Ocean Wind
An Ørsted & PSEG project

Appendix A- Alternatives Analysis

Ocean Wind 1
An Ørsted & PSEG project

Ocean Wind 1 Offshore Wind Farm

Appendix A
Alternatives Analysis

August 2022

Table of Contents

List of Figures

List of Tables

1. Project Siting and Screening

1.1 Introduction

This alternatives analysis describes the alternatives that have been considered for the Ocean Wind 1 Offshore Wind Farm Project (Project) for those portions of the project associated with the New Jersey Department of Environmental Protection application within the jurisdiction of the state of New Jersey. This report discusses the alternatives Ocean Wind LLC (Ocean Wind 1) evaluated for each of the Project components including the offshore cable route within state waters, landfalls, nearshore cable route, upland cable route, onshore substation, and point of interconnection (POI). The information contained in this report was obtained from publicly available desktop data such as research articles/studies, government digital datasets; various field studies; and agency and stakeholder input. The following sections provide analyses and discussions commensurate with the scale of individual Project components and their overall environmental impact, as required by N.J.A.C. 7:7A-16.2(b).

1.2 Initial Project Siting

Ocean Wind 1's siting process involved determining onshore POI and substation locations that would form the onshore endpoints for the Project, developing offshore and onshore export cable route corridors and landfall options, to connect the WTGs and associated offshore infrastructure to the POI.

First, Ocean Wind 1 conducted a statewide search for potential POIs to identify the range of interconnection points with the existing PJM electric transmission system that would be able to accept all or a portion of the power of from the Project with minimal upgrades. Second, Ocean Wind 1 identified substation locations within 10 miles of the selected POI. Substation locations were prioritized within 10 miles of the POI to avoid or minimize impacts to environmental features, optimize proximity to the export cable route to minimize environmental impacts, minimize neighborhood disruption, and reduce costs associated with the cable connections to the POI. Substation locations were evaluated for sufficient land availability, consistency with adjacent land uses, constructability, optimization of cable route lengths, and availability of suitable landfall locations nearby.

After the POI and substation locations were sited, Ocean Wind 1 then developed landfall study areas to identify potential landfall alternatives. Landfalls were prioritized to avoid or minimize impacts to environmental resources by leveraging existing conditions, prioritize property availability including roads and existing utility ROWs, consistency with adjacent land uses, constructability, optimization of cable route lengths, and use of existing ROWs to access the water when a parcel for the landfall location was not adjacent to the water.

Finally, onshore and offshore export cable corridors were identified and cable routes were developed in parallel to connect the onshore substation to the offshore substation sited within the Ocean Wind 1 BOEM Lease Area OCS-A 0498 (Lease Area). Offshore cable routes were evaluated to minimize extreme changes in slope and water depths, utilize coarse grain sediments of sufficient depth to meet target cable burial depths while avoiding pockets of contaminated sediments and organic sediments, optimize cable route lengths, avoid marine use conflicts, and minimize impacts to aquatic resource communities and sensitive habitats. Onshore cable routes were evaluated to minimize extreme changes in topography, target existing ROWs, limit cable length, prioritize property availability (i.e. public vs. private), avoid known Superfund Sites or sites designated as hazardous, avoid known locations of historic or archaeological resources, avoid or minimize impacts to existing onshore infrastructure, wetlands and floodplains, sensitive terrestrial habitats (i.e., pinelands), aesthetic resources and minimize impacts to sensitive receptors. For more information on screening criteria refer to **Table 1-1**.

1.3 Project Screening

Ocean Wind 1 applied the following criteria to identify and screen alternatives for the Project components (see **Table 1-1** below).

Table 1-1. Summary of criteria for Project screening and siting.

Project Component	Criteria
Point of Interconnection (POI)	• Capable of accepting all or a portion of the power from the Project with minimal upgrades • Located within 10 miles of the coastline to minimize environmental impacts and optimize cable route length • Avoid or minimize impacts to environmental features (e.g., critical habitat, wetlands, cultural resources, existing contamination). • Consistency with, and reduced or low potential impacts on, adjacent land uses. • Constructability (e.g., land use, slopes, access, temporary staging areas, and utility locations). • Availability of suitable landfall locations (i.e., those that minimize environmental impacts and are within 10 miles of the POI).
Onshore Substations	• Proximity to POI (within 10 miles) to minimize environmental impacts and optimize cable route length • Avoid or minimize impacts to environmental features (e.g., critical habitat, wetlands, cultural resources, existing contamination). • Proximity to the export cable route to minimize environmental impacts, neighborhood disruption (e.g., disturbances, interruptions, or changes), and costs associated with the cable connections to the POI). • Sufficient land available (a minimum of 6 acres). • Consistency with, and reduced or low potential impacts on, adjacent land uses. • Constructability (e.g., land use, slopes, access, temporary staging areas, and utility locations). • Optimization of cable route lengths. • Availability of suitable landfall locations (i.e., those that minimize environmental impacts and are within 10 miles of the substation).
Export Cable Landfalls	• Avoid or minimize impacts to environmental features (e.g., critical habitat, shellfish lease areas, fish spawning areas, cultural resources, and existing contamination) by leveraging existing conditions (i.e., existing roadways or parking lots or previously disturbed areas). • Prioritize property availability, including State- and county-owned roadways, and existing utility ROW • Consistency with, and reduced or low potential impacts on, adjacent land uses. • Constructability (e.g., land use, slopes, access, temporary staging areas, and utility locations). • Optimization of cable route lengths. • Availability of suitable landfall locations (i.e., are within 10 miles of the substation to minimize onshore impacts to local communities and sensitive natural resources). • Use of existing ROWs to access the water when a parcel for the landfall location was not adjacent to the water.

Project Component	Criteria
Offshore Export Cable Route within NJ State Waters	• Minimize extreme changes in slope and water depths. • Coarse grain sediments of sufficient depth to meet target cable burial depths while avoiding pockets of contaminated sediments and organic sediments. • Optimization of cable route lengths. • Avoid or limit crossing navigation channels and anchorage areas. • Avoid known submerged shipwrecks and other cultural resources. • Avoid mining and or dredge spoil areas. • Minimize number of infrastructure (e.g., utility) crossings. • Minimize impacts to aquatic communities and sensitive habitats. • Constructability (e.g., habitat type, depths, slopes, access, and utility locations).
Onshore Export Cable Route	• Minimize extreme changes in slope. • Prioritize property availability, including State- and county-owned roadways, and existing utility ROW. • Avoid known Superfund Sites or sites designated as hazardous. • Avoid known locations of historic or archaeological resources. • Avoid or minimize number of infrastructure (e.g., roads, bridges, culverts) crossings to reduce impacts to existing onshore infrastructure. • Minimize impacts to wetlands and floodplains. • Minimize the overall length of the route to minimize impacts to terrestrial communities, wildlife species, and sensitive habitats. • Minimize impacts to aesthetic resources. • Minimize impacts to sensitive receptors such as hospitals, schools, and churches.

1.3.1 Screening Assessment

The criteria described in **Table 1-1** was applied to the alternatives for each Project component in each of the three phases as described below:

1. Phase 1: Initial screening which involved a high-level review and evaluation of each project component, taking into consideration Ocean Wind 1's purpose and need (Permit Application, Section 1.3), proposed project technologies, and the criteria summarized in **Table 1-1.**
2. Phase 2: Desktop study that analyzed opportunities and constraints for the Project components. Resource maps were developed using existing GIS resource data (no new data were generated for this study) and were based on the application of Project criteria (**Table 1-1)**.

   In the case of export cable routes, this phase also included a review of existing resources including but not limited to: bathymetry, geology, contaminated soils/sediments, commercial and recreational fishing activities, navigation channels, anchorage areas, shipping activities, restricted areas, public open space, environmentally sensitive areas, known cultural and historical resources, existing infrastructure, surface waters (wetlands and watercourses), and threatened and endangered species, as these resources are likely to impact the development, permitting, and construction of the Project. Windshield surveys were conducted to ground truth the GIS desktop study and stakeholder outreach was conducted to collect additional information to assist in routing and siting. Disruption to local residents and communities due to cable installing including road closures, traffic diversions, and similar impacts was also considered.

   Resource maps were used during Phase 2 to identify and develop Study Areas, corridors, and route options. First, Study Areas were developed around the proposed POIs. Then, corridors were selected

to take advantage of opportunities and avoid constraints where possible. Route options were then developed based on resource opportunities and constraints in combination with engineering requirements (**Table 1-1**). Candidate routes were identified to take advantage of opportunities, including State and County-owned ROWs which includes highways, roads, railroads and other previously disturbed and maintained existing ROWs, and to avoid constraints such as identified natural and mapped cultural resources. Routes that crossed railroad ROWs were not preferred based on engineering and construction challenges including crossing agreements, cable protection, maintenance of traffic, HDD and potential service interruptions; and routes that wildlife refuges and wildlife management areas were eliminated due to sensitive habitats and permitting requirements such as Endangered Species Act permitting or mitigation requirements as a result of Project impacts. Routes that crossed inlets were eliminated based sediment and current dynamics that would dictate a burial depth requirement from regulatory agencies (USACE, U.S. Coast Guard [USCG]) which would incur insurmountable engineering constraints.

3. Phase 3: Site specific surveys were conducted at selected alternatives to refine routing and siting, support cable design and environmental assessments, and identify preferred options.

Additionally, the routing and siting process included coordination with Federal and State agencies, local municipalities and various stakeholders including non-government organizations (NGOs) and communities in each Phase as appropriate. During this coordination and outreach, additional substation and export cable route options were developed and analyzed (Section 2.3 and Section 2.6) based on agency feedback and to minimize impacts to sensitive resources (community and natural resources).

Ocean Wind 1 ultimately selected the proposed routes to each interconnection point based on technical feasibility of cable design, constructability, real estate availability, environmental, and stakeholder considerations. Onshore components of the Project have been sited within previously disturbed areas and existing road rights-of-way (ROWs) to the maximum extent practicable to minimize environmental impacts. Appropriate measures will be used to mitigate environmental impacts to the maximum extent feasible as described in Appendix S.

1.3.2 Cable Routing

Ocean Wind 1 further developed routing criteria to guide the cable route selection process for Phases 1 through 3 as described in **Table 1-2** that includes Opportunities, Sensitivities, Technical Guidelines, and Regulatory Guidelines defined as follows:

- Opportunities – sediments suitable for cable burial and foundations (i.e., sand), gradual or minimal slopes, low fishing activity, low vessel traffic, and federal waters along which transmission line development is potentially compatible.
- Sensitivities – resources or conditions that can potentially limit transmission line development and may include areas restricted by regulations (i.e., habitat areas of particular concern, anchorage areas, artificial reefs, or disposal areas), areas with high fishing activity, traffic separation schemes or other high vessel traffic routes, obstructions and wrecks, unexploded ordinance, or where impacts to these resources would be very difficult or impractical to mitigate (i.e., danger zones).
- Technical Guidelines – the cost and specific engineering- and sediment-related requirements and objectives of the proposed Project.
- Regulatory Guidelines –State and/or Federal permits, approvals, and authorizations required to build and operate the proposed Project in the offshore environment.

The goal of the routing process was to avoid or minimize impacts to resources with sensitivities, utilize geographies with maximum opportunities, minimize cable lengths and costs, and maximize system

reliability. **Table 1-2** includes the list of potential Opportunities and Sensitivities developed for the Project. Throughout the route selection process, Opportunities and Sensitivities for the Project were considered and reviewed concurrently. Ocean Wind 1 considered additional Opportunities and Sensitivities as they were identified via stakeholder outreach. Technical Guidelines developed by Ocean Wind 1 for the Project are also included in **Table 1-2**. These guidelines provided technical limitations related to design, construction, ROW requirements, environmental resources, and/or reliability concerns.

Table 1-2. Routing Opportunities, Sensitives, and Technical Guidelines

Routing Opportunities, Sensitives, and Technical Guidelines	
Opportunities	
Existing Infrastructure (i.e., cables, pipelines)	Gradual Slopes
Existing transmission line corridors	Sandy sediments
Low fishing activity	Low vessel traffic
Sensitivities	
Artificial Reef Sites	Recreational Fishing Areas
Bathymetry	Recreational Uses
Benthic Resources	Sand Mining Areas/Borrow Areas
Caution Areas including unexploded ordinance (UXO), anchorage areas, security zones, and restricted areas	Sea Turtles/Marine Mammals
Dumping Grounds (General)	Shellfish Areas
Existing Infrastructure	Shipwrecks and Obstructions
Federal and Tribal Lands and Areas	Shorebird Restricted Access Areas
Federal and State Dredging Areas/Borrow Areas	Sediment Quality
Federal and State Fish Surveys	Sediment Type
Federal and State Navigation Channels	Submerged Aquatic Vegetation
Fisheries Resources	Traffic Separation Systems (TSS) / Shipping Routes
Paleo-Indian Channels	Unique and Sensitive Habitats
Nautical Navigation Aids (NAVAID)	Wildlife Management Areas and Preserves
Technical Guidelines	
Minimizes extreme changes in slope and water depths.	
Target fine to coarse grain sediments that are sufficient depth to meet target cable burial depths while avoiding pockets of contaminated sediments and organic sediments	
Avoids and limits crossing navigation channels and anchorage areas where there is increased potential for anchor drag	
Avoid known submerged shipwrecks and other cultural resources	
Avoid mining and or dredge spoil areas	
Minimize number of infrastructure crossings	
Minimize number of shipping lane crossings	
Minimize the overall length of the route to minimize impacts to aquatic communities and avoid sensitive habitats	
Avoid unique habitats (i.e., gravel and artificial reef)	

1.3.3 Cable Technology Selection

The electrical system is comprised of the cables and components required to step up/down the voltages at the Wind Turbine Generators (WTGs) and to transport the electricity generated from the Offshore Wind Farm to the interconnection points. The system consists of a low voltage side from the WTGs to the offshore substation and a high voltage side from the offshore substations to the interconnection points. Each offshore substation will collect the power transmitted from the WTGs and transform the voltage for transmission through the export

cable to the onshore substations. The onshore infrastructure will consist of a buried onshore export cable system, substations, and a connection to the existing electrical grid at each interconnection point.

Horizontal Directional Drill (HDD) technology was included in the Project Design Envelope and included for cable and landfall routing. HDD is a method to install underground cables through a trenchless method. For more information on HDD installation technology refer to Section 2.1.2.1 of the Permit Application. A typical HDD cross-section is provided in **Figure 1-1**.

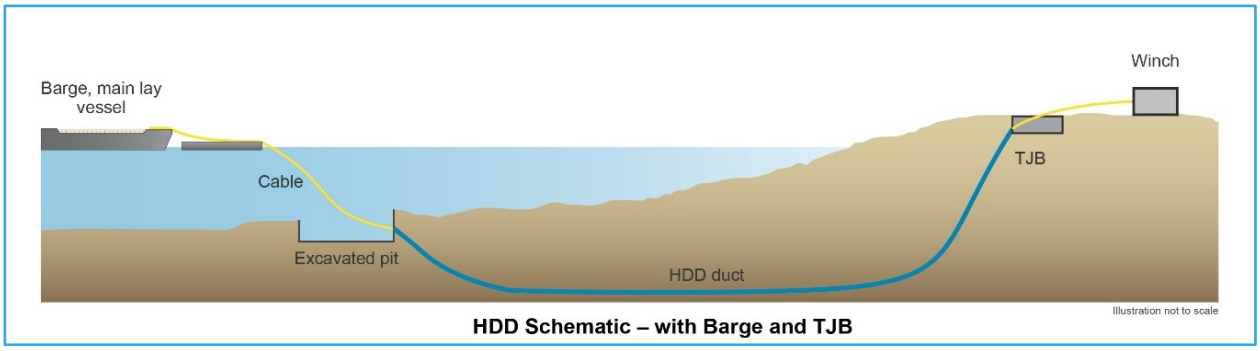


Figure 1-1. Typical transitional HDD Cross-Section

Water-to-Water HDD were determined to be impracticable both from and engineering and environmental constraints. Water-to-Water HDD would require building for each location temporary artificial islands to host the HDD spread (approx. 26,910 square feet for entry location and 5,380 square feet exit location) plus constant supply transport for bentonite, water, consumables, cuttings removal, and personnel will have to be installed.

