

S. Executive Summary

S.1. Introduction

This Draft Environmental Impact Statement (EIS) assesses the reasonably foreseeable impacts on physical, biological, socioeconomic, and cultural resources that could result from the construction and installation, operations and maintenance (O&M), and conceptual decommissioning of a commercial-scale offshore wind energy facility and transmission cable to shore known as the Coastal Virginia Offshore Wind Commercial Project (CVOW-C or Project). The Bureau of Ocean Energy Management (BOEM) has prepared the Draft EIS under the National Environmental Policy Act (NEPA) (42 U.S. Code [U.S.C.] 4321–4370f). This Draft EIS will inform BOEM’s decision on whether to approve, approve with modifications, or disapprove the Project’s Construction and Operations Plan (COP).

Cooperating agencies may rely on this EIS to support their decision-making. In conjunction with submitting its COP, Virginia Electric and Power Company doing business as Dominion Virginia Power (Dominion Energy, the lessee) applied to the National Marine Fisheries Service (NMFS) for an incidental take authorization under the Marine Mammal Protection Act (MMPA) of 1972, as amended (16 U.S.C. 1361 et seq.), for incidental take of marine mammals during Project construction. NMFS is required to review applications and, if appropriate, issue an incidental take authorization under the MMPA. NMFS intends to adopt the Final EIS if, after independent review and analysis, NMFS determines the Final EIS to be sufficient to support the authorization. The U.S. Army Corps of Engineers (USACE) similarly intends to adopt the EIS to meet its responsibilities under Section 404 of the Clean Water Act (CWA) and Section 10 and Section 14 of the Rivers and Harbors Act of 1899 (RHA).

S.2. Purpose and Need for the Proposed Action

In Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, issued January 27, 2021, President Joseph R. Biden stated that it is the policy of the United States “to organize and deploy the full capacity of its agencies to combat the climate crisis to implement a Government-wide approach that reduces climate pollution in every sector of the economy; increases resilience to the impacts of climate change; protects public health; conserves our lands, waters, and biodiversity; delivers environmental justice; and spurs well-paying union jobs and economic growth, especially through innovation, commercialization, and deployment of clean energy technologies and infrastructure.”

Through a competitive leasing process under 30 Code of Federal Regulations (CFR) 585.211, Dominion Energy was awarded commercial Renewable Energy Lease OCS-A-0483. Dominion Energy has the exclusive right to submit a COP for activities within the Lease Area, and it has submitted a COP to BOEM proposing the construction and installation, O&M, and conceptual decommissioning of an offshore wind energy facility in the Lease Area (the Project) (Figure S-1).

Dominion Energy’s goal is to develop a commercial-scale offshore wind energy facility in the Lease Area; to provide between 2,500 and 3,000 megawatts (MW) of energy, making landfall in Virginia Beach, Virginia; and to use the offshore wind power generated from the proposed Project to supply its own customers (see Section 1.3 of the COP). Based on the goals of Dominion Energy, BOEM’s authority, and Executive Order 14008, the purpose of BOEM’s action is to respond to Dominion Energy’s COP proposal and determine whether to approve, approve with modifications, or disapprove Dominion Energy’s COP to construct and install, operate, and maintain, and decommission a commercial-scale offshore wind energy facility within the Lease Area (the Proposed Action). BOEM’s action is needed to

further the United States policy, including Executive Order 14008, to make Outer Continental Shelf (OCS) energy resources available for expeditious and orderly development, subject to environmental safeguards (43 U.S.C. 1332(3)), including consideration of natural resources, safety of navigation, and existing ocean uses.

In addition, the National Oceanic and Atmospheric Administration's NMFS received a request for authorization to take marine mammals incidental to construction activities related to the Project under the MMPA on February 16, 2022. NMFS' issuance of an MMPA incidental take authorization is a major federal action, and, in relation to BOEM's action, is considered a connected action (40 CFR 1501.9I(1)). The purpose of the NMFS action—which is a direct outcome of Dominion Energy's request for authorization to take marine mammals incidental to specified activities associated with the Project (e.g., pile driving)—is to evaluate the lessee's request pursuant to specific requirements of the MMPA and its implementing regulations administered by NMFS, consider impacts of the lessee's activities on relevant resources, and, if appropriate, issue the authorization. NMFS needs to render a decision regarding the request for authorization due to NMFS' responsibilities under the MMPA (16 U.S.C. 1371(a)(5)(A and D)) and its implementing regulations. If, after independent review, NMFS makes the findings necessary to issue the requested authorization, NMFS, after independent review, intends to adopt BOEM's EIS to support that decision and fulfill its NEPA requirements.

