd. J.C. 2009. A Short Geological History of Block Island and Rhode Island Sounds. Ocean Special Area Management Plan.

Island State Waters boundary in 1975 (McMullen et al. 2009)).[9,10]. Because of the paucity of seismic data in the region of the Brayton Point ECC, the areas identified in the Ocean SAMP are general and do not reflect high-resolution distribution of moraine deposits and subsequent erosion and deposition of surficial sediments that affect benthic habitats.

The Ocean SAMP does not identify any moraines in Rhode Island state waters that overlap with the Brayton Point ECC (Attachment H, Figure 4-5); however, Glacial Moraine habitats were mapped in the Brayton Point ECC in Rhode Island Sound using data collected by SouthCoast Wind (Attachment H, Figure 4-5). Most of the moraine area identified in the Ocean SAMP at Southwest Shoal was also mapped as Glacial Moraine using data collected by SouthCoast Wind (Figure 3-2). In contrast, only a discrete area of the Ocean SAMP-identified moraine near the Rhode Island state waters boundary was mapped as Glacial Moraine using data collected by SouthCoast Wind (see Attachment H and Figure 4-5).

Attachment H - Benthic Habitat Mapping Report, integrates the geophysical, grain size and benthic biological data collected to provide detailed mapping and discussion of surface deposits in the Project Area. In general, sediments in Mount Hope Bay and the Sakonnet River were primarily fine grained (mud to muddy sand) typical of depositional estuarine environments. *Crepidula,* a colonizing limpit, was found overlying these muds in some areas in the upper Sakonnet River and in the lower Mount Hope Bay. Very small areas of Mud to Muddy Sand – with Boulder Field(s) typical of glacial moraine and Bedrock were mapped in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2). There is also evidence of anthropogenic debris such as rock and backfill over pipelines.

Sediments became coarser at the mouth of the Sakonnet River and in Rhode Island Sound where deposits included gravels, sand and mud with boulders. The distribution of these deposits is related to the offshore extension of the Buzzards Bay moraine, a terminal moraine that is perhaps an extension of the Point Judith moraine near the mouth of the Sakonnet River (as mapped by Baldwin et al. 2016; COP, Appendix E, MSIR)).[11].

Clusters of individual surficial boulders with poorly sorted gravels, sands and muddy sands (Glacial Moraine, Mixed-Size Gravel in Muddy Sand to Sand – with Boulder Field(s)) and proximal areas were mapped in RI Sound from the RI State Waters Line to the mouth of the Sakonnet River, and in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2).

### 3.1.2. Sediment Grain Size Analysis

Sediment grab samples were collected for grain size analysis during the 2021 and 2022 benthic surveys from eight locations in Mount Hope Bay, 14 locations in the Sakonnet River, and seven locations in Rhode Island Sound for a total of 29 sample locations. Grain size data is presented in Attachment I - Sediment Sample Grain Size Analytical Results. Additional details on sample collection and analysis are included in Appendix M.2 and Appendix M.3 of the COP, and data is integrated into the benthic habitat assessment in Attachment H. Note that grain size data was generated by two methods: Wentworth and USCS.

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[9] McMullen, K. Y., L. J. Poppe, T. A. Haupt, and J. M. Crocker, 2009. Sidescan-sonar imagery and surficial geologic interpretations of the sea floor in western Rhode Island Sound. U.S. Geological Survey Open-File Report 2008-1181. Report and data available online at: http://woodshole.er.usgs.gov/pubs/of2008-1181/index.html

[10] McMullen, K. Y., L. J. Poppe, and N. K. Soderberg, 2009. Digital seismic-reflection data from western Rhode Island Sound, 1980. U.S. Geological Survey Open-File Report 2009-1002. Report and data available online at: http://pubs.usgs.gov/of/2009/1002/index.html

[11] Baldwin et. a al. 2016.

In Mount Hope Bay the sediments are primarily fine silts and clays with varying amounts of sand. Sediments in the Sakonnet River ranged from fine silts to sands with varying amounts of gravel. At the mouth of the Sakonnet River (southern end) and moving into Rhode Island Sound the predominant sediment fraction is fine sand mixed with coarse and medium sand.

## 3.1.3. Potential Project Impacts

### *3.1.3.1. Offshore Export Cables*

The routing of the ECC has been designed to avoid or minimize impacts to geologic resources in the marine environment. The G&G marine surveys completed by SouthCoast Wind were used to guide refinement of the cable placement within the ECC to avoid or minimize impacts in the marine environment.

The offshore export cables will be buried to a depth range from 3.2 to 13.1 ft (1.0 to 4.0 m) below the seabed, with a target burial depth of approximately 6 feet. Specific target burial depth will vary along the cable route and may be greater or less, based on assessment of the local soil conditions and risk to the buried cables from external risk factors. The primary cable burial objective will be to achieve a suitable target burial depth along the entire ECC as informed by the Cable Burial Risk Assessment (Attachment D - "Confidential", provided under separate cover). Cable routing within the ECC focused on micro-routing the cables to the extent practicable, in order to achieve target burial depth and to avoid surficial geologic and anthropogenic features informed by data collected in the G&G surveys.

Anchoring during cable installation will be limited to shallow water and thus only the Sakonnet River and Mount Hope Bay which are primarily soft bottom. Refer to Section 2.3 and Figure 2-2 for additional information about anchoring.

The cable burial methods are not expected to cause permanent seafloor impacts, and the shallow trench left after the cable-lay and burial is expected to naturally backfill with sediment. The sea-to-shore landfalls will be completed using HDD methodology and will avoid disturbance of the nearshore/shoreline areas of the Sakonnet River and Mount Hope Bay. Once the cable is buried, the area above the cable, except for those areas with secondary cable protection, will recover through the natural and dynamic migration and deposition of marine sediments.

Permanent impacts to seabed conditions are limited to locations where secondary cable protection is required because conditions do not allow target cable burial or where other infrastructure (pipelines) are crossed. Sediment disturbance will be limited to a swath up to approximately 20 ft (6.0 m) wide within the ECC, and where cable protection is required, it will span approximately 20 ft (6.0 m) across the cable.

As a conservative estimate for planning purposes, SouthCoast Wind estimates up to 15% of the ECC within Rhode Island state waters will require secondary cable protection. Secondary cable protection is expected to be required primarily at the identified cable/pipeline crossing locations in the Sakonnet River, and in Rhode Island Sound where areas of harder seabed have been identified. Generally, the seabed conditions in the remainder of the ECC in the Sakonnet River and Mount Hope Bay are comprised of softer sediments which are expected to be suitable for cable burial and not require substantial secondary cable protection.

The offshore export cable installation and burial methods proposed by SouthCoast Wind will cause temporary disturbances to the seafloor within the ECC as outlined in Table 3-1 below. Sediment redeposition on the seabed following suspension during cable installation is evaluated in Attachment G - Hydrodynamics and Sediment Dispersion Modeling Technical Report; overall redeposition is localized.

Based on currently available information on the ECC, the percentage of the ECC that may require each type of seabed preparation method, cable installation method, and cable protection was estimated on a preliminary basis. This percentage was then used to estimate the total potential area of temporary seafloor disturbance during offshore export cable construction. These estimates are summarized in Table 3-1 with area of disturbance measured in acres and hectares.

**TABLE 3-1. ESTIMATED TEMPORARY SEABED DISTURBANCE AREAS IN RHODE ISLAND**

| Seabed Disturbance | Area [a,c] (hectare)[d] |
|---|---|
| Export Cable Corridor (ECC) | |
| Offshore Export Cables | |
| Seabed Preparation [a] | 25.3 (10.2) |
| Cable Installation [b] | 94.9 (38.4) |
| Cable Protection [c] | 15.2 (6.2) |
| **Total Seabed Disturbance Area (Temporary)** | **136.6 (54.8)** |

*Notes:*

*[a] Seabed preparation includes boulder field clearance over up to approximately 10% of the ECC in Rhode Island state waters, as well as local boulder removal via boulder grabs in other locations. It is also assumed that a grapnel run will be performed along the entire length of the ECC in Rhode Island state waters.*

*[b] Cable installation assumes cable burial along the ECC via one of the several methods under consideration, and conservatively assumes a width of surface impact of 19.7 ft (6.0 m) around each cable. Anchor impacts are considered as well—it is conservatively assumed that an anchored vessel will be used along the entire ECC in Rhode Island state waters. The area of impact due to anchoring assumes that an 8-point mooring spread is used, with an estimated impact diameter of 16.4 ft (5.0 m) per anchor. Where practical and safe, SouthCoast Wind will utilize dynamically positioned vessels, which will reduce anchoring impacts.*

*[c] The primary objective is to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire cable route, by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions. Cable protection impact areas assume mattresses and/or rock placement will be used at cable/pipeline crossings (where burial in the seabed is not possible) and for additional cable protection along the ECC if needed. Based on preliminary understanding of site conditions from desktop studies of the offshore export route, SouthCoast Wind estimates that up to 15% of the ECC in Rhode Island state waters will require additional cable protection, including material used at cable/pipeline crossings. It is assumed that a 19.7 ft (6.0 m) wide rock berm will be constructed if required. At each of the three third-party pipelines expected to be crossed, rock berms and/or a number of 9.8 ft (3.0 m) width x 19.7 ft (6.0 m) length mattresses are assumed to be used for cable separation and protection.*

*[d] Seabed disturbance calculations conservatively assume that the cables are un-bundled along the entire ECC in Rhode Island state waters, so the impact numbers presented assume two separately installed submarine power cables (with one dedicated communications cable installed along with one of the power cables). Where practicable, SouthCoast Wind will install the offshore export cables in a bundled configuration, which will significantly reduce seabed disturbance impacts (seabed disturbance areas will be reduced by approximately half where cables are bundled offshore).*

### 3.1.4. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to surficial geology and sediments that SouthCoast Wind will adopt:

- SouthCoast Wind will use BMPs to minimize sediment mobilization during offshore export cable installation.
- SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations. This will include targeting to use cable burial methods (such as use of jet-sled cable burial tooling or other methods that employ sediment fluidization) that encourage natural backfill of the cable burial trench with the disturbed sediment during the trenching operation.
- SouthCoast Wind, where practical and safe, will utilize dynamically positioned vessels.
- SouthCoast Wind will utilize HDD for sea-to-shore transition to avoid disturbance to shoreline areas. Two "long-distance" HDD operations are proposed from the Sakonnet River to Portsmouth and HDD from Mount Hope Bay to Portsmouth. Both HDD trajectories will be advanced well beneath the nearshore waters, coastal wetlands, and shoreline features.
- The offshore export cables will be installed in a bundled configuration, where practicable, to reduce installation impact area and post-installation occupied area.
- The primary cable burial objective will be to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire ECC (where possible), by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tooling for the seabed conditions.
- SouthCoast Wind has specific burial performance criteria that the cable installation contractor will be contractually responsible to meet. The contractor will perform a trenching functional trial before operations to demonstrate that the proposed tool is fully functional as designed. The tool utilized will be selected based on the soil conditions as determined from the Cable Burial Assessment Study.
- Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.

## 3.2. WATER QUALITY

This section discusses offshore surface water uses and water quality in the Project Area. Available data on the affected environment from several sources was reviewed, including the Center for Coastal Studies, the Northeast Fisheries Science Center, NOAA, USEPA, USGS, RIDEM, RI CRMC, and Massachusetts Department of Environmental Protection (MassDEP). Water temperature, salinity, chlorophyll *a*, nutrients, dissolved oxygen, and turbidity were evaluated. SouthCoast Wind has prepared a hydrodynamic model and sediment transport analysis for the Project to evaluate potential for turbidity impacts during construction that is discussed in the sections below and included as Attachment G.

## 3.2.1. Affected Environment

The affected environment is described in this section in terms of regulatory classifications and available water quality data.

### *3.2.1.1. RI CRMC Water Use Categories*

RI CRMC assigns water use categories for marine and coastal waters in accordance with the State or Rhode Island CRMP, as amended (aka, *The Redbook*) Section 2.00 Tidal and Coastal Pond Waters A.[12] Rhode Island state waters the ECC goes through are depicted on Figure 1-5 and described as follows:

- The Sakonnet River is designated as a Type 2 water. Type 2 waters are defined by the RI CRMC as having high scenic qualities, high value for fish and wildlife habitat, and with some exceptions, good water quality. Densely developed residential areas abut much of the waters in this category, and docks and the activities and small-scale alterations associated with residential waterfronts may be suitable.
- The Cove at Island Park in Portsmouth, Rhode Island will not be crossed by the Project, but is in the vicinity of the Project and is included here for completeness. This water body is designated as a Type 2 water, low-intensity use.
- The ECC in Mount Hope Bay is located in Type 4 waters. Type 4 waters are categorized by: (1) large expanses of open water in Narragansett Bay and the Sounds which support a variety of commercial and recreational activities while maintaining good value as fish and wildlife habitat; and (2) open waters adjacent to shorelines that could support water-dependent commercial, industrial, and/or high-intensity recreational activities.
- A short segment of the ECC is located within the lower bay of Mount Hope Bay overlaps with Type 6 waters (see Figure 1-5). To establish the boundaries of Type 6 waters the CRMC established a buffer to federal navigation channels that measures three times the channel depth. Type 6 waters are categorized for: (1) industrial waterfronts; and (2) commercial navigation channels. SouthCoast Wind has consulted with the USACE and has committed to routing the cables to avoid the Mount Hope Bay main shipping channel, the Tiverton channel and the buffer to these federal navigation channels, thus will not place cables within the Type 6 waters.

**RIDEM Water Quality Classifications**

The RIDEM Surface Water Quality Standards (250-RICR-150-05-1) and Water Quality Certification Regulations further categorize water quality standards for each waterbody. The waters of the State of Rhode Island (meaning all surface water and groundwater of the State) are assigned a Use Classification which is defined by the most sensitive uses which it is intended to protect. Waters are classified according to specific physical, chemical, and biological criteria which establish parameters of minimum water quality necessary to support the water Use Classification.

A majority of the ECC including Rhode Island Sound, Sakonnet River, and lower and mid-bay of Mount Hope Bay is mapped as Class SA (see Figure 1-4), which are waters designated for shellfish harvesting, direct human consumption, primary and secondary contact recreational activities, and fish and wildlife habitat. A small portion of the ECC in Mount Hope Bay near the Massachusetts state line is mapped as

[12] 650-RICR-20-00-1

Class SB, which are waters designated for primary and secondary contact recreational activities, shellfish harvesting for controlled relay and depuration, and fish and wildlife habitat. Another small portion near the Massachusetts state line is mapped as Class SB1 which are waters designated for primary and secondary contact recreational activities and fish and wildlife habitat and suitable for aquacultural uses, navigation and industrial cooling. Class SA, SB and SB1 waters have good aesthetic value.

## Clean Water Act Assessments

The federal CWA, under Section 305(b) requires states to assess and report on the overall quality of waters in their state including the 303(d) List of Impaired Waters. The State of Rhode Island Impaired Waters Report[13] provides an Integrated List consisting of five categories of water quality assessment information, with the fifth category being the list of impaired waters needing a Total Maximum Daily Load (TMDL). Table 3-2 identifies the waterbodies, water use categories and types, water quality standards and impairment status designated by the RI CRMC and RIDEM. Areas of Mount Hope Bay (Waterbody IDs RI0007032E-01A, RI0007032E-01B, RI0007032E-01C, and RI0007032E-01D) are listed Category 5 impaired waterbodies due to dissolved oxygen, total nitrogen, and fecal coliform. Nearshore areas of the Sakonnet River (Waterbody ID RI0010031E-01A) near the landfall in Portsmouth, Rhode Island are listed as Category 4A, waterbody impairments having approved TMDLs, due to fecal coliform. The TMDL was completed by RIDEM and approved by USEPA on April 7, 2005 so it was removed from the Category 5 Impaired Waters List.

[13] RIDEM Office of Water Resources. 2022. State of Rhode Island 2022 Impaired Waters Report. February 2022. Accessed from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/2022%20RIDEM%20Impaired%20Waters%20Report%2012-01-2021.pdf.

TABLE 3-2. SURFACE WATER CATEGORIES AND CLASSIFICATIONS

| Waterbody | Water Use Category[a] | Water Quality Classification[b] | TMDL[c] | Impairment Category[d/e] | Special Resource | Other |
|---|---|---|---|---|---|---|
| Sakonnet River (offshore) | 2 | SA | No | No | Recreation, ecological habitat, federal park, critical habitat (rare & endangered species) | Type 1 waters surround Gould Island |
| Sakonnet River Nearshore at Aquidneck Island cable landing | 2 | SA | Fecal Coliform | 4A (fecal coliform) | No | TMDL completed 4/7/2005 |
| Mount Hope Bay (mid-bay & lower bay) | 4 | SA | Fecal Coliform | 5 (dissolved oxygen, total nitrogen, & fecal coliform) | No | TMDL for dissolved oxygen and total nitrogen scheduled for 2029. |
| Mount Hope Bay (upper bay) | 4 | SB/SB1 | Fecal Coliform | 5 (dissolved oxygen, total nitrogen, & fecal coliform) | No | TMDL for dissolved oxygen and total nitrogen scheduled for 2029. |
| Founder's Brook | N/A | A | No | 5 (enterococcus) | No | Warm water fishery |

*Notes:*

[a] *Water use categories are defined in accordance with the RI CRMC "Red Book" (650-RICR-20-00-1). The definitions of the water use categories can be found below.*

[b] *Water quality classifications are defined in accordance with 250-RICR-150-05-1. The definitions can be found below.*

[c] *TMDL is defined in accordance with 73 C.F.R. 41069 - Clean Water Act Section 303(d).*

[d] *The impairment categories for waterbodies in Rhode Island were identified in the State of Rhode Island 2018-2020 Impaired Waters Report.*

[e] *RIDEM Office of Water Resources. 2021. Final 2018-2020 Delisting Document - Waterbody Impairments Removed from the Impaired Waters Lists. January 2021.*

***Category 2:*** *Attaining some of the designated uses; and insufficient or no data and information is available to determine if the remaining uses are attained.*

***Subcategory 4A:*** *TMDL has been completed and approved by the USEPA.*

***Subcategory 4B:*** *-Other pollution control requirements are expected to result in attainment of the water quality standard associated with the impairment. Note: These waters will continue to be listed as impaired for aquatic life use with causes of total nitrogen and dissolved oxygen and impaired for shellfishing use and primary and secondary contact use with fecal coliform as the cause.*

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### Sakonnet River

Water quality data is available for the Sakonnet River collected in 2018 and 2019 by the USGS at Buoy monitoring station 413642071125701 located in the Sakonnet River near Gould Island, Rhode Island (USGS Sakonnet River Station Buoy).[14] Data collected for water temperature, salinity, dissolved oxygen, chlorophyll a, turbidity, total nitrogen, and total phosphorus are provided in Table 3-3.

The Sakonnet River remains saline throughout the year due to tidal influence. Water temperatures peak in the summer months when the river also reaches its lowest dissolved oxygen levels (Table 3-3).