Furthermore, the cable to be installed has a maximum installation length through ducts of approx. 3,280 feet. This will then lead to additional joints to be installed in the cable. These joints will need to be lowered to the seabed and then buried. The overall disturbance of and additional risk to the environment is therefore much higher than more traditional installation methods like a jet plow for burial.

During Phase 1 planning stage of the Project, cable technology, including type of cable and its capacity, was reviewed. Different cable capacities were considered including the use of High-Voltage Alternative Current (HVAC) and High-Voltage Direct Current (HVDC) cable technology; however, as HVDC did not meet the project Purpose and Need, it was eliminated during the initial screening process (Phase 1) (**Table 1-3**). The Project includes three HVAC cable systems, two cables to Oyster Creek and one to BL England. The target system capacity of 275 kilovolt (kV) for the export cable route was selected as the most cost-effective HVAC transmission system available with current technology. Additional power transfer using the same technology would require additional cable installations and would include construction of a converter station and/or HVAC Booster Station, greatly increasing project impacts and cost. The available alternate technologies are higher cost, require additional space, and have higher potential environmental impacts and were, therefore, eliminated from consideration early in project development.

Table 1-3. Technology Options reviewed and not carried forward.

Technology Options	Not Selected
Technology	
HVDC	• HVDC is not economically or technically desirable for this Project as it is typically used for transmitting energy over longer distances than the Ocean Wind 1 Project. • HVDC cable supply is constrained and use of this technology would not meet the Project schedule.

Technology Options	Not Selected
	• HVDC cable would require the construction of onshore converter stations which would increase potential environmental impacts.
HVAC Booster Station	• Additional impacts associated with siting additional facilities either offshore or onshore. • Additional offshore or onshore permanent space. • Additional aboveground or above water infrastructure. The HVAC Booster would be similar in size to the offshore substations.

2. Alternatives Analysis

Ocean Wind 1 considered several alternatives to the Project, including the No Action Alternative. Several interconnection point, substation location, landfall and export cable route alternatives were also identified and analyzed. Alternatives were identified and screened during Phase 1 as described in Section 1.3 above to eliminate impracticable alternatives. In Phase 2, alternatives were screened using desktop analyses. Final proposed alternatives were field surveyed. As defined in N.J.A.C. 7:7A-1.3, "practicable alternative" means other choices available and capable of being carried out after taking into consideration cost, existing technology, and logistics in light of overall project purposes, and may require an area not owned by the applicant which could reasonably have been or be obtained, utilized, expanded, or managed in order to fulfill the basic purpose of the proposed activity.

2.1 No Action Alternative

Under the No Action alternative, Ocean Wind 1 Project would not be constructed. If the proposed facilities are not constructed, the benefits of the Project would not occur, including development of BOEM Lease Area OCS-A 0498 to meet the need to deliver competitively priced renewable energy and additional capacity to meet State and regional renewable energy demands and goals; replacement of fossil fuel energy generation with renewable energy generation; air quality benefits; and increased employment, income, and tax revenues. Further, Ocean Wind 1 would not be able to supply the 4,851 gigawatt-hours (GWh) per year of renewable energy production to NJBPU pursuant to the 2019 Power Purchase Agreement resulting from the NJBPU's competitive selection process.

Implementing the No Action alternative would not support an increase in New Jersey renewable energy use and access to New Jersey renewable energy generation, to meet the demand outlined by the Renewable Portfolio Standard. If adequate renewable energy generation is not available, consumers would need to seek other sources of fuel for energy generation, many of which are environmentally less desirable. Furthermore, short term environmental impacts would not be completely avoided as the demand for renewable energy would eventually be met through some other infrastructure project. Additionally, the No Action alternative would not satisfy the requirements of New Jersey's Offshore Wind Economic Development Act of 2010, which mandates 1,100 megawatts (MW) of offshore wind resources. The No Action alternative would also not contribute to meeting the need established by both NJ Executive Order 8, which set a goal for 3,500 MW of renewable energy by 2030, and Executive Order 92, which in November 2019 increased the goal to 7,500 MW by 2035. The purpose and need for the Project cannot be met with the No Action alternative.

2.2 Offshore Renewable Energy Certificate Points of Interconnection

Ocean Wind 1 conducted an initial statewide screening of POIs to identify the range of possible POI with the existing PJM electric transmission system, taking into consideration the geographic, engineering, and interconnection criteria summarized in **Table 1-1** and **Table 1-2**.

2.2.1 Phase 1: Initial Screening

A total of 15 POIs were identified for the Project (**Figure 2-1 and Table 2-1**). During initial screening, the Dennis/Corson, Deepwater, Salem, and Monmouth POIs were eliminated from consideration and not carried forward into the desktop study phase due to engineering constraints, required upgrades, environmental and permitting constraints, and lack of available real estate within 10 miles of the POI needed to construct an onshore substation for connection. The primary criteria used during this phase to eliminate POIs from further consideration included (see specific details in **Table 2-1** below):

- Export cable route length of over 56 miles (mi) which would have required either HVDC or HVAC booster station. As described above, these technologies were identified as unavailable, more costly, and/or more impactful;
- Inadequate and/or unavailable land for substation siting;
- Inadequate POI capacity; and
- Grid upgrades that would not be achievable within the time frame established in the Project Purpose and Need.

2.2.2 Phase 2: Desktop Analysis

Ocean Wind 1 then carried out a desktop analysis of the remaining POIs including: Oyster Creek, BL England, Cardiff, New Freedom, Manitou, Deans, Higbee/Ontario, Lewis, and Larrabee using the criteria listed above in **Table 1-1**. Geographical information system (GIS) data was used to identify opportunities and constraints. Constraints were defined as resources or conditions that could limit or prevent siting. Constraints also included areas restricted by regulatory requirements or areas where impacts on resources would be difficult to avoid, minimize, and/or mitigate. Opportunities were defined as resources or conditions that would facilitate Project development when considering and balancing the varying and competing challenges associated with infrastructure development. The identification of opportunities and constraints were also based on technical guidelines (i.e., engineering and design requirements). These guidelines are specific to the Project and provide technical limitations related to the design, ROW requirements, and reliability.

The primary criteria used during this phase to eliminate POIs from further consideration included (see specific details in **Table 2-1** below):

- A requirement for HVAC booster station based on cable length and associated increased impacts;
- Inadequate and/or unavailable land for substation and/or onshore export cable siting;
- Engineering constraints (e.g., HVDC or HVAC Booster, constructability, and substation upgrades);
- Permitting constraints (e.g., permitting for multiple states, threatened and endangered species, sensitive habitats, and pinelands management areas); and
- Increased impacts on communities associated with longer onshore export cable routes.

2.2.3 Phase 3: Site Specific Surveys

Based on discussions with utilities regarding POI upgrades, available technology and the results of the desktop study, the following POI options were identified to carry forward for further Project development:

- Oyster Creek
- BL England
- Higbee/ Ontario

Surveys included habitat assessments, cultural resource surveys, visual resources surveys, and geotechnical surveys. These surveys also informed potential substation locations and potential cable routes for further review in this Alternatives Analysis. These results are described further in Sections 2.3, 2.4, 2.5 and 2.6 below.

Although the Higbee and Ontario substations in Atlantic City are located closest to the Wind Farm Area, these substations are unable to accept the output of the Ocean Wind 1 Project without major widespread onshore system upgrades. These upgrades could not be completed in time to accept power generated by the Ocean Wind 1 Project schedule. Furthermore, the site required for the onshore substation associated with the Higbee and Ontario POI would have additional impacts to visual resources, cultural resources, and overburdened communities. This POI was not further developed as it would not meet the purpose and need for the Project and, therefore would not be a practicable alternative.

2.2.4 Selected POIs

The Oyster Creek nuclear plant was retired during the development of Ocean Wind 1 and is entering the decommissioning phase. Similarly, the BL England coal, oil, and diesel plant has retired in phases from 2014 to 2019. Utilizing the existing grid infrastructure used to formerly interconnect these plants with the PJM electric transmission system provides the most efficient method of connecting offshore wind energy to the grid. The BL England POI can accommodate approximately 400 MW of power and would require one export cable to complete the interconnection. The Oyster Creek POI can accommodate approximately 800 MW of power and would require two export cables to complete the interconnection.

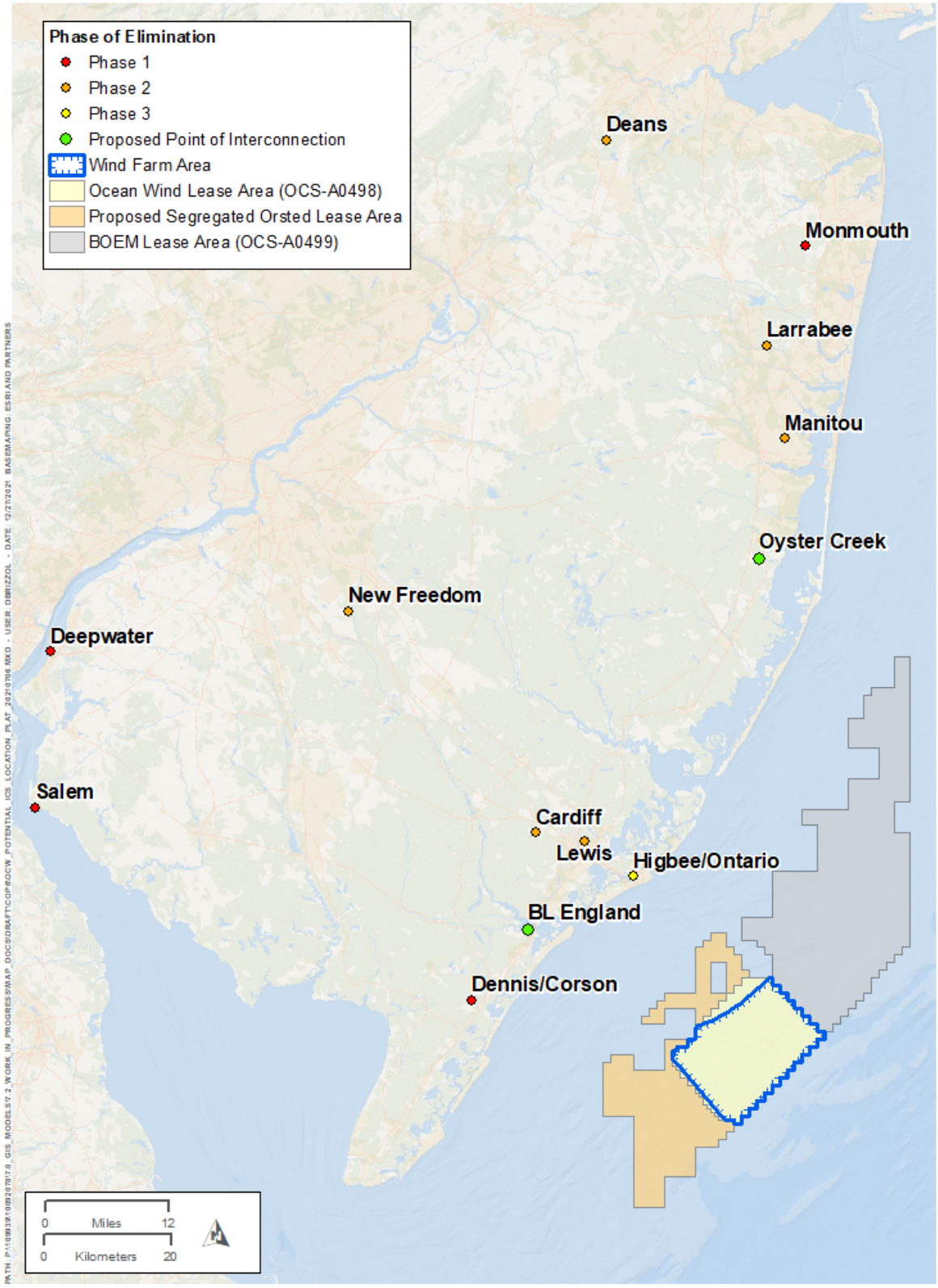


Figure 2-1. Points of Interconnection Considered

Table 2-1. Point of Interconnection Screening Summary and Primary Criteria evaluated.

Interconnection Point Name	Location	Capacity Substation Could Support Without Upgrades	Export Cable Length (miles)	HVDC or HVAC Booster Required	Real Estate Constraints	Engineering Consideration	Natural Resources Impacts	Marine User Conflicts	Phase Eliminated from Consideration
Monmouth	Colts Neck Township	1,200 MW	94	Yes	Availability of land for new easement is limited.	Not evaluated	HVAC Booster would cause additional impacts to benthic resources	HVAC Booster would cause potential conflicts with navigation	1
Dennis/Corson (Two separate POIs)	Dennis Township	200 MW	30	No	The site has land within proximity and could have existing ROW for transmission.	Substantial system-wide electrical infrastructure upgrades required to receive the Project load.	Land surrounding the substation have identified habitat for threatened and endangered species. Wetland areas in the bay are all designated as habitat for threatened and endangered species. Routes from potential landfall areas will likely need to navigate through threatened and endangered habitat. Substation is not located within designated wetlands, but possible cable routes will likely pass-through designated wetlands along the coastline or bay area. Route planning from the upland landfall area to the substation can likely avoid wetlands.	Crossing Bays would impact the Intracoastal Waterway	1
Salem	Lower Alloways Creek Township	1,200 MW	94	Yes	This site has limited space for a new under/above ground transmission line within the existing utility ROW available. Availability of land for new easement could be limited. There appears to be land for interconnection	Extensive system-wide updates would also be needed to interconnect the Project load.	Sandbar Shark HAPC has been proposed in the Delaware Bay. Land surrounding the Artificial Island have identified habitat for threatened and endangered species. Upland and wetland areas to the north and east of the substation have been designated as habitat for threatened and endangered species. If landfall is made in these locations the cable route will likely need to navigate through threatened and endangered habitat. Substation is located with the Upper Wetlands Boundary; cable landfall or routing will need to pass through wetland areas. Additional fishery impacts, oyster habitat, North Atlantic Right Whale management areas, and potential entry to Delaware State waters. This would add additional impacts and permitting.	POI location within the Delaware River would require siting of HVAC booster station near mouth of the Delaware River, resulting in potential significant maritime conflicts. Cable routing within Delaware bay would cause potential navigation impacts to the federal navigation channel.	1
Deepwater	Pennsville Township	400 – 1,200 MW	114	Yes	This site has limited space within proximity for a new interconnecting substation.	Not Evaluated	Same impacts as noted for Salem POI above	Same impacts as noted for Salem POI above	1

Interconnection Point Name	Location	Capacity Substation Could Support Without Upgrades	Export Cable Length (miles)	HVDC or HVAC Booster Required	Real Estate Constraints	Engineering Consideration	Natural Resources Impacts	Marine User Conflicts	Phase Eliminated from Consideration
Cardiff	Egg Harbor Township	400 MW	30	No	Major risk involves use of existing ROW or creating new ROW within pinelands.	HDD crossing across Lakes Bay and Absecon Bay wetlands not possible due to unfavorable ground conditions and space constraints.	Sandbar Shark HAPC has been proposed in the offshore and bay/wetland areas surrounding Atlantic City. Land surrounding the substation have identified habitat for threatened and endangered species. Wetland areas in the bay are all designated as habitat for threatened and endangered species. Routes from potential landfall areas will likely need to navigate through threatened and endangered habitat.	Crossing Lake Bay and Absecon Bay would impact the Intracoastal Waterway	2
Larrabee	Howell Township	1,200 MW	80	Yes	This site has limited space for a new under/above ground transmission line within the existing utility ROW available. Availability of land for new easement could be limited.	There were very limited onshore cable route opportunities found for this option. Placing two cables within the landfall or roadways was not practicable	Area surrounding the substation has identified habitat for threatened and endangered species, these areas mostly follow rivers and streams in the area. Substation is not located within designated wetlands, but possible cable routes will likely pass-through designated wetlands to the North, South, or East.	HVAC Booster would cause potential conflicts with navigation	2
New Freedom	Winslow Township	1,200 – 3,500 MW	64	Yes	One of the furthest locations from landfall area, which would require several easements if existing ROW cannot be used. The ROW may have space that can be utilized.	The export cable would require a long and complicated onshore route through the New Jersey Pinelands, and to make a HVAC booster effective, it would need to be located onshore.	Land surrounding substation has identified habitat for threatened and endangered species. Additionally, the ROW from Cardiff station which would be prioritized for routing has identified habitat for threatened and endangered species. Lands to the immediate east are part of the Great Egg Harbor River watershed. The ROW from Cardiff station which would be prioritized for routing has identified wetlands within the corridor.	Same impacts as the Cardiff/Corson POI listed above	2
Deans	South Brunswick Township	1,200 – 3,500 MW	135	Yes	One of the furthest locations from landfall area, which would require several easements if existing ROW cannot be used. The ROW for a good portion of this appears to have limited to no space. There is land available for interconnection.	Deans would require a very long offshore export cable route, north along the Atlantic Coast, passing through both Sandy Hook Bay and Raritan Bay.	Property that immediately surrounds the substation are deciduous woodland wetlands. Depending on the route taken to the substation wetlands to the north, east or south will need to be considered via route planning.	Cable route would pass through the New York Harbor Traffic Separation Scheme (TSS), Sandy Hook Bay, and Raritan Bay.	2
Manitou	Toms River Township	**	73	Yes	Same constraints as the Larrabee POIs	Same constraints as the Larrabee POI.	Same constraints as the Larrabee POI.	Same constraints as the Larrabee POI	2