USACE Norfolk District anticipates a permit action to be undertaken through authority delegated to the District Engineer by 33 CFR 325.8, under Section 10 of the RHA (33 U.S.C. 403) and Section 404 of the CWA (33 U.S.C. 1344). In addition, it is anticipated that a Section 408 permission will be required pursuant to Section 14 of the RHA (33 U.S.C. 408) for any proposed alterations that have the potential to alter, occupy, or use any USACE federally authorized Civil Works projects. USACE considers issuance of a permit or permissions under these three delegated authorities a major federal action connected to BOEM's Proposed Action (40 CFR 1501.9(e)(1)). The purpose and need for the Project as provided by the lessee in Section 1.3 of the COP and reviewed by USACE for NEPA purposes is to provide a commercially viable offshore wind energy project within the area covered by Lease OCS-A-0483 to help states achieve their renewable energy goals. The basic Project purpose, as determined by USACE for Section 404(b)(1) guidelines evaluation, is offshore wind energy generation. The overall Project purpose for Section 404(b)(1) guidelines evaluation, as determined by USACE, is the construction and operation of a commercial-scale offshore wind energy project for renewable energy generation and distribution to the PJM Interconnections energy grid. The purpose of the USACE Section 408 action as determined by Engineer Circular 1165-2-220 is to evaluate the lessee's request and determine whether the proposed alterations are injurious to the public interest or impair the usefulness of the USACE project. The USACE Section 408 permission is needed to ensure that Congressionally authorized projects continue to provide their intended benefits to the public. USACE intends to adopt BOEM's EIS to support its decision on any permits or permissions requested under Section 10 of the RHA, Section 404 of the CWA, or Section 14 of the RHA. USACE would adopt the EIS pursuant to 40 CFR 1506.3 if, after its independent review of the document, it concludes that the EIS satisfies USACE's comments and recommendations. Based on its participation as a cooperating agency and its consideration of the Final EIS, USACE would issue a Record of Decision to formally document its decision on the Proposed Action.