A small area in the upper Sakonnet River north of a line extending from the southwestern-most corner of the stone bridge in Tiverton to the eastern-most extension of Morningside Lane in Portsmouth, and including the Project's cable landing area is listed in the *State of Rhode Island 2022 Impaired Waters Report* as impaired based on fecal coliform.[15] The area is identified as Category 4A – Waterbodies for which a TMDL has been developed. The 0.281-square mile area is impaired for shellfishing due to the presence of fecal coliform.[16]

**TABLE 3-3. WATER QUALITY PARAMETERS MEASURED IN THE SAKONNET RIVER NEAR GOULD ISLAND BY USGS (2018-2019)**

| Season | Water Temp. (°C)[1] | Salinity (psu)[1,2] | Dissolved Oxygen (mg/L)[1] | Chlorophyll *a* (µg/L)[1] | Turbidity (NTU)[1,2] | Total Nitrogen (mg/L)[1] | Total Phosphorus (mg/L)[1] |
|---|---|---|---|---|---|---|---|
| Spring (n=8)[3] | 15.9 ± 2.4 | 29 ± 0.8 | 7.3 ± 0.4 | 5.9 ± 3.1 | 1.7 ± 0.7 | 0.23 ± 0.04 | 0.04 ± 0.01 |
| Summer (n=28)[3] | 22.9 ± 1.7 | 30.9 ± 0.3 | 5.9 ± 0.8 | 6.5 ± 5.5 | 2.2 ± 0.5 | 0.29 ± 0.07 | 0.07 ±0.01 |
| Fall (n=14)[3] | 15 ± 4.4 | 29.3 ± 1.1 | 7.4 ± 0.9 | 2.7 ± 0.7 | 2.5 ± 0.7 | 0.34 ± 0.08 | 0.08 ± 0.01 |

*Notes:*

*[1] Results show mean ± 1 standard deviation. psu = Practical Salinity Units; mg/L = milligrams per liter; µg/L = micrograms per liter; NTU = Nephelometric Turbidity Units; °C = degrees Celsius.*

*[2] Values for turbidity and salinity were only measured in 2018.*

*[3] n= number of samples (not all samples were analyzed for all parameters).*

*Source: USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.*

### Mount Hope Bay

Water quality data was not found for Rhode Island state waters in Mount Hope Bay in Rhode Island, but data from two monitoring buoys in Massachusetts state waters are available. Two fixed-location buoys in Mount Hope Bay maintained by the University of Rhode Island Graduate School of Oceanography and MassDEP in the Cole River and Taunton River collect data during the summer and early fall between May and November. Data collected from these stations are available for the 2017 and 2018 seasons and is presented in Table 3-4.[17] Mount Hope Bay Buoy Data Report: 2017 and 2018 Fixed-Site Continuous

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[14] USGS. 2019. *Water Quality Samples for USA: Sample Data.* https://nwis.waterdata.usgs.gov/nwis/qwdata.

[15] RIDEM Office of Water Resources. 2022. State of Rhode Island 2022 Impaired Waters Report. February 2022. Accessed from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/2022%20RIDEM%20Impaired%20Waters%20Report%2012-01-2021.pdf.

[16] USEPA. n.d.. How's My Waterway? EPA. Retrieved February 10, 2023, from https://mywaterway.epa.gov/waterbody-report/RIDEM/RI0010031E-01A/2022/.

[17] Narragansett Bay Fixed-Site Monitoring Network. 2018. *Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files].* https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

Monitoring is the most recently published summary report for the Cole River and Taunton River buoys.[18] Raw monitoring result data is available from 2019-2020, though summary statistics for these data sets have not yet been published.[19]

The four assessment units in the Rhode Island portion of Mount Hope Bay (RI0007032E-01A, RI0007032E01B, RI0007032E-01C, RI0007032E-01D) were previously listed as impaired for aquatic life use due to fish bioassessments in 1996, following a sharp decline in the number and diversity of fish associated with operations of the Brayton Point Power Station in Somerset.[20] These segments were also listed for water temperature impairment in 2000 due to the Brayton Point Power Station's thermal inputs. The TMDL for the water temperature impairment has been completed and approved by USEPA and the mid-bay and lower bay of Mount Hope Bay were reclassified from Category 5 (303d list) to Subcategory 4B (other pollution control requirements are reasonably expected to result in attainment of the water quality standard associated with the impairment) for fish bioassessments and water temperature.[21] Current monitoring data from this waterbody indicates that water quality standards for the once impaired Bay are now being met. Mount Hope Bay is still listed as an impaired water for dissolved oxygen, total nitrogen, and fecal coliform (see Table 3-3 above).

**TABLE 3-4. MEAN AND STANDARD DEVIATION FOR WATER QUALITY PARAMETERS MEASURED IN MOUNT HOPE BAY (2017-2018)**

| Year | Site | Water Temp. (°C)[1] | Salinity (psu)[1] | Dissolved Oxygen (mg/L)[1] | Chlorophyll (RFU)[1] | Nitrate-N (mg/L)[1] |
|---|---|---|---|---|---|---|
| 2017 | Taunton River | 20.3 ± 3.2 | 27.4 ± 1.2 | 7.4 ± 1.3 | 2.5 ± 2.2 | 0.12 ± 0.06 |
| | Cole River | 20.5 ± 3.3 | 27.9 ± 1.9 | 7.9 ± 1.3 | 4.3 ± 3.7 | 0.13 ± 0.06 |
| 2018 | Taunton River | 21.3 ± 4.3 | 27.2 ± 2.6 | 7.1 ± 1.2 | 2.7 ± 2.2 | 0.18 ± 0.08 |
| | Cole River | 21.4 ± 4.4 | 27.5 ± 2.1 | 7.5 ±1.2 | 2.7 ± 2.0 | 0.16 ± 0.06 |

*Note:*

*[1] Results show mean ± 1 standard deviation. psu = Practical Salinity Units; mg/L = milligrams per liter; RFU = relative fluorescence units; °C = degrees Celsius.*

*Source: Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.*

### 3.2.1.2. Summary of Water Quality Parameters

This section provides a discussion of available water quality data for each parameter including context within the hydrologic system.

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[18] MassDEP. 2020. Mount Hope Bay Buoy Data Report: 2017 and 2018 Fixed-Site Continuous Monitoring. June 2020. https://www.mass.gov/doc/technical-memorandum-cn-5300-mount-hope-bay-buoy-data-report/download.

[19] Narragansett Bay Fixed-Site Monitoring Network. 2018.

[20] State of Rhode Island. 2021. Press Release: RI's List of Impaired Waters Approved by USEPA. February 26, 2021.

[21] RIDEM Office of Water Resources. 2021. Final 2018-2020 Delisting Document - Waterbody Impairments Removed from the Impaired Waters Lists. January 2021.

## Temperature and Salinity

In tidal estuaries, temperature and salinity are affected by seasonal temperatures, tidal mixing and seasonal fresh water inflows from tributaries. Generally, temperature and salinity are higher in the summer and fall, and lower in the winter and spring. These general trends are illustrated in data presented in Tables 3-3 and 3-4. The Sakonnet River is a tidal straight with most influence coming from the Rhode Island Sound and Atlantic Ocean. Further upstream in Mount Hope Bay, mean salinity (Table 3-4) is slightly lower due to the freshwater influence from the Taunton and Cole rivers as well as the surrounding Narragansett watershed.[22]

## Chlorophyll *a*

Chlorophyll *a* is a photosynthetic green pigment found in most phytoplankton and plant cells. Measuring chlorophyll *a* in the surface water is an indication of how much primary production is occurring in the surface of the ocean. Chlorophyll *a* is used as an indicator for eutrophication and levels will increase with increased phytoplankton production, which is often related to increased nutrient inputs.

The USGS reported Chlorophyll *a* in the Sakonnet River in 2018 and 2019 and there was some seasonal variability (Table 3-3).[23] During the summer, median concentrations of Chlorophyll *a* were 6.5 micrograms per liter (µg/L) while during the fall median concentrations were 2.7 µg/L. Upstream in Mount Hope Bay, the Chlorophyll *a* concentrations were slightly lower (Table 3-4).[24]

## Nutrients

Nitrogen and phosphorus are two of the primary nutrients measured in coastal and marine waters. These nutrients are required for the growth of algae and phytoplankton, but excessive levels of these nutrients can lead to eutrophication, reduced water clarity, and lower levels of dissolved oxygen.

The USGS reported total nitrogen and total phosphorus concentrations for the Sakonnet River (Table 3-3), and the Narragansett Bay Fixed-Site Monitoring Network reported nitrate-N concentrations for Mount Hope Bay were much higher than in the Rhode Island Sound (Table 3-4). While both studies reported nutrients differently than the Center for Coastal Studies and USEPA National Coastal Condition Assessment studies, they indicated that nutrients were higher in the Sakonnet River and Mount Hope Bay. The Sakonnet River experienced its highest amount of nutrients, both nitrogen and phosphorus, in the fall season. Nutrient inputs are expected to come from the surrounding Narragansett Bay watershed, consisting of mostly developed land.

## Dissolved Oxygen

Dissolved oxygen is essential for maintaining present conditions for aquatic life. Concentrations below 2.0 mg/L can lead to hypoxia, which is detrimental to most organisms. Dissolved oxygen level can be influenced by physical factors (e.g., water temperature) and biological factors (e.g., respiration, photosynthesis, and bacterial decomposition).

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[22] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.
[23] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.
[24] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

In the USGS data, the Sakonnet River dissolved oxygen levels were lowest in the summer months. During the summer the mean dissolved oxygen was about 5.9 mg/L (Table 3-3).[25] The Cole River and Taunton River buoys report healthy mean dissolved oxygen levels for Mount Hope Bay of around 7.5 mg/L (Table 3-4).[26]

**Turbidity**

Turbidity is a measure of water clarity or how much the material suspended in the water column decreases light penetration. Excessively turbid water can be detrimental to water quality if suspended sediments settle out and bury benthic communities, adversely affect filter feeders, or block sunlight needed by submerged vegetation.

Turbidity in the Sakonnet River reported by USGS (Table 3-3) was highest in the summer and fall seasons but overall, relatively low (less than 3 Nephelometric Turbidity Units).[27]

Ambient total suspended solids (TSS) load and concentrations have been monitored in Mount Hope Bay for many years, related to concerns for impacts of the three waste water treatment plants that discharge into the bay and rivers feeding the bay ~~(USEPA 2016; Abdelrhman 2016; Desbonnet et al. 1992[28]).~~.[29,30] Ambient TSS concentrations were observed ranging regularly from 2 mg/L to 15 mg/L, with a mean of in the range of 11 mg/L from a combination of the analysis of the river water used in the elutriate analyses (C2D 2003) and past dry and wet weather TSS measurements ~~(Swanson and Isaji 2006).[31]~~.[32]

## 3.2.2. Potential Project Impacts

### *3.2.2.1. Construction and Decommissioning*

Sediment suspension and effects on water turbidity during cable installation and HDD construction area excavation are the primary concerns for water quality impacts. To evaluate this impact, SouthCoast Wind contracted with Swanson Environmental to complete a hydrodynamic and sediment transport modeling study for cable installation and HDD construction area excavation, which is included as Attachment G.

The model was used to estimate the highest concentration of sediment suspended in the water column (measured as TSS) and the areal extent at any one point during cable installation and HDD construction

[25] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.

[26] Narragansett Bay Fixed-Site Monitoring Network. 2018. Mount Hope Bay Marine Buoys [Water Quality Continuous Multiprobe Data Files]. https://www.mass.gov/info-details/mount-hope-bay-marine-buoy-continuous-probe-data#data-files-for-mount-hope-bay-marine-buoys-.

[27] USGS. 2019. Water Quality Samples for USA: Sample Data. https://nwis.waterdata.usgs.gov/nwis/qwdata.

~~[28] Desbonnet, A., D. Lazinsky, S. Codi, C.Baisden, and L. Cleary, 1992. An Action Plan for the Taunton River Watershed: Assessment and Recommendations. Report of the U. Mass. Boston to the National Oceanic and Atmospheric Administration. Funded by grant NOAA Award No.-NA90AA-H-CZB42.~~

[29] Desbonnet, A., D. Lazinsky, S. Codi, C.Baisden, and L. Cleary, 1992. An Action Plan for the Taunton River Watershed: Assessment and Recommendations. Report of the U. Mass. Boston to the National Oceanic and Atmospheric Administration. Funded by grant NOAA Award No.-NA90AA-H-CZB42.

[30] USEPA. 2016. Modeling Total Suspended Solids (TSS) Concentrations in Narragansett Bay, by Mohamed A. Abdelrhman. U.S. Environmental Protection Agency Atlantic Ecology Division NHEERL ORD, 27 Tarzwell Drive Narragansett, RI 02882 USA National Health and Environmental Effects Research Laboratory Office of Research and Development Narragansett, RI 02882 USA. EPA/600/R-16/195, August 2016.

~~[31] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.~~

[32] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.

area excavation. The duration that sediment was suspended in the water as the sediment resettled to the seabed was also estimated.

The water column concentrations presented are the maximum TSS concentration above background anywhere in the water column at each 20 m x 20 m (65 ft x 65 ft) concentration grid cell over the total duration of the cable installation. Ambient TSS load and concentrations have been monitored in Mount Hope Bay for many years, related to concerns for impacts of the three waste-water treatment plants that discharge into the bay and rivers feeding the bay (USEPA 2016; Abdelrhman 2016; Desbonnet et al. 1992).[33] Ambient TSS concentrations were observed ranging regularly from 2 mg/L to 15 mg/L, with a mean of in the range of 11 mg/L from a combination of the analysis of the river water used in the elutriate analyses (C2D 2003) and past dry and wet weather TSS measurements (Swanson and Isaji 2006).[34] .[35]

An overview of the distance from the cable installation point where TSS may be elevated by 100 mg/L and the duration of that concentration as sediment resettles to the seabed is provided in Table 3-5. The 100 mg/L increase is typically used as a biological threshold in water quality evaluations. In the Sakonnet River, suspended sediment concentrations fell below 100 mg/L 20 minutes or less after the cable was installed at a given location. The duration of the elevated water column concentrations in Mount Hope Bay was longer (up to 4.6 hours) apparently due to higher currents in the bay. In Rhode Island Sound, the duration was generally less than 20 minutes, except for an area near the RI state line where the duration was longer (up to 3.0 hours).

**TABLE 3-5. TURBIDITY INCREASE DURING CABLE INSTALLATION– EXTENT AND DISSIPATION OF 100 MG/L TSS**

| | Maximum Distance from Indicative ECC Centerline (km) | Time for TSS to Drop Below 100 mg/L (min) |
|---|---|---|
| Sakonnet River | 0.61 | 20 |
| Mount Hope Bay | 1.16 | 280 |
| RI Sound | 0.37 | 175 |

The HDD construction area excavation impacts were smaller compared with the impact resulting from cable installation (Table 3-6). The 100 mg/L threshold TSS concentration was contained within 0.32 km (0.2 mi) and was within the ECC boundaries in all cases. The modeling approach was highly conservative, as the source was assumed to be at a single point and continuous over a 1-hour period, releasing 100% of the dredged material into the water column. The area coverage of the 100 mg/L or greater level was contained within an average of 5.0 ha (12 ac).

**TABLE 3-6. TURBIDITY INCREASE DURING OFFSHORE HDD CONSTRUCTION EXCAVATION – EXTENT AND DISSIPATION OF 100 MG/L TSS**

| HDD Construction Area | Maximum Distance from Release (km) | Time for TSS to Drop Below 100 mg/L (min) |
|---|---|---|

[33] USEPA. 2016. Modeling Total Suspended Solids (TSS) Concentrations in Narragansett Bay, by Mohamed A. Abdelrhman. U.S. Environmental Protection Agency Atlantic Ecology Division NHEERL ORD, 27 Tarzwell Drive Narragansett, RI 02882 USA National Health and Environmental Effects Research Laboratory Office of Research and Development Narragansett, RI 02882 USA. EPA/600/R-16/195, August 2016.

[34] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.

[35] Swanson. C. and Isaji. T. 2006. Simulation of Sediment Transport and Deposition from Cable Burial Operations for the Alternative Site of the Cape Wind Energy Project. ASA Final Report 05-128.

| | | |
|---|---|---|
| Mount Hope Bay HDD | 0.14 | 100 |
| Sakonnet River HDD | 0.25 | 100 |

Water quality effects from vessel operations are not anticipated. All operations will be compliant with relevant and applicable state and federal regulations for management, storage and disposal of equipment, fuels, maintenance materials and waste products. Procedures outlined in the Emergency Response Plan (ERP) Requirements (Attachment E) and the Oil Spill Response Plan (OSRP) (COP, Appendix AA) will be followed, and contractors will develop task specific procedures where necessary prior to in-water construction activities to include spill response, solid waste management, hazardous material management and sanitary waste management.

Water quality impairment issues in the Project Area include coliform bacteria, total nitrogen and dissolved oxygen in Mount Hope Bay and nearshore areas of the Sakonnet River. The Project will not result in any discharges related to these parameters and will not contribute to these water quality impairments.

Increased turbidity during cable installation and HDD excavation will dissipate quickly and will be short term, with no long term effects on water quality.

### 3.2.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to water quality that SouthCoast Wind will adopt:

- SouthCoast Wind will select and use BMPs to minimize sediment mobilization during construction.
- SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations. This will include targeting to use cable burial methods (such as use of jet-sled cable burial tooling or other methods that employ sediment fluidization) that encourage natural backfill of the cable burial trench with the disturbed sediment during the trenching operation.
- Project vessels will follow USCG requirements at 33 C.F.R. 151 and 46 C.F.R. 162 regarding bilge and ballast water.
- All Project vessels are to comply with regulatory requirements related to the prevention and control of discharges and accidental spills including USEPA requirements under the USEPA 2013 Vessel General Permit and state and local government requirements.
- SouthCoast Wind will comply with the regulatory requirements related to the prevention and control of discharges and accidental spills as documented in the proposed Project's ERP (Attachment E).
- SouthCoast Wind has developed an HDD Inadvertent Release of Drilling Muds Contingency Plan (Attachment F) to mitigate, control, and avoid unplanned discharges related to HDD activities.

## 3.3. Benthic and Shellfish Resources

### 3.3.1. Affected Environment

This section includes and evaluation of benthic and shellfish resources within the ECC. Additional information about shellfish is discussed in the context of essential fish habitat of invertebrate species in Section 3.3.1.3 below.

SouthCoast Wind has collected extensive geophysical data (COP, Appendix E, MSIR) and benthic survey ground-truth data (COP, Appendices M and M.2, M.3 Benthic Resources) to support the mapping and characterization of benthic habitats within the Project Area.

SouthCoast Wind conducted two benthic surveys of the ECC in Fall 2021 and Spring 2022; sediment grab samples (analyzed for grain size, total organic carbon and biological communities) and images of the seabed were collected and analyzed. A total of 180 benthic stations were sampled within the ECC in Rhode Island state waters. Geophysical surveys were also conducted for the entire ECC and resulting datasets on sediment type, boulders, geoforms, and bedforms were also used in to characterize benthic resources in the Study Area. These multiple data streams were integrated to prepare detailed benthic habitat assessment and mapping which is presented in Attachment H.

Approximately 6,036 acres were mapped in the ECC in Rhode Island state waters (Table 3-6), with distinct differences in habitat composition in the estuarine (Mount Hope Bay and Sakonnet River) and offshore (Rhode Island Sound) areas (Figure 3-2). Forty-one percent of the ECC in Rhode Island state waters was comprised of Mud to Muddy Sand habitat, and 21% was Sand habitat, which was primarily mapped at the mouth of the Sakonnet River and in Rhode Island Sound.

Mud to Muddy Sand habitats were the primary habitat types mapped throughout the Sakonnet River and Mount Hope Bay (Figure 3-2), which are both depositional estuarine environments. *Crepidula* Substrate was found overlying these muds in some areas of the upper Sakonnet River and in the lower Mount Hope Bay (Figure 3-2). Very small areas of Mud to Muddy Sand – with Boulder Field(s), Glacial Moraine, and Bedrock habitat types were mapped in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-2).

The benthic habitat assessment prepared by Inspire Environmental (Attachment H), makes a distinction between Glacial Moraine A and Glacial Moraine B habitats to distinguish between areas of unconsolidated geological debris: (A) and consolidated geological debris (B); Glacial Moraine B was not mapped within the Project Area. Glacial Moraine B deposits are characteristically poorly sorted and dense with very high boulder densities resulting in greater structural complexity and permanence. By comparison, the surface of Glacial Moraine A units found in the Project Area were reworked with sand and gravel deposits resulting in less structural complexity and permanence.