Interconnection Point Name	Location	Capacity Substation Could Support Without Upgrades	Export Cable Length (miles)	HVDC or HVAC Booster Required	Real Estate Constraints	Engineering Consideration	Natural Resources Impacts	Marine User Conflicts	Phase Eliminated from Consideration
Lewis	Atlantic City	**	25	No	Same constraints as Cardiff/Corson POI listed above	Same constraints as POI Cardiff/Corson listed above	Same constraints as POI Cardiff/Corson listed above	Same constraints as Cardiff/Corson POI listed above	2
Higbee/Ontario (Two separate POIs)	Atlantic City	300 MW	20	No	Property for the onshore substation was not available	These substations are unable to accept the output of the Ocean Wind 1 Project without major widespread onshore system upgrades	Cable routing through Atlantic City would avoid wetland impacts and sensitive habitats	Same constraints as Cardiff/Corson listed above	3
Oyster Creek	Lacey Township	800 - 1,200 MW	64	No	Property for substation is available around the POI within the Holtec / former Oyster Creek Generating Station area	Adequate space for export cables, substation, and interconnection cables in the previously developed Oyster Creek Generating Station POI	Likely cable route would cross Island Beach State Park within previously disturbed areas and avoid Submerged aquatic vegetation to the extent practicable, onshore wetlands are previously disturbed.	No HVAC Booster would be required. Cable would be routed to avoid marine use conflicts such as borrow arears, artificial reefs, and navigational aids.	Proposed POI
BL England	Upper Township	400 MW	25	No	Property for substation is available around the POI within the former BL England Generating Station area	Adequate space for export cable, substation, and interconnection cables in the previously developed BL England Generating Station POI	Cable route through Ocean City would avoid impacts to SAV and wetlands within Great Egg Harbor Bay. Substation location is within previously disturbed golf course.	Same constraints as Cardiff/Corson listed above	Proposed POI

2.3 Onshore Substations

In order to connect the electricity generated offshore at the Wind Farm Area to the grid an onshore substation is needed. Typically, the optimal location for an onshore substation site is adjacent to the existing grid and POI because it allows for minimized interconnection lines. Following identification of the potential POIs, Ocean Wind 1 then evaluated potential onshore substation locations using the screening criteria described in **Table 1-1**.

2.3.1 BL England

The BL England POI is located adjacent to the BL England Generating Station within Beesley's Point in Upper Township. Three substation potential subdivisions were evaluated in proximity to the POI to avoid sensitive resources including wetlands, threatened and endangered species, and minimizing overhead lines (see **Figure 2-3** below). Following evaluation of available parcels, two parcels were eliminated as they did not meet the criteria in **Table 1-1**. One potential location was identified that minimized impacts to sensitive resources, provides adequate access for construction, minimized the distance from onshore substation to the POI, and has been previously developed, maintained, or disturbed.

Parcels located within Upper Township tax parcel 76 were evaluated for potential substation locations. The parcel is substantial (over 290 acres) and several areas that were evaluated for use as the location of the substation location for the BL England POI. The areas evaluated are shown in **Figure 2-3** and their description below:

- Red: Within this area is the BL England Generating Station, waste ash ponds, salt marshes, and portions of a dilapidated 9-hole, par-3 golf course for the former generating station employees.
- Yellow: A dilapidated baseball field and freshwater forest wetlands
- Green: A portions of a dilapidated 9-hole, par-3 golf course for the generating station employees, and freshwater forest wetlands

2.3.1.1 Phase 1

Phase 1 for onshore substation evaluation considered current land use using publicly available aerial imagery and potential project impacts. During this first phase the red parcels was eliminated from consideration as it consisted of either tidal wetlands and salt marsh habitat or the BL England Generating Station (**Figure 2-2**). Construction within this parcel may result in significant impacts to undisturbed areas or require the demolition of the BL England Generating station and site access to construct within its footprint.

2.3.1.2 Phases 2 and 3

Phase 2 considered neighborhood disruption (e.g., disturbances, interruptions, or changes), and costs associated with the cable connections to the POI. During this phase the yellow substation parcel was eliminated due to proximity to local businesses, in additional site-specific surveys conducted in Phase 3 showed the alternative substation parcel is primarily wetland habitat, and the property would not provide adequate acreage to meet the substation criteria described in **Table 1-1** without significant permanent impacts to wetlands. This substation parcel is also closer to public areas resulting in additional visual impacts to local residents. A summary of the BL England substation alternative analysis is provided in **Table 2-2**.

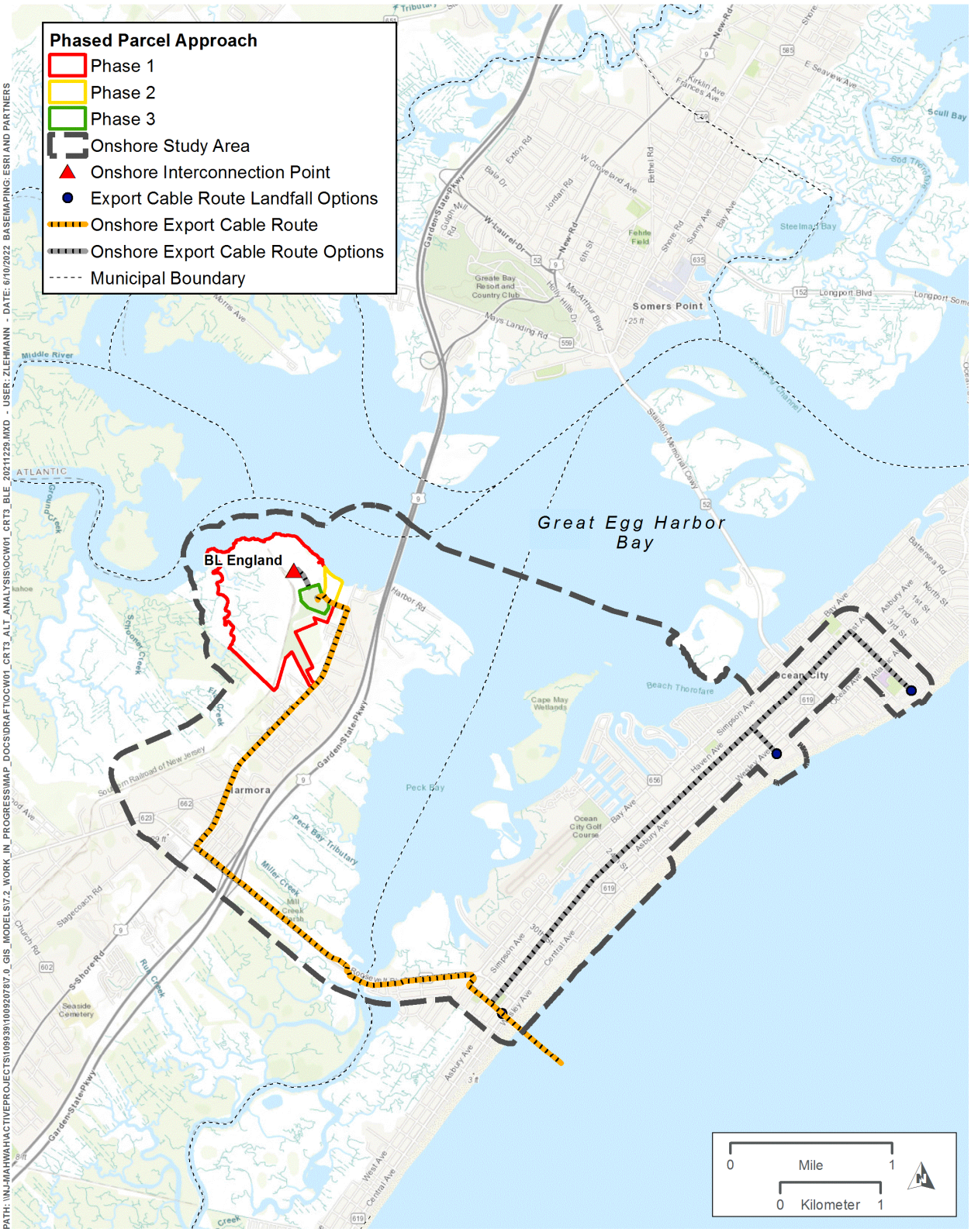


Figure 2-2. BL England substation parcels evaluated and tax parcel numbers.

Table 2-2. Summary of BL England substation parcel alternative analysis.

Substation Parcel	Parcel Description	Parcel Size (acres)	Distance to POI (mi)	Existing Land Use	Wetland Impacts (NWI/NJDEP) (acres)	Streams Crossed	Engineering Constraints	Phased Approach	Alternative Analysis Conclusion
Red	Extensive wetland complex that includes freshwater forested wetlands and coastal wetlands, BL England generating facility, dilapidated golf course	276	0.53	Urban, Wooded, and Wetland	4[1]	1	Construction within this parcel may result in significant impacts to undisturbed areas or require the demolition of the BL England Generating station and site access to construct within its footprint.	1	This parcel is inconsistent with the criteria listed in **Table 1-1**.
Yellow	Dilapidated baseball field and freshwater forested wetlands	10	0.35	Wooded and Wetland	3	1	Parcel is located in close proximity to local businesses, site specific surveys showed the alternative substation parcel is primarily wetland habitat. In order to avoid significant impacts to freshwater forested wetlands the substation area would be less than the minimum 6-acre criteria.	2	This parcel is inconsistent with the criteria listed in **Table 1-1**.
Green	Dilapidated golf course and freshwater forested wetlands	12.6	0.25	Wooded and Wetland	0.7	1	Parcel is located in close proximity to the BL England generating station. Minor site clearing and wetland fill is required.	3	Parcel selected as the BL England POI substation location

1 – Actual wetland impacts could be reduced if site access to BL England substation footprint is available.

The BL England substation will require 8 acres for the permanent site and an additional 3 acres for construction. The substation was sited within a previously disturbed, dilapidated golf course. An NJDEP Letter of Interpretation (LOI) for the property was issued March 19, 2019 (File No. 0511-03-0011.4 FWW180001). Because this LOI is valid for a period of five years, it was relied upon for siting of the proposed substation. The selected substation parcel was designed to avoid the wetlands identified on the LOI, however, subsequent wetlands within the proposed substation location were identified by NJDEP staff during a wetland verification site visit in November 2021. Of the areas made available by the owner (at the time that Ocean Wind 1 entered into an option agreement), the portion of the parcel selected was chosen for substation development because of its proximity to the onshore interconnection point at the BL England Generating Station. The topography of the proposed development area is also relatively flat and would not require extensive import of fill. Siting the onshore substation in this area would also make use of the adjacent generating station access road and limit the amount of additional impervious surface required to access the substation. The areas outside of the proposed development area within the parcel contain an extensive wetland complex that includes freshwater forested wetlands and coastal wetlands north of the railroad ROW. Wetlands and their associated transition areas identified by the 2019 LOI are avoided within the development parcel. The additional wetlands identified during the field verification that cannot be avoided will be mitigated for in accordance with state and federal regulations.

2.3.2 Oyster Creek

The Oyster Creek POI is located adjacent to the Oyster Creek Generating Station just west of the Oyster Creek discharge channel. Five substation parcels were evaluated in proximity to the POI to avoid sensitive resources including wetlands and threatened and endangered species, and to minimize overhead lines (see **Figure 2-2** below). Following evaluation of available parcels, a potential location was identified via desktop review that minimized impacts to sensitive resources, provided adequate access for construction, minimized the distance from onshore substation to the POI, and has been previously developed, maintained, or disturbed.

2.3.2.1 Phase 1

Phase 1 for onshore substation evaluation considered current land use using public ally available aerial imagery and potential project impacts. During this first phase two substation parcels were eliminated from consideration (**Figure 2-3**). These parcels were eliminated as they are primarily forest and wetland areas which would require significant clearing to accommodate the onshore substation and laydown areas.

2.3.2.2 Phase 2

Phase 2 considered neighborhood disruption (e.g., disturbances, interruptions, or changes), and costs associated with the cable connections to the POI. During this phase two substation parcels were eliminated due to proximity to local businesses and neighborhoods. These parcels were determined to result in additional visual impacts and neighborhood disruption over the proposed substation parcel. A summary of the Oyster Creek alternative analysis is provided in **Table 2-3**.

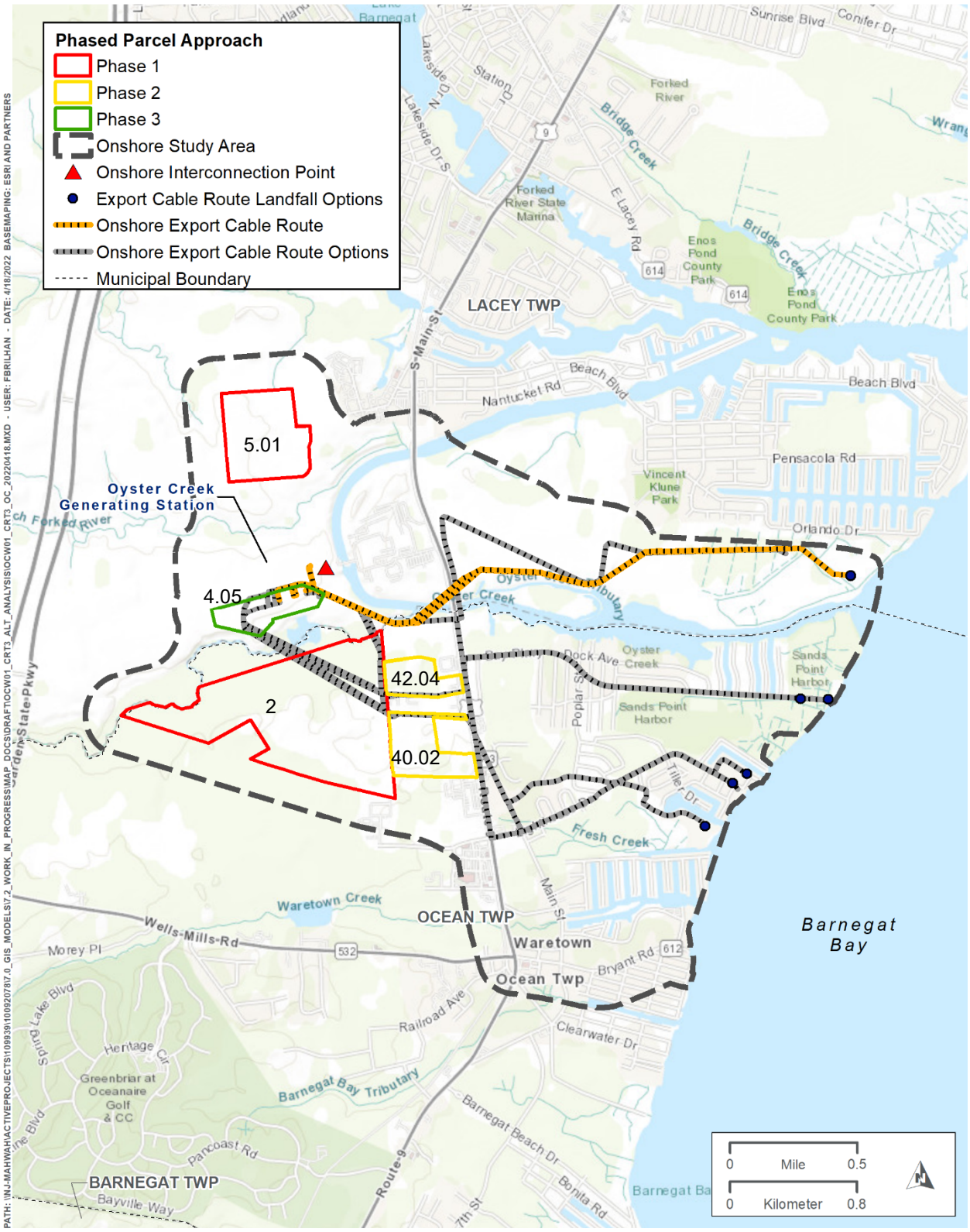


Figure 2-3. Oyster Creek substation parcels evaluated and tax parcel numbers.