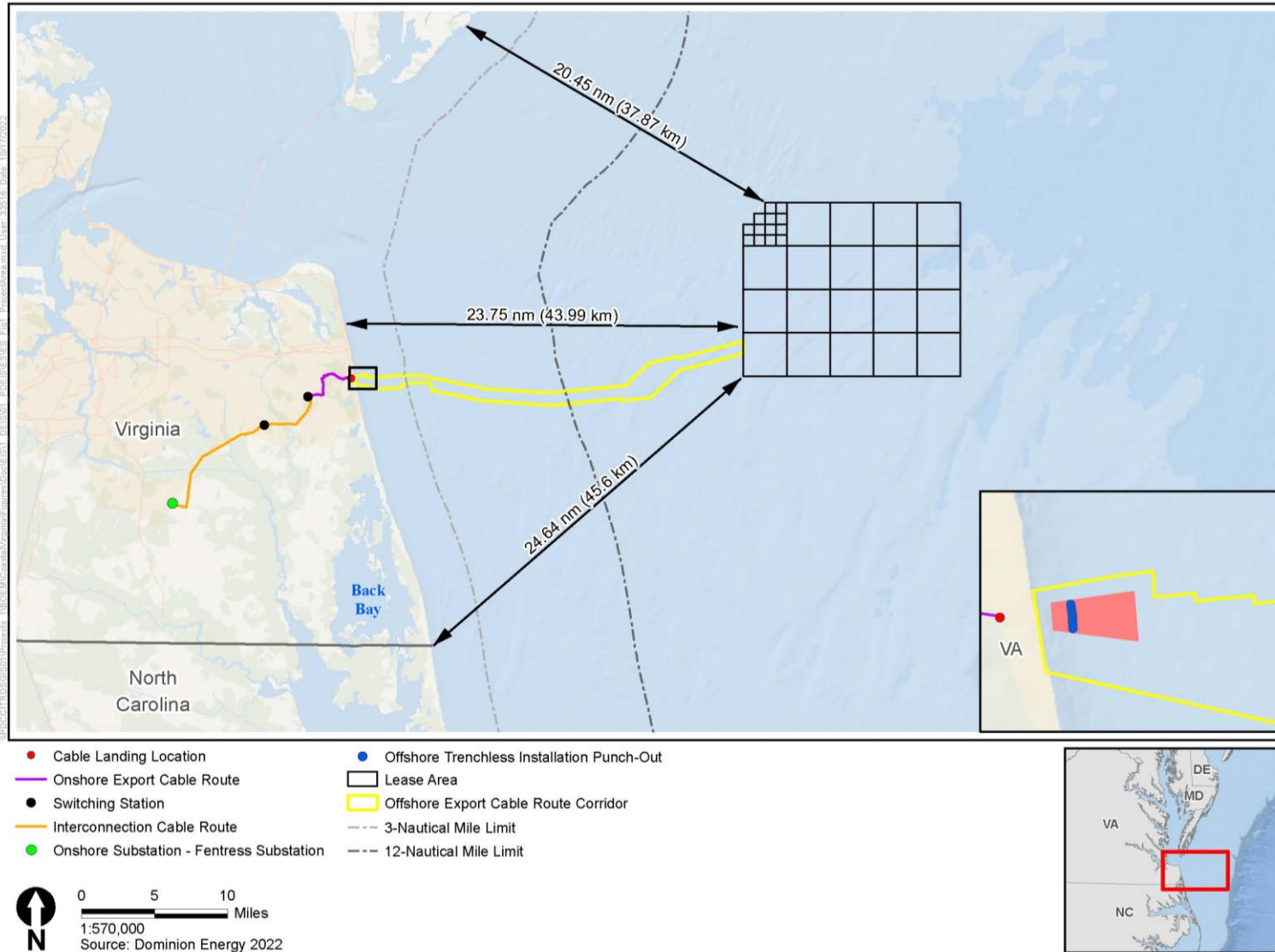


Figure S-1 Coastal Virginia Offshore Wind Commercial Project

S.3. Public Involvement

On July 2, 2021, BOEM issued a Notice of Intent (NOI) to prepare an EIS, initiating a 30-day public scoping period from July 2 to August 2, 2021 (86 *Federal Register* 35329). The NOI solicited public input on the significant resources and issues, impact-producing factors, reasonable alternatives, and potential mitigation measures to analyze in the EIS. BOEM also used the NEPA scoping process to initiate the Section 106 consultation process under the National Historic Preservation Act (54 U.S.C. 300101 et seq.), as permitted by 36 CFR 800.2(d)(3), and sought public comment and input through the NOI regarding the identification of historic properties or potential effects on historic properties from activities associated with approval of the Dominion COP. BOEM held three virtual public scoping meetings on July 12, July 14, and July 20, 2021, to present information on the Project and NEPA process, answer questions from meeting attendees, and to solicit public comments. Scoping comments were received through Regulations.gov on docket number BOEM-2021-0040, via email to a BOEM representative, and through oral testimony at each of the three public scoping meetings. BOEM received total of 52 comment submissions from federal and state agencies, local governments, non-governmental organizations, and the general public during the scoping period. The topics most referenced in the scoping comments included mitigation and monitoring; commercial fisheries and for-hire recreational fishing; finfish, invertebrates, and essential fish habitat; marine mammals; birds; air quality and climate change; employment and job creation; wetlands and Waters of the U.S.; purpose and need; alternatives; and cumulative impacts. BOEM considered all scoping comments while preparing this Draft EIS. Publication of this Draft EIS initiates a 60-day public comment period. BOEM will consider the comments received on the Draft EIS during preparation of the Final EIS.

S.4. Alternatives

BOEM considered a reasonable range of alternatives during the EIS development process that emerged from scoping, interagency coordination, and internal BOEM deliberations. The Draft EIS evaluates the No Action Alternative and four action alternatives (two of which have sub-alternatives). The action alternatives are not mutually exclusive; BOEM may select a combination of alternatives that meet the purpose and need of the proposed Project. The alternatives are as follows:

- No Action Alternative
- Alternative A—Proposed Action
 - Alternative A-1—Revised Layout to Align Substations and Wind Turbine Generators (WTGs)
- Alternative B—Revised Layout to Accommodate the Fish Haven and Navigation
- Alternative C—Sand Ride Impact Minimization Alternative
- Alternative D—Onshore Habitat Impact Minimization Alternative
 - Alternative D-1—Interconnection Cable Route Option 6 (Hybrid Route)
 - Alternative D-2—Interconnection Cable Route Option 1

Alternatives considered but dismissed from detailed analysis and the rationale for their dismissal are described in Section 2.1.6.