Glacial Moraine A was mapped in Rhode Island Sound near the Rhode Island state waters line; intermixed with these habitats and extending further north were Mixed-Size Gravel in Muddy Sand to Sand habitats interspersed with Sand habitats (Figure 3-2). The distribution of these habitats is related to the offshore extension of the Buzzards Bay moraine, a terminal moraine that is perhaps an extension of the Point Judith moraine near the mouth of the Sakonnet River.[36] Clusters of individual surficial boulders generally with gravel components (Glacial Moraine, Mixed-Size Gravel in Muddy Sand to Sand

[36] As mapped by Baldwin et al., 2016; COP Appendix E, MSIR.

– with Boulder Field(s)) and proximal areas were mapped in Rhode Island Sound and in the lower portion of Mount Hope Bay near Aquidneck Island. The sensitive taxa of the northern star coral *Astrangia poculata* was observed at 80% of the glacial moraine stations along the ECC.

### 3.3.1.1. Submerged Aquatic Vegetation

Submerged Aquatic Vegetation (SAV) beds, dominated by *Zostera marina*, represent unique habitats in shallow coastal waters. SAV extent varies over time and these aquatic plants experience peak growth during late summer months. SAV are found in mud and muddy sand sediments. SAV distribution is periodically mapped across Narragansett Bay using aerial imagery and field verification by the URI Environmental Data Center on behalf of the state of Rhode Island (URI Environmental Data Center and RIGIS; Figure 4-3, Attachment H). SAV beds were not mapped by URI within the ECC. The closest SAV mapped by URI is near the mouth of the Sakonnet River, located over 1.0 km from the edges of the ECC (Figure 4-3, Attachment H). However, based on distinct side-scan sonar signatures in the geophysical data collected by SouthCoast Wind, SAV and/or macroalgae may be present in the vicinity of the ECC in the Sakonnet River south of the onshore Aquidneck Island crossing, but this area has not yet been field-verified (Figure 4-4, Attachment H). The area will be re-surveyed for SAV prior to construction, as necessary, during the appropriate time period outlined in the CRMC regulations to guide HDD placement to avoid impacts to SAV. If necessary and applicable based on final cable routing and agency discussions, SouthCoast Wind would conduct the SAV survey during the appropriate and agreed upon time frame, and use the Colarusso & Verkade methodology as reference.

### 3.3.1.2. Consistency with Previous Studies

Several recently published studies are available in the peer-reviewed and gray literature related to benthic habitats and fauna within Narragansett Bay, which include the Sakonnet River and/or Mount Hope Bay (e.g., LaFrance et al. 2019; Hale et al. 2018[37]; Shumchenia and King 2019; Shumchenia et al. 2016[38]).[39] The benthic habitats and their characterizing sediments and benthic biological communities as mapped for this SouthCoast Wind assessment generally agree with these recent publications. Surficial sediment and benthic habitat maps compiled from a suite of geophysical data and sediment grab samples show Mount Hope Bay as composed primarily of Sandy Mud and Mud (LaFrance et al. 2019). The Sakonnet River was not mapped in this study.

Recent biotopes mapped from a SPI survey conducted throughout Narragansett Bay in 2018 (Shumchenia and King 2019)[40] provide further support for the habitat types mapped in the Sakonnet River and Mount Hope Bay by SouthCoast Wind. For example, "Mud with Crepidula Beds" was the biotope identified at the sampling station in that study coincident with the Mud and Sandy Mud with *Crepidula* Substrate habitat type mapped by SouthCoast Wind (Tables 3-7 and 3-8) at the northern end of the Sakonnet River. Similarly, "Mud with Shell Hash and burrowers" was documented at two stations sampled in that study at the southwestern end of Mount Hope Bay coinciding with and in the vicinity of

[37] Hale, S.S., Hughes, M.M., & Buffum, H.W., (2018). Historical trends of benthic invertebrate biodiversity spanning 182 Years in a southern New England estuary. Estuaries and Coasts. http://link.springer.com/article/10.1007/s12237-018-0378-7.
[38] Shumchenia, E.J., Guarinello, M.L., & King, J.W. (2016). A re-assessment of Narragansett Bay Benthic Habitat Quality Between 1988 and 2008. Estuaries and Coasts 39: 1463-1477.
[39] LaFrance., M., Shumchenia. E., King. J., Pockalny. R., Oakley. B., Pratt. S., and Boothroyd. 2010. Benthic Habitat Distribution and Subsurface Geology Selected Sites from the Rhode Island Ocean Special Area Management Study Area. Ocean Special Area Management Plan.
[40] Shumchenia. E.J. and King. J.W. 2010.Comparison of Methods for Integrating Biological and Physical Data for Marine Habitat Mapping and Classification. Continental Shelf Research. Volume 30, Issue 16, 30 September 2010, ppg. 1717-1729.

Mud and Sandy Mud with Shell/*Crepidula* Substrate habitats where Soft Sediment Fauna and Mollusk Reef Biota Coastal and Marine Ecological Classification System (CMECS) Biotic Subclasses were documented by SouthCoast Wind. There was similar concordance to the northeast in Mount Hope Bay near the Rhode Island-Massachusetts state waters boundary where biotopes of "Mud with burrowers" and "Mud or Organic-rich Mus with small tube-builders" mapped by that study corresponded to Mud to Muddy Sand habitats with Soft Sediment Fauna CMECS Biotic Subclasses mapped by SouthCoast Wind.

Northern star coral (*Astrangia poculata)* were observed in locations within the ECC sampled by SouthCoast Wind in Rhode Island Sound only, outside of the Sakonnet River and well removed from proposed dredge area. The sensitive taxa of the northern star coral were observed in the SouthCoast Wind ECC in federal waters (20% of stations) and in Rhode Island State waters (80% of stations).

Northern star coral were observed in SouthCoast Wind ECC in federal waters, corresponding with Glacial Moraine A and Sand – with Boulder Field(s) habitats at Southwest Shoal and in Rhode Island State waters in Rhode Island Sound, seaward of the Sakonnet River, corresponding with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats. See Figure 3-19 from the Benthic Habitat Mapping Report (Attachment H). SouthCoast Winds continues to evaluate micro-routing options for the offshore export cable to avoid and/or minimize impacts to habitats.

**TABLE 3-7. COMPOSITION AND CHARACTERISTICS OF MAPPED BENTHIC HABITAT TYPES WITHIN THE BRAYTON POINT ECC IN RHODE ISLAND STATE WATERS**

| Brayton Point ECC - Rhode Island State Waters (~6,036 acres mapped) | | Presence in Brayton Point ECC – RI State Waters | |
|---|---|---|---|
| | | Area (acres) | Percentage |
| Glacial Moraine A | Predominantly in Rhode Island Sound | 185 | 3.1% |
| Mixed-Size Gravel in Muddy Sand to Sand | Only in Rhode Island Sound | 510 | 8.5% |
| Coarse Sediment - with Boulder Field(s) | Only in Rhode Island Sound | 0.004 | 0.0001% |
| Coarse Sediment | Only in Rhode Island Sound | 0.1 | 0.001% |
| Sand - with Boulder Field(s) | Only in Rhode Island Sound | 61 | 1.0% |
| Sand - Mobile with Boulder Field(s) | Only in Rhode Island Sound | 33 | 0.6% |
| Sand – Mobile | Only in Rhode Island Sound | 121 | 2.0% |
| Sand | In Rhode Island Sound & the Sakonnet River | 1,263 | 20.9% |
| Mud to Muddy Sand - with SAV | Only in the Sakonnet River | 3.6 | 0.06% |
| Mud to Muddy Sand - *Crepidula* Substrate with Boulder Field(s) | Only in Mount Hope Bay | 4.4 | 0.07% |
| Mud to Muddy Sand - (Likely) *Crepidula* Substrate with Boulder Field(s) | Only in Mount Hope Bay | 86 | 1.4% |
| Mud to Muddy Sand - Shell / *Crepidula* Substrate | Only in Mount Hope Bay | 511 | 8.5% |
| Mud to Muddy Sand - *Crepidula* Substrate | In the Sakonnet River & Mount Hope Bay | 704 | 11.7% |
| Mud to Muddy Sand - (Likely) *Crepidula* Substrate | Only in the Sakonnet River | 37 | 0.62% |
| Mud to Muddy Sand - Mobile | Only in the Sakonnet River | 29 | 0.48% |
| Mud to Muddy Sand | In the Sakonnet River & Mount Hope Bay | 2,476 | 41.0% |
| Bedrock | In the Sakonnet River & Mount Hope Bay | 3.3 | 0.06% |

| Brayton Point ECC - Rhode Island State Waters *(~6,036 acres mapped)* | | Presence in Brayton Point ECC – RI State Waters | |
|---|---|---|---|
| | | Area (acres) | Percentage |
| Anthropogenic | In the Sakonnet River & Mount Hope Bay | 6.7 | 0.11% |

*SAV = Submerged Aquatic Vegetation*

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**TABLE 3-8. CHARACTERISTICS OF MAPPED BENTHIC HABITAT TYPES AS INFORMED BY BENTHIC GROUND-TRUTH DATA WITHIN THE BRAYTON POINT ECC IN RI STATE WATERS**

| Brayton Point ECC - RI State Waters *(~6,036 acres mapped)* | | Glacial Moraine A *Predominantly in RI Sound* | Mixed-Size Gravel in Muddy Sand to Sand *Only in RI Sound* | Sand - with Boulder Field(s) *Only in RI Sound* | Sand – Mobile *Only in RI Sound* | Sand *In RI Sound & the Sakonnet River* | Mud to Muddy Sand – with Boulder Field(s) *Only in Mount Hope Bay* | Mud to Muddy Sand - *Crepidula* Substrate *In the Sakonnet River & Mount* | Mud to Muddy Sand *In the Sakonnet River & Mount Hope Bay* |
|---|---|---|---|---|---|---|---|---|---|
| **SPI/PV Ground-truth Values** | Number of benthic stations[1] | 10 | 25 | 4 | 4 | 20 | 1 | 40 | 64 |
| | CMECS Substrate Subgroups Observed in Ground-truth Data[2] | Gravel Pavement, Sandy Gravel, Muddy Sand Gravel, Muddy Gravel, Very Coarse/Coarse Sand | Gravel Pavement, Sandy Gravel, Muddy Gravel, Gravelly Sand, Gravelly Muddy Sand, Medium Sand, Fine/Very Fine Sand | Sandy Gravel, Medium Sand, Fine/Very Fine Sand | Gravelly Sand, Medium Sand | Medium Sand, Fine/Very Fine Sand | N/A | Pebble/Granule, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, Gravelly Mud | Muddy Gravel, Gravelly Muddy Sand, Muddy Sand, Fine/Very Fine Sand, Gravelly Mud |
| | CMECS Biotic Subclasses Observed in Ground-truth Data | Attached Fauna, Soft Sediment Fauna | Attached Fauna, Inferred Fauna, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna | Attached Fauna, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna | None | Attached Fauna, Inferred Fauna, Mollusk Reef Biota, Soft Sediment Fauna | Inferred Fauna, Soft Sediment Fauna |

| Brayton Point ECC - RI State Waters *(~6,036 acres mapped)* | | Glacial Moraine A *Predominantly in RI Sound* | Mixed-Size Gravel in Muddy Sand to Sand *Only in RI Sound* | Sand - with Boulder Field(s) *Only in RI Sound* | Sand – Mobile *Only in RI Sound* | Sand *In RI Sound & the Sakonnet River* | Mud to Muddy Sand – with Boulder Field(s) *Only in Mount Hope Bay* | Mud to Muddy Sand - *Crepidula* Substrate *In the Sakonnet River & Mount* | Mud to Muddy Sand *In the Sakonnet River & Mount Hope Bay* |
|---|---|---|---|---|---|---|---|---|---|
| | Presence of Attached Fauna Observed in Ground-truth Data (% of stations) | Yes (90.0%) | Yes (28.0%) | No | Yes (25.0%) | No | No | Yes (40.0%) | Yes (1.6%) |
| | Sensitive Taxa Observed in Ground-truth Data (% of stations)[3] | Northern Star Coral (80.0%) | Northern Star Coral (12.0%) | None | None | None | None | None | None |
| | Non-Native Taxa Observed in Ground-truth Data (% of stations)[3] | None | None | None | None | None | None | None | None |

*Notes:*
*N/A = Not Applicable*
*Of the 18 total habitat types mapped (Table 3-6), 8 intersect with ground-truth stations.*
*[1] Benthic sampling includes SPI/PV, grab, and GrabCam stations.*
*[2] Substrate Subgroup determined from combined SPI/PV analysis.*
*[3] Sensitive and Non-Native Taxa determined from PV analysis.*

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### *3.3.1.3. Shellfish*

According to the Rhode Island Shellfish Management Plan, the Sakonnet River portion of the ECC is home to several commercially valuable shellfish, including the bay scallop (*Agropected irradians*), ocean quahog (*Arctica islandica)*, and soft-shelled clam (*Mya arenaria).*[41] Ocean quahogs have also been observed in Mount Hope Bay, alongside channeled and knobbed whelks. Historic abundances of these species have been reduced by water quality degradation and habitat loss. Currently, the Sakonnet River is protected as a Shellfish Management Area by RIDEM (R.I.G.L. § 20-3-4) for the purposes of shellfish conservation and stock rebuilding. Management strategies employed by RIDEM to achieve these goals include reduced daily harvest limits, no harvest, limited access time, and rotational harvest.[42]

Shellfishing is currently prohibited in the vicinity of the Project Area in portions of Rhode Island state waters in Mount Hope Bay (Area GA-3) and in portions of the upper Sakonnet River (GA4).[43]

The ECC does not overlap with any current aquaculture areas, although there are some in the vicinity. There are several approved aquaculture areas (see Figure 3-3) within The Cove on Aquidneck Island and adjacent to Hog Island, both areas are located within the Town of Portsmouth. The aquaculture areas within The Cove and along the east and west banks of the Sakonnet River primarily culture Eastern oysters (*Crassostrea virginica*) and soft-shelled clams (*Mya arenaria*).

SouthCoast Wind will be conducting a whelk pot survey within the Sakonnet River as part of a Fisheries Monitoring Plan (FMP), which RIDEM reviewed and provided comments on July 27, 2023. The whelk survey component of the FMP focuses on parts of the ECC that are known whelk fishing grounds. SouthCoast Wind believes the sampling locations for the whelk survey are appropriately located to understand the potential impacts from cable installation.

## 3.3.2. Potential Project Impacts

SouthCoast Wind is siting the marine cable based on field data collection, analysis and mapping of the physical and biological characteristics of the seabed and engineering the cable route to minimize bottom disturbance, avoid sensitive resources and to reach target burial depths to the extent practicable. The cable route engineering drawings in Attachment C-1 are a product of a multi-year effort to carefully site the marine cables. The potential impacts to benthic habitat are discussed in the following subsections.

### *3.3.2.1. Impacts to Glacial Moraine*

As discussed above, 185 acres of the ECC (3.1% of the ECC in RI waters) was mapped as moraine habitat, mostly in RI Sound with small area of moraine in lower Mount Hope Bay near the Portsmouth cable landing. Cable route engineering used seabed mapping to avoid moraine and boulders wherever practicable, and to minimize the need to move boulders during pre-installation seabed preparation. Where moving boulders is required, the boulders will be moved a minimum distance and within a similar habitat as practicable. During O&M, disturbance to the seafloor could result from temporarily anchored maintenance vessels and secondary cable protection along the export cables where needed. Decommissioning activities will have similar impacts to the seafloor as construction. Because the area of

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[41] URI Coastal Resources Center. 2014. *Rhode Island Shellfish Management Plan Version II: November 2014.* Available online at: http://www.rismp.org/wp-content/uploads/2014/04/smp_version_2_11.18.pdf.
[42] URI Coastal Resources Center, 2014
[43] RIDEM Office of Water Resources. 2022. Notice of Polluted Shellfishing Grounds May 2022 Amended September 2022. Accessed January 4, 2023. https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-09/shellfish_0.pdf

moraine crossed by the cable laying is relatively minimal, cable crossing of moraine within the ECC is minimized through microrouting where practicable, movement of boulders during seabed preparation is mitigated by BMPs, impacts of cable installation are short-term and localized, and no impacts are anticipated during operation, the overall impacts to moraine habitat from the Project are anticipated to be minimal.

SouthCoast Wind acknowledges that side-casting may not be the best methodology for the area due to other soft sediment taxa, such as polychaetes, Ampelisca amphipods, etc., present in Mount Hope Bay. SouthCoast Wind will conduct further studies to propose options for the dredging material, such as backfill in the HDD construction areas, and will propose these options to RIDEM. A benthic monitoring plan, developed in accordance with BOEM recommendations, is being submitted as an attachment to the WQC/Marine Dredge Application (Attachment N).

### *3.3.2.2. Impacts to Benthos at HDD Locations*

All the potential HDD construction area locations under consideration in RI State Waters are located within Mud to Muddy Sand – *Crepidula* Substrate or Shell / *Crepidula* Substrate (Figure 4-2, Attachment H). It is expected that *Crepidula* gastropods would recolonize areas disturbed by the offshore HDD area construction relatively quickly for several reasons. First, in this region, *Crepidula* are present and extend over a much broader area than the specific areas that would be disturbed at the offshore HDD construction area. This regional population will be a source of larvae to aid in recolonization of the disturbed seafloor. Timing for recolonization will depend on larval recruitment; the gregarious settlement of their larvae on conspecifics ~~(Zhao and Qian 2002)~~[44] generally leads to very dense accumulations with a flat, reef-like texture as live shells build over dead shells. *Crepidula* have relatively high fecundity, typically reproducing in the spring and/or summer, and often females will reproduce twice per year ~~(Pechenik et al. 2017; Proestou et al. 2008[45]; Richard et al. 2006[46])~~.[47,48,49] These life cycle characteristics aid in the proliferation of *Crepidula* populations and allow for the recovery of populations following disturbance given a source of larvae is maintained. *Crepidula* are native to the United States Atlantic coast but have been successful at quickly spreading in the United States Pacific Northwest and in Europe where they are not native ~~(SERC 2022)[50]~~.[51] This indicates that Crepidula are capable of recolonizing an area relatively easily following a disturbance such as HDD construction area excavation.

[44] Zhao, B., Qian, P. (2002) Larval settlement and metamorphosis in the slipper limpet Crepidula onyx (Sowerby) in response to conspecific cues and the cues from biofilm. Journal of Experimental Marine Biology and Ecology, 269 (1): 39-51.

~~[45] Proestou, D.A., Goldsmith, M.E., & Twombly S. (2008). Patterns of Male Reproductive Success in *Crepidula fornicata* Provide New Insight for Sex Allocation and Optimal Sex Change. *Biological Bulletin*, 214: 184-202.~~

~~[46] Richard, J., Huet, M., Thouzeau, G., & Paulet, Y. (2006). Reproduction of the invasive slipper limpet, *Crepidula fornicata*, in the Bay of Brest, France.~~

[47] Proestou, D.A., Goldsmith, M.E., & Twombly S. (2008). Patterns of Male Reproductive Success in *Crepidula fornicata* Provide New Insight for Sex Allocation and Optimal Sex Change. *Biological Bulletin*, 214: 184-202.

[48] Richard, J., Huet, M., Thouzeau, G., & Paulet, Y. (2006). Reproduction of the invasive slipper limpet, *Crepidula fornicata*, in the Bay of Brest, France.

[49] Pechenik, J.A., Diederick, C.M., Chaparro, O.R., Montory, J.A., Paraedes, F.J., & Franklin, A.M. (2017). Differences in resource allocation to reproduction across the intertidal-subtidal gradient for two suspension-feeding marine gastropods: Crepidula fornicata and Crepipatella peruviana. Marine Ecology Progress Series, 572: 165-178.

~~[50] Smithsonian Environmental Research Center (SERC) National Estuarine and Marine Exotic Species Information System (NEMESIS). (2022). *Crepidula fornicata* species profile. Accessed September 11, 2022 https://invasions.si.edu/nemesis/species_summary/72623.~~

[51] Smithsonian Environmental Research Center (SERC) National Estuarine and Marine Exotic Species Information System (NEMESIS). (2022). *Crepidula fornicata* species profile. Accessed September 11, 2022 https://invasions.si.edu/nemesis/species_summary/72623.