Table 2-3. Summary of Oyster Creek substation parcel alternative analysis.

Substation Parcel	Location	Parcel Description	Parcel Size (acres)	Distance to POI (mi)	Existing Land Use	Wetland Impacts (NWI/NJDEP) (acres)	Streams Crossed	Engineering Constraints	Phase Eliminated from Consideration	Alternative Analysis Conclusion
5.01	Lacey Township	Primarily wooded and wetlands. Surrounding property is within the Edwin B Forsythe National Wildlife Refuge	67	0.43	Forest and Wetlands Parcel is located within pinelands forest management area and is primarily wooded.	2	1-4	Development would require significant clearing. Surrounding land use is National Wildlife Refuge where hunting is permitted. Substation location would require onshore cable to cross the Forked River adding additional length and complexity to the route.	1	Parcel is inconsistent with criteria listed in Table 1-1
2	Waretown	Primarily wooded and wetlands	218	0.60	Forest and Wetlands Parcel is located within pinelands forest management area and is primarily wooded.	4	1-2	Development would require significant clearing. Substation location would require an easement from other property owner for access.	1	Parcel is inconsistent with criteria listed in Table 1-1
40.02	Waretown	Primarily wood and wetlands. There are existing paved / disturbed areas on the parcel used for various commercial purposes	39	0.85	Urban, Forest, and Wetlands Parcel is located within Designated Centers of the NJ Stat Development and Redevelopment Plan.	4	1-2	This area is adjacent to Route 9 and closer to local businesses and residents. Construction of the substation would result in additional impacts to local residents over the selected substation parcel.	2	Parcel is inconsistent with criteria listed in Table 1-1
42.04	Waretown	Primarily wood and wetlands. There are existing paved / disturbed areas on the parcel used for various commercial purposes	23	0.62	Urban, Forest, and Wetlands Parcel is located within Designated Centers of the NJ Stat Development and Redevelopment Plan.	7	1-2	This area is adjacent to Route 9 and closer to local businesses and residents. Construction of the substation would result in additional impacts to local residents over the selected substation parcel.	2	Parcel is inconsistent with criteria listed in Table 1-1
4.05	Lacey Township	Previously disturbed or maintained area	29	0.15	Urban and Forest	1.3	1-2	Parcel provides adequate access for construction and is previously disturbed or maintained area that does not require significant sitework.	3	Parcel selected as the Oyster Creek POI substation location

2.3.2.3 Phase 3

The Oyster Creek substation will require 15 acres for the permanent site and an additional 2 acres for construction. The substation was optimized within the eastern portion of the parcel because of its close proximity to the onshore interconnection point, flat topography, avoids wetland impacts, and other sensitive resources. The area is dominated by early successional forest and scrub shrub with mostly eastern red cedar. An NJDEP Letter of Interpretation (LOI) for the property was issued August 15, 2017 (1512-17-0013.1 FWW170001) identifying isolated freshwater wetlands of intermediate value. Because this LOI is valid for a period of five years, it was relied upon for siting of the proposed substation. Subsequent wetlands within the proposed substation location were identified by NJDEP staff during a wetland verification site visit in November 2021. The western portion of the parcel contains varying topography with a "gully" feature that slopes from an elevation of approximately 27 ft (NAVD88) down to 19 ft elevation before returning to approximately 26 ft elevation and would require a significant amount of fill to develop. Therefore, the substation was sited in the eastern portion of the parcel. The substation location and layout reduces visual impacts to local residents as it is located approximately 0.5 miles from the nearest public access area along the Barnegat Branch Trail pedestrian path along Route 9.

2.4 Landfall, Onshore and Offshore Export Cable Alternatives Reviewed and Not Carried Forward

Several landfalls, onshore cable routes, and offshore cable routes were evaluated to avoid specific sensitive resources and/or communities. If an evaluated landfall was determined to be impracticable or inconsistent with the criteria listed in **Table 1-1** it was eliminated from consideration and a cable route was not further evaluated. For landfalls that were determined to be practicable there were several cable routes evaluated that utilize the evaluated landfall. During Phase 1 several landfalls and cable routes were determined to be not practicable and were not carried forward for further analysis.

Phase 1 of this analysis eliminated landfall and onshore and offshore export cable alternatives based on the alternative's use of a technology that was not carried forward (e.g., HVDC or HVAC booster station) or because they were inconsistent with the criteria in **Table 1-1**. These alternative landfalls and routes are shown in **Figure 2-4** and **Figure 2-5** in red and are summarized in **Table 2-4** and **Table 2-5** below. The landfalls and onshore and offshore export cable route alternatives that continued to Phase 2 and Phase 3 for further evaluation are described in Section 2.5 and Section 2.6 respectively.

Table 2-4. BL England Cable Landfall and Route Alternatives Determined not Practicable

Alternative Name	Reasons the Alternative was Determined Not Practicable

Great Egg Harbor Route	• Engineering Constraints
	  ○ Sediments in the inlet are dynamic; therefore, additional cable protection such as cable mattresses would be needed, resulting in additional impacts to natural resources.
	  ○ There is an existing USACE borrow area at the mouth of the inlet. USACE typically does not authorize crossing of borrow areas or would require impracticable mitigations including burial depths of up to 80 feet below the federal project limit.
	• Community/Environmental Constraints
	  ○ Access to the inlet by other vessels would be restricted during construction, which would result in additional impacts to other marine uses and navigation.
	  ○ In-water route through the Great Egg Harbor Bay and Shipping Channel would result in 5.8 miles of cable burial within designated shellfish habitat.

Alternative Name	Reasons the Alternative was Determined Not Practicable
	○ The route would cross under two, or three, bridges with low clearance, making construction significantly challenging.
Sea Isle City Landfall and Route	• Engineering Constraints ○ The onshore route following Sea Isle City Boulevard and Route 9 would involve several stream crossings, including a major tributary of Ludlam Bay (intracoastal waterway), as well as crossings of underground pipeline connectors. These types of crossings would not be necessary using the proposed route • Community/Environmental Constrains ○ The offshore cable route would cross USACE and state borrow areas, prime fishing areas, an artificial reef and Carl Shuster Horseshoe Crab Reserve. ○ The landfall would cross a Green Acres encumbered parcel and a USACE beach nourishment project with a constructed dune in place. ○ The onshore route would cross or be adjacent to multiple historic sites and districts including the Atlantic City Railroad Cape May Division Historic District. ○ The route may abut or cross through several National Heritage Priority Sites, including the Corson Inlet South and Whale Beach, the Seaville Methodist Church Site, and the Magnolia Lake Site. ○ The route would potentially cross or abut Excursion Park and/or JFK Boulevard Park and Pinelands regional growth and forest areas and would cross a known groundwater contamination area
Strathmere Landfall and Route	• Engineering Constraints ○ The route would make landfall within Strathmere and then follow Commonwealth Ave into Sea Isle City and would be co-located along that route. ○ The onshore route following Sea Isle City Boulevard and Route 9 would involve several stream crossings, including a major tributary of Ludlam Bay (intracoastal waterway), as well as crossings of underground pipeline connectors. These types of crossings would not be necessary using the proposed route • Community/Environmental Constraints ○ The offshore export cable route to Strathmere (Upper Township) would cross prime fishing areas, extensive borrow areas, and the Carl Shuster Horseshoe Crab Reserve. ○ The landfall would cross a Green Acres encumbered parcel and a USACE beach nourishment project with a constructed dune in place. The route would make landfall within Strathmere and then follow Commonwealth Ave into Sea Isle City and would be co-located along that route. ○ The onshore route would cross or be adjacent to multiple historic sites and districts including the Atlantic City Railroad Cape May Division Historic District. ○ The route may abut or cross through several National Heritage Priority Sites, including the Corson Inlet South and Whale Beach, the Seaville Methodist Church Site, and the Magnolia Lake Site. ○ The route would potentially cross or abut Excursion Park and/or JFK Boulevard Park and Pinelands regional growth and forest areas and would cross a known groundwater contamination area

Table 2-5. Oyster Creek Landfall and Cable Route Alternatives Determined Not Practicable.

Alternative Name	Reasons the Alternative was Determined Not Practicable
North of Island Beach State Park (IBSP) Landfall	• Engineering constraints o Lack of previously-disturbed landfall workspace, o Inability to collocate cable on Route 37 bridge or to perform multiple HDD crossings o The addition of 15-20 miles of in-water and onshore cable route necessitating a HVAC booster station • Community/Environmental Constraints o Significant disturbance to residential communities o Impacts to shellfish and SAV habitat within the Bay
Single HDD under IBSP	• Engineering Constraints o Excessive length of HDD o Shallow water depths at HDD exit pits o Dredging required to provide access of the inshore export cable o Existing geotechnical conditions of IBSP and Barnegat Bay being unfavorable for construction of an HDD under all of IBSP • Community/Environmental Constraints o Additional impacts to SAV to accommodate dredging to access inshore cable route
SAV Minimization Route #1 and #2	• Engineering Constraints o Increases cable route length by 6 mi. which requires the installation of an HVAC Booster station approximately 3-5 miles offshore of IBSP due to energy dissipation and consequent limits of the distance that active power can be carried • Community/Environmental Constraints o Impacts to visual resources, vessel navigation, recreational and commercial fishing, benthic habitat, fish habitat, marine mammals, prime fishing areas, state and federal sand borrow areas, ocean disposal areas, and artificial reefs due to HVAC Booster station
Southern IBSP Route	• Engineering Constraints o Lack of previously-disturbed onshore workspace • Community/Environmental Constraints o Significant clearing would be required in sensitive onshore habitats (beaches, dunes, wetland) o Significant disturbance to sensitive habitats within Barnegat Bay (SAV and shellfish habitat, Sedge Island Wildlife Management Area / Marine Conservation Zone and the IBSP Southern Natural Area)
Barnegat Inlet Route	• Engineering Constraints o Sediments in the inlet are dynamic; therefore, engineering and construction requirements for installing and designing cable in area of highly mobile sediments would not be feasible o Extensive cable protection such as cable mattresses would be needed that would result in additional impacts to natural resources and would require these fills on the channel bottoms • Community/Environmental Constraints o Access to the inlet by other vessels would be restricted during construction, which would result in additional impacts to other marine uses and navigation
Ship Bottom Landfall and Route	• Engineering Constraints o Space within the roadway is too limited to accommodate the two export cables for Oyster Creek POI o Ship bottom landfall would add 20-40 miles of the onshore cable (an 8-16 times magnitude increase in the proposed onshore cable length), thereby extending the onshore construction from months to years

Alternative Name	Reasons the Alternative was Determined Not Practicable
	○ Additional water crossing and HDD crossing (including water-to-water HDD connections) ○ Potential utility conflicts with existing utility ROWs ○ Extended construction schedule would impact the Commercial Operation Date agreed to in the New Jersey Board of Public Utilities Offshore Wind Solicitation, awarded to Ørsted September 17, 2018. Further, lengthening the duration of construction activities would delay New Jersey's 2019 Energy Master Plan initiative to provide 7,500 MW of offshore power by 2035. ○ Inability to co-locate the high-voltage cable on existing overhead lines or along the existing bridges crossing back bays necessitating significant infrastructure upgrades. • Community/Environmental Constraints ○ Roadway construction would be within close proximity to local business or residents to accommodate two cables required for Oyster Creek POI ○ The onshore cable route would pass through downtown Ship Bottom along the major throughfare that provides access onto and off the barrier island which would disrupt local traffic during construction ○ Avoiding co-location along the bridges on East Bay Avenue would require multiple HDDs that would make landfall on the islands within Barnegat Bay. The workspaces that would be required to facilitate these HDDs would have the potential to impact additional in-water resources including SAV, tidal wetlands, and other habitats on Cedar Bonnet Island.
Oyster Creek Channel Route	• Engineering Constraints ○ Design and construction constraints due to the channel's narrow width and shallow water depths outside of the channel. Significant dredging along the entire length of the channel would be required. ○ If a failure of the cable was to occur during operations, the entire cable throughout the Oyster Creek Channel would need to be replaced • Community/Environmental Constraints ○ The channel is a state-maintained channel and would require additional coordination and regulatory approval. ○ If a failure of the cable was to occur during operations, the entire cable throughout the Oyster Creek Channel would need to be replaced, affecting access to abutting properties and boating, and disturbing an excessive amount of material within the channel
Forked River Channel Route	• Engineering Constraints ○ Challenges of this route are similar to Oyster Creek, however would be larger due to the longer channel ○ Significant dredging along the entire length of the channel would be required ○ Like Oyster Creek, if a failure of the cable was to occur during operations, the entire cable throughout the Forked River Channel would need to be replaced, affecting access to abutting properties and boating, and disturbing an excessive amount of material within the channel. • Community/Environmental Constraints ○ Similar to Oyster Creek, the channel is a state-maintained channel and would require additional coordination and regulatory approval. ○ Forked River also has more residences along the waterway and would cause disruption to a larger community. • Challenges of this route are similar to Oyster Creek, however would be larger due to the longer channel.