S.4.1 No Action Alternative

Under the No Action Alternative, BOEM would not approve the COP. Project construction and installation, O&M, and decommissioning would not occur, and no additional permits or authorizations for the Project would be required. Any potential environmental and socioeconomic impacts, including

benefits, associated with the Project as described under the Proposed Action would not occur. However, all other existing or other reasonably foreseeable future activities described in Appendix F, *Planned Activities Scenario*, would continue. The ongoing effects of the No Action Alternative serve as the baseline against which all action alternatives are evaluated.

S.4.2 Alternative A—Proposed Action

The Proposed Action would construct, operate, maintain, and eventually decommission an up-to 3,000-MW wind energy facility on the OCS offshore Virginia and associated onshore power distribution facilities within the range of design parameters described in Chapters 1 through 3 of the CVOW-C COP (Dominion Energy 2022) and summarized in Table S-1 and Appendix E, *Project Design Envelope and Maximum-Case Scenario*. Under the Proposed Action, the wind energy facility would consist of up to 205 WTGs ranging from 14 MW to 16 MW each. Refer to Chapter 2 of the CVOW-C COP (Dominion Energy 2022) for additional details on Project design.

- **Alternative A-1 – Revised Layout to Align Substations and WTGs:** Alternative A-1 is the same as Alternative A, except that under Alternative A-1 the three offshore substations (OSSs) would be placed within the rows of the gridded WTG layout, taking the place of three WTG positions (i.e., Alternative A-1 would result in up to 202 WTGs and three OSSs).

Table S-1 Summary of Project Design Envelope Parameters

Project Parameter Details
General (Layout and Project Size)
<ul style="list-style-type: none"> • 176 to 205 WTGs • Anticipated to begin offshore construction in 2024 (foundations) and 2025 (WTGs) • Construction of the Project is expected to be complete within approximately 3 years
WTGs and Foundations
<ul style="list-style-type: none"> • Siemens Gamesa Renewable Energy SG 14-222 DD WTG with power-boost technology • 14- to 16-MW WTGs characterized as “minimum” and “maximum” capacity • Rotor diameter ranging from 725 to 761 feet (221 to 232 meters) • Hub height from mean sea level (MSL) ranging from 446 to 489 feet (136 to 149 meters) • Turbine tip height from MSL ranging from 804 to 869 feet (245 to 265 meters) • Installation of monopiles through pile driving • Scour protection is proposed to be installed around WTG monopile foundations. Installation vessels to include jack-up, platform supply, crew transfer, tugs, barges, heavy-lift vessels, fall pipe vessels, walk-to-work, and other support vessel types as necessary.
Inter-Array Cables
<ul style="list-style-type: none"> • Up to 66-kV cables buried 3.3 to 9.8 feet (1 to 3 meters) beneath the seabed • Up to 300 miles (484 kilometers) total length of inter-array cables (average inter-array cable length of 5,868 feet [1,789 meters] between turbines) • Installation by jet trenching, chain cutting, trench former, or other available technologies • Installation vessels to include deep-draft cable lay, walk-to-work, crew transfer, trenching support, burial tool, survey, multipurpose support vessels, and other support vessel types as necessary

Project Parameter Details
<p>Offshore Export Cables</p> <ul style="list-style-type: none"> • Up to nine 230-kV offshore export cables buried 3.3 to 16.4 feet (1 to 5 meters) beneath the seabed; with additional cover in some sections, total burial depth may be up to 24.6 feet (7.5 meters) • Nine offshore export cables (in a single corridor) • Up to 416.9 miles (671 kilometers) total length of offshore export cable • Installation by jet trenching, plowing, chain cutting, trench former, or other available technologies • Installation vessels to include pull-in support barge, tug, multipurpose support, survey, shallow-draft cable lay, hydroplow, crew transfer, deep-draft, walk-to-work, trenching support, burial tool vessels, and other support vessel types as necessary • Cable protection at the cable crossings
<p>Offshore Substations</p> <ul style="list-style-type: none"> • Three OSSs • OSSs installed atop piled jacket foundations • Scour protection installed at all foundation locations • Installation vessels to include barge, tug, transport, heavy lift, anchor handling, jack-up vessels, platform support, and other support vessel types as necessary
<p>Onshore Facilities</p> <ul style="list-style-type: none"> • Landfall of offshore export cable(s) would be completed via Trenchless Installation • Maximum area of temporary disturbance for cable landing location: 2.8 acres (1.1 hectares maximum temporary workspace at the Nearshore Trenchless Installation Area approximately 8.8 acres [3.6 hectares]) • Construction work area for the switching station: maximum of approximately 45.4 acres (18.4 hectares) • Construction work area for the upgrades at the onshore substation (existing Dominion Energy Fentress substation): maximum of approximately 18.5 acres (7.5 hectares) • Maximum onshore export cable length of approximately 4.41 miles (7.10 kilometers) • Maximum interconnection cable length of approximately 14.2 miles (22.9 kilometers) • Maximum area of temporary disturbance for onshore export cable route of approximately 26.6 acres (10.8 hectares) acres (27.6 hectares)¹ • Maximum area of permanent disturbance for onshore export cable route of approximately 1.0 acre (0.4 hectares)² • Maximum area of temporary disturbance for Interconnection Cable Route Option 1 of approximately 0 acres (0 hectares)² • Maximum area of permanent disturbance for Interconnection Cable Route Option 1 of approximately 1 acre (0.4 hectare)³ • Maximum area of temporary disturbance for Hybrid Interconnection Cable Route Option 6 of approximately 29.0 acres (11.7 hectares)⁴ • Maximum area of permanent disturbance for Hybrid Interconnection Cable Route Option 6 of approximately 4.2 acres (1.7 hectares)⁵