### 3.3.2.3. *Impacts from Sediment Suspension and Resettlement on the Seabed*

During installation of the cable and excavation of the offshore HDD construction areas, disturbed sediments will become suspended in the water column and redeposited on the seabed. According to the results of the Hydrodynamics and Sediment Transport Modelling Report (Attachment G), the sediment deposition footprint resulting from cable installation will be localized along the ECC where the mass settles out quickly. Deposition thicknesses of 1.0 mm (0.04 inch) and greater are generally limited to a corridor with a maximum width of 30 - 35 m (100 – 115 ft) around the cable centerline. In the areas where there are finer grain sediments, the 1.0 mm (0.04 inch) thickness contour distance can increase locally to 165 m (540 ft) from the ECC indicative centerline. Following construction, currents and tidal action will likely redistribute sediment to pre-construction conditions.

The sedimentation footprint for HDD sites is calculated to be very small with a maximum coverage of the 1.0 mm (0.04 inch) thickness contour of only 0.5 ha (1.2 ac), extending a maximum distance of 95 m (312 ft) and 1.0 ha (2.5 ac) for the 0.5 mm (0.02 inch) thickness contour, extending a maximum distance of 158 m (518 ft) from the HDD site. Deposition thicknesses are greater if the location of the release is fixed. Cable burial operations are mobile, and thus will produce smaller maximum deposit thicknesses. The total coverage of the 1.0 mm (0.04 inch) and 0.5 mm (0.02 inch) thickness levels along the entire ECC was 361 ha (892 ac) and 531 ha (1,312 ac), respectively.

Some benthic species exhibit mechanical and possibly physiological adaptations that allow them to survive deposition events of the magnitude commonly encountered in estuarine environments, which can be similar to sediment deposition caused by cable installation.[52] Burrowing bivalve clams, burrow-forming amphipods, and juvenile oysters were highly tolerant, while a tube-dwelling (*Stresblospio benedicti*) was relatively unsuccessful at moving through the sediment to regain the sediment-water interface.[53] Benthic substrates that shift constantly due to waves and currents could experience lower potential burial effects.

Sediment redistribution and deposition on the seabed during construction is expected to be localized. Given the naturally occurring tidal currents within the Project Area, local species are expected to have some level of tolerance to sediment redistribution. Following construction, currents and tidal action will likely redistribute sediment to pre-construction conditions.

### 3.3.2.4. *Displacement of Benthic Communities during Construction Activities*

The benthic habitat will also be impacted by short-term displacement during cable installation and anchoring. Benthic communities are expected to recolonize the impact area following construction activities. Recolonization rates of benthic habitats are driven by the benthic communities inhabiting the area surrounding the impacted region. Habitats that can be easily colonized from neighboring areas and communities well adapted to disturbance within their habitats (e.g., sand sheets) are expected to recover quickly. For communities not well adapted to frequent disturbance (e.g., deep boulder communities), recovery depends on a range of factors, such as seasonal larval abundance, and are assumed to generally take longer to become established - upwards of a year to begin recolonization. Depending on the type(s) of cable and scour protection used by SouthCoast Wind, these introduced hard bottom substrates may lead to habitat gain in localized areas for benthic communities and may

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[52] Hinchey, E.K., L.C. Schaffner, C.C. Hoar, B.W. Vogt, and L.P. Batte. 2006. Responses of Estuarine Benthic Invertebrates to Sediment Burial : The Importance of Mobility and Adaptation. *Hydrobiologia* 556, 85-98. February 2006.
[53] Hinchey et al. 2006

cause an artificial reef effect, turning biodiversity-poor, soft-sediment habitat into hardbottom, biodiverse communities.

Impacts are not anticipated to SAV during construction and decommissioning. HDD will be used at cable landings to avoid shallow areas with potential for SAV. Potential SAV identified at the Sakonnet River landing at Portsmouth will be field inspected as needed prior to construction. SouthCoast wind acknowledges RIDEM's shellfish resources comments. The potential SAV bed in the vicinity of the HDD at Portsmouth is approximately 656 ft (200 m) northeast of the indicative HDD pit location. Given the short-term suspension and redeposition of sediment during the offshore HDD construction area excavation as discussed above, impacts to SAV are not anticipated.

Shellfish resources within the ECC and the offshore HDD construction areas will be disturbed during cable installation. SouthCoast Wind will use HDD at landings to avoid disturbance to nearshore productive shellfish beds to the extent practicable. SouthCoast Wind will select lower impact construction methods where possible and will micro-route cables within the selected ECC to avoid complex habitats to the extent practicable. To further decrease impacts, SouthCoast Wind's ECC was selected with consideration to minimize the length of cable needed.

SouthCoast Wind will, to the greatest extent practicable, bury cables to a target burial depth and use proper burial methods to allow for benthic recolonization after construction is complete.

### *3.3.2.5. Changes in Ambient EMF*

SouthCoast Wind conducted an EMF analysis including several different modeled offshore export cable burial and cable spacing scenarios to represent both likely (typical) submarine cable conditions and worst-case (atypical) conditions following cable installation (Attachment J).

The highest modeled magnetic field (MF) levels for the typical case (bundled HVDC cables) and atypical (conservative) cases would occur directly above the cables (peaking at 123 mG for the typical installation case, and ranging from 1,909 to 3,785 mG across the two other possible installation cases), with a rapid reduction in MF levels with increasing lateral and vertical distance from the cables. For example, MF cancellation is increased by the bundling of two cables with current in equal but opposite polarity, the analysis shows 93 > 99% reductions in MF levels. At lateral distances of ±25 ft (±7.6 m) from the cable bundle centerlines and at lateral distances of ±25 ft, there is little difference in MF levels for the buried versus the surface-laid cables.

The conservative modeling analysis showed that DC MF levels will be increased only for small areas along the seafloor around certain localized cable locations where conservative (and atypical/worst case) installation conditions are present, contributing to highly localized deviations from the earth's DC geomagnetic field. As discussed in Attachment J, the weight of the currently available scientific evidence does not provide support for concluding there would be population-level harm to marine species from EMFs associated with HVDC submarine transmission.

The offshore export cables will be shielded/armored and buried beneath the seafloor, which is expected to substantially decrease EMF detection by EMF-sensitive marine species. Potential exposure to EMFs will be short- or long-term, depending on the proximity of the species to the cables. Sessile benthic species are expected to be exposed to potential EMFs more than mobile benthic species, which are expected to move in and out of the cable area.

There is limited research indicating that some invertebrate species are able to detect changes in EMF, and that EMF effects from undersea cables could cause disorientation in invertebrate species and may redirect locomotion in response to the changes in the magnetic environment. [54,55] However, given that the target burial depth and the cable shielding/armoring will dampen the EMF effects, EMFs from the proposed export cables are not expected to affect benthic communities.

The steady MFs associated with DC submarine cables do not directly induce electric fields, but weak DC electric fields will be induced by water flow or marine animal movement through the DC MFs associated with DC submarine cables, similar to the induced electric fields associated with water movement and marine animal movement through the earth's geomagnetic field. These motion-induced electric fields are generally weak in nature, including for the typical buried HVDC offshore cable installation case, being small as compared to the motion-induced electric fields associated with movement through the earth's steady geomagnetic field. CSA Ocean Sciences Inc. and Exponent[56] referred to DC electric field strengths of approximately 0.075 mV/m (0.000075 V/m) or less for the movement of ocean currents through the earth's geomagnetic field. There is a lack of evidence demonstrating a likelihood of significant impacts/effects from the motion-induced electric fields associated with DC submarine cables. CSA Ocean Sciences Inc. and Exponent[57] discussed how electrosensitive marine species can distinguish natural bioelectric fields used locate prey, mates, and predators from naturally occurring motion-induced electric fields. The 2022 Brief titled *Electromagnetic Field Effects on Marine Life* that was authored by researchers at the U.S. Department of Energy's Wind Energy Technologies Office, National Renewable Energy Laboratory, and Pacific Northwest National Laboratory as part of the U.S. Offshore Wind SEER effort considered these motion-induced electric fields in its assessment of the state of the knowledge of the potential impacts of EMFs from submarine cables on marine life. The Brief included the following summary of the overall state of the knowledge: "Overall, there is no conclusive evidence that EMFs from a subsea cable creates any negative environmental effect on individuals or populations. To date, no impacts interpreted as substantially negative have been observed on electrosensitive or magnetosensitive species after exposure to EMFs from a subsea cable. Behavioral responses to subsea cables have been observed in some species, but a reaction to EMFs does not necessarily translate into negative impacts. Continued research and monitoring are required to understand the ecological context within which short-term effects are observed and if species experience long-term or cumulative effects resulting from underwater exposure to EMFs."[58]

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[54] Hutchison, Z., Sigray, P., He, H., Gill, A.B., King, J., & Gibson, C. 2018. Electromagnetic Field (EMF) impacts on elasmobranch (shark, rays, and skates) and American lobster movement and migration from direct current cables. OCS Study BOEM 2018-003. https://espis.boem.gov/final%20reports/5659.pdf.; Love, M.S., M.M. Nishimoto, L. Snook, D.M. Schroeder & A.S Bull. 2017. A Comparison of Fishes and Invertebrates Living in the Vicinity of Energized and Unenergized Submarine Power Cables and Natural Sea Floor off Southern California, USA. Journal of Renewable Energy, 2017, Article ID 8727164. 13 pages. https://doi.org/10.1155/2017/8727164.; Normandeau (Normandeau Associates, Inc.). 2014. Understanding the Habitat Value and Function of Shoal/Ridge/Trough Complexes to Fish and Fisheries on the Atlantic and Gulf of Mexico Outer Continental Shelf: Draft Literature Synthesis pursuant to BOEM Contract No. M12PS00031. https://www.boem.gov/sites/default/files/non-energy-minerals/Final-Draft-Report.pdf.

[55] Gill, A.B., Gloyne-Phillips, I., Neal, K.J., & Kimber J.A. 2005. The potential effects of electromagnetic fields generated by sub-sea power cables associated with offshore wind farm developments on electrically and magnetically sensitive marine organisms – a review. Collaborative Offshore Wind Research into the Environment (COWRIE), Ltd, UK. 128 pp. https://tethys.pnnl.gov/sites/default/files/publications/The_Potential_Effects_of_Electromagnetic_Fields_Generated_by_Sub_Sea_Power_Cables.pdf.

[56] CSA Ocean Sciences Inc and. Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England*. Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

[57] *Id.*

[58] US Offshore Wind Synthesis of Environmental Effects Research (SEER). 2022. *Electromagnetic Field Effects on Marine Life*. 13p. Accessed on September 28, 2022 at https://tethys.pnnl.gov/sites/default/files/summaries/SEER-Educational-Research-Brief-Electromagnetic-Field-Effects-on-Marine-Life.pdf.

### 3.3.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to benthic and shellfish resources that SouthCoast Wind will adopt:

- SouthCoast Wind will use HDD at landfall locations to avoid disturbance to nearshore productive shellfish beds to the extent practicable.
- SouthCoast Wind has developed an HDD Inadvertent Release of Drilling Muds Contingency Plan (Attachment F), which outlines the measures to be implement should there be a pressure loss and release of drillings muds during the HDD operations.
- Design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., cofferdam and/or gravity cell).
- Use HDD at landings to avoid disturbance to nearshore finfish, invertebrates, EFH, and sensitive habitats (e.g., SAV beds) to the extent practicable and to minimize spatial and temporal effects to benthic organisms.
- Select export cable corridors and micro-route cables within selected corridors to avoid complex habitats, where possible (see Offshore Export Cable Engineering Drawings in Attachment C-1).
- Design the cable burial layout to minimize length of cable needed and bury cables, where possible, to allow for benthic recolonization after construction is complete.
- Use industry standard cable burial and cable shielding methods to reduce potential effects/change in ambient EMF during operations and maintenance. In addition, SouthCoast Wind's Project cable burial layout was designed to minimize length of cable needed to reduce potential effects from EMF.
- Install offshore export cables to target burial depths and use cable shielding materials to minimize effects of EMF.
- SouthCoast Wind has developed a benthic monitoring plan, in accordance with BOEM recommendation, which is included herein as Attachment N.
- Incorporate lower-impact construction and decommissioning methods, where possible, to reduce introduced sound into the environment and to reduce actions that may displace biological resources.
- SouthCoast Wind will select lower impact construction methods, where possible.
- The ECC was designed to minimize length of cable (and associated seabed impacts) needed. SouthCoast Wind will bury cables, where possible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable, but are expected, at a minimum, to be installed at crossings of existing submarine cables and pipelines in accordance with the International Cable Protection Committee protocols.
- The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.

## 3.4. FINFISH AND ESSENTIAL FISH HABITAT

This section describes finfish and associated Essential Fish Habitat (EFH) with a focus on species of particular concern in the Rhode Island ECC. Detailed information on EFH in the Project Area is available in the COP, Appendix M3 and Attachment H - Benthic Habitat Mapping Report. Information from both of those sources, along with publicly available data and reports, is integrated into the following section.

### 3.4.1. Affected Environment

Commercially valuable species that have been observed along the ECC include red and silver hake (*Merluccius bilinearis*), summer and winter flounder, and scup.[59, 60] Demersal residents in these nearshore areas include winter flounder, American eel (*Anguilla rostrata*), Atlantic tomcod (*Microgadus tomcod*), and white perch (*Morone americana*).[61] In recent years, there has been a community shift from year-round resident species to summer migrants (such as summer flounder (*Paralichthys dentatus)*, black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops)*, and butterfish (*Peprilus triacanthus*).[62, 63]

Rhode Island Sound provides important linkages between the estuarine, nearshore and offshore systems, including nutrient fluxes, larval transport, and juvenile and adult migrations.[64] A total of 101 species were recorded in a multiyear fishery-independent survey (2009 to 2012) in Rhode Island and Block Island Sounds.[65] Biodiversity decreased in Rhode Island Sound during the winter and increased during summer and fall, with an influx of anadromous species, including alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass (*Morone saxatilis*).[66, 67]

#### 3.4.1.1. Designated Essential Fish Habitat

There are 38 species of finfish, skate, and shark species with mapped EFH in the ECC. Table 3-9 provides an overview of the fishery status and preferred habitats of the species with known EFH in the ECC based on NOAA's *Essential Fish Habitat Mapper* and the SouthCoast Wind Essential Fish Habitat Assessment and Protected Fish Species Assessment (COP Appendix N).

The Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended in 1996 by the Sustainable Fisheries Act, sets forth a mandate for NMFS, regional Fishery Management Councils, and other federal agencies to identify and protect important marine and anadromous fisheries habitat, referred to as EFH, and further requires that EFH consultation be conducted for any activity that may adversely affect important habitats of federally managed marine and anadromous fish species. EFH has been defined as, "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]).

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[59] Malek et al. 2014
[60] Stokesbury. 2012 and 2014
[61] Evans et al. 2015
[62] Rhode Island Sea Grant. 2018. The Murder Mystery of Narragansett Bay's Winter Flounder. Available online at: http://seagrant.gso.uri.edu/murder-mystery-narragansett-bays-winter-flounder/.
[63] Evans et al., 2015
[64] Malek, A.J., J.S. Collie, and J. Gartland. 2014. Fine-scale spatial patterns in the demersal fish and invertebrate community in a northwest Atlantic ecosystem. *Estuarine and Coastal Shelf Science* 147:1-10.
[65] Malek et al., 2014
[66] Evans, N.T., K.H. Ford, B.C. Chase, & J.J. Sheppard. 2015. *Recommended Time of Year Restrictions (TOYs) for Coastal Alteration Projects to Protect Marine Fisheries Resources in Massachusetts*. Report by the Massachusetts Division of Marine Fisheries.
[67] Malek et al., 2014

**TABLE 3-9. FINFISH, SKATE, AND SHARK SPECIES WITH MAPPED EFH IN THE BRAYTON POINT ECC**

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| **Finfish** | | |
| Albacore tuna | *Thunnus alalunga* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Butterfish | *Peprilus triacanthus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic cod | *Gadus morhua* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic herring | *Clupea harengus* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Atlantic mackerel | *Scomber scombrus* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for egg, larval, and juvenile life stages only in the offshore portion of the ECC. |
| Atlantic wolffish | *Anarhichas lupus* | • EFH for all life stages in the offshore portion of the ECC. |
| Black sea bass | *Centropristis striata* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Bluefin tuna | *Thunnus thynnus* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Bluefish | *Pomatomus saltatrix* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Haddock | *Melanogrammus aeglefinus* | • EFH for egg, larval, and juvenile life stages only in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Monkfish | *Lophius americanus* | • EFH for all life stages in the offshore portion of the ECC. |
| Ocean pout | *Macrozoarces americanus* | • EFH for egg, juvenile, and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Offshore hake | *Merluccius albidus* | • Larval life stage EFH in the offshore portion of the ECC. |
| Pollock | *Pollachius and P. virens* | • EFH for egg, larval, and juvenile life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Red hake | *Urophycis chuss* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Scup | *Stenotomus chrysops* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for juvenile and adult life stages only in the offshore portion of the ECC. |
| Silver hake | *Merluccius bilinearis* | • EFH for egg, larval, and adult life stages only in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Skipjack tuna | *Katsuwonus pelamis* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for adult life stage only at the Sakonnet River/Mount Hope Bay portion of the ECC. |

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| Summer flounder | *Paralichthys dentatus* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| White hake | *Urophycis tenuis* | • EFH for larval and juvenile life stages only in the offshore portion of the ECC. |
| Windowpane flounder | *Scophthalmus aquosus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Winter flounder | *Pseudopleuronectes americanus* | • EFH for all life stages in the Sakonnet River/Mount Hope Bay portion of the ECC.<br>• EFH for larval, juvenile, and adult life stages only in the offshore portion of the ECC. |
| Witch flounder | *Glyptocephalus cynoglossus* | • EFH for egg, larval, and adult life stages only in the offshore portion of the ECC. |
| Yellowfin tuna | *Thunnus albacares* | • EFH for juvenile and adult life stages in the offshore portion of the ECC.<br>• EFH for juvenile life stage only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Yellowtail flounder | *Pleuronectes ferruginea* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| **Skates** | | |
| Little skate | *Leucoraja erinacea* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Winter skate | *Leucoraja ocellata* | • Juvenile and adult life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| **Sharks** | | |
| Basking shark | *Cetorhinus maximus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Blue shark | *Prionace glauca* | • Neonate, juvenile, and adult life stage EFH in the offshore portion of the ECC. |
| Common thresher shark | *Alopias vulpinus* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Dusky shark | *Carcharhinus obscurus* | • EFH for all life stages in the offshore portion of the ECC. |
| Great white shark | *Carcharodon carcharias* | • EFH for all life stages in the offshore portion of the ECC.<br>• EFH for neonate life stage only in Sakonnet River/Mount Hope Bay portion of the ECC. |
| Sand tiger shark | *Carcharias taurus* | • Neonate and juvenile life stage EFH in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Sandbar shark | *Carcharhinus plumbeus* | • EFH for juvenile and adult life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |
| Shortfin mako shark | *Isurus oxyrinchus* | • Neonate, juvenile, and adult life stage EFH in the offshore portion of the ECC. |
| Smoothhound shark (Atlantic Stock) | *Mustelus canis* | • EFH for all life stages in the offshore portion and Sakonnet River/Mount Hope Bay portion of the ECC. |

| Common Name | Species Name | Mapped EFH in the Offshore Project Area |
|---|---|---|
| Spiny dogfish | *Squalus acanthias* | • Male and female sub-adult and adult life stage EFH in the offshore portion of the ECC.<br>• EFH for sub-adult female and adult male life stages only in the Sakonnet River/Mount Hope Bay portion of the ECC. |
| Tiger shark | *Galeocerdo cuvier* | • Juvenile and adult life stage EFH in the portion of the ECC. |

### 3.4.1.2. *Endangered and Threatened Finfish Species*

There are two federally and state-listed finfish species that may occur in the ECC: Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)* and shortnose sturgeon (*Acipenser brevirostrum*).[68]

The Atlantic sturgeon is listed as endangered under the ESA.[69] It is also a Species of Greatest Conservation Need under the Rhode Island Wildlife Action Plan.[70] Due to its preference for inshore coastal water depths and gravelly and sand substrates.[71] Atlantic sturgeon may be present within the ECC and near the landfall locations throughout the year. This species is likely to be more prevalent in the warmer months of the year, when individual adult Atlantic sturgeon migrate to coastal rivers and streams for spawning.[72]

The shortnose sturgeon is listed as endangered under the ESA and as a Species of Greatest Conservation Need under the Rhode Island Wildlife Action Plan.[73, 74] It is an anadromous finfish species found mainly in large freshwater rivers and coastal estuaries located along the east coast of North America, from New Brunswick to Florida. Based on its habitat preferences, shortnose sturgeon may occur in the nearshore areas of the ECC and landfall locations.