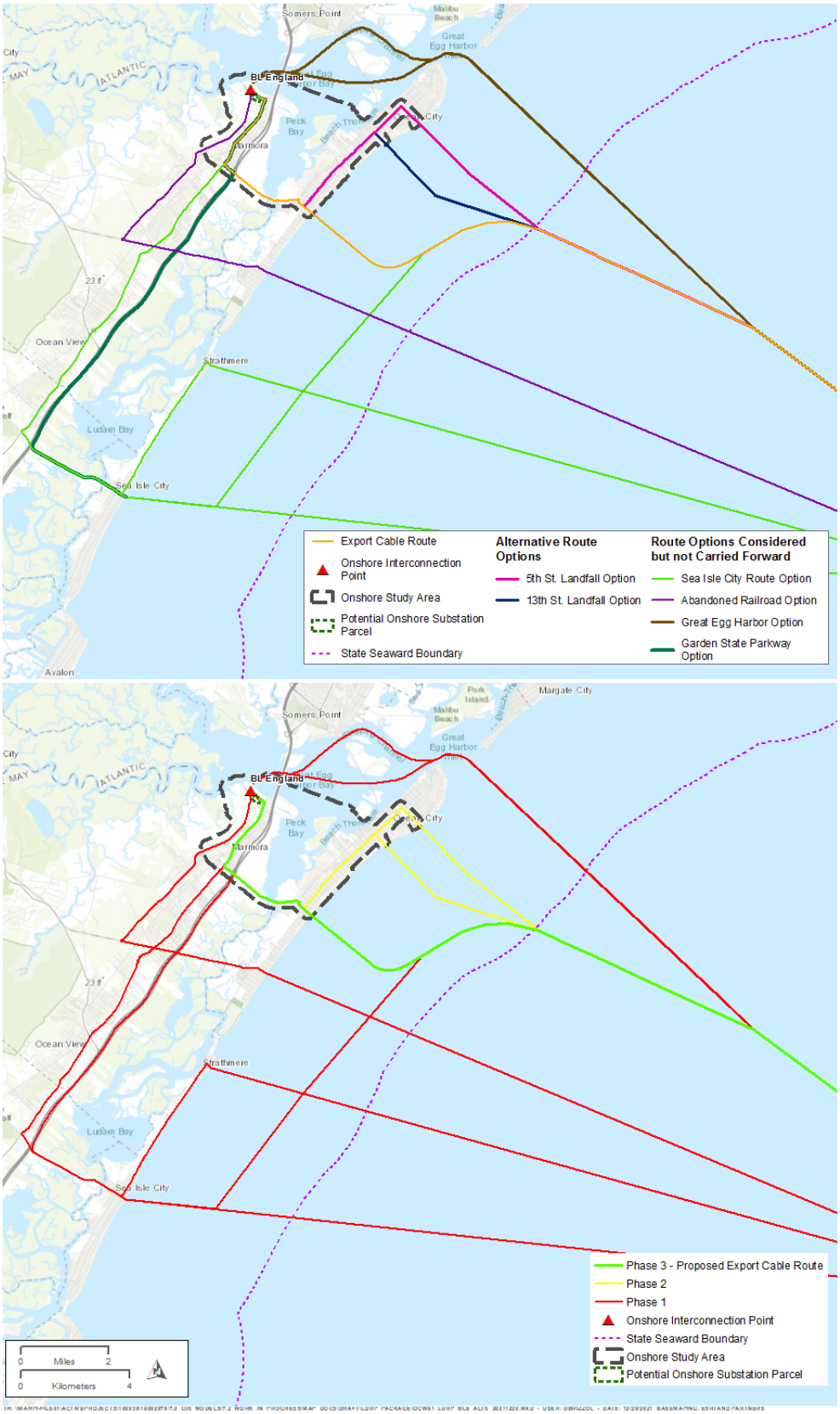
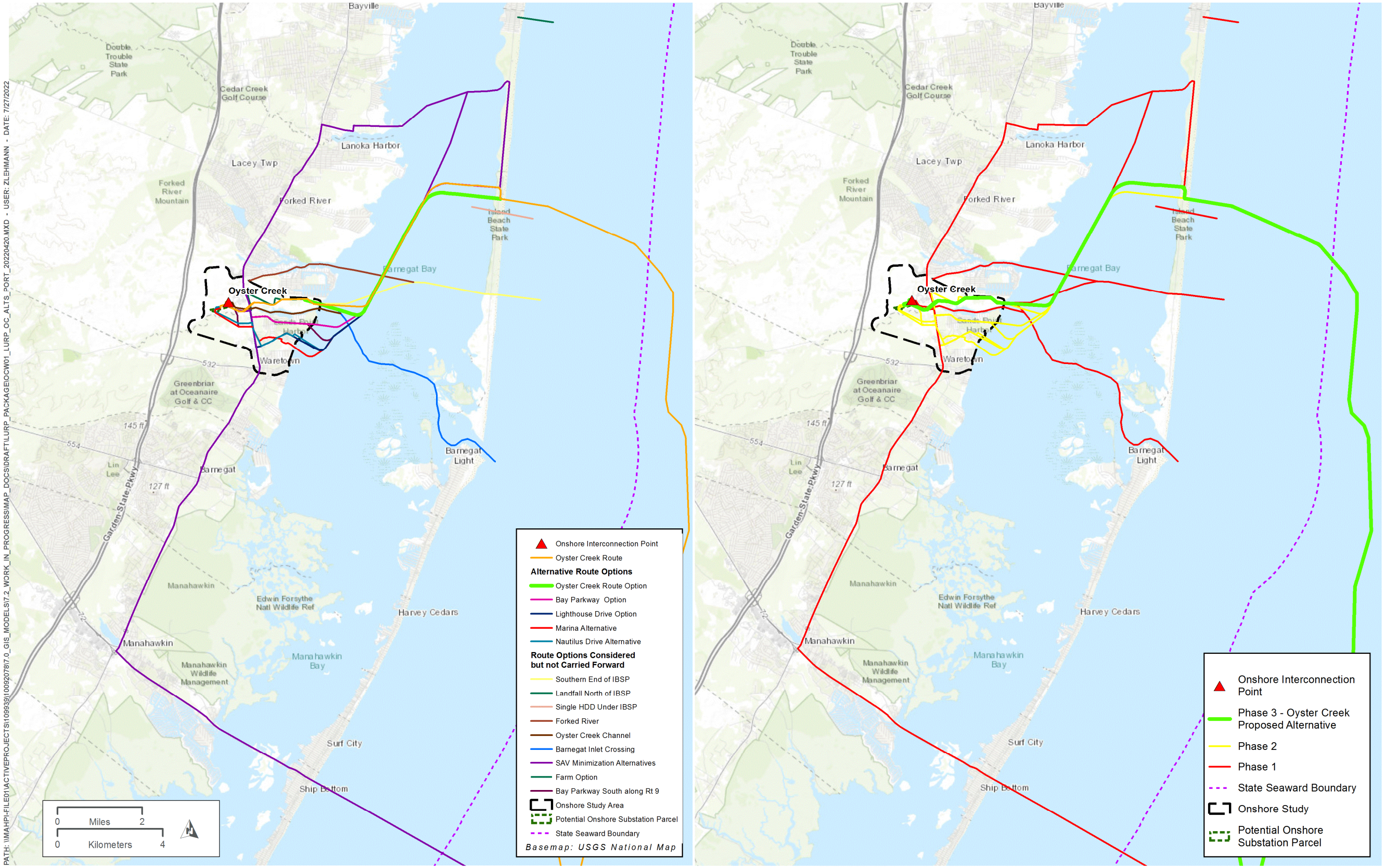


Figure 2-4. BL England Alternatives



PATH: \\MAHPI-FILE01\ACTIVEPROJECTS\109938\100920787.0_GIS_MODELS\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LURP_PACKAGE\OCW01_LURP_OC_ALTS_PORT_20220420.MXD - USER: ZLEHMANN - DATE: 7/27/2022

Figure 2-5. Oyster Creek Alternatives

2.5 Landfalls

Following the initial screening of landfalls and cable routes those routes that were determined to be practicable were further evaluated via desktop studies and windshield surveys. During this phase of evaluation, the remaining landfall sites for the Oyster Creek and BL England Routes were reviewed against the design and construction criteria (**Table 1-1, Table 1-2**) including property availability, avoiding or minimizing impacts to environmental features by leveraging existing conditions, optimization of cable length, and constructability. If the desktop studies or windshield surveys determined the landfall did not meet the criteria in **Table 1-1** it was removed from further evaluation. The remaining landfalls were then screened based on real estate availability, site-specific surveys, and input received from local municipalities or screened according to the phased approach in Section 1.3.

2.5.1 BL England

The BL England corridor begins within the Wind Farm Area and proceeds west to make landfall in New Jersey. The BL England corridor requires one landfall location to reach the POI. Potential landfalls within Ocean City were evaluated for further investigation and design. Landfalls are shown in **Figure 2-4** above and a summary of the landfalls evaluated are further discussed in **Table 2-6,** below.

Table 2-6. BL England onshore landfall alternative analysis.

Landfall Alternative	Alternative Analysis Results

5th Street, Ocean City Landfall	• Engineering Constraints
	  ○ The 5th Street landfall is located in a paved municipal parking lot. The landfall would use an HDD under the Ocean City beaches and Green Acres encumbered parcels to make landfall in a highly developed area and continue within existing road ROWs.
	• Community/Environmental Constraints
	  ○ The beaches of Ocean City are in the USACE Beach Nourishment Program, which requires a minimum cable burial depth below the active beach template (which starts at approximately -30 feet North American Vertical Datum 1988 [NAVD88]) to avoid the cable being impacted by beach erosion and beach replenishment activities.

13th Street, Ocean City Landfall	• Engineering Constraints
	  ○ The 13th Street landfall is located within the local roadway. Landfall would use an HDD under the Ocean City beaches and Green Acres encumbered parcels to make landfall in a highly developed area and continue within existing road ROWs.
	• Community/Environmental Constraints
	  ○ The beaches of Ocean City are in the USACE Beach Nourishment Program, which requires a minimum cable burial depth below the active beach template (which starts at approximately -30 feet North American Vertical Datum 1988 [NAVD88]) to avoid the cable being impacted by beach erosion and beach replenishment activities.

Landfall Alternative	Alternative Analysis Results

35th Street, Ocean City Landfall	• Engineering Constraints
	  ○ The 35th Street landfall is located within the local roadway. Landfall would use an HDD under the Ocean City beaches and Green Acres encumbered parcels to make landfall in a highly developed area and continue within existing road ROWs.
	• Community/Environmental Constraints
	  ○ The beaches of Ocean City are in the USACE Beach Nourishment Program, which requires a minimum cable burial depth below the active beach template (which starts at approximately -30 feet North American Vertical Datum 1988 [NAVD88]) to avoid the cable being impacted by beach erosion and beach replenishment activities.

As the constraints and potential impacts associated with each landfall within Ocean City were the same. The selection of the landfall was made in conjunction with the onshore export cable route selection. The impacts associated with the onshore export cable route is discussed in Section 2.6.1 below.

2.5.2 Oyster Creek

The Oyster Creek corridor requires two landfall locations to reach the POI. The first landfall (Island Beach State Park Landfall) would be made at IBSP from the offshore portion of the export cable from the Wind Farm Area. Once on IBSP, the cable would cross the park and enter Barnegat Bay west of the IBSP shoreline. The Oyster Creek export cable route would then travel across Barnegat Bay before making a second landfall (Onshore Landfall) in Lacey Township or Waretown west of Barnegat Bay. A summary of the landfalls evaluated are discussed below.

2.5.2.1 Island Beach State Park Landfall

Following elimination of four landfall alternatives on IBSP in Phase 1 As described in **Table 2-5**, only one landfall location was determined to be practicable and considered for further evaluation. This landfall is located within IBSP auxiliary parking lot of Swimming Area #2.

Two alternatives were evaluated to cross IBSP to enter Barnegat Bay. The first alternative, referred to as the Prior Channel Alternative, would utilize a previously disturbed channel located near a maintenance area. The second alternative, referred to as the IBSP West HDD Alternative, would involve the HDD from the same parking lot (Swimming Area # 2 parking lot) that the offshore landfall utilized (**Figure 2-6**). These alternatives are described in **Table 2-7**.

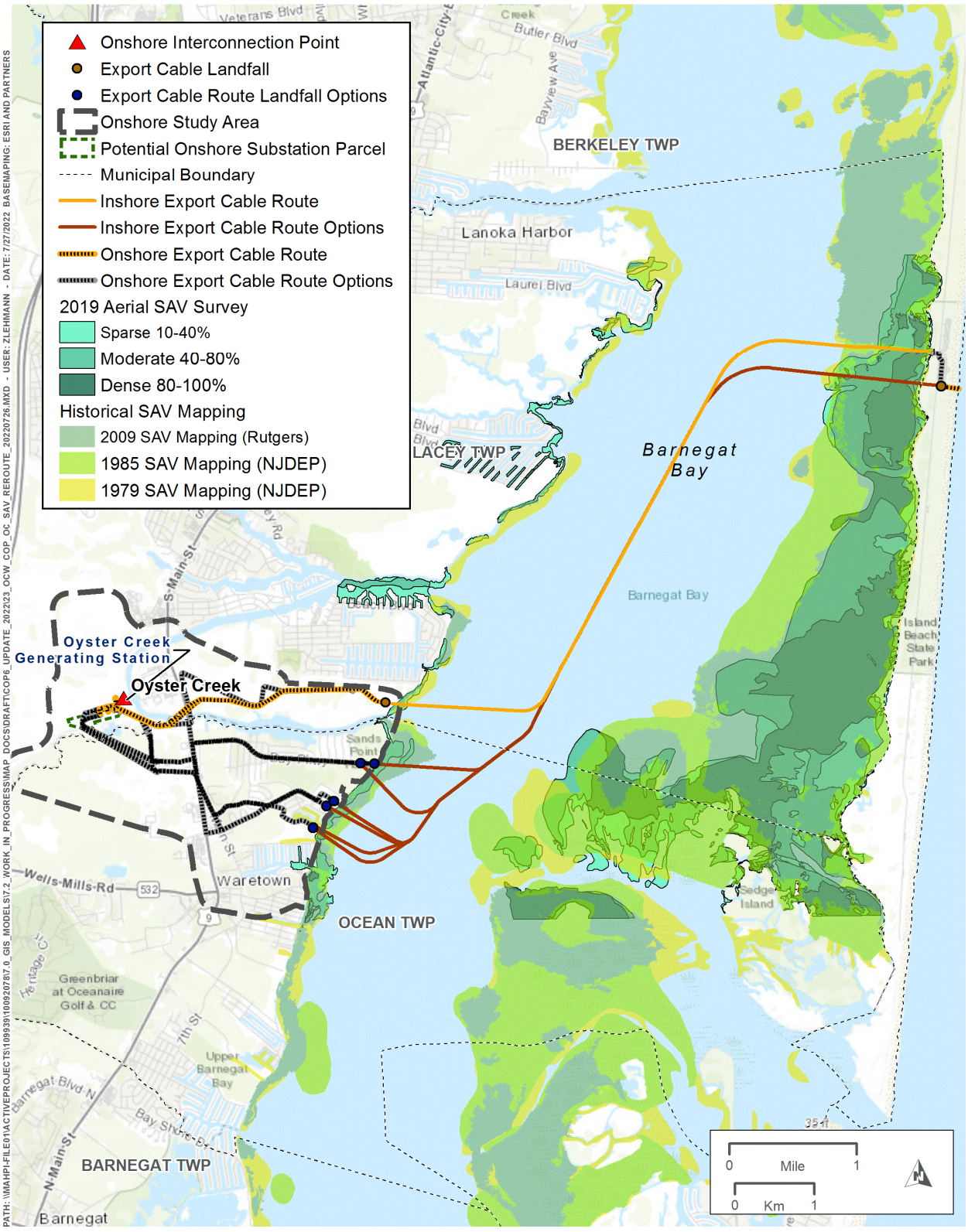


Figure 2-6. Barnegat Bay/Oyster Creek Alternatives and Aerial SAV mapping by Rutgers (Lathrop and Haag 2011), NJDEP (1979 and 1985), and Ocean Wind 1 (2019) in Barnegat Bay around Oyster Creek.

Table 2-7. Barnegat Bay Landfall Alternative Analysis

Landfall Alternative	Landfall Description	Real Estate Constraints	Engineering Constraints	Environmental Constraints	Alternative Analysis
Prior Channel	To enter Barnegat Bay, an open trench cut would be constructed within a previously disturbed channel near a maintenance area workspace on the western shoreline of IBSP approximately 300 ft west of Shore Road and approximately 1,110 ft north of the offshore landfall. Utilization of the previously disturbed main parking lot and the maintenance area avoids impacts on Shore Road, which is the main thoroughfare to the southern portion of the island. Some minor clearing and wetland disturbance would be required west of Shore Road, but the landfall through the maintenance area allows for direct access to the prior channel.	Additional access rights and easements would be required along Shore Road and maintenance area for cable installation.	HDD installation requires a 50m separation of the cables to provide adequate spacing for the drills, bore holes, and prevent inadvertent returns. Due to sediment quality an open cut approach will be required for cable burial and landfall. Open cut approach allows for reduced cable spacing to keep the cable route within the prior channel and avoid SAV habitat.	Cable route and landfall will result in additional wetland impacts.	This landfall meets the criteria listed in **Table 1-1** including minimizing impacts to regulated resources, Ocean Wind 1 has selected this Alternative based on coordination with federal agencies (National Oceanic and Atmospheric Administration [NOAA] and BOEM) and the reduction of impacts on SAV resources associated with the cable route from this landfall. For more information on impacts associated with this landfall and the cable routes that will use these landfalls please refer to Section 2.6.2.
IBSP West HDD	The landfall would begin within IBSP auxiliary parking lot of Swimming Area #2 and would exit IBSP via HDD from the same parking lot approximately 360 m into the Bay. The HDD exit pit would be located on the eastern shoreline of Barnegat Bay. HDD conduit stringing for IBSP West drills would take place within the southbound lane of Shore Road at IBSP and would require partial road closure and traffic attenuation.	None	None	HDD into Barnegat Bay is unable to reach beyond SAV beds due to sediment properties, therefore the HDD pit will be within existing SAV beds.	This landfall would result in additional SAV impacts versus the Prior Channel Alternative therefore Ocean Wind 1 has de-selected this Alternative based on coordination with federal agencies (NOAA and BOEM) and State Agencies (NJDEP).