Sources: COP Table 1.2-1; Dominion Energy 2022; BOEM and Dominion Energy 2022..
 kV = kilovolt; MSL = mean sea level.

¹ For the purposes of this analysis, the estimated temporary disturbance for the onshore export cable route is associated with the areas of the route that are surface trenched (60-foot-wide [18-meter-wide] trench for ~3.7 miles [6 kilometers]).

² For the purposes of this analysis, the estimated permanent disturbance for the onshore export cable route is associated with the permanent structures (i.e., manhole vaults).

³ For the purposes of this analysis, the total permanent disturbance for Interconnection Cable Route Option 1 is associated with the new permanent structures (i.e., transmission towers) to be installed within the new/proposed right-of-way. For the purposes of this analysis, it is assumed that no other land disturbance will occur within the interconnection cable route.

⁴ For the purposes of this analysis, the estimated temporary disturbance for Hybrid Interconnection Cable Route Option 6 is associated with the area of the underground portion of the route that is surface trenched.

⁵ For the purposes of this analysis, the estimated permanent disturbance for Hybrid Interconnection Cable Route Option 6 is associated with the permanent structures (i.e., manhole vaults for the underground portion of the route and transmission towers for the overhead portion of the route).

S.4.3 Alternative B—Revised Layout to Accommodate the Fish Haven and Navigation

Under Alternative B, the construction, O&M, and eventual decommissioning of a 2,587-MW wind energy facility on the OCS offshore Virginia would occur within the range of the design parameters outlined in the COP, subject to applicable mitigation measures. However, the fish haven area along the northern boundary of the Lease Area would be an exclusion zone where eight WTGs and associated inter-array cables and other Project infrastructure would not be sited. Three WTGs and associated inter-array cables would also be excluded from the northwest corner of the Lease Area to avoid conflicts with a proposed vessel traffic fairway. Up to 176 WTGs under Alternative B would each be 14 MW and capable of generating up to 14.7 MW using power-boost capability in a 0.93- by 0.75-nautical-mile (1.72- by 1.39-kilometer) offset grid in an east–west by northwest by southeast gridded layout. The three OSSs would be placed within the rows of the gridded WTG layout to minimize disruptions to surface and aerial navigation through the Wind Turbine Area. This configuration would still allow micrositing of infrastructure (WTGs, inter-array cables, and OSSs), up to 500 feet, to avoid sensitive cultural resources and marine habitats. Onshore components would be the same as described under Alternative A.

S.4.4 Alternative C—Sand Ridge Impact Minimization Alternative

Alternative C was developed through the scoping process for the Draft EIS in response to comments received requesting an alternative to minimize impacts on offshore benthic habitats. Under Alternative C, the construction, O&M, and eventual decommissioning of a wind energy facility would include a similar offshore layout and range of design parameters as described under Alternative B. However, in addition to avoiding the fish haven and the proposed vessel traffic fairway, Alternative C would avoid and minimize impacts on sand ridge habitat and shipwrecks through a combination of micrositing of infrastructure (WTGs, inter-array cables, and OSSs), up to 500 feet, the removal of four WTGs from priority ridge habitat, and the relocation of one WTG to a spare position. Under Alternative C, the removal of four WTGs and relocation of one WTG allows for the reconfiguration of inter-array cabling that would otherwise be developed within priority sand ridge habitats, thus reducing potential seafloor disturbance, including the cross-cutting and trenching of sand ridges. As a result, an up-to 2,528 MW wind energy facility consisting of up to 172 WTGs (inclusive of two spare WTG positions) and three OSSs with associated export cables would be developed under Alternative C. As under Alternative B, Alternative C would use 14 MW WTGs generating up to 14.7 MW each using power-boost capability in a 0.93- by 0.75-nautical-mile (1.72- by 1.38-kilometer) offset grid pattern. Onshore components would be the same as described under the Proposed Action.