### 3.4.1.3. *Essential Fish Habitat and Habitat Areas of Particular Concern*

EFH and Habitat Areas of Particular Concern (HAPC) are designated by the New England Fishery Management Council for certain species and life stages of fish and invertebrates in the nearshore and offshore waters of New England, including the area covered by the Study Area. These designations are comprised of two components: (1) broad geographic areas (e.g., nearshore waters and seafloor shallower than 20 m; mapped 10-min squares) and (2) text documentation that describes the habitat characteristics that constitute EFH and/or HAPC within the designated geographic areas. Therefore, spatial data on the distribution of those habitat characteristics are needed to refine the specific location of EFH and/or HAPC.

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[68] Greater Atlantic Regional Fisheries Office (GARFO). 2019. The Greater Atlantic Region ESA Section 7 Mapper (vers. 2.0). Retrieved October 2020 from: https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27.

[69] National Oceanic and Atmospheric Administration. NOAA. 2020. Species directory: Atlantic Sturgeon. Available on-line at: https://www.fisheries.noaa.gov/species/atlantic-sturgeon.

[70] RIDEM. 2015. 2015 Rhode Island Wildlife Action Plan. http://www.dem.ri.gov/programs/bnatres/fishwild/swap/sgcncomm.pdf.

[71] Stein, A.B., Friedland, K.D., & Sutherland, M. 2004. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*, 133(3), 527-537.

[72] Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus*) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. U.S. *National Marine Fisheries Service Fishery Bulletin*, 108, 450–464.

[73] NOAA 2020.

[74] RIDEM 2015.

HAPC designated by the New England Fishery Management Council for juvenile cod include structurally complex rocky-bottom or vegetated habitat in inshore areas at depths less than 65 ft (20 m) that provide juvenile cod with protection from predation and support a wide variety of prey items (NEFMC 2017)[75]. Cobble habitats are essential for the survival of juvenile cod in that they may assist with avoiding predation by older year classes ~~(Gotceitas and Brown 1993)~~[76] and recent studies suggest that rocky, hard bottom habitats may be important for reproduction ~~(DeCelles et al. 2017)[77].~~.[78] Additional studies suggest that structures such as boulders and SAV, which provide vertical relief for predator avoidance and feeding, may be the primary drivers of cod settlement and nursery habitat use in Narragansett Bay and coastal Rhode Island rather than complex cobble substrates given that these waters are largely characterized by fine-grained sediments ~~(Langan et al. 2020)[79].~~.[80] The entire seafloor of both the Sakonnet River and Mount Hope Bay is shallower than 20 m, but only very limited areas contain complex rocky-bottom habitat consistent with characteristics that match the HAPC description for juvenile cod. The majority of the ECC shallower than 20 m was mapped as Sand and Mud to Muddy Sand which are habitats less likely to be used by juvenile cod (Figure 4-6, Attachment H). The majority of the 361 acres (6% of the ECC in Rhode Island state waters), mapped with HAPC characteristics, is located in Rhode Island Sound.

Winter flounder are a demersal species likely to occur year-round within the Study Area. Adult winter flounder prefer soft bottom muddy and sandy substrates, but also utilize hard bottoms on offshore banks ~~(Pereira et al. 1999).~~.[81] Adult winter flounder migrate to nearshore/estuarine waters in the late fall and early winter to spawn and then may migrate to cooler, offshore waters in the summer. Winter flounder lay benthic eggs in shallow (<16 ft [5.0 m]) nearshore waters, bays, and estuaries in mud, muddy sand, gravel, macroalgae, and submerged aquatic vegetation ~~(NEFMC 2017).~~.[82] EFH designated by the New England Fishery Management Council for winter flounder eggs, young-of-the-year (YOY) juveniles, and spawning adults in the Study Area are likely to be found from January through June ~~(Massie 1998)~~[83] in Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats, as well as any benthic substrate with SAV. The characteristic of these mapped habitats match the EFH description and have been mapped to encompass 731 acres of the ECC (12.1% of the portion in Rhode Island state waters; Figure 4-7, Attachment H). Non-spawning winter flounder adults and older juveniles are more frequently found in continental shelf benthic habitats and deeper

[75] New England Fishery Management Council (NEFMC). (2017). *Omnibus essential fish habitat amendment 2. Volume 2: EFH and HAPC designation alternatives and environmental impacts.* October 25, 2017.

[76] Gotceitas, V. & Brown, J.A. (1993). Substrate selection by juvenile Atlantic cod (Gadus morhua): effects of predation risk. Oecologia 93: 31-37

~~[77] DeCelles, G. R., Martins, D., Zemeckis, D. R., & Cadrin, S. X. (2017). Using Fishermen's Ecological Knowledge to map Atlantic cod spawning ground on Georges Bank. ICES Journal of Marine Science, 74: 1587–1601.~~

[78] DeCelles, G. R., Martins, D., Zemeckis, D. R., & Cadrin, S. X. (2017). Using Fishermen's Ecological Knowledge to map Atlantic cod spawning ground on Georges Bank. ICES Journal of Marine Science, 74: 1587–1601.

~~[79] Langan, J.A., M.C. McManus, D.R. Zemeckis, and J.S. Collie. (2020). Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. *Fishery Bulletin* 120:187–189.~~

[80] Langan, J.A., M.C. McManus, D.R. Zemeckis, and J.S. Collie. (2020). Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. *Fishery Bulletin* 120:187–189.

[81] Pereira, J. J., Goldberg, R., Ziskowski, J. J., Berrien, P. L., Morse, W. W., & Johnson, D. L. (1999). Essential fish habitat source document: winter flounder, Pseudopleuronectes americanus, life history and habitat characteristics. NOAA Tech Memo NMFS-NE-138; 48 pp.

[82] New England Fishery Management Council (NEFMC). (2017). Omnibus essential fish habitat amendment 2. Volume 2: EFH and HAPC designation alternatives and environmental impacts. October 25, 2017.

[83] Massie, F. D. (1998). The Uncommon Guide to Common Life on Narragansett Bay. Providence, Rhode Island: Save The Bay.

coastal waters than in the shallower habitats utilized by eggs and YOY (NEFMC 2017; Phelan 1992)[84]. [74,85] Therefore, juveniles and non-spawning adults are likely to utilize Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats in the Study Area.

## 3.4.2. Potential Project Impacts

### *3.4.2.1. Construction Impacts Assessment - Finfish*

Most of the potential Project impacts to finfish and EFH would be temporary and reversible in nature. Finfish communities and EFH are expected to return to pre-construction conditions following the Project's construction. Construction activities may temporarily illicit avoidance or attraction behaviors and/or a stress response in finfish. Introduced sound and/or a change in ambient lighting during construction activities may cause this behavioral disturbance. Changes in ambient lighting will occur on a limited, highly localized basis as necessary for safe construction and are not expected to significantly affect finfish.

The actual footprint of Project activities will be smaller than the Study Area (i.e., the entire corridor for which habitats were mapped). Where juvenile cod benthic habitats are found, these habitats would experience some impacts from Project activities that permanently or temporarily disturb the seafloor, such as the burying of export cables and long-term presence of secondary cable protection measures in hard bottom areas where target cable burial depth is not possible. Given their preference for hard bottom/complex habitat, cable mattresses, rock berms, or frond mattresses used as secondary cable protection may provide increased habitat availability for both adult and juvenile cod (Reubens et al. 2013).[86] Depending on the material used, secondary protection may be colonized by barnacles, tube-forming species, hydroids, and other fouling species found on existing hard bottom habitat in the region. Other Project activities are not expected to result in long term adverse impacts to either adult or juvenile cod EFH.

Impacts from Project activities related to installation of the export cable in shallow nearshore (<16 ft [5.0 m]) waters may temporarily directly affect winter flounder eggs, YOY, and spawning adults. Eggs could be entrained within the jet plow or experience increased mortality due to sediment suspension (Berry et al. 2011).[87] These impacts are expected to be minor because they will disturb a small portion of available EFH in the area and temporary because the substrates within nearshore portions of the ECC are expected to return to essentially the same as pre-existing conditions, allowing for continued use by spawning winter flounder, YOY, and eggs. Juveniles and adult flounder may also be temporarily displaced by seafloor disturbing activities. Winter flounder are expected to recolonize most areas once construction is complete, however similar to other species that utilize sandy habitats, they may

[84] Phelan, B. A. (1992). Winter flounder movements in the inner New York Bight. Trans. Am. Fish. Soc., 121: 777-784.

[85] Phelan, B. A. (1992). Winter flounder movements in the inner New York Bight. Trans. Am. Fish. Soc., 121: 777-784.

[86] Reubens, J., Braeckman, U., Vanaverbeke, J., Van Colen, C., Degraer, S., & Vincx, M. (2013). Aggregation at windmill artificial reefs: CPUE of Atlantic cod (Gadus morhua) and pouting (Trisopterus luscus) at different habitat in the Belgian part of the North Sea. Fish. Res. 139: 28-34.

[87] Berry, W. J., Rubinstein, N. I., Hinchey, E. K., Klein-MacPhee, K. G., & Clarke, D. G. (2011). Assessment of DredgingInduced Sedimentation Effects on Winter Flounder (Pseudopleuronectes americanus) Hatching Success: Results of Laboratory Investigations. Proceedings of the Western Dredging Association Technical Conference and Texas A&M Dredging Seminar. Nashville, TN.

experience small amounts of permanent habitat loss in areas that are converted from sandy sediments to hard bottom habitats should secondary cable protection be needed.

Loss of habitat due to conversion to hard bottom where cable protection is required is not expected to have a significant impact on these species due to the large area of alternate suitable habitat available. See Section 2.3.9 for additional details on the potential need for secondary cable protection.

The concentrations of suspended sediment in the water column (measured as turbidity) will increase for a short period during and following cable installation in the seabed; see Section 3.2.2 of this application and the Hydrodynamics and Sediment Dispersion Modeling Report in Attachment G. Elevated turbidity levels are expected to decrease quickly following cable installation, dropping to under 100 mg/L over ambient concentrations within five hours. Given the short duration and relatively low levels of increase, impacts to fish and fishing activities are not anticipated.

Potential harassment or mortality could occur due to seabed disturbance, planned and unplanned discharges, and other accidental events. The Emergency Spill Response Plan will be followed to prevent and respond to unplanned discharges and accidental events. Reduced prey availability and habitat loss may occur during Project construction. The seabed surface is expected to return to pre-construction conditions due to natural infill from tidal motion, except where secondary cable protection is necessary. In these areas, habitat modification will occur through the addition of cable and scour protection.

#### *3.4.2.2. EMF Impacts Assessment - Finfish*

EMFs are created anywhere there is a flow of electricity, and their strength diminishes within a short distance from the source. Thus, a change in ambient EMF may occur around the submarine power cables. The strength of electric fields depends on voltage, which is the pressure behind the flow of electricity. Magnetic fields are produced by current, which is the flow of electricity. A Magnetic Field Analysis study was conducted by POWER and Gradient, Inc. to model the magnetic fields produced by typical offshore cable configurations for the Project and contextualize them to the latest research and guidelines for the marine environment (Attachment J). The modeling analysis focuses on magnetic fields because the electric fields arising from the voltage on the export cables will be shielded by cable materials.

Three configurations of offshore HVDC cables were modeled, including the typical installation case where the two direct current conductors are bundled together as well as two atypical, worst-case installation scenarios.[88] Only for the two atypical installation cases will magnetic field levels above the offshore export cables appreciably differ from the earth's steady (DC) geomagnetic field, and only within short distances from the cables. The weight of the currently available evidence does not provide support for concluding there would be population-level harms to marine species from EMF associated with HVDC submarine transmission. This conclusion regarding a lack of evidence of population-level harm to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews.

No regulatory thresholds or guidelines for allowable EMF levels in marine environments have been established for either HVDC or HVAC transmission. There is a growing body of evidence suggesting that EMFs from HVDC cables may be perceptible to some electromagnetic-sensitive marine species, but

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[88] One worst-case installation case assumes the bundled conductors are laid directly on the seafloor surface and covered by a concrete mattress, such as at a cable crossing location. The other is an unbundled installation case where the two DC conductors are separately buried approximately 164 ft (50 m) apart at a target depth of 2.0 m to be used as needed to ensure safe installation and repair of the separate cables, as well as to minimize risk of damage to both cables from threats such as anchor strike.

there remains a lack of evidence indicating potential harmful impacts at the population- or community-level for the various types of marine species which may experience exposure to DC EMFs from submarine export cables.[89] Additional details can be found in Attachment J – Magnetic Field Modeling Report. This conclusion regarding a lack of evidence of population-level harms to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews. A BOEM sponsored study in 2019 concluded, based on its review of the state of the knowledge regarding potential EMF-related impacts on marine life, "The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes within the southern New England area. Negligible effects, if any, on bottom-dwelling species are anticipated. No negative effects on pelagic [i.e., in upper layers of the open sea] species are expected due to their distance from the power cables buried in the seafloor."

Two recent reports commissioned by BOEM[90,91] have discussed the scientific evidence bearing on the potential impacts of EMFs from submarine power cables on the European eel and the American eel. While acknowledging the evidence indicating that multiple eel species can potentially detect the earth's steady (DC) geomagnetic field and the "mixed evidence" that eel species can detect electric fields, the 2019 report highlighted findings from two studies of European eels supporting a lack of significant effects of AC magnetic fields on eel species. In particular, this report described one laboratory study as reporting no effect of a 950 mG magnetic field from a 50-Hz AC power source on the swim behavior or orientation of European eels, and a field study as reporting findings that migration of European eels was not prevented by an unburied AC power cable. The 2021 report also discussed findings from these two studies of European eels, concluding that they provide "insufficient evidence to confidently decipher the behavioral response to cable EMFs in the context of AC or DC cables."

Importantly, the 2021 Hutchison et al. report[82] described findings from a field investigation of the EMF impacts on American eel movement and migration from a buried DC power cable, specifically the 330-MW bipolar Cross Sound Cable (CSC) that transects Long Island Sound between New Haven, CT, and Shoreham, NY. For the range of DC MFs encountered by American eels in this study (-17.0 to 86.9 nT, or -0.17 to 0.869 mG).[82] reported some evidence using highly sensitive tracking metrics that the HVDC cable MFs may have resulted in faster and more directed movement of eels, but these findings did not provide evidence of a barrier to migration. Hutchison et al.[82] highlighted the need for further work to better understand the implications of their findings for migratory behavior of American eels.

The 2019 report[81] concluded overall that the impact consequence of any exposure of American eels to EMFs from buried submarine power cables was "negligible." This conclusion was based on the small and localized portion of the pelagic habitat that would experience detectable EMFs from buried submarine

[89] CSA Ocean Sciences Inc.; Exponent. 2019. "Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England." Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM). OCS Study BOEM 2019-049, 62p., August.; Gill, AB; Desender, M. 2020. "Risk to Animals from Electromagnetic Fields Emitted by Electric Cables and Marine Renewable Energy Devices." Report to Ocean Energy Systems (OES), in OES-Environmental 2020 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World (Eds: Copping, AE; Hemery, LG), p. 87-103. doi: 10.2172/1633088.; US Offshore Wind Synthesis of Environmental Effects Research (SEER). 2022. "SEER Webinar #4: Electromagnetic Fields & Vessel Collision: Effects on Marine Life from Offshore Wind Energy." February 22, 32p. Accessed on March 7, 2022 at https://tethys.pnnl.gov/sites/default/files/events/SEER-EMFVessels-Webinar-Slides.pdf.; Taormina, B; Bald, J; Want, A; Thouzeau, G; Lejart, M; Desroy, N; Carlier, A. 2018. "A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions." Renew. Sustain. Energy Rev. 96 :380-391. doi: 10.1016/j.rser.2018.07.026.

[90] CSA Ocean Sciences Inc and Exponent. 2019. *Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England*. Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2019-049. 62p., August.

[91] Hutchison, ZL; Sigray, P; Gill, AB; Michelot, T; King, J. 2021. "Electromagnetic Field Impacts on American Eel Movement and Migration from Direct Current Cables." Report to US Department of the Interior, Bureau of Ocean Energy Management (BOEM) OCS Study BOEM 2021-83. 150p., December.

power cables, and the available scientific evidence supporting any biological effects as being either not detectable or small changes. This report highlighted how changes in the earth's magnetic field are potentially just one of many environmental cues (e.g., water temperature, light, salinity) that can guide the migratory behavior of eels.

## 3.4.3. Proposed Avoidance, Minimization, and Mitigation Measures

SouthCoast Wind will conduct activities in accordance with 30 C.F.R. § 585.621. Table 2-9 of the Project's RI CRMC Assent application and Table 16-1 of the COP Volume II summarizes the various avoidance, minimization and mitigation measures the Project intends to abide by to minimize impact during all phases of construction and operations. These tables also illustrate that the Project intends to apply Best Management Practices (BMPs) that are included in Attachment A of BOEM's Information Guidelines for a Renewable Energy COP.

As indicated in Table 16-1 of the COP, SouthCoast Wind will select and use BMPs including the use of a Stormwater Pollution Prevention Plan (SWPPP) to minimize sediment mobilization during offshore construction of WTGs and OSPs, scour protection placement, and HDD operations. SouthCoast Wind, when feasible, will use technologies that minimize sediment mobilization and seabed sediment alteration for cable burial operations.

As indicated in Table 2-9 of the Assent application, SouthCoast Wind will select and use BMPs including the use of a SESC plan to minimize sediment mobilization during offshore construction and HDD operations. SouthCoast Wind will have an HDD Contingency Plan in place to mitigate, control, and avoid unplanned discharges related to HDD activities. SouthCoast Wind will implement an SESC plan during trenching and excavation activities, in accordance with the *Rhode Island Soil Erosion and Sediment Control Handbook*, and in accordance with approved plans and permit requirements. The erosion control devices will function to mitigate construction-related soil erosion and sedimentation and will also serve as a physical boundary to separate construction activities from resource areas.

Impacts associated with the installation of a cofferdam or casing pipe with goal posts (if necessary) would be similar to those discussed for seafloor preparation, but on a smaller scale. The cofferdam or casing pipe with goal posts will be a temporary structure used during construction only. Therefore, no conversion of habitat is expected, and the cofferdam will be removed prior to the operations phase. Proposed avoidance, minimization, and mitigation measures applicable to the potential impacts from construction and operations to finfish and EFH are presented below.

- SouthCoast Wind will design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., offshore cofferdam and/or gravity cell).
- Cable route engineering is being completed to achieve target burial depth of 6.0 ft where practicable, to avoid use of surface cable protection and to minimize the potential for EMF effects.
- The Project will use HDD at landfall locations to avoid disturbance to finfish and invertebrate EFH to the extent practicable.
- SouthCoast Wind will coordinate with RIDEM Division of Fish and Wildlife (RI DFW), RIDEM Division of Marine Fisheries (RI DMF), RI CRMC, RIDEM, the USFWS and the NMFS to identify appropriate mitigation measures, including seasonal construction constraints, if required.
- SouthCoast Wind will select lower impact construction methods, where possible.