Although both landfalls meet the criteria listed in **Table 1-1** while limiting impacts to regulated resources, Ocean Wind 1 has selected the Prior Channel Alternative based on coordination with federal agencies (NOAA and BOEM) and the reduction of impacts on SAV resources associated with the cable route from this landfall. For more information on impacts associated with this landfall and the cable routes that will use these landfalls please refer to Section 2.6.2.2.

2.5.2.2 Onshore Landfall

Five onshore landfall options were evaluated from Barnegat Bay to the Oyster Creek POI. However, as noted in **Table 2-9,** four landfall options were determined to be not preferred and were not carried forward for further consideration. The landfall that was considered the preferred alternative is described below. Currently site-specific high resolution geophysical and geotechnical (HRG&G) data is under review to determine the practicability of HDD at the landfalls described below. HDD is the preferred method of installation however if site conditions prevent the use of HDD then an open cut solution would be required.

These landfalls were evaluated as part of the Phased approach described in Section 1.3. Following determining that the landfalls were practicable desktop studies were conducted. These studies identified various engineering, real estate, and environmental constraints however were still considered viable. Site specific surveys were conducted as part of Phase 3 analysis to determine the preferred landfall location. Final landfall location was determined in conjuncture with export cable route impacts. For more details refer to **Table 2-8** and **2-9** below.

Table 2-8. Impacts to regulated resources Proposed Alternative and IBSP West HDD Alternative

Alternative Considered	Installation Type	Regulated Resource Temporary Impacts					
		SAV (Acres)	Shellfish (Acres)	Wetlands (Acres)	ISS (Acres)	Dredging	
						Area (Acres)	Volume (Cubic Yards)
Bay Parkway[1], Bay Parkway Alternative South[1]	HDD	0.4	5.5	6	0	4	24,400
	Open Cut	1.3	7.5	6	1.2	5.4	33,100
Marina Alternative[1]	HDD	0	3.2	0	0	3.2	15,300
	Open Cut	1.2	6.3	0	1.4	2.7	16,600
Nautilus Drive Alternative[1]	HDD	0	2.7	0	0	2.7	13,200
	Open Cut	1.2	4.1	0	1.3	2.8	17,500
Lighthouse Drive[1]	HDD	0	2.8	0	0	2.8	12,700
	Open Cut	1.1	4.6	0	1.3	2.8	17,500
Oyster Creek Route[2], Oyster Creek Route Alternative 1[2]	HDD	0	1.8	5.3	0	7.5	39,900
	Open Cut	1.2	3.7	5.3	1.2	9.5	64,100

[1]assumes single cable landfall; Project requirements would necessitate a second landfall and cable route.

[2]assumes double cable landfall, no additional landfall locations would be necessary.

Table 2-9. Oyster Creek Onshore Landfall Alternative Analysis

Landfall Alternative	Location	Landfall Description	Real Estate Constraints	Engineering Constraints	Alternative Analysis Results
Bay Parkway, Bay Parkway Alternative South	Waretown	The Bay Parkway landfall is located at the end of Bay Parkway in Ocean Township within an existing road ROW. Bay Parkway is a narrow, two-lane road approximately 28 ft wide with minimal shoulder.	Property to the north and south of the end of Bay Parkway are New Jersey Natural Lands Trust native salt marsh communities. A private residence is located at the very end of Bay Parkway. No easements, ROW, or private property was available for the landfall beyond the width of Bay Parkway.	HDD: This area at the end of the road would not provide the required workspace and setbacks from the bulkhead for HDD into the Bay without setting the HDD entry pits and onshore TJBs back into the salt marsh wetlands, causing significant impacts. There is only enough space for one of the two cables required to Oyster Creek. Due to ground conditions the HDD exit pit offshore would be within designated SAV habitat resulting in additional impacts to SAV habitat. Open Cut: An open cut solution would require the removal of the existing bulkhead and would have resulted in impacts to shoreline areas of SAV and shellfish habitat. Bay Parkway also provides the only means of vehicular access to over 130 residences. This alternative would require significant disruption to local residents requiring significant detours and traffic attenuation. There is only enough space for one of the two cables required to Oyster Creek.	This landfall would result in the direct impact of undisturbed, high-ecological value wetlands owned by the New Jersey Natural Lands Trust and also significant disruption of the communities along Bay Parkway which would not have alternative routes to and from their homes during periods of construction. This landfall would result in additional impacts to Barnegat Bay over the proposed landfall due to increased cable route length within the Bay resulting in additional impacts to SAV and shellfish habitat on the western shoreline. See Table 2-8 for additional details. There is only enough space for one of the two cables required to Oyster Creek which would require the use of a second landfall in addition to this one.
Marina Alternative	Waretown Lacey Township	The Marina alternative is located at the end of private marina that has been previously disturbed and is utilize for parking space and offseason boat storage.	Landfall is located on private land and requires easement from property owner.	HDD: Construction of the HDD from the landfall would likely impact shellfish aquaculture lease due to anchor placement to support barge placement and kedging. Installation would require crossing a state-regulated channel which would require additional coordination and burial depth. There is only enough space for one of the two cables required to Oyster Creek. Open Cut: Like Bay Parkway, an open cut of the shoreline at this location would require the removal of the existing bulkhead, resulting in impacts to shoreline areas of SAV and shellfish. Installation would require crossing a state-regulated channel which would require additional coordination and burial depth. There is only enough space for one of the two cables required to Oyster Creek.	This landfall would result in additional impacts to Barnegat Bay over the proposed landfall due to increased cable route length within the Bay resulting in additional impacts to SAV and shellfish habitat on the western shoreline. See Table 2-8 for additional details. There is only enough space for one of the two cables required to Oyster Creek which would require the use of a second landfall in addition to this one.
Nautilus Drive Alternative	Waretown Lacey Township	The Nautilus Drive landfall is located within an existing road ROW. Nautilus Road is a narrow, two-lane road approximately 25 ft wide with no shoulder and dense housing along the roadway.	Landfall would require access to two vacant lots along Pirate Drive in order to provide adequate access to Barnegat Bay and workspace.	HDD: HDD from the landfall would require occupying a significant area of privately-owned land adjacent to the bulkhead. There is only enough space for one of the two cables required to Oyster Creek. Open Cut: Like Bay Parkway, an open cut of the shoreline at this location would require the removal of the existing bulkhead, resulting in impacts to shoreline areas of SAV and shellfish. There is only enough space for one of the two cables required to Oyster Creek.	This landfall would result in additional impacts to Barnegat Bay over the proposed landfall due to the longer route within the Bay including impacts to SAV and shellfish habitat on the western shoreline. See Table 2-8 for additional details. There is only enough space for one of the two cables required to Oyster Creek which would require the use of a second landfall in addition to this one.
Lighthouse Drive	Waretown	The Lighthouse Drive landfall is located at the end of Lighthouse Drive in Ocean Township on private property and then utilizes existing road ROW. Lighthouse Drive presents many of the same difficulties as Bay Parkway. The terminus of the narrow (25-30 ft) road at the	Property rights for the private land at the landfall was unavailable. Similar to Bay Parkway construction would be required to stay within the ROW of Lighthouse Drive.	HDD: HDD from the landfall would require occupying a significant area of the privately-owned beach club adjacent to the bulkhead. There is only enough space for one of the two cables required to Oyster Creek. Open Cut: Like Bay Parkway, an open cut of the shoreline at this location would require the removal of the existing bulkhead, resulting in impacts to shoreline areas of SAV and shellfish. There is only enough space for one of the two cables required to Oyster Creek.	This landfall would result in additional impacts to Barnegat Bay over the propose landfall due to the longer route within the Bay including impacts to SAV and shellfish habitat on the western shoreline. See Table 2-8 for additional details. There is only enough space for one of the two cables required to Oyster Creek which would require the use of a second landfall in addition to this one.

Landfall Alternative	Location	Landfall Description	Real Estate Constraints	Engineering Constraints	Alternative Analysis Results
		Bay also has a bulkhead with very limited workspace.			
Oyster Creek Route, Oyster Creek Route Alternative 1	Lacey Township	Landfall is located at the shore of Barnegat Bay within the Holtec Property. The two HDDs will extend for a distance of approximately 1,300 feet and were designed to target previously disturbed areas on land where possible.	Land is available through coordination with Holtec which is responsible for the decommissioning of the Oyster Creek Generating Station. Landfall is not in direct proximity to private homes and require the acquisition of private land.	HDD: Landfall is located within previously disturbed tidal wetlands. Landfall will require HDD spacing of 165 ft to accommodate installation. Open Cut: An open cut solution would result in impacts to shoreline areas of SAV and shellfish habitat.	Landfall via HDD at the Holtec Property in Lacey Township will allow for avoidance of impacts to shellfish habitat, SAV, ISS, beaches, and mapped coastal wetlands. While there will be a small area of permanent impacts to wetlands in this location, all temporary impacts from construction activities will be restored to pre-construction conditions and impacts (both temporary and permanent) will be mitigated. At the HDD entry pit, a small hardstand area around the transition joint bay will permanently remain, flush with the ground surface to allow for access and maintenance during operation as needed. This landfall would provide adequate space for both cables required for Oyster Creek.

1 – Actual temporary wetland impacts per field delineations are 4.5 acres. Acres Refer to Appendix C for more details.

2.6 Onshore and Offshore Export Cable Routes

Two offshore export cable route corridors were identified, one to Oyster Creek and one to BL England. (**Figure 2-7**). The Oyster Creek Study Corridor was located within Ocean County along Barnegat Bay and coastal waters of the Atlantic Ocean to the 3nm state line and the BL England Study Corridor was located in Cape May county and includes Great Egg Harbor and coastal waters of the Atlantic Ocean to the 3nm state line.

These corridors were developed to avoid sensitive resources and hazards and were sized to accommodate modifications to the selected routes as described below based on site specific high resolution geophysical and geotechnical (HRG&G) surveys conducted in from 2018 through 2022 as well as to accommodate potential micrositing needs in the event there is a need that arises during construction.

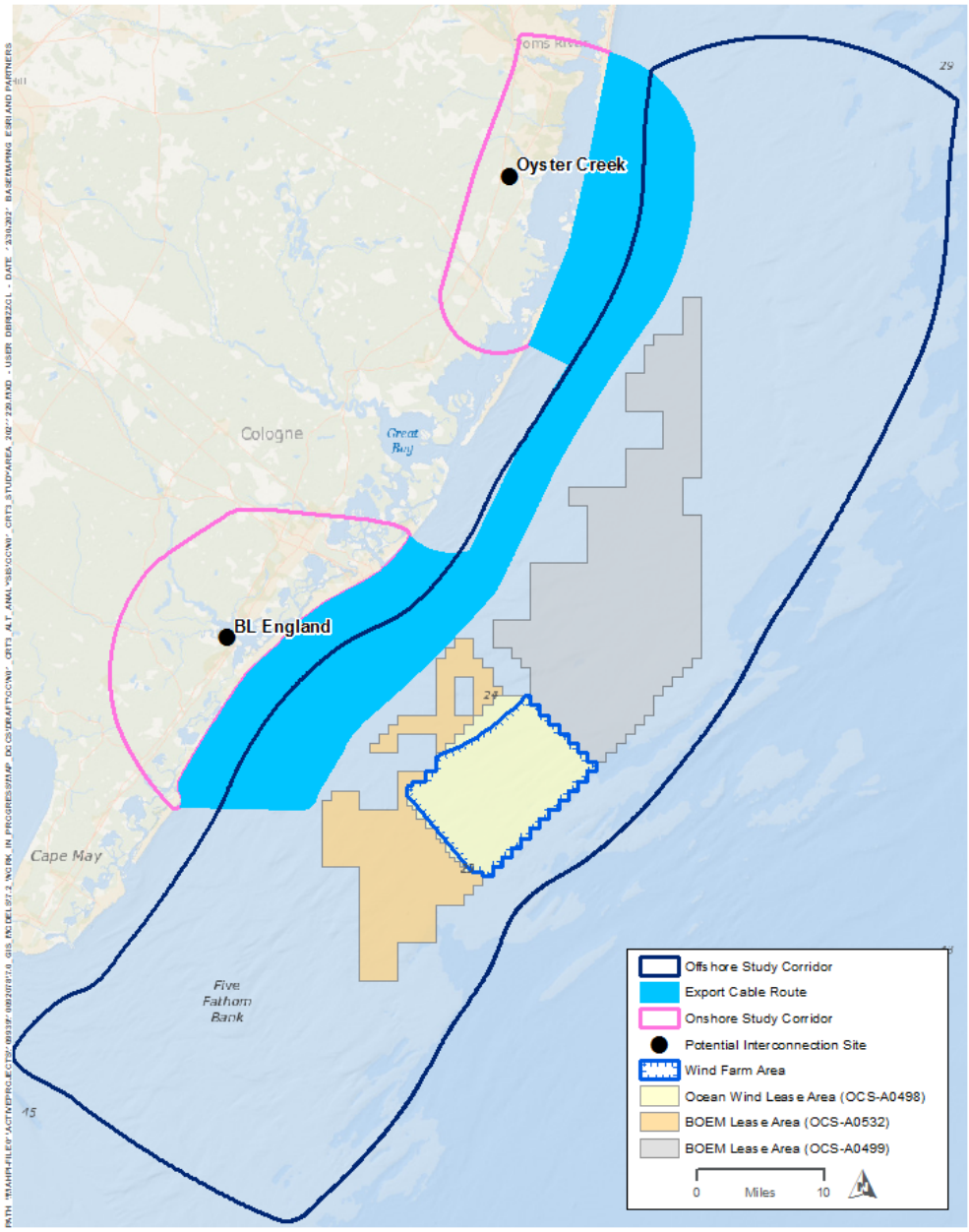


Figure 2-7. Oyster Creek and BL England offshore and onshore export cable route study corridors

2.6.1 BL England

Three cable route options were evaluated based on the landfalls discussed in Section 2.4. These routes are discussed further and are shown in **Figure 2-4** above.

2.6.1.1 BL England Offshore Export Cable Route

The BL England offshore Export Cable Route (ECR) contains a single cable that begins within the Wind Farm Area at one offshore substation and proceeds approximately 20 miles northwest to the Atlantic Ocean landfall at 35 Street within Ocean City. Within State waters, the ECR will extend for approximately 6 miles before terminating at the HDD exit pit. Along the ECR, the cable has been sited to avoid existing sensitive resources to the maximum extent practicable including prime fishing areas, artificial reefs, submerged wrecks/obstructions, and State and federal borrow areas.

2.6.1.2 BL England Landfall and Onshore Cable Route Alternatives

Of the six onshore cable routes included in the initial phased approach three were carried forward in Phase 2 further analysis based on the onshore landfalls evaluated. These routes are shown in **Figure 2-4**. Desktop studies, coordination with property owners and local municipalities, and windshield surveys conducted determined that landfalls at 35th street, 13th street, and 5th street were practicable and carried forward to Phase 3 for site specific surveys and further evaluation. A summary of the routes evaluated in Phase 2 and 3 is provided below.

- Onshore Cable Route, 5th Street Landfall - The 5th Street route would follow 5th Street to West Avenue, the cable would then be within West Avenue to 35th Street, then would follow the 35th street route described above. This route is 3.7 miles longer than the 35th street route, incurring additional impacts to the local communities.
- Onshore Cable Route, 13th Street Landfall - The 13th Street route would follow 13th Street to West Avenue, the cable would then be within West Avenue to 35th Street, then would follow the route from 35th Street described above. This route is 2.6 miles longer than the proposed route, incurring additional impacts to the local communities.
- Onshore Cable Route, 35th Street Landfall - After making landfall at 35th Street in Ocean City and travelling on local roads west, the cable would cross Peck Bay and the Intracoastal Waterway (undeveloped area) at Roosevelt Boulevard Bridge via trenchless technology methods and then the cable would continue on the existing County road ROW of Roosevelt Blvd turning north on State Route 9 (North Shore Road) to the potential substation property at the decommissioned BL England Generating Station.