S.4.5 Alternative D—Onshore Habitat Minimization Alternative

Alternative D was developed through the scoping process for the Draft EIS in response to public comments regarding the potential impacts on sensitive onshore habitats, including wetlands. Under Alternative D, the construction, O&M, and eventual decommissioning of a wind energy facility would include the same offshore layout and range of design parameters as Alternative A: an up-to 3,000 MW wind energy facility consisting of up to 205 WTGs ranging from 14 MW to 16 MW each and three OSSs

in the Lease Area, with associated export cables. Unlike Alternative A, the construction of onshore interconnection cables under Alternative D would follow either Interconnection Cable Route Option 1 or Interconnection Cable Route Option 6 (Hybrid Route). Therefore, under Alternative D BOEM would consider and potentially approve Interconnection Cable Route Option 1 or Interconnection Cable Route Option 6, whereas only Interconnection Cable Route Option 1 is considered under Alternative A. Each of the following sub-alternatives may be individually selected or combined with any or all other alternatives or sub-alternatives, subject to the combination meeting the purpose and need.

- **Alternative D-1:** Interconnection Cable Route Option 1 would be the same as described under the Proposed Action and would be approximately 14.2 miles (22.9 kilometers) long and installed entirely overhead. From the common location north of Harpers Road, Interconnection Cable Route Option 1 would continue to the onshore substation, and the new Harpers Switching Station would be located at Naval Air Station (NAS) Oceana Parcel, pending Navy approval.
- **Alternative D-2:** Interconnection Cable Route Option 6 (Hybrid Route) would be approximately 14.2 miles (22.9 kilometers) long and mostly follow the same route as Interconnection Cable Route Option 1, with the exception of the switching station. Interconnection Cable Route Option 6 would be installed via a combination of underground and overhead construction methods. Following Interconnection Cable Route Option 1 as an underground transmission line for approximately 4.5 miles (7.2 kilometers) to a point north of Princess Anne Road, Interconnection Cable Route Option 6 would transition to an overhead transmission line configuration. The Chicory Switching Station would be built north of Princess Anne Road; therefore, no aboveground switching station would be built at Harpers Road. From the Chicory Switching Station, Interconnection Cable Route Option 6 would align with Interconnection Cable Route Option 1 for the remaining 9.7 miles (15.6 kilometers) to the onshore substation. The maximum construction and operational corridor for the underground portion of Interconnection Cable Route Option 6 would be 86.5 feet (26 meters); the overhead portion would be 250 feet (76.2 meters), which is equivalent to the corridor width for Interconnection Cable Route Option 1.

Interconnection Cable Route Option 1 would be an entirely overhead route, while Interconnection Cable Route Option 6 (Hybrid Route) would involve installation of the interconnection cable using a hybrid of overhead and underground construction methods. Both interconnection cable route options are intended to avoid and minimize impacts on onshore sensitive habitats, including wetlands, surface waters, and ecological cores when compared to the other interconnection cable routes considered in the Project Design Envelope (Interconnection Cable Route Options 2 through 5).

S.5. Environmental Impacts

This Draft EIS uses a four-level classification scheme to characterize the potential beneficial impacts and adverse impacts of alternatives as either **negligible**, **minor**, **moderate**, or **major**. Resource-specific adverse and beneficial impact level definitions are presented in each Chapter 3 resource section. Table S-2 summarizes the impacts of each alternative and the impacts of each alternative combined with other reasonably foreseeable impacts. Under the No Action Alternative, the environmental and socioeconomic impacts and benefits of the action alternatives would not occur.

NEPA implementing regulations (40 CFR 1502.16) require that an EIS evaluate the potential unavoidable adverse impacts associated with a proposed action. Adverse impacts that can be reduced by mitigation measures but not eliminated are considered unavoidable. The same regulations also require that an EIS review the potential impacts of irreversible or irretrievable commitments of resources resulting from implementation of a proposed action. Irreversible commitments occur when the primary or secondary impacts from the use of a resource either destroy the resource or preclude it from other uses. Irretrievable commitments occur when a resource is consumed to the extent that it cannot recover or be replaced.