- SouthCoast Wind has engineered the cable route to avoid EFH and sensitive benthic habitats, where possible.
- The ECC was designed to minimize length of cable (and associated seabed impacts). SouthCoast Wind will bury cables, where feasible, to allow for benthic recolonization after construction is complete. Use of secondary cable protection (rock and/or mattresses) will be limited to the extent practicable.
- The offshore export cables will be installed in a bundled configuration where practicable, to reduce installation impact area and post-installation occupied area.

## 3.5. Marine Mammals and Sea Turtles

### 3.5.1. Affected Environment

This section includes and evaluation of whales, other marine mammals and sea turtles within the ECC.

#### *3.5.1.1. Marine Mammals*

SouthCoast Wind evaluated available literature and government databases, marine mammal-specific surveys conducted for the proposed Project, as well as local and regional information regarding habitat use, abundance, and distribution of marine mammal species known to occur in the waters surrounding the ECC.

Sightings of whales and dolphins in the Sakonnet River, Mount Hope Bay, and nearshore Rhode Island are rare, and there have only been a few reported sightings of marine mammal species, besides seals, within Narragansett Bay.[92] Harbor seals (*Phoca vitulina)* are routinely sited from fall through spring and several haul-out sites exist at Rome Point, Brenton Point, Citing Rock, Cold Spring Rock, Seal Rock, and Cormorant Cove with the size of the region harbor seal population and number of haul-out sites increasing in recent years.[93] Since the majority of the Rhode Island ECC is within the Sakonnet River and Mount Hope Bay, the risk of impact to marine mammals in Rhode Island waters is very low given the low overall densities of animals and the avoidance and mitigation measures that SouthCoast Wind vessels are required to implement, such as assigning protected species and environmental observers to operating vessels and implementing strike avoidance measures.

Additional marine mammal species can be found in the Rhode Island Sound, as listed in Table 3-10 Fifteen species are considered common or uncommon in terms of their likely occurrence within the ECC in Rhode Island Sound. The remaining sixteen species are considered rare within the ECC. The marine mammal species listed in Table 3-10 have been previously observed and/or recorded during surveys specific to offshore wind development for BOEM-specific assessments, surveys conducted in and around the Rhode Island/Massachusetts Wind Energy Area and the ECC as part of long-term population assessments, and/or in NOAA Marine Mammal Stock Assessment reports of the Rhode Island/ Massachusetts Wind Energy Area.

[92] Raposa, K.B., and M.L. Schwartz. 2009. *An Ecological Profile of the Narragansett Bay National Estuarine Research Reserve*. 2009.
[93] Schwartz, 2021

**TABLE 3-10. MARINE MAMMAL SPECIES WITH POTENTIAL TO OCCUR IN RHODE ISLAND SOUND**

| Common Name | Scientific Name | Stock | RI SGCN[a] | Likely Occurrence within Project Area |
|---|---|---|---|---|
| Baleen whales | | | | |
| Blue whale | *Balaenoptera musculus* | Western North Atlantic | - | Rare |
| Fin whale | *Balaenoptera physalus* | Western North Atlantic | SGCN | Common |
| Humpback whale | *Megaptera novaeangliae* | Gulf of Maine | SGCN | Common |
| Minke whale | *Balaenoptera acutorostrata* | Canadian East Coast | - | Common |
| North Atlantic right whale | *Eubalaena glacialis* | Western North Atlantic | SGCN | Common |
| Sei whale | *Balaenoptera borealis* | Nova Scotia | - | Common |
| Toothed whales | | | | |
| Atlantic white-sided dolphin | *Lagenohynchus acutus* | Western North Atlantic | - | Common |
| Atlantic spotted dolphin | *Stenella frontalis* | Western North Atlantic | - | Rare |
| Blainville's beaked whale | *Mesoplodon densirostris* | Western North Atlantic | - | Rare |
| Common bottlenose dolphin[b] | *Tursiops truncatus* | Western North Atlantic | - | Common |
| Cuvier's beaked whale | *Ziphius cavirostris* | Western North Atlantic | - | Rare |
| Dwarf sperm whale | *Kogia sima* | Western North Atlantic | - | Rare |
| Gervais' beaked whale | *Mesoplodon europaeus* | Western North Atlantic | - | Rare |
| Killer whale | *Orcinus orca* | Western North Atlantic | - | Rare |
| Long-finned pilot whale | *Globicephala melas* | Western North Atlantic | - | Uncommon |
| Pantropical spotted dolphin | *Stenella attenuata* | Western North Atlantic | - | Rare |
| Pygmy sperm whale | *Kogia breviceps* | Western North Atlantic | - | Rare |
| Risso's dolphin | *Grampus griseus* | Western North Atlantic | - | Uncommon |
| Short-beaked common dolphin | *Delphinus delphis* | Western North Atlantic | - | Common |
| Short-finned pilot whale | *Globicephala macrorhynchus* | Western North Atlantic | - | Rare |
| Sowerby's beaked whale | *Mesoplodon bidens* | Western North Atlantic | - | Rare |
| Sperm whale | *Physeter macrocephalus* | North Atlantic | - | Uncommon |

| Common Name | Scientific Name | Stock | RI SGCN[a] | Likely Occurrence within Project Area |
|---|---|---|---|---|
| Striped dolphin | *Stenella coeruleoalba* | Western North Atlantic | - | Rare |
| True's beaked whale | *Mesoplodon mirus* | Western North Atlantic | - | Rare |
| White-beaked dolphin | *Lagenorhynchus albirostris* | Western North Atlantic | - | Rare |
| Porpoises | | | | |
| Harbor porpoise | *Phocoena phocoena* | Gulf of Maine/Bay of Fundy Stock | SGCN | Common |
| Pinnipeds | | | | |
| Gray seal | *Halichoerus grypus* | Western North Atlantic | - | Common |
| Harp seal | *Pagophilus groenlandicus* | Western North Atlantic | - | Uncommon |
| Harbor seal | *Phoca vitulina* | Western North Atlantic | SGCN | Common |
| Hooded seal | *Crysophora cristata* | Western North Atlantic | - | Rare |
| West Indian Manatee | *Trichechus manatus* | Florida | - | Rare |

*Notes:*

*[a] Species of Greatest Conservation Need (SGCN) are identified by RIDEM and the Rhode Island Chapter of The Nature Conservancy in the Rhode Island Wildlife Action Plan.*

### *3.5.1.2. Sea Turtles*

Four species of sea turtles have the potential to occur in the ECC, all of which are federally listed and listed as a Species of Greatest Conservation Need (SGCN) in Rhode Island (Table 3-10). Sea turtle species that have the potential to occur in and in the vicinity of the ECC include the loggerhead sea turtle (*Caretta caretta*), leatherback sea turtle (*Dermochelys coriacea*), Kemp's ridley sea turtle (*Lepidochelys kempii*) and green sea turtle (*Chelonia mydas*). Federally endangered hawksbill sea turtles (*Eretmochelys imbricata)* generally prefer tropical and subtropical waters and are very rarely seen in Massachusetts and Rhode Island waters (observations are typically the result of cold-stun strandings), and therefore, will not be evaluated further in this assessment.[94, 95, 96] The sea turtle species listed in Table 3-11 have been previously observed and recorded during surveys for BOEM-specific offshore wind development assessments and/or surveys conducted near and within the ECC as part of long-term population assessments. Although sea turtles could occur in the Sakonnet River and Mount Hope Bay, they are more apt to be in the Rhode Island Sound waters of the ECC.

[94] Lutz, P.L. &. Musick, J.A. 1997. *The Biology of Sea Turtles*. Boca Raton, Florida: CRC Press.

[95] National Marine Fisheries Service & United State Fish and Wildlife Service. 1993. Recovery Plan for Hawksbill Turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico National Marine Fisheries Service, St. Petersburg, Florida.

[96] Lazell, J. 1980. New England Waters: Critical Habitat for Marine Turtles. *Copeia*, 2: 290-295. doi:10.2307/1444006.

TABLE 3-11. SEA TURTLE SPECIES WITH POTENTIAL TO OCCUR IN THE ECC

| Common Name | Scientific Name | ESA Status[a] | RI Status[a] | Occurrence within Project Area |
|---|---|---|---|---|
| Green sea turtle | *Chelonia mydas* | T | SGCN | Uncommon |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | E | SGCN | Uncommon |
| Atlantic Hawksbill sea turtle | *Eretmochelys imbricata* | E | - | Rare |
| Leatherback sea turtle | *Dermochelys coriacea* | E | SGCN | Common |
| Loggerhead sea turtle | *Caretta caretta* | T | SGCN | Common |

*Notes:*

*[a] ESA = Endangered Species Act (16 U.S.C. §.1531 et seq.); Rhode Island Wildlife Action Plan Species Profiles, Species of Greatest Conservation Need (SGCN). SGCN species are identified by RIDEM and the Rhode Island Chapter of The Nature Conservancy in the Rhode Island Wildlife Action Plan. It should be noted that SGCN designation does not represent an equivalent to ESA species listings; rather, this represents a publicly available data source to identify species which Rhode Island considers to be of greatest concern, based on the threat affecting each (RIDEM 2015). E = Endangered; T = Threatened; NL = Not listed.*

Data on sea turtle abundance and distribution in Rhode Island state waters are limited. However, available studies suggest that all four species are generally found offshore during the summer and fall.[97, 98, 99] Loggerhead, leatherback, green, and Kemp's ridley sea turtles are highly migratory and are known to forage in nearby Cape Cod Bay during the summer months when sea surface temperatures range from 61 to 79 degrees Fahrenheit (16 to 26 degrees Celsius).[100]

## 3.5.2. Potential Project Impacts

The risk of impact to marine mammals in Rhode Island waters is very low given the low overall densities of animals and the avoidance and mitigation measures that SouthCoast Wind vessels are required to implement. Also, impact pile driving is not planned within Rhode Island waters, and sound sources will be non-impulsive, which is less of a concern than impulsive noise sources for marine mammals. Noise producing vessels within Rhode Island state waters will include the use of a DP vessel.

During the construction phase, marine mammals and sea turtles may co-occur with, and be affected by, Project activities in the ECC. During the operations phase, marine mammals and sea turtles may co-occur with the proposed ECC, including minimal vessel traffic for maintenance and associated effects. Marine mammal and sea turtle likelihood of co-occurrence with Project activities in specific Project locations is a function of overall occurrence levels that range from "rare" to "common" as listed in Tables 3-9 and 3-10, respectively.

To minimize the potential for vessel strikes, environmental monitoring, reporting, and vessel strike avoidance measures are required during in-water activities as outlined in SouthCoast Wind's COP Appendix O Marine Mammal and Sea Turtle Monitoring and Mitigation Plan. Given these strike avoidance measures and the low probability of marine mammal occurrence (with the possible exception of seals) in the Sakonnet River and Mount Hope Bay, risk of potential vessel strikes is low in Rhode Island

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[97] Kraus, S.D., Leiter, S., Stone, K., Wikgren, B., Mayo, C., Hughes, P., Kenney, R.D., Clark, C.W., Rice, A.N., Estabrook, B. & Tielens, J. 2016. *Northeast Large Pelagic Survey Collaborative Aerial and Acoustic Surveys for Large Whales and Sea Turtles*. U.S. Department of the Interior, Bureau of Ocean Energy Management, Sterling, Virginia. OCS Study BOEM 2016-054. 117 pp. + appendices.

[98] Lazell. 1980.

[99] Schwartz. 2021.

[100] Cetacean and Turtle Assessment Program. 1982. *A Characterization of Marine Mammals and Turtles in the Mid and North Atlantic Areas of the U.S. Outer Continental Shelf* (Report No. AA551-CT8-48). Report by University of Rhode Island. Report for U.S. Department of the Interior.

waters. Unplanned discharges will be prevented through the use of best management practices and the Emergency Response Plan (Attachment E).

Pinnipeds that may be present along the ECC could also be susceptible to in-air noise disturbance at haul out sites or pupping grounds, and in-air thresholds have been established by the National Marine Fisheries Service. However, in-air noise producing activities, which do not include pile driving in Rhode Island waters or the Ocean SAMP area, are anticipated to produce relatively low levels of in-air noise and are expected to be short in duration.

During the construction phase of the Project, temporary displacement may occur due to disturbance and modification of habitat and/or temporary disturbance of prey species causing reduced prey availability. Following construction and during the operational phase, the seafloor is expected to return to pre-construction condition through natural movement (transport) and sorting by waves and currents and marine mammals, sea turtles, and their prey are expected to return.

Artificial lighting during construction will be associated with navigational and deck lighting on vessels from dusk to dawn. Only a limited area would be associated with the artificial lighting used on Project vessels relative to the surrounding unlit areas and the linear installation of the ECC will cause the lit area to constantly move along the cable route. Because of the relatively short duration of installation activities, impacts are considered short-term for marine mammals.

### 3.5.3. Proposed Avoidance, Minimization, and Mitigation Measures

Below is a list of measures applicable to marine mammals and sea turtles that SouthCoast Wind will adopt:

- All relevant requirements of the BOEM *Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection* will be followed wherever applicable, including strike avoidance measures, vessel speed restrictions, monitoring, mitigation, and reporting.
- Adhere to NMFS vessel speed restrictions and monitor relevant channels for alerts and updates, as appropriate.
- SouthCoast Wind will implement measures as identified in the Project Marine Mammal and Sea Turtle Monitoring and Mitigation Plan (COP, Appendix O) and the final Incidental Take Authorization to be authorized by NMFS.
- Marine construction staff will be trained in species identification, monitoring and mitigation.
- Environmental Monitors and/or Protected Species Observers will be identified on all vessels to perform monitoring and mitigation, as necessary and required.
- Adhere to the NMFS Guidelines for the Northern Right Whale Ship Strike Avoidance Rule.
- SouthCoast Wind will continue to consult with the RIDEM DFW, RIDEM DMF, RI CRMC, USFWS and NMFS to identify appropriate mitigation measures.
- SouthCoast Wind will train construction staff on biodiversity management and environmental compliance requirements.

## 3.6. COMMERCIAL AND RECREATIONAL FISHING

This section describes and analyzes commercial and recreational fisheries and fishing activity that has the potential to occur in the ECC, followed by an evaluation of potential Project-related effects and corresponding potential avoidance, minimization, and mitigation measures. Fishing activity is impacted by species abundance, market forces, regulations, and a large number of other variables.

### 3.6.1. Affected Environment

This section includes an evaluation of commercial and recreational fisheries within the ECC.

### 3.6.1.1. *Commercial Fishing*

#### Aquaculture

SouthCoast Wind will avoid or minimize adverse impact to aquaculture in Rhode Island and will work with RI CRMC, the RI DMF other relevant agencies, and the local aquaculture industry to achieve that end. RI CRMC is the regulatory body that manages aquaculture leasing and permits within Rhode Island waters. Much of the Rhode Island aquaculture activities occur within the State's several inland salt ponds, but aquaculture is also scattered nearshore in Narragansett Bay.[101] Although there are several approved aquaculture areas within The Cove on Aquidneck Island and adjacent to Hog Island, the export cable route is not directly adjacent or collocated with any of these sites. There are no aquaculture lease sites within the ECC within Rhode Island state waters, based on the RI DMF (2021) mapping of aquaculture lease areas in Rhode Island state waters (Figure 3-3).

SouthCoast Wind is continuing their routing assessment and inventory of marine resources to minimize impacts on recreational fishing and recreational boating with the intention to avoid important recreational fishing areas and established moorings. In the event that any moorings in the Sakonnet River and Mount Hope Bay are temporarily displaced, SouthCoast Wind will coordinate with the applicable Harbor Master and owner of the mooring(s).

#### Fish Traps

The floating fish trap fishery in Rhode Island is a gear type unique to Rhode Island. Essentially a hybrid of a fishing weir and a fish trap, this gear is predominantly fished in shallower, inshore areas close to shore. While this is a wild capture fishery, it is in some ways permitted and operated as an aquaculture activity. Permits to operate fish traps are tied to specific, permanent locations which offer certainty in the spatial extent of fishing effort, unlike other wild capture fisheries. However, while fish trap locations offer spatial certainty, the issuance of a permit or appearance of a fish trap on the RI DMF Map does not necessarily mean that that fish trap is being actively fished. Fish traps may become actively fished at any time, although there are requirements for the fisherman to provide the necessary notifications.[102] SouthCoast Wind has conducted outreach, including to the RI DMF, and performed scouting in advance of geophysical and geotechnical surveys to gain temporal knowledge of the location of fish traps in addition to the spatial certainty offered by permit location information. There are currently no licenses in Mount Hope Bay. Several licenses for fish traps have been issued for locations at the mouth of the Sakonnet River. SouthCoast Wind will coordinate with RI DMF prior to construction operations to confirm permitted locations of fish traps that may likely be fished during the period of Project impacts and will communicate directly with the operators of those fish traps.

### 3.6.1.2. *Commercial Fishing Landings*

A diverse array of commercial fishing activity occurs in the region. Fisheries resources are targeted in the region and within the ECC by vessels of different sizes using different gear types and are dictated by seasons, quotas, environmental factors, market forces, and federal and state-led regulations.

Table 3-12 shows the landings for Rhode Island ports in 2019 and 2020 as reported by NMFS. Point Judith on the coast of Narragansett is the highest valued port in Rhode Island. In 2019, it was the 12th highest valued in the United States, and the 18th highest valued in 2020.

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[101] RIDEM. 2021. *RIDEM Marine Fisheries Maps*.
https://ridemgis.maps.arcgis.com/apps/webappviewer/index.html?id=8beb98d758f14265a84d69758d96742f.

[102] J. Livermore. 2021. RIDEM Division of Marine Fisheries [COP], personal communication, July 22, 2021.

### TABLE 3-12. LANDINGS BY PORTS IN RHODE ISLAND (VIA NMFS)

| Port | 2019 | | 2020 | |
|---|---|---|---|---|
| | Millions of Pounds | Millions of Dollars | Millions of Pounds | Millions of Dollars |
| Point Judith, RI | 48.1 | $65.9 | 42.6 | $46.7 |
| North Kingstown, RI | 19.2 | $14.1 | 19.6 | $14.4 |
| Newport, RI | 4.9 | $7.8 | 5.2 | $7.0 |
| Little Compton, RI | 3.9 | $3.4 | 4.7 | $2.8 |
| **Total** | **76.1** | **$91.2** | **72.1** | **$70.9** |

*Source: NOAA Fisheries. (NMFS). 2021. NOAA Fisheries Landing Queries. Retrieved from: https://foss.nmfs.noaa.gov/apexfoss/f?p=215:200.*

In 2019, these ports landed 76.1 million pounds of fish valued at $91.2 million. The most commonly landed species in Rhode Island by weight were shortfin squid, longfin squid, and butterfish. The highest landed species by value were sea scallops, longfin squid, and American lobster. In 2020, these ports landed 72.1 million pounds of fish valued at $70.9 million. The most commonly landed species in Rhode Island by weight were shortfin squid, longfin squid, and skate. The highest landed species by value were longfin squid, sea scallops, and shortfin squid.

Table 3-13 shows the landings for Rhode Island ports in 2020 and 2021 as reported by RIDEM via the Standard Atlantic Fisheries Information System. In Table 3-13 a dash ("-") does not necessarily mean that no landings were reported but can instead mean that landings are confidential. Commercial fisheries landings data have confidentiality protections in place when disclosing landings could feasibly be tied back to an individual business.