These three routes eventually would follow the same route along Roosevelt Avenue to the BL England Generating Station, therefore the portion of the routes within Ocean City is the only portion where alternative analysis to determine is applicable. A summary of impacts associated with the routes within Ocean City is provided below in **Table 2-10**.

Table 2-10. BL England Route Alternatives.

Route Name	Route Length (Miles)	Alternative Analysis Conclusion
5th Street	3.7	This route was deselected due impacts to local residents and businesses associated with the additional route length within Ocean City.
13th Street	2.6	This route was deselected due impacts to local residents and businesses associated with the additional route length within Ocean City.
35th Street	0.1	This route was selected as the proposed cable landfall

Along Roosevelt Boulevard, Ocean Wind 1 considered three alternates, two of which are south of the Roosevelt Boulevard bridge over Peck Bay (Roosevelt Boulevard Parcel Alternative 1 and Roosevelt Boulevard Parcel Alternative 2). Table 2-11 provides a comparison of these routes to the proposed route at this location.

Table 2-11. Comparison of Roosevelt Boulevard Parcel Alternative Routes 1 and 2 and the Proposed Route.

Route Name	Route Length (Miles)	Green Acres Impacts (Acres)	Environmental and Other Constraints	Zoning and Land Use	Alternative Analysis Conclusion
Roosevelt Boulevard Alternative 1	4.88	0	• Wetlands Rank 1 and 4 Habitat • Property Access Rights to private landowner at marina	• Zoned as Conservation area Land use/land cover mapped as wetlands and water	This route was deselected due impacts to local residents and businesses and lack of access rights
Roosevelt Boulevard Alternative 2	4.92	0.068	• Multiple crossings of Roosevelt Boulevard • Rank 3 and 4 Habitat	• Zoned Residential Multi-Family Bayfront Land use/land cover mapped as urban, wetlands and water Adjacent to multifamily residential	This route was deselected due to impacts to Green Acre encumbered parcels
Roosevelt Boulevard Alternative 3	4,90	0	• Cape May County, the owner of the bridge, refused the request to attach the cable to the Bridge	• Attached to bridge, surrounding zoning Conservation. • Land use/land cover mapped as urban, wetlands and water	This route was deselected due to lack of access rights
Proposed Route	4.90	0	• Existing utilities • Multiple crossings of Roosevelt Boulevard • Rank 1, 3 and 4 Habitat	• Zoned Conservation and Residential Multi-Family Bayfront Land use/land cover mapped as urban, wetlands and water Adjacent to multifamily residential Dock, a boat launch and associated parking facilities	This route was selected due to avoided impacts Green Acres and local businesses.

After making landfall at 35th Street, the ECR would travel northwest within the paved areas of 35th Street before turning to the northeast for a distance of approximately 330 feet, at which point the ECR turns back to the northwest and onto Roosevelt Boulevard. The cable would remain within the Roosevelt Boulevard Cape May County ROW adjacent to coastal wetlands to the north until the alignment exits Roosevelt Boulevard paved areas just prior to the bridge crossing Peck Bay/Crook Horn Creek. The ECR exits the pavement to the south of Roosevelt Boulevard and onto Waterview Boulevard, then continues on Nautilus Drive within the roadway, to a previously disturbed parking area at the end of Nautilus Drive. At this point the cable will cross beneath Crook Horn Creek south of the Roosevelt Boulevard Bridge via HDD technology with the entry/exit pit within the paved area at the end of Nautilus Drive. On the west side of Crook Horn Creek, the cable will exit the

HDD within a previously disturbed area used as a rowing club, south of the Roosevelt Boulevard Bridge before crossing to the north side of Roosevelt Boulevard and re-entering the northbound paved ROW of Roosevelt Boulevard. HDD installation under Crook Horn Creek will avoid impacts to submerged aquatic vegetation (SAV), shellfish, wetlands, and a Green Acres encumbered parcel north of the bridge (Block 3350.01, Lot 17 owned by Ocean City). From here, the cable will continue to follow Roosevelt Boulevard to the northwest entirely within paved areas for approximately 1.1 miles before turning northeast onto State Route 9 (North Shore Road) for 1.8 miles. The onshore ECR will then turn northwest onto Clay Avenue and terminate at the proposed onshore substation within the prior golf course area at the decommissioned BL England Generating Station.

2.6.2 Oyster Creek

Two cable route options were evaluated to cross Barnegat Bay and four onshore cable route options were evaluated to based on the landfalls discussed in Section 2.5.2. These routes are discussed further and are shown in **Figure 2-5** above.

2.6.2.1 Oyster Creek Offshore Export Cable Route Corridor

The corridor begins within the Wind Farm Area and proceeds northwest to the Atlantic Ocean side of IBSP. Within State waters, the two cables will run parallel to each other separated by approximately 300 ft at the 3 nm boundary, before narrowing to approximately 200 ft just prior to HDD landfall at IBSP. Along the ECR, the cables will avoid the majority of the existing sensitive resources to the maximum extent practicable including prime fishing areas, artificial reefs, submerged wrecks/obstructions, and state and federal borrow areas. Within State waters, just prior to landfall, the ECR will cross approximately 1.7 miles of the Cedar Creek Prime Fishing Ground in a nearly straight alignment so as to minimize the impacts to the area. The crossing of this Prime Fishing Ground is unavoidable to make cable landfall at IBSP in this location.

As noted in Section 2.4, alternative cable routes were evaluated through Barnegat Inlet and to Ship Bottom but both were determined to be not practicable and therefore were eliminated from consideration. Therefore, the offshore export cable route is the only alternative proposed.

2.6.2.2 Oyster Creek Island Beach State Park Routes, and Inshore Export Cable Corridor

Following identification of the landfalls on IBSP from the Atlantic ocean, two cable routes were evaluated in Phase 2 and 3 for further analysis. These routes are shown in **Figure 2-6** and described in detail below.

- Prior Channel Alternative
  - To cross IBSP, the proposed route will begin within the auxiliary parking lot of Swimming Area #2 at the HDD entry pit and would continue north for approximately 1,100 ft through the western side of the main parking lot via traditional cable duct installation, then northwest approximately 300 ft across Shore Road to the maintenance area workspace on the western shoreline. From the maintenance area workspace, the route would continue via open cut into Barnegat Bay within a prior channel (previously disturbed and unmaintained), before traversing southwest across Barnegat Bay. Utilization of the previously disturbed main parking lot adjacent to the north and the maintenance area to the west of Shore Road avoids impacts on Shore Road, which is the main thoroughfare to the southern portion of the island. Some minor clearing and wetland disturbance would be required west of Shore Road, but the route through the maintenance area allows for direct access to the prior channel.
  - Utilization of the prior channel to the west of the maintenance area would make use of a previously disturbed area of deeper water and minimize the impacts to SAV and ISS. Furthermore, deeper water within this area allows for substantially less dredging than other routes, and greater likelihood of using jetting technology for longer distances. Additionally, this would minimize the

amount of added length to the export cable route, making this alternative feasible from an engineering perspective without the need for an HVAC booster. Use of open-cut installation allows for a reduced cable separation (20m for open cut rather than 50m for HDD), which keeps the majority of workspace within the prior channel and outside of areas of dense SAV beds.

- The IBSP West HDD Alternative
  - The route would begin within IBSP auxiliary parking lot of Swimming Area #2 and would exit IBSP via HDD from the same parking lot approximately 360 m into the Bay. The route would then crosses Barnegat Bay southwest, to make landfall north of Oyster Creek in the Holtec Property in Lacey Township. However, due to engineering constraints limiting the length the western drills into Barnegat Bay, this option would have incurred significant long-term impacts to SAV, which serves as important habitat to a number of finfish species. HDD lengths for both drills west from the parking lot was limited to approximately 360 m (1180 ft) because of existing geotechnical conditions (highly organic), thermal bottleneck requiring cable rating reduction, and the very shallow water depths. This option would still have required installing two export cables through SAV habitat for nearly 3,700 linear ft. For much of this distance, significant dredging would also likely be required to remove sediment for cable installation as there are limited installation tools that can work in shallow waters and also to allow vessel access through shallow water into the HDD workspace within the Bay.

Phase 2 included evaluation of potential impacts via desktop studies including impacts within Barnegat Bay to SAV, wetlands, shellfish habitat, navigation and other applicable resources. During Phase 2 both routes were determined practicable and carried forward into Phase 3 for site-specific surveys to confirm impacts to SAV and wetlands along the routes. Impacts to regulated resources for these two routes are summarized in **Table 2-12** below. Impacts evaluated are all considered temporary as they are related to construction dredging for cable installation and onshore clearing and trenching. Impacts would be restored in either scenario upon completion of construction.

Table 2-12. Impacts to regulated resources Proposed Alternative and IBSP West HDD Alternative

Alternative Considered	Regulated Resource Temporary Impacts					
	SAV (Acres)	Shellfish (Acres)	Wetlands (Acres)	ISS (Acres)	Dredging	
					Area (Acres)	Volume (Cubic Yards)
Prior Channel Alternative	<1	<1	<1	3.9	15.4	53,300
IBSP West HDD Alternative	16.8	3.4	0	9.6	23.3	134,500

2.6.2.3 Oyster Creek Onshore Cable Route Alternatives

Of the fifteen onshore cable routes included in the initial phased approach six were carried forward in Phase 2 further analysis based on the onshore landfalls evaluated. These routes are shown in **Figure 2-5**. Desktop studies, coordination with property owners and local municipalities, and windshield surveys conducted determined that routes along Bay Parkway and Lighthouse Drive were not practicable. Therefore, Oyster Creek Route Option and Alternative 1 were included in Phase 3 for spite specific surveys to assess impacts. A summary of the routes evaluated in Phase 2 and 3 and their impacts are summarized in **Table 2-13**.

Table 2-13. Oyster Creek Onshore Cable Route Options.

Route Name	Locations	Route Length (Miles)	Wetland Impacts (Acres)	Alternative Analysis Conclusion
Lighthouse Drive	Waretown Lacey Township	2.5	0	• Engineering Constraints o Construction would result in significant disruption of the communities along Lighthouse Drive which would not have alternative routes to and from their homes during periods of construction. • Community/Environmental Constraints o Lighthouse Drive from the Bay to Route 9 is also very narrow with adjacent commercial and residential properties. These properties would be significantly disrupted by traffic impacts during cable installation within the roadway. o Cable route would utilized part of the Barnegat Branch Trail Bike/pedestrian path that runs adjacent to route 9. This bicycle path is a county-owned easement that is encumbered by Green Acres and would have required a major diversion of parkland from NJDEP's Green Acres Program.
Bay Parkway	Waretown Lacey Township	2.3	6	• Engineering Constraints o The road terminates at the bay in a small, paved area adjacent to steel bulkheads. This area at the end of the road would not provide the required workspace and setbacks from the bulkhead for HDD into the Bay. o The drills would have been set back into the salt marsh wetlands to accommodate construction o An open cut solution would require the removal of the existing bulkhead. o The route is also longer and therefore, the duration of work within the Ocean Township roads would be significantly increased. • Community/Environment Constraints o The Bay Parkway routes is longer, resulting in overall greater impacts to the onshore communities and natural resources. o Bay Parkway, a county road, bisects two large tracts of open space parcels owned by the State of New Jersey Natural Lands Trust. Bay Parkway is a narrow, two-lane road approximately 28 ft wide with minimal shoulder. o An open cut solution would require the removal of the existing bulkhead and would have resulted in impacts to shoreline areas of SAV and shellfish habitat. o The drills would have been set back into the salt marsh wetlands, causing significant impacts, or the landings would have required open cut through the shoreline. o Bay Parkway also provides the only means of vehicular access to over 130 residences. This alternative would have required significant disruption to local residents requiring significant detours and traffic attenuation.
Oyster Creek Route Alternative 1	Lacey Township	2.8	1.5	• Engineering Constraints o The crossing of Oyster Creek could be conducted using trenchless technology methods or by an independent utility bridge (existing Route 9 bridge or new construction). o Impacts to the access roads that is utilized for service if necessary, to the NJDOT confined disposal facility and through to Vincent Clune Park o Longer onshore cable lengths and sharp turns of the cable route • Community/Environmental Constraints o In order to minimize potential impacts to wetlands and vegetation, the route would follow existing berms, paths, and trails where practical. o An additional approximate 0.8 acres of freshwater forested wetland transition area would be temporarily impacted under the Proposed Onshore alternative
Oyster Creek Route Option	Lacey Township	2.3	1.5	• Engineering Constraints o The cable will be installed within a small area of coastal wetlands, wetland transition area and riparian zone while within these previously disturbed areas o The route would proceed west across the Holtec Property in Lacey Township through undeveloped land, following previously disturbed upland berms and dirt trails. o The cable route crosses a forested area that will require minor clearing of some brush and trees. o This route will avoid disturbance to roads in the form of pavement opening for installation of utilities in the vicinity of the New Jersey Department of Transportation's (NJDOT) combined disposal facility (CDF). • Community/Environmental Constraints o In order to minimize potential impacts to wetlands and vegetation, the route would follow existing berms, paths, and trails where practical. o Use of historically disturbed upland berms and trails minimizes impacts to wetlands and State open waters.

3. Proposed Alternatives

3.1 BL England Proposed Alternative

This section describes the BL England Proposed Alternative by project component. Within each project area, different installation technologies (described in Permit Application, Section 2.1) will be utilized. **Table 3-1** highlights which technologies will be utilized by project area.

Table 3-1. BL England Design technologies by project area.

Project Component Within State Waters (Milepost)	Installation Technology									
	Seabed Preparation (Displacement Plow/Subsea Grab)	Jet Trenching Technologies (Jet Sled/ Jet Plow/CFE/Vertical Injection)	Dredging (Mechanical Excavation)	Jet-Assisted Cable Plow	Vertical Injection	HDD	Open Cut	Transition Joint Bay	Cable Duct Installation	Onshore Grid Interconnection
Offshore Export Cable (MP 5 through 10.3)[1]	X	X	X	X	X					
Offshore Landfall (MP 4.3 through 5)	X	X	X			X				
Onshore Export Cable Route (MP 0 through 4.3)						X		X	X	
Onshore Substation (MP0)									X	X

[1] Reference Project Plans in Appendix C for milepost locations

3.1.1 Offshore Export Cable

The BL England offshore ECR contains a single cable that begins within the Wind Farm Area at one offshore substation and proceeds approximately 20 miles northwest to the Atlantic Ocean landfall at 35 Street within Ocean City. Within State waters, the ECR will extend for approximately 6 miles before terminating at the HDD exit pit. Along the ECR, the cable has been sited to avoid existing sensitive resources to the maximum extent practicable including prime fishing areas, artificial reefs, submerged wrecks/obstructions, and State and federal borrow areas.

3.1.2 Offshore Landfall

The offshore ECR terminates at a single onshore TJB within the onshore HDD workspace. The transition to shore Is made via HDD from an HDD exit pit location approximately 1,600 ft from the mean high water (MHW) line in Ocean City. The cable landfall HDD will be approximately 2,500 feet in length and surface onshore within 35th Street in Ocean City between Central Avenue and Asbury Avenue. The existing paved areas within the city streets will be utilized as temporary workspace from West Avenue to the beach bulkhead at 35th Street. Using HDD at landfall from the Atlantic Ocean will allow the project to avoid impacts to sensitive resources such as beaches, dunes, and overwash areas. Additionally, HDD will allow the Project to avoid surficial impacts to beachfront Green Acres-encumbered parcels owned by Ocean City (Block 611.11, Lots 137 and 145). Use of

HDD will also avoid impacts to the ongoing USACE beach nourishment operations within Ocean City. The cable will be approximately 50 feet below the peak of the dunes on the beach and approximately 35 feet below USACE's construction template for beach nourishment activities (see Appendix C Design Plans). The cable will also be buried between 10 and 15 feet below the beach nourishment project's depth of closure elevation of -22 ft NAVD88. Based on correspondence with USACE, while all of Ocean City's beaches are within USACE's beach nourishment program, this portion of the Ocean City beach is not actively being renourished and has remained stable for many years. The alignment to land within the 35th Street roadway right-of-way (ROW) was selected because it is previously disturbed with sufficient space to allow for HDD work areas. Noise attenuation measures such as sound screens and/or curtains will be implemented and construction will take place in winter months so as to reduce impacts to local residents and tourism/recreation.