Appendix L, *Other Impacts*, describes potential unavoidable adverse impacts. Most potential unavoidable adverse impacts associated with the Proposed Action would occur during the construction phase and would be temporary. Appendix L also describes irreversible and irretrievable commitment of resources by resource area. The most notable such commitments could include effects on habitat or individual members of protected species.

Table S-2 Summary and Comparison of Impacts Among Alternatives with No Mitigation Measures

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
3.4 Air Quality					
<i>Alternative Impacts</i>	Moderate	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate; moderate beneficial	Minor; moderate beneficial	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial
3.5 Bats					
<i>Alternative Impacts</i>	Minor	Negligible to minor	Negligible to minor	Negligible to minor	Negligible to minor
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor	Minor	Minor	Minor	Minor
3.6 Benthic Resources					
<i>Alternative Impacts</i>	Moderate; moderate beneficial	Negligible to moderate; moderate beneficial	Negligible to moderate; moderate beneficial	Negligible to moderate; moderate beneficial	Negligible to moderate; moderate beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial
3.7 Birds					
<i>Alternative Impacts</i>	Moderate	Negligible to moderate; moderate beneficial	Negligible to moderate; moderate beneficial	Negligible to moderate; moderate beneficial	Moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial	Moderate; moderate beneficial

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
3.8 Coastal Habitats					
<i>Alternative Impacts</i>	Moderate	Minor	Minor	Minor	Minor
<i>Alternative Combined with Other Foreseeable Impacts</i>	Negligible	Minor	Minor	Minor	Moderate; minor beneficial
3.9 Commercial Fisheries and For-Hire Recreational Fishing					
<i>Alternative Impacts</i>	Moderate to major on commercial fisheries and moderate on for-hire recreational fishing	Moderate on commercial fisheries and for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Moderate on commercial fisheries and for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Moderate on commercial fisheries and for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Moderate to major on commercial fisheries and moderate on for-hire recreational fishing
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate to major on commercial fisheries and moderate on for-hire recreational fishing	Major on commercial fisheries and moderate on for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Major on commercial fisheries and moderate on for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Major on commercial fisheries and moderate on for-hire recreational fishing; minor beneficial on for-hire recreational fishing	Moderate to major on commercial fisheries and moderate on for-hire recreational fishing
3.10 Cultural Resources					
<i>Alternative Impacts</i>	Moderate on individual onshore and offshore cultural resources	Moderate to major on onshore and offshore cultural resources without National Historic Places Act (NHPA) pre-construction requirements	Moderate to major on onshore and offshore cultural resources without NHPA pre-construction requirements	Moderate to major on onshore and offshore cultural resources without NHPA pre-construction requirements	Negligible to major on onshore and offshore cultural resources without NHPA pre-construction requirements

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate on individual onshore and offshore cultural resources	Moderate to major without pre-construction NHPA requirements, considering long-term or permanent and irreversible impacts on cultural resources	Negligible to major assuming implementation of mitigation measures	Negligible to major assuming implementation of mitigation measures	Negligible to major assuming implementation of mitigation measures
3.11 Demographics, Employment, and Economics					
<i>Alternative Impacts</i>	Minor adverse impacts; minor beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; minor beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor on demographics, economics, and employment	Minor adverse; minor to moderate beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics	Negligible to minor adverse; negligible to moderate beneficial impacts on demographics, employment, and economics
3.12 Environmental Justice					
<i>Alternative Impacts</i>	Minor to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
3.13 Finfish, Invertebrates, and Essential Fish Habitat					
<i>Alternative Impacts</i>	Minor to moderate	Negligible to moderate; minor beneficial	Negligible to moderate	Negligible to moderate	Negligible to moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor to moderate; moderate beneficial	Negligible to moderate	Negligible to moderate	Negligible to moderate	Negligible to moderate
3.14 Land Use and Coastal Infrastructure					
<i>Alternative Impacts</i>	Minor; minor beneficial	Negligible to minor; minor beneficial	Negligible to minor; minor beneficial	Negligible to minor; minor beneficial	Negligible to minor; minor beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial	Minor; minor beneficial
3.15 Marine Mammals					
<i>Alternative Impacts</i>	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial	Negligible to moderate; minor beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate to major	Moderate to major	Moderate to major; minor beneficial	Moderate to major; minor beneficial	Moderate to major; minor beneficial
3.16 Navigation and Vessel Traffic					
<i>Alternative Impacts</i>	Moderate	Minor to moderate	Minor to major	Minor to major	Minor to moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor to moderate	Minor to major	Minor to major	Minor to major	Minor to major