*Note: Because of what is assumed to be rounding, the total field for the 'Percentage of State Landings by Value' column in Table 3-13 does not sum to exactly 100%. However, it is essentially 100% for both 2020 and 2021 when summing all fields in that column. Also, differences in port and total values for the same areas in the same time frame can be attributed to how source data was collected, packaged, and in some cases withheld to protect confidentiality.*

### TABLE 3-13. LANDINGS BY PORTS IN RHODE ISLAND (VIA RIDEM)

| Port | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Pounds | Dollars | % of Total State Landings by Value | Pounds | Dollars | % of Total State Landings by Value |
| Barrington | - | - | - | - | - | - |
| Bristol | 1,767,460 | $1,065,623 | 2.26% | 1,532,789 | $1,003,387 | 0.98% |
| Bristol (County) | - | - | - | 3,572,204 | $1,098,001 | 1.07% |
| Charlestown | - | - | - | - | - | - |
| Davisville (community) | - | - | - | - | - | - |
| East Greenwich | - | - | - | - | - | - |
| Jamestown | 23,200 | $37,119 | 0.03% | 31,850 | $86,990 | 0.08% |

| Port | 2020 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Pounds | Dollars | % of Total State Landings by Value | Pounds | Dollars | % of Total State Landings by Value |
| Little Compton | 3,272,004 | $2,798,250 | 4.18% | 2,130,088 | $2,483,433 | 2.42% |
| Melville | - | - | - | - | - | - |
| Middletown | - | - | - | - | - | - |
| Narragansett (census name Narragansett Pier) | - | - | - | - | - | - |
| New Shoreham | 15,118 | $35,616 | 0.02% | 14,024 | $46,412 | 0.05% |
| Newport | 4,824,613 | $6,997,646 | 6.17% | 6,029,861 | $6,378,574 | 6.22% |
| Newport (County)(in PMSA 2480,6480) | - | - | - | 9,401 | $10,430 | 0.01% |
| North Kingstown (local name Wickford) | 20,613,405 | $13,597,762 | 26.34% | 18,884,680 | $14,131,846 | 13.77% |
| Point Judith | 42,240,850 | $45,537,030 | 53.98% | 43,916,203 | $71,079,310 | 69.27% |
| Portsmouth | 159,809 | $402,232 | 0.20% | 136,212 | $425,457 | 0.41% |
| Providence (County)(in PMSA 6060,6480) | - | - | - | - | - | - |
| Rhode Island (State) | 46,892 | $189,030 | 0.06% | 180,987 | $2,975,245 | 2.90% |
| South Kingstown (Town of) | 58,406 | $179,608 | 0.07% | 76,814 | $218,455 | 0.21% |
| Tiverton | 335,629 | $400,194 | 0.43% | 463,197 | $808,330 | 0.79% |
| Unknown | - | - | - | - | - | - |
| Wakefield | 600 | $512 | 0.00% | - | - | - |
| Warren | 33,107 | $140,131 | 0.04% | 12,109 | $66,966 | 0.07% |
| Warwick | - | - | - | - | - | - |
| Warwick (RR name Apponaug) | 4,837,338 | $1,324,468 | 6.18% | 5,609,852 | $1,695,417 | 1.65% |
| Westerly (census name Westerly Center) | 25,512 | $71,997 | 0.03% | - | - | - |
| **Total** | **78,253,942** | **$72,777,217** | **100.00%** | **82,600,271** | **$102,508,252** | **100.00%** |

*Source: RIDEM DMF. 2022. Rhode Island Annual Fisheries Report: 2020. March 2022. Retrieved from: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/AnnualRpt_2020.pdf. and RIDEM DMF. 2022. Rhode Island Annual Fisheries Report: 2021. May 2022. Retrieved from: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/AnnualRpt_2021.pdf.*

Year to year variations (e.g., a large decrease from 2019 to 2020 and then an increase from 2020 to 2021) seen in Tables 3-12 and 3-13 can largely be attributed to the COVID-19 pandemic and its severe impact on the fishing industry. Outreach to the commercial fishing industry in Rhode Island by SouthCoast Wind confirmed that there were differential impacts on fisheries (e.g., squid) because of the pandemic's differential impact on restaurant versus at-home seafood consumption and the species typically consumed in those different situations.

While the fishing activity in the ECC is relatively lower than in other areas of the region, there are commercial fishing vessels from Rhode Island, Massachusetts, and other states that fish in the ECC and fish caught in the ECC may be landed in other states besides Rhode Island and Massachusetts. The top 10 ports with the highest annual average landings based on annual totals from 2008 to 2018 in the ECC are presented in Table 3-14. When considering ports with sufficient dealers and unique permits,[103] the top three ports in the ECC were New Bedford, Massachusetts, Point Judith, Rhode Island, and Newport, Rhode Island.

**TABLE 3-14. ANNUAL AVERAGE LANDINGS AND VALUE FOR TOP 10 PORTS IN THE ECC**

| Port Landed | Average Yearly Landings (lbs.) | Average Yearly Value (dollars) |
|---|---|---|
| New Bedford, MA | 575,459 | $265,404 |
| Point Judith, RI | 264,544 | $248,449 |
| Newport, RI | 114,982 | $37,928 |
| Little Compton, RI | 91,258 | $120,977 |
| All Others | 85,044 | $40,282 |
| Fall River, MA | 56,161 | $13,358 |
| Gloucester, MA | 28,054 | $4,226 |
| Montauk, NY | 21,992 | $24,981 |
| Boston, MA | 19,966 | $3,646 |
| Barnstable, MA | 2,609 | $2,458 |
| Total for All Ports | 1,331,827 | $910,751 |

*Source: Source: B. Galuardi, personal communication, 2 July 202.1*

### *3.6.1.3. Vessel Trip Report Data Analysis*

National Marine Fisheries Service Vessel Trip Report (VTR) data was used to determine the average fish landings from 2008-2018 as presented below in Table 3-15. VTR is a self-reported data reporting system required for all federally permitted fishing vessels. There are some reasonable limitations to VTR data but it currently represents the best Offshore Project Area-specific data sets available and it is analyzed here to provide a sense of where, when, and how certain species are being caught. Full records of the VTR data analyzed by SouthCoast Wind can be found in Appendix V of the COP - Commercial and Recreational Fisheries and Fishing Activity Technical Report.

103 Data for ports with an insufficient number of unique dealers and/or permit holders are anonymized and aggregated and fall under the "All Others" category.

Within the ECC, the average annual fish landings were 1,331,827 pounds valued at $910,751. The most commonly landed species by weight were Atlantic herring, skate wings, and Loligo squid. The most commonly landed species by revenue were American lobster, Loligo squid, and summer flounder/fluke (Table 3-15). Bluefish also represented the highest percent exposure (0.05%) of total landings by weight caught within the ECC. Atlantic herring represented the highest average landings, but also the highest variability. In 2013, landings of Atlantic herring in the ECC totaled $238,472 and 2,000,563 pounds but did not exceed $90,492 and 1,081,204 pounds in any other year between 2008 and 2018 (B. Galuardi, personal communication, ~~6~~ October 6, 2020).

**TABLE 3-15. AVERAGE VTR LANDINGS IN THE ECC FROM 2008-2018**

| Species | Average Annual Landings (lbs.)/Year | Average Annual Value ($)/Year | Species Landings (lbs.) Exposure (percent) | |
|---|---|---|---|---|
| | | | Minimum | Maximum |
| Atlantic herring | 441,022 | $ 50,638 | 0.0 | 0.01 |
| Skate Wings | 299,731 | $ 44,196 | 0.0 | 0.02 |
| Loligo Squid | 167,324 | $191,311 | 0.0 | 0.01 |
| All others | 113,148 | $72,783 | N/A | N/A |
| Scup/ Porgy | 59,187 | $39,147 | 0.0 | 0.01 |
| American lobster | 43,638 | $211,205 | 0.0 | 0 |
| Spiny dogfish | 31,903 | $7,026 | 0.0 | 0.01 |
| Silver Whiting/hake | 27,256 | $15,480 | 0.0 | 0 |
| Summer flounder/fluke | 25.457 | $85,426 | 0.0 | 0 |
| Bluefish | 21,344 | $10,859 | 0.0 | 0.05 |
| Jonah crab | 18,843 | $12,924 | 0.0 | 0.0 |
| Atlantic mackerel | 18,229 | $3,921 | 0.0 | 0.0 |
| Monk | 11,397 | $18,629 | 0.0 | 0.0 |
| Butterfish | 8,961 | $5,917 | 0.0 | 0.0 |
| Black sea bass | 8,021 | $30,510 | 0.0 | 0.0 |
| Channeled whelk (bushel) | 6,189 | $48,848 | 0.0 | 0.0 |
| **Total for All Species** | **1,331,827** | **$910,751** | **0.0** | **0.05** |

*Source: B. Galuardi, personal communication, 2 July 2021.*

### *3.6.1.4. Vessel Monitoring System Data Analysis*

Vessel Monitoring System (VMS) data was used to supplement the VTR analysis above. Commercial vessels are required by law to carry mechanisms of monitoring on board to aid in management and regulatory enforcement. VMS utilize mobile transceiver units to record and transmit vessel locations at least once per hour (50 C.F.R. § 660.14).

A fishing vessel is required to carry a VMS and transmit a signal indicating its position when fishing for species in a method that triggers VMS requirements. Within the ECC, VMS is broadly required when fishing for Atlantic sea scallops, monkfish, Atlantic herring, Atlantic surf clam, ocean quahog, shortfin squid, longfin squid, butterfish and species managed under the Northeast Multispecies Management and Consolidated Atlantic Highly Migratory Species Management Plans. The results of the VMS data analysis (using data from 2011-2014 and 2015-2016) indicated a varied density of commercial fishing vessel activity within the applicable fisheries; squid, Northeast Multispecies, monkfish, Atlantic herring, Atlantic sea scallop, Atlantic surf clam, and Atlantic mackerel fisheries in the northeast and mid-Atlantic regions. Overall, there is a comparatively higher density of fishing activity in the ECC than the SouthCoast Wind Lease Area, due to the variety of favorable benthic habitat characteristics in the ECC. A characterization of the benthic habitat in the ECC can be found in Section 3.3.

### 3.6.1.5. Automatic Identification System Data Analysis

Automatic Identification System (AIS) is an automated, continuous Global Positioning System (GPS) tracking system that provides a record of the operational history of a vessel. Federal regulations (33 C.F.R. § 164.46) mandate which vessels are required to carry AIS; this includes fishing vessels that are greater than 65 ft (20 m) in length and are self-propelled. The AIS data analysis showed that the ECC passes one area of high fishing vessel transit activity within Rhode Island waters, including vessels transiting to and from New Bedford.[104] As a caveat, not all fishing vessels carry AIS transponders or have them actively recording vessel locations outside of 12 nm (22 km) from the coastline.

### 3.6.1.6. Common Commercial Gear Types in the ECC

**Bottom Trawling**

Bottom trawling (also referred to as otter trawling or dragging) is a common mobile gear type in the Northeast used for catching target species that live on the seafloor. Each trawl fishery utilizes unique gear designed specifically to capture the target species (i.e., various mesh sizes, often different within various panels of the same net, different panel configurations, various sizes, designs, and varied doors and door spreads). Modern trawling operations sometimes employ sensors that can be monitored from the wheelhouse in real-time to verify that the gear is properly deployed and fishing effectively as it is towed.

Common species commercially caught in southern New England and within the ECC using bottom trawls include butterfish, flounder species, scup, cod, silver hake, monkfish, and other species.

**Pots and Traps**

Pots and traps are submerged wire cages that attract target species (usually by bait) and allow them to enter but make it difficult to exit.[105] Fishermen haul the traps back onto their vessel typically using lines attached to the trap with a marker buoy or a high-flyer buoy at the surface to mark its location. Traps can be set individually or strung together in what are called "trawls." Target species for pots and traps include crabs, lobsters, whelk, scup, black sea bass, and eels.[106] In southern New England, lobsters are the primary species targeted by pots and traps, although whelk is becoming increasingly more common

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[104] Northeast Regional Ocean Council (NROC). 2018. *Vessel Monitoring Systems (VMS) Commercial Fishing Density, Northeast and Mid-Atlantic Regions.* Data download: https://services.northeastoceandata.org/arcgis1/rest/services/OceanUses.
[105] NMFS. 2019. *Fishing Gear: Traps and Pots.* https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-traps-and-pots.
[106] NMFS 2019.

as lobster populations have been declining in recent decades in this area.[107, 108, 109] Engagement with individual vessels targeting whelk in the ECC has confirmed that gear configurations and deployment/ hauling methods are consistent with standards in the region, pot and trap gear being set in an approximately east-west orientation at regular intervals, although the whelk effort in the Sakonnet River is reported to currently be lower than it had been in recent years.[110]

Jonah crab is another species that has seen targeted increases in southern New England in recent years. The increase in Jonah crab landings is generally attributed to the decrease in the abundance of southern New England lobsters, resulting in a shift in fishing activity and an increase in the price of other crab species, creating a substitute market for Jonah crab meat.[111]

VTR data from 2008 to 2018 demonstrates that pot and trap fishermen in the ECC landed an annual average of 43,638 pounds of American lobster, 18,843 pounds of Jonah crab, and 6,440 pounds of whelk (channeled and knobbed).

**Midwater Trawls**

Midwater trawls are similar to bottom trawls that utilize the same general types of equipment (net, doors, etc.), but utilize doors that are configured to allow the gear to be towed at varying levels in the water column off bottom. Common species targeted by midwater trawls include squid, shrimp, and pelagic schooling fish.[112] In southern New England, squid are the primary species targeted with midwater trawl gear. Commercial squid trawling comprises a substantial percentage both by value and by weight of commercial catch landed in Rhode Island.[113]

Engagement by SouthCoast Wind with the New England squid fishery has confirmed that gear configurations and fishing patterns are consistent with standards for the region. Squid are captured by trawling in either a directed fishery or a mixed species fishery, often with mackerel or butterfish, which is broadly the reason for those species being managed under a shared Fisheries Management Plan. Midwater trawling is far more concentrated in state and federal waters along the ECC compared to within the Lease Area, according to VMS data from 2011 to 2016.

**Gillnetting**

Gillnets trap fish by their gills as they try to swim through the netting.[114] The size of the gaps in the net determine which species will get caught and which will be able to swim through freely. Gillnets can be configured in a variety of ways, but typically consist of floats along the top of the net and weights along the bottom to keep the panel aligned vertically in the water column.

Common gillnet target species include, but are not limited to: groundfish (cod, haddock, pollock, flounder, hake), herring, black sea bass, sharks, and other species, depending on the region.[115] In southern New England, gillnets are typically tended on a daily to semi-weekly basis for groundfish

[107] Atlantic States Marine Fisheries Commission (ASMFC). 2019. *Jonah Crab*. Available at: http://www.asmfc.org/species/jonah-crab.
[108] Gomez-Chiarri, M. & J.S. Cobb. 2012. Shell Disease in the American Lobster, Homarus americanos: A Synthesis of Research from the New England Lobster Research Initiative: Lobster Shell Disease. *Journal of Shellfish Research*, 31(2) : 583-590. https://bioone.org/journals/journal-of-shellfish-research/volume-31/issue-2/035.031.0219/Shell-Disease-in-the-American-Lobster-iHomarus-americanus-i/10.2983/035.031.0219.pdf.
[109] Giannini, C. and P. Howell. 2010. *Connecticut Lobster (Homarus americanus) Population Studies*. NOAA - NMFS, Northeast Region, New London, Connecticut.
[110] Atlantic Coastal Cooperative Statistics Program (ACCSP). 2021. *Comprehensive, species-specific landings database*. https://www.accsp.org.
[111] ASMFC. 2019. *American Lobster*. http://www.asmfc.org/species/american-lobster.
[112] NMFS. 2019. *Fishing Gear: Midwater Trawls*. https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-midwater-trawls
[113] Liberman, Ellen. 2017. Squid fishing is a boon to the local economy. *Rhode Island Monthly. May 30, 2017.* Available online: https://www.rimonthly.com/squid-fishing-boon-local-economy/.
[114] NMFS. 2019. *Fishing Gear: Gillnets*. https://www.fisheries.noaa.gov/national/bycatch/fishing-gear-gillnets.
[115] NMFS. 2019. *Fishing Gear: Gillnets*.

species, managed under the Northeast Multispecies Fisheries Management Plan. Anchored gillnets set very near the seabed are known as 'bottom gillnets or 'sink gillnets' and represent the most common type of gillnetting in the New England commercial fishing industry.[116, 117]

#### Hydraulic Clam Dredge

Hydraulic clam dredges harvest bivalves from the soft bottom sediments in which they are buried. This technique of harvesting Atlantic surf clams and ocean quahogs is utilized where soft bottom conditions allow for the gear to penetrate the seafloor enough to make this method efficient for capturing clams. The hydraulic dredges are dragged slowly along the bottom by the fishing vessel as a large hydraulic pump on the fishing vessel pumps sea water through a hose to a manifold on the front of the dredge.

The manifold jets the water into the sand, temporarily fluidizing the sand and allowing the dredge to penetrate the sediment to a depth below the seafloor of approximately 1.0 ft (0.3 m), capturing bivalves (and similarly sized rocks, debris, or fish) in the process.

As this is a depletion fishery, these vessels will make repeated passes through an area until the clam numbers drop. In addition, clams are long-lived bivalves, and it has historically proven difficult to predict where commercially viable volumes may be found, resulting in a high degree of inter-annual variation in landings.

Atlantic surf clams and ocean quahogs are the most common species commercially targeted by this gear in southern New England, but fishing activity is more concentrated outside of the ECC than in it.

### *3.6.1.7. Summary of Commercial Fishing in the ECC*

VMS, AIS, and VTR data were used to evaluate fishing activity in the ECC. In addition to actively fishing in the ECC, commercial fishing vessels also transit through this area throughout the year. This is based on an analysis of charts of AIS tracks overlaid on the proposed ECC and discussions of relative fishing effort via VMS and VTR data analysis. Based on the time ranges of these datasets, SouthCoast Wind anticipates that fishing vessel transit and activity will continue in this area for the lifetime of the proposed Project.

VTR data shows bottom trawl and pots and trap fishing activity within the Sakonnet River near the cable landfall location in the ECC.

As shown above in Table 3-13, Point Judith, Rhode Island and New Bedford, Massachusetts received the highest revenue from commercial fish caught and landed from the ECC. The Port of New Bedford is identified as a potential port for Project construction, O&M, and decommissioning activities. SouthCoast Wind has validated fisheries landing data with field observations from geophysical surveys, consultation with fishing stakeholders, including Fisheries Representatives, fishing organizations, and individual vessels. Further consultation with stakeholders as well as fisheries economists will determine the level of exposure that exists for boats using the ports and their use of the ECC.

Fishing is considered exposed in the 2017 Kirkpatrick et al.[118] study if it occurs within 1.0 nm (1.9 km) of a Wind Energy Area, which, for the purposes of the proposed Project, is the Kirkpatrick Study Area (composed of both the Rhode Island/ Massachusetts Wind Energy Area and the Massachusetts Wind

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[116] NMFS. 2019. *Fishing Gear: Gillnets.*

[117] Pol, M. and H.A. Carr. 2000. Overview of Gear Developments and Trends in the New England Commercial Fishing Industry. *Northeastern Naturalist* 7(4): 329-336.

[118] Kirkpatrick, A.J., S. Benjamin, G.S. DePiper, T. Murphy, S. Steinback, and C. Demarest. 2017. SocioEconomic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic. Volume II—Appendices. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region, Washington, D.C. OCS Study BOEM 2017-012. 191 pp.

Energy Area).[119] For commercial fisheries, exposure does not measure economic impact or loss but is defined as the potential for a fishery to see an impact from offshore wind development. Based on the exposed fisheries within the Kirkpatrick Study Area[120] trawling, midwater trawling, gillnetting, and pots and traps are the most prominent gear types utilized in the area. Bottom trawlers in the Kirkpatrick Study Area target species within the Small Mesh Multispecies Fishery Management Plan (FMP) (silver hake, red hake, offshore hake) as well as Squid, Mackerel, Butterfish FMP (Atlantic mackerel, chub mackerel, longfin squid, shortfin squid, and butterfish).[121, 122, 123] Gillnetters in the Kirkpatrick Study Area primarily target monkfish, skates, and spiny dogfish, as well as summer flounder, scup, and black sea bass.[124] Pots and traps catch species in the ECC including Jonah crab,[125] American lobster,[126] whelks,[127] rock crabs,[128] and black sea bass.[129] A description of these gear types is provided above.