3.1.3 Onshore Export Cable Route

After making landfall at 35th Street, the ECR would travel northwest within the paved areas of 35th Street before turning to the northeast for a distance of approximately 330 feet, at which point the ECR turns back to the northwest and onto Roosevelt Boulevard. The cable would remain within the Roosevelt Boulevard Cape May County ROW adjacent to coastal wetlands to the north until the alignment exits Roosevelt Boulevard paved areas just prior to the bridge crossing Peck Bay/Crook Horn Creek. The ECR exits the pavement to the south of Roosevelt Boulevard and onto Waterview Boulevard, then continues on Nautilus Drive within the roadway, to a previously disturbed parking area at the end of Nautilus Drive. At this point the cable will cross beneath Crook Horn Creek south of the Roosevelt Boulevard Bridge via HDD technology with the entry/exit pit within the paved area at the end of Nautilus Drive. On the west side of Crook Horn Creek, the cable will exit the HDD within a previously disturbed area used as a rowing club, south of the Roosevelt Boulevard Bridge before crossing to the north side of Roosevelt Boulevard and re-entering the northbound paved ROW of Roosevelt Boulevard. HDD installation under Crook Horn Creek will avoid impacts to submerged aquatic vegetation (SAV), shellfish, wetlands, and a Green Acres encumbered parcel north of the bridge (Block 3350.01, Lot 17 owned by Ocean City). From here, the cable will continue to follow Roosevelt Boulevard to the northwest entirely within paved areas for approximately 1.1 miles before turning northeast onto State Route 9 (North Shore Road) for 1.8 miles. The onshore ECR will then turn northwest onto Clay Avenue and terminate at the proposed onshore substation within the prior golf course area at the decommissioned BL England Generating Station.

3.1.4 Onshore Substation

The onshore substation has been sited within approximately 12 acres of Upper Township Block 479, lot 76. The substation was sited within a previously disturbed, dilapidated golf course. An NJDEP Letter of Interpretation (LOI) for the property was issued March 19, 2019 (File No. 0511-03-0011.4 FWW180001). Because this LOI is valid for a period of five years, it was relied upon for siting of the proposed substation. Subsequent wetlands within the proposed substation location were identified by NJDEP staff during a wetland verification site visit in November 2021. Of the areas made available by the owner (at the time that Ocean Wind 1 entered into an option agreement), the portion of the parcel selected was chosen for substation development because of its proximity to the onshore interconnection point at the BL England Generating Station. The topography of the proposed development area is also relatively flat and would not require extensive import of fill. Siting the onshore substation in this area would also make use of the adjacent generating station access road and limit the amount of additional impervious surface required to access the substation. The areas outside of the proposed development area within the parcel contain an extensive wetland complex that includes freshwater forested wetlands and coastal wetlands north of the railroad ROW. Wetlands and their associated transition areas identified by the 2019 LOI are avoided within the development parcel. The additional wetlands identified during the field verification that cannot be avoided will be mitigated for in accordance with state and federal regulations (**Table 3-2**).

Table 3-2. BL England Ocean Wind 1 Project Area proposed temporary and permanent impacts to State Regulated Resources

Regulated Resource	Onshore Export Cable Installation		Onshore Substation		Total	
	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
Freshwater Wetlands	-	-	1.289	0.653	1.289	0.653
Freshwater Wetlands Transition Area	-	-	1.294	0.010	1.294	0.010
Coastal Wetlands	0.006	-	-	-	0.006	-
Coastal Wetlands Transition Area	0.472	-	-	-	0.472	-

3.2 Oyster Creek Proposed Alternative

This section describes the Oyster Creek Proposed Alternative by project component. Within each project area, different installation technologies (described in Permit Application, Section 2.1) will be utilized. **Table 3-3** highlights which technologies will be utilized by project area.

Table 3-3. Oyster Creek Design technologies by project area.

Project Component Within State Waters (Milepost)	Installation Technology								
	Seabed Preparation (Displacement Plow/Subsea Grab)	Jet Trenching Technologies (Jet Sled/ Jet Plow/CFE/Vertical Injection)	Dredging (Mechanical Excavation)	Jet-Assisted Cable Plow	HDD	Open Cut	Transition Joint Bay	Cable Duct Installation	Onshore Grid Interconnection
Offshore Export Cable (MP 9.5 through 12.5)[1]	X	X	X	X					
Offshore Landfall (MP 9 through 9.5)	X	X	X		X				
Crossing of Island Beach State Park (MP 8.8 through 9)						X	X	X	
Barnegat Bay Crossing and Lacey Township Landfall (MP 2.5 through 8.8)	X	X			X	X[2]			
Onshore Export Cable Route (MP 0 through 2.5)					X		X	X	
Onshore Substation (MP 0)								X	X

[1] Reference Project Plans in Appendix C for milepost locations

[2] Open Cut is an alternate installation technique for the Oyster Creek mainland landfalls

3.2.1 Offshore Export Cable

The Oyster Creek offshore Export Cable Route (ECR) contains two cables and begins within the Wind Farm Area at two offshore substations and proceeds north for approximately 57 miles to the Atlantic Ocean side of IBSP. Within State waters, the two cables will run parallel to each other separated by approximately 300 feet at the 3 nm boundary, before narrowing to approximately 200 ft just prior to HDD landfall at IBSP. Along the ECR, the cables will avoid the majority of the existing sensitive resources to the maximum extent practicable including prime fishing areas, artificial reefs, submerged wrecks/obstructions, and state and federal borrow areas. Within State waters, just prior to landfall the ECR will cross approximately 1.7 miles of the Cedar Creek Prime Fishing Ground in a nearly straight alignment so as to minimize the impacts to the area.

3.2.2 Offshore Landfall

The offshore ECR terminates at two onshore TJBs within the onshore HDD workspace. The transition to shore is made via HDD from two HDD exit pit locations in the Atlantic Ocean approximately 950 ft from the MHW line at IBSP. The two cable landfall HDDs will be approximately 1,550 ft in length and will surface onshore within the southern auxiliary lot of Swimming Area #2. The existing paved areas within the remaining parking lot for Swimming Area #2 will be utilized as temporary workspace so as to minimize the impacts to natural resources. The area is comprised of previously disturbed areas that have been paved. HDD landfall from the Atlantic Ocean will allow the Project to avoid impacts to sensitive resources such as beaches, dunes, and overwash areas. The alignment to land in the auxiliary parking lot of Swimming Area #2 was selected as this area is seasonally used by the park (closed between October and June) and represents a previously disturbed, paved area with sufficient space to allow for HDD work areas.

3.2.3 Crossing of Island Beach State Park

To cross IBSP, the proposed route will begin within the auxiliary parking lot of Swimming Area #2 at the TJBs within the HDD workspace and would continue north for approximately 1,100 ft through the western side of the main parking lot via traditional cable duct installation, then northwest approximately 300 ft across Shore Road to the maintenance area workspace on the western shoreline. From the maintenance area workspace, the route would continue via open cut into Barnegat Bay within a prior channel (previously disturbed and unmaintained), before traversing southwest across Barnegat Bay. Utilization of the previously disturbed main parking lot adjacent to the north and the maintenance area to the west of Shore Road avoids impacts on Shore Road, which is the main thoroughfare to the southern portion of the island. Some minor clearing and wetland disturbance would be required west of Shore Road, but the route through the maintenance area allows for direct access to the prior channel. Utilization of the prior channel to the west of the maintenance area would make use of a previously disturbed area of deeper water and minimize the impacts to SAV and Intertidal and Subtidal Shallows (ISS). Furthermore, deeper water within this area allows for substantially less dredging than other routes, and greater likelihood of using jetting technology for longer distances (see Appendix A Alternatives Analysis). Additionally, this would minimize the amount of added length to the export cable route, making this alternative feasible from an engineering perspective, without the need for a high voltage alternative current (HVAC) booster. Use of open-cut installation allows for a reduced cable separation (20m for open cut rather than 50m for HDD), which keeps the majority of workspace within the prior channel and outside of areas containing dense SAV beds.

3.2.4 Barnegat Bay Crossing and Lacey Township Landfall

The ECR will cross the shallow waters of Barnegat Bay from the open cut landfall on IBSP, starting within the prior channel traveling due west with a cable separation of approximately 65 ft, before widening to 160 ft outside of the channel and turning southwest for approximately 3.5 miles. The ECR then turns due west again before the inshore portion of the ECR terminates at two onshore TJBs within the onshore HDD workspace at

the Holtec Property. The preferred method of installation for the transition to shore is HDD from two HDD exit pits between 700 and 800 feet from the MHW line at Lacey Township in Barnegat Bay (**Table 3-4**). Geotechnical investigations upon which installation design depends are ongoing. Ocean Wind 1 anticipates that the preliminary data from these surveys needed to complete installation design will be available in Quarter 4, 2022. At that time, data will be reviewed to determine whether HDD is the installation technique with the least environmental impact, or whether the risk of inadvertent return is such that open cut would result in the least impact. The offshore plans included in Appendix C provide details for the preferred option HDD installation as well as alternative installation in the event that open cut installation would minimize impacts. Should open cut trenching be required, more detail and advanced design will be presented in a subsequent permit submittal to NJDEP. Potential additional impacts of open cut trenching can be found in **Table 3-5**. Through Barnegat Bay, the cable minimizes impacts to the majority of NJDEP-mapped SAV and shellfish resources. Furthermore, based on the most recent studies available, much of these areas show substantially less SAV and shellfish to be currently present in these areas. Ocean Wind 1 will conduct additional in-water video collection in summer 2022 to further refine the delineations of SAV beds near the Project footprint, document percent cover, and identify species. The results will be used to inform final Project design to minimize impacts to SAV. Six months prior to cable installation (within the growing season), a focused pre-construction in-water SAV survey will be conducted to characterize the SAV condition (e.g., shoot density) within the Project's potential area of impact.

The Lacey Township landfall is located at the shore of Barnegat Bay within a parcel owned by Holtec (Lacey Township Block 100, Lot 1.06). The two HDDs will extend for a distance of approximately 1,200 ft and were designed to target previously disturbed areas on land where possible. Landfall via HDD at the Holtec Property in Lacey Township will allow for avoidance of impacts to shellfish habitat, SAV, ISS, beaches, and mapped coastal wetlands. HDD operations onshore will be minimized through the use of timber matting in the workspace around the HDD entry pits. While there will be a very small area of permanent impacts to wetlands in this location (likely the size of four manhole covers), all temporary impacts from construction activities will be restored to pre-construction contours and impacts (both temporary and permanent) will be mitigated. For additional information on wetland impacts, please see Appendix S. At the HDD entry pit, a small hardstand area around the TJB will permanently remain below the ground surface, with two manholes flush with the ground surface to allow for access and maintenance during operation as needed.

3.2.5 Onshore Export Cable Route

The proposed onshore ECR proceeds west across the Holtec Property in Lacey Township through undeveloped land, following previously disturbed upland berms and dirt trails. The cable will be installed within a small area of coastal wetlands, wetland transition area and riparian zone within these previously disturbed areas. Use of historically disturbed upland berms and trails minimizes impacts to wetlands and State open waters. The cable will follow the berms and trails west and then southwest, just south of the existing paved access road. The ECR then crosses a forested area that will require minor clearing of some brush and trees. The cables will be installed within two duct banks that range from 6 to 15 feet in separation through the Holtec Property. This route will avoid disturbance to roads in the form of pavement opening for installation of utilities in the vicinity of the New Jersey Department of Transportation's (NJDOT) combined disposal facility (CDF). This route option traverses a previously disturbed but currently undeveloped area and will shorten the distance to the onshore substation, allowing the cables to function at maximum capacity. This route will also allow for reduced conflict with existing users along the narrow Holtec Property access road east of Route 9. Based on correspondence with local stakeholders, the road serves as emergency access to the Vincent Clune Park and also as NJDOT access to the State-owned CDF. The shortened route south of the Holtec Property access road also reduces sharp turns along Route 9 and consolidates the Oyster Creek and Route 9 HDD crossings. As the ECR approaches Route 9, it turns to the southwest and crosses underneath Oyster Creek and Route 9 using

HDD methodology, surfacing in an existing private access road. The route then continues within this previously disturbed, paved access road for approximately 3,000 linear feet until the termination at the proposed onshore substation parcel. The HDD crossing of Oyster Creek allows for a more direct route to the substation and avoids road opening work and major traffic attenuation along Route 9. Using HDD under Oyster Creek will also allow for avoidance of surficial impacts to open waters and freshwater and coastal wetlands. Utilizing the existing paved access road to run the cable west to the substation parcel will allow for avoidance to adjacent wetlands and watercourses.

3.2.6 Onshore Substation

The onshore substation has been sited within the eastern portion of Lacey Township's Block 1001, Lot 4.06, a parcel acquired by Ocean Wind 1 for development. The parcel has been historically disturbed as part of the development of the Oyster Creek Nuclear Generating Station and was often used for storage and staging, based on historic aerial imagery. The eastern portion of the parcel was selected for development of the substation because of its proximity to the onshore interconnection point, flat topography and lack of natural resources. The area is dominated by early successional forest and scrub shrub habitat dominated by eastern red cedar. An NJDEP Letter of Interpretation (LOI) for the property was issued August 15, 2017 (1512-17-0013.1 FWW170001) identifying isolated freshwater wetlands of intermediate value. Because this LOI is valid for a period of five years, it was relied upon for siting of the proposed substation. Subsequent to the siting of the substation, wetlands within the proposed substation location were identified by NJDEP staff during a wetland verification site visit in November 2021. The western portion of the parcel contains varying topography with a "gully" feature that slopes from an elevation of approximately 27 ft (North American Vertical Datum [NAVD]88) down to 19 ft elevation before returning to approximately 26 ft elevation and would require a significant amount of fill to develop. Therefore, the substation was sited in the eastern portion of the parcel. Refer to **Table 3.4** below for summary of temporary and permanent impacts to State regulated resources.

.

Table 3-4. Offshore Oyster Creek Ocean Wind 1 Project Area proposed temporary and permanent impacts to State regulated resources.

Regulated Resource	Jetting/Jet-assisted Cable Plow Trench		Jetting/Jet-assisted Cable Plow Skids		Dredging Activities				Mooring and Anchoring Activities		Shoreline Stabilization		TOTAL			
	Temporary (ac)	Permanent (ac)	Temporary (ac)	Permanent (ac)	Temporary (ac)	Temporary Volume (CY)	Permanent Volume (CY)	Permanent (ac)	Temporary (ac)	Permanent (ac)	Temporary (ac)	Permanent (ac)	Temporary (ac)	Temporary Volume (CY)	Permanent Volume (CY)	Permanent (ac)
State Open Waters	6.311	-	41.253	-	26.279	118,359	18,030	3.645	1.644	-	-	0.083	56.24	118,359	18,030	3.728
Submerged Aquatic Vegetation Habitat	-	-	-	-	1.803	8,120	4,507	0.911	0.020	-	-	0.083	1.832	8,120	4,507	0.994
Shellfish Habitat	3.425	-	20.622	-	4.748	21,386	18,030	3.645	0.695	-	-	-	29.495	21,386	18,030	3.645
Intertidal and Subtidal Shallows	-	-	-	-	3.936	13,093	-	-	0.025	-	-	0.083	3.961	13,093	-	0.083
Prime Fishing Areas	1.335	-	10.061	-	-	-	-	-	0.094	-	-	-	11.490	-	-	-

*Dredging impacts within SAV habitat are based on the Department's mapped SAV, dated 1986. SAV surveys from 1979 (NJDEP), Rutgers (2009, 2003, 1996-99), Ocean Wind 1 (2021) have determined that the prior channel west of IBSP does not currently support SAV

Table 3-5. Potential additional impacts to NJDEP-regulated resources as a result of open cut trenching cable installation.

Regulated Resource	Temporary (acres)	Temporary Volume Removed (CY)	Permanent (acres)	Permanent Volume Removed (CY)
State Open Water	2.22	24,300	-	-
Submerged Aquatic Vegetation	1.1	12,100	-	-
Shellfish Habitat	1.9	21,100	-	-
Intertidal and Subtidal Shallows	1.2	12,800	-	-

*Impacts to be further refined later based on advanced engineering should open cut trenching be required