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
3.17 Other Uses					
<i>Alternative Impacts</i>	Negligible on Marine Mineral extraction, marine and national security uses, aviation and air traffic, cables and pipelines, and radar systems; moderate on scientific research and surveys	Minor on marine mineral extraction; moderate on military and national security uses; negligible on aviation and air traffic with implementation of mitigation measures; negligible on cables and pipelines with implementation of mitigation measures; minor on radar systems; major on scientific research and surveys	Minor on marine mineral extraction; moderate on military and national security uses; negligible on aviation and air traffic with implementation of mitigation measures; negligible on cables and pipelines with implementation of mitigation measures; minor on radar systems; major on scientific research and surveys	Minor on marine mineral extraction; moderate on military and national security uses; negligible on aviation and air traffic with implementation of mitigation measures; negligible on cables and pipelines with implementation of mitigation measures; minor on radar systems; major on scientific research and surveys	Minor on marine mineral extraction; moderate on military and national security uses; negligible on aviation and air traffic with implementation of mitigation measures; negligible on cables and pipelines with implementation of mitigation measures; minor on radar systems; major on scientific research and surveys
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor on marine mineral extraction and national security and military uses; negligible on aviation and air traffic, cables and pipelines, and radar systems; major on scientific research and surveys	Negligible to minor on aviation and air traffic; negligible to minor on cables and pipelines; negligible to minor for marine mineral extraction; negligible to minor on radar systems; moderate on most military and national security uses; negligible to minor on radar systems; moderate for scientific research and surveys	Negligible to minor on aviation and air traffic; negligible to minor on cables and pipelines; negligible to minor on marine mineral extraction; negligible to minor on radar systems; moderate on most military and national security uses; negligible to minor on radar systems; major on scientific research and surveys	Negligible to minor on aviation and air traffic; negligible to minor on cables and pipelines; negligible to minor on marine mineral extraction; negligible to minor on radar systems; moderate on most military and national security uses; negligible to minor on radar systems; major on scientific research and surveys	Negligible to minor on aviation and air traffic; negligible to minor on cables and pipelines; negligible to minor on marine mineral extraction; negligible to minor on radar systems; moderate on most military and national security uses; negligible to minor on radar systems; major on scientific research and surveys

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
3.18 Recreation and Tourism					
<i>Alternative Impacts</i>	Negligible; negligible beneficial	Negligible to minor; negligible to minor beneficial	Negligible to minor; negligible to minor beneficial	Negligible to minor; negligible to minor beneficial	Negligible to minor; negligible to minor beneficial
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor; minor beneficial	Minor; minor beneficial	Negligible to minor; minor beneficial	Negligible to minor; minor beneficial	Negligible to minor; minor beneficial
3.19 Sea Turtles					
<i>Alternative Impacts</i>	Moderate	Moderate	Moderate	Moderate	Moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate; minor beneficial	Moderate	Moderate	Moderate	Moderate
3.20 Scenic and Visual Resources					
<i>Alternative Impacts</i>	Minor	Minor to moderate	Minor to moderate	Minor to moderate	Moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate to major	Moderate	Moderate	Moderate	Moderate
3.21 Water Quality					
<i>Alternative Impacts</i>	Minor	Minor to moderate	Minor to moderate	Minor to moderate	Minor to moderate
<i>Alternative Combined with Other Foreseeable Impacts</i>	Minor	Minor	Minor	Minor	Minor
3.22 Wetlands					
<i>Alternative Impacts</i>	Moderate	Moderate to major	Moderate to major	Moderate to major	Moderate to major

Resource	No Action Alternative	Alternative A Proposed Action	Alternative B Revised Layout to Accommodate the Fish Haven and Navigation	Alternative C Sand Ridge Impact Minimization Alternative	Alternative D Onshore Habitat Impact Minimization Alternative
<i>Alternative Combined with Other Foreseeable Impacts</i>	Moderate	Moderate to major	Moderate to major	Moderate to major	Moderate to major

Impact rating colors are as follows: orange = major; yellow = moderate; green = minor; light green = negligible or beneficial to any degree. All impact levels are assumed to be adverse unless otherwise specified as beneficial. Where impacts are presented as multiple levels, the color representing the most adverse level of impact has been applied.

NRHP = National Register of Historic Places.