### 3.6.2. Recreational Fishing

For the purposes of this section, recreational fishing is referred to as saltwater fishing for sport or pleasure, either by for-hire boats or by private anglers.[130] Saltwater recreational fishing takes place from shore, aboard private or rented boats, and on boats that take passengers for hire. For-hire recreational fishing can be assessed from either a boat level or angler level. Boat level recreational fishing activity is assessed in terms of the average annual number and percentage of exposed boats, trips, and revenues. Angler level recreational fishing activity is assessed in terms of average annual number and percentage of exposed angler trips and expenditures. Approximately 96 for-hire recreational fishing boats are ported in Rhode Island.[131] The intensity and locations of recreational fishing within Rhode Island state waters are not expected to be affected. In fact, the proposed Project may provide some positive effects to recreational fisheries by creating new fish-friendly habitats for certain species.[132] It has been recognized that the Project infrastructure may function as fish aggregating devices[133] and provide additional habitat for certain species.

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119 Kirkpatrick et al. 2017.
120 Kirkpatrick et al. 2017.
121 Kirkpatrick et al. 2017.
122 New England Fishery Management Council. 2021. *Small-mesh Multispecies FMP. Plan Overview.* https://www.nefmc.org/management-plans/small-mesh-multispecies
123 Mid-Atlantic Fishery Management Council. 2021. Overview. *Mackerel, Squid, and Butterfish.* https://www.mafmc.org/msb.
124 Kirkpatrick et al. 2017.
125 Atlantic States Marine Fisheries Commission. (ASFMC). 2021. *Jonah Crab.* http://www.asmfc.org/species/jonah-crab.
126 ASMFC. 2019. *American Lobster.* Available online: http://www.asmfc.org/species/american-lobster.
127 Massachusetts Division of Marine Fisheries. (MA DMF). 2021. *Whelks and Whelk Management.* https://www.mass.gov/service-details/whelks-and-whelk-management.
128 Maine Sea Grant. (n.d.). *Maine Seafood Guide – Crab.* https://seagrant.umaine.edu/maine-seafood-guide/crab/.
129 ASFMC. 2021. *Black Sea Bass.* http://www.asmfc.org/species/black-sea-bass.
130 NMFS. 2020. *Saltwater Recreational Fishing in the Greater Atlantic Region.* Retrieved November 2020 from: https://www.fisheries.noaa.gov/new-england-mid-atlantic/recreational-fishing/saltwater-recreational-fishing-greater-atlantic.
131 Steinback, S. & A. Brinson. 2013. *The Economics of the Recreational For-hire Fishing Industry in the Northeast United States,* 2nd ed. Northeast Fisheries Science Center Social Sciences Branch, NOAA Fisheries. Woods Hole, MA. https://www.savingseafood.org/images/recreational_econ.pdf.
132 Kirkpatrick, A.J., S. Benjamin, G.S. DePiper, T. Murphy, S. Steinback, and C. Demarest. 2017. SocioEconomic Impact of Outer Continental Shelf Wind Energy Development on Fisheries in the U.S. Atlantic. Volume I—Report Narrative. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region, Washington, D.C. OCS Study BOEM 2017-012. 150 pp. Retrieved from: https://espis.boem.gov/final%20reports/5580.pdf
133 Kramer, S. H., C. D. Hamilton, G. C. Spencer, and H. D. Ogston. 2015. Evaluating the Potential for Marine and Hydrokinetic Devices to Act as Artificial Reefs or Fish Aggregating Devices, Based on Analysis of Surrogates in Tropical, Subtropical, and Temperate U.S. West Coast and Hawaiian Coastal Waters. OCS Study BOEM 2015-021. U.S. Department of Energy, Energy Efficiency and Renewable Energy, Golden, Colorado.

Species targeted by this fishing community exist throughout the entire near-coastal region and within the Kirkpatrick Study Area. Commonly caught species for recreational fishing include striped bass, Atlantic mackerel, scup, black sea bass, and haddock (Table 3-16).

**TABLE 3-16. COMMONLY CAUGHT RECREATIONAL FISH SPECIES IN RHODE ISLAND (2019)**

| Rank | Species | Pounds (lbs.) |
|---|---|---|
| 1 | Scup | 2,856,492 |
| 2 | Striped bass | 2,299,617 |
| 3 | Tautog | 1,483,139 |
| 4 | Black sea bass | 1,225,072 |
| 5 | Bluefish | 932,001 |
| 6 | Summer flounder | 837,116 |
| 7 | Atlantic cod | 143,753 |
| 8 | Atlantic menhaden | 135,763 |
| 9 | Atlantic bonito | 102,213 |
| 10 | Striped sea robin | 53,819 |

*Source: NMFS. 2019. Recreational Fishing Data and Statistics Queries. Accessed from NOAA Fisheries Recreational Fishing Data: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-and-statistics-queries.*

Total expenditures of recreational fishing between 2007 and 2012 in Rhode Island were $1.1 million with 3.8% exposed to Wind Energy Areas.[134] Recreational fishing aboard and private boats is considered exposed if it occurs within 1.0 nm (1.9 km) of the Offshore Project Area. In 2019, 3,739,018 angler trips via shore fishing, private/rental boats, charter boats, and party boats were estimated to occur in state and federal waters off the coast of [135] Rhode Island.

Recreational fishing locations occur throughout the Sakonnet River, Mount Hope Bay, and Rhode Island Sound. Recreational fishing boats may also transit through the ECC to reach a site, but their exact transit routes are not represented on commonly used, publicly available datasets, as these vessels do not have the VTR, VMS, or AIS requirements discussed previously for commercial fishing vessels. However, recreational fishing effort is known to exist in and around the ECC and much of the effort is clustered in several locations as these boats target these locations (Table 3-17).

**TABLE 3-17. FOR-HIRE RECREATIONAL FISHING LOCATIONS WITHIN OR NEAR THE ECC**

| Name of Fishing Location | Location | Fish species targeted a/ |
|---|---|---|
| Brown's Ledge | Offshore of Sakonnet Point | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Beavertail State Park | The opening of the West Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Brenton Point State Park | The opening of the West Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |
| Sachuest Point National Wildlife Refuge | The opening of the East Passage, inshore | Scup, black sea bass, striped bass, summer flounder, bluefish |

[134] Kirkpatrick et al. 2017.

[135] NMFS. 2019. *Recreational Fishing Data and Statistics Queries*. Accessed from NOAA Fisheries Recreational Fishing Data: https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-and-statistics-queries.

| Name of Fishing Location | Location | Fish species targeted a/ |
|---|---|---|
| Breakwater at Sakonnet | Inshore of the East Passage, Sakonnet River | Scup, black sea bass, striped bass, summer flounder, bluefish |

*Sources: CRMC. 2010. Rhode Island Ocean SAMP. https://seagrant.gso.uri.edu/oceansamp/pdf/samp_crmc_revised/RI_Ocean_SAMP.pdf.*

For-hire recreational fishing typically occurs from spring through fall for summer flounder, black sea bass, and scup and in late summer/early fall for yellowfin, bluefin, and albacore tuna, sharks, bonito, and false albacore. Striped bass recreational fishing typically occurs in the spring, summer, and fall.

In the Sakonnet River, there are relatively low levels of recreational shellfishing, notably for hard clams. Rhode Island allows recreational harvesting of whelk and bay scallops by Rhode Island residents (with no license requirement), and for the recreational harvesting of lobster and crabs (with a license requirement.[136] In Rhode Island waters, oysters may be harvested with a state permit from September-May, and bay scallops may be harvested in November and December, depending on the gear type.[137]

## 3.6.3. Potential Project Impacts

This analysis includes potential impacts to commercial and recreational fishing (both for-hire and private anglers).

### *3.6.3.1. Aquaculture*

Although there are several approved aquaculture areas within The Cove on Aquidneck Island and adjacent to Hog Island, the export cable route is not directly adjacent or co-located with any of these sites. Further, the ECC is being engineered to select the most feasible and least impactful route centerline and therefore the entire width of the ECC will not be disturbed during cable installation. No impacts are anticipated on aquaculture facilities.

### *3.6.3.2. Commercial and Recreational Fishing*

Commercial and recreational fishermen may be temporarily excluded from actively fishing within or transiting through the localized construction areas and safety exclusion zones during construction of the Project. This may result in a temporary loss of access to fishing grounds. Short-term disturbance of species targeted by commercial or recreational fisheries may occur during the construction phase of the proposed Project, resulting from cable burying and disturbance to the seafloor. However, these impacts will be temporary and localized to discrete zones within the ECC.

Construction activities will cover discrete and localized portions of the offshore Project Area on a temporary basis, relative to the available open water to navigate through, or grounds to fish within. Once construction activities are completed within safety exclusion zones, marine activities, including commercial and recreational fishing, will be allowed to continue as they were prior to construction. SouthCoast Wind will provide the fishing community with advance notice, prior to formal LNMs being issued, describing the location, extent, and duration of construction activities. Should fixed gear become separated from marker buoys, set adrift inadvertently, or mobile gear becoming snagged on, or entangled in cables or other Project components, SouthCoast Wind will work with fishermen through a lost gear claims form process to determine if reimbursement is warranted. A process to compensate

[136] RIDEM. 2021. *Recreational Fishing*. http://www.dem.ri.gov/programs/marine-fisheries/recreational-fishing.php.
[137] RIDEM. 2021.

fishermen for entanglements of fishing gear by geophysical and geotechnical survey gear has already been developed jointly with other offshore wind developers and with input from the fishing industry via Fisheries Representatives. This joint developer gear loss compensation application form has been made publicly accessible and is available on SouthCoast Wind's website. Additionally, the SouthCoast Wind Fisheries Liaison Officer (FLO) proactively contacts fishermen if their gear is entangled by geophysical and geotechnical survey operations and will continue to do so in later phases of the proposed Project, including during construction.

Short-term disturbance of species targeted by commercial or recreational fisheries may also occur during the construction phase of the proposed Project, resulting from cable burying and disturbance to the seafloor. However, these impacts will be temporary and localized to discrete zones within the ECC. These commercially and recreationally targeted species are expected to disperse to other nearby locations accessible by commercial or recreational fishing vessels.

The concentrations of suspended sediment in the water column (measured as turbidity) will increase for a short period during and following cable installation in the seabed; see Section 3.2.2 of this application and the Hydrodynamics and Sediment Dispersion Modeling Report in Attachment G. Elevated turbidity levels are expected to decrease quickly following cable installation, dropping to under 100 mg/L over ambient concentrations within five hours. Given the short duration and relatively low levels of increase, impacts to fish and fishing activities are not anticipated.

As conveyed in Table 3-16, the ECC is more frequently used for vessels transiting through to their desired fishing locations than for active fishing. As construction begins, commercial and recreational fishermen may find their route extended at times to accommodate certain construction activities, which could temporarily increase their steam times to access fishing grounds.

SouthCoast Wind will coordinate with commercial and recreational fishermen and the RI DMF to provide advance notice of the pre-lay grapnel run/ gear clearance plan, which is performed to clear the centerline of the cable route to facilitate burial of the cable via the jet-plow. The advance notice is intended to allow fishermen the opportunity to remove their deployed fishing gear.

SouthCoast Wind will coordinate with fishermen and the USCG ahead of marine construction operations to review operational planning and schedules to identify areas where fishing operations may be temporarily displaced. These strategies include broad communication strategies (e.g., USCG LNMs and also targeted, direct outreach) to coordinate construction and fishing activities in order to minimize risks to the commercial and recreational fishing industries and deployed gear, as well as other mariners.

Vessel activity during the operational phase will typically involve single vessels transiting at far less frequent intervals than during construction (or decommissioning phases), and therefore is not expected to create measurable interference with commercial or recreational fisheries activities. Therefore, once the proposed Project is operational, fishing vessels will not be considerably impeded from accessing their home ports or their fishing grounds within or outside of the ECC. As part of the future decommissioning of the Project, should the buried export cables be retired in-place, effects on commercial and recreational fishing are not expected.

Secondary cable protection (e.g., mattresses, rock placement, fronded mattress) will be used at cable crossings and for additional cable protection along the ECC if needed where target burial depth is not achieved. Cable protection may result in that area of bottom being a snag concern for trawling or dredging (i.e., due to the potential for gear hangs). Cable protection areas will be marked appropriately on nautical charts, which will limit the likelihood of interaction with fixed or mobile gear. In some cases, areas of hardbottom may have already been known seabed obstructions (snags) prior to construction, as they often represent pre-existing surficial obstructions. Lobster, crabs, and other invertebrate species may also seek shelter within cable protection, resulting in localized, indirect changes in species assemblages and concentrations.

SouthCoast Wind has conducted a Cable Burial Risk Assessment (see Attachment D - "Confidential", provided under separate cover) to calculate the target cable lowering depth to minimize risks to the offshore export cables from damage, and to mitigate potential conflicts between commercial or recreational fishermen and the new structure. This also includes potential risks to the cable from trawling activity along the ECC. To minimize conflicts between fishing gear and the proposed Project's offshore export cables, the offshore export cables will be buried at depths of 3.2 to 13.1 ft (1.0 to 4.0 m), with a target burial depth of 6.0 ft.

For unplanned maintenance of the offshore export cables, a vessel may require anchoring within the ECC. If required, this would also be a low-frequency, short-term activity. In addition, SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.

Within the Brayton Point export cable corridor, the annual yearly landings for all species were valued at $910,751. Loligo squid and lobster represented the highest annual value per year in the ECC from 2008 to 2018. Once the proposed Project is operational, the gear types primarily used by these fisheries (e.g., midwater trawls for squid, pots for lobster) are not expected to be impacted by the presence of the buried offshore export cables within the ECC. Therefore, following installation of the proposed Project, these fisheries are expected to continue to account for landings within the ranges reported from 2008 to 2018, barring outside sources of variance (e.g., inter-annual variation of population abundance, geographic shifts, climate change, or other factors, such as market forces or regulations).

Impacts resulting from decommissioning of the proposed Project are expected to be similar to or less than those already described for construction. The proposed Project's offshore export cables may be left in place to minimize environmental impact, which will also result in a reduction in vessel traffic along the ECC. If cable removal is required, vessel activity for removing the offshore export cables will be limited temporally to the cable removal process, limited spatially to the offshore export cable route, and similar to those experienced during cable installation. Furthermore, decommissioning techniques are expected to advance during the lifetime of the proposed Project. Prior to the decommissioning phase, a full decommissioning plan will be provided to the appropriate regulatory agencies for approval, along with a re-evaluation of potential impacts within the context of the best available science to be considered at that time.

Overall, adverse effects to commercially and recreationally targeted species are expected to be negligible within the context and scale of the southern New England region.[138]

### *3.6.3.3. Commercial Fishing Landings*

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 ECC; therefore, these fisheries are most likely to be affected during installation of the ECC. During O&M, commercial and recreational fisheries are expected to experience none to limited effects from the presence of the offshore export cables because they will be buried beneath the seabed. SouthCoast Wind has and will continue to work to limit

[138] CRMC. 2010. *Rhode Island Ocean SAMP*. https://seagrant.gso.uri.edu/oceansamp/pdf/samp_crmc_revised/RI_Ocean_SAMP.pdf.

the amount of protection associated with cable crossings and areas in which target burial depth is infeasible. Cable crossings are coordinated with pre-existing cable owners and areas in which target burial depth is infeasible are typically areas of hard bottom, so any added cable protection closely resembles the existing bottom type. SouthCoast Wind will make available the locations of cable protection and use design and installation methods for protection that minimize impacts to both fisheries resources and fishing activity.

The USCG's stated policy is that in the United States vessels will have the freedom to navigate through [wind farms], including export cable routes.[139] Commercial and recreational fishermen will have the ability to continue to fish along the ECC. SouthCoast Wind is currently working with a fisheries economist to prepare an economic exposure analysis to provide a more detailed estimation of impacts to commercial fishing landings (as well as impacts to recreational fisheries) from Project impacts.

## 3.6.4. Proposed Avoidance, Minimization, and Mitigation Measures

### *3.6.4.1. Proposed Fisheries Monitoring Research and Activities*

SouthCoast Wind has prepared an FMP (included as Attachment K) for Rhode Island state waters. This plan is a product of engagement with RI DMF and outreach to the recreational and commercial fishing industry. In addition, in federal waters, SouthCoast Wind is working with the University of Massachusetts Dartmouth's School for Marine Science and Technology, the Anderson Cabot Center of Ocean Life at the New England Aquarium to conduct baseline surveys of existing fisheries information in and around the Offshore Project Area and establish monitoring plans for pre-construction, construction, post-construction. These fisheries monitoring plans will be designed to align with Bureau of Ocean Energy Management guidelines (BOEM 2020a[140]), and additional recommendations provided by the Responsible Offshore Science Alliance (ROSA) Fisheries Monitoring Working Group. SouthCoast Wind began a regional monitoring study of Highly Migratory Species and recreational fishing in 2021; collaborating with the New England Aquarium, Inspire Environmental, and other Rhode Island/ Massachusetts Wind Energy Area developers. SouthCoast Wind is also actively participating in regional efforts with other developers, the fishing industry, and academic researchers to promote and standardize fisheries monitoring research and non-extractive survey methods.

The SouthCoast Wind Project will help fuel innovation, advance research, and build consistency across modeling, monitoring and research efforts.

### *3.6.4.2. Proposed Fisheries Mitigation Measures*

Below is a list of measures applicable to commercial and recreational fisheries that SouthCoast Wind will adopt:

- SouthCoast Wind has developed a Fisheries Communication Plan (COP, Appendix W) with the aid of a FLO and multiple Fisheries Representatives.
- SouthCoast Wind has taken Input from the commercial fishing industry on Project siting, design, navigation, and access.

[139] See Coast Guard Navigation and Vessel Inspection Circular 01-19 dated 1 August 2019.

[140] Bureau of Ocean Energy Management (BOEM) Office of Renewable Energy Programs. 2019. Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585. June 2019 and 2020.

- SouthCoast Wind has developed a process for financial compensation to commercial fishermen for damages to or loss of fishing gear as well as lost revenue due to gear loss from Project activities.
- SouthCoast Wind has and will continue to add fishermen with local experience as Fisheries Onboard Representatives on geophysical survey vessels, when possible, to coordinate survey activities with fishing activities
- ~~SouthCoast Wind will work with municipal shellfish constables to coordinate shellfish seeding with planned activities prior to construction activities.~~.
- SouthCoast Wind is currently not aware of any aquaculture lease sites that would be directly affected by the ECC, but will continue to coordinate with RIDEM, RI DMF, RI CRMC, the Habitat Advisory Board, and the Fishermen's Advisory Board.
- SouthCoast Wind is currently working with commercial and recreational fishermen as well as fisheries representatives to determine construction timing and locations with fishing vessels to anticipate and avoid/minimize/mitigate gear interactions that may occur during construction.
- Temporary safety zone restrictions associated with construction activities will limit direct access to areas with construction activity for the safety of mariners and Project employees, but these areas will be limited spatially and temporally.
- SouthCoast Wind will implement temporary safety zones around active construction areas in consultation with USCG and in communication with RIDEM.
- SouthCoast Wind will provide prompt updates to mariners and corresponding web updates as they become available – the frequency of these updates will be dictated by the type of activity, which could be as frequent as daily notifications during construction.
- SouthCoast Wind will notify mariners via LNMs of the presence and location of partially installed structures.
- The SouthCoast Wind FLO will proactively contact fishermen if their gear is entangled during construction.
- SouthCoast Wind will consider the use of fixed mooring buoys at various strategic locations in the Project Area to avoid the need for anchoring.
- SouthCoast Wind will continue to ensure that all Project-related vessels follow appropriate navigational routes and other USCG requirements, communicate via USCG LNMs, issue regular mariner updates and/or direct offshore radio communications to help mitigate risks to the commercial and recreational fishing industries, as well as other mariners.