

Appendix C: Project Design Envelope and Maximum-Case Scenario

Mayflower Wind Energy LLC (Mayflower Wind) would implement a Project Design Envelope (PDE) concept. This concept allows Mayflower Wind to define and bracket proposed project characteristics for environmental review and permitting while maintaining a reasonable degree of flexibility for selection and purchase of project components such as wind turbine generators (WTGs), foundations, submarine cables, and offshore substation platforms (OSPs).

The Bureau of Ocean Energy Management (BOEM) invited Mayflower Wind and other lessees to submit construction and operations plans (COPs) using the PDE concept—providing sufficiently detailed information within a reasonable range of parameters to analyze a “maximum-case scenario” within those parameters for each affected environmental resource. BOEM identified and verified that the maximum-case scenario based on the PDE provided by Mayflower Wind and analyzed in this Environmental Impact Statement (EIS) could reasonably occur if approved. This approach is intended to provide flexibility for lessees and allow BOEM to analyze environmental impacts in a manner that minimizes the need for subsequent environmental and technical reviews. In addition, the PDE approach may enable BOEM to expedite review by beginning National Environmental Policy Act (NEPA) evaluations of COPs before a lessee has finalized all its design decisions.

This EIS assesses the impacts of the reasonable range of project designs that are described in the Mayflower Wind COP by using the “maximum-case scenario” process. The maximum-case scenario analyzes the aspects of each design parameter that would result in the greatest impact for each physical, biological, and socioeconomic resource. This Draft EIS considers the interrelationship between aspects of the PDE rather than simply viewing each design parameter independently. This EIS also analyzes the planned action impacts of the maximum-case scenario alongside other reasonably foreseeable past, present, and future actions.

Certain resources evaluated in this EIS may have multiple maximum-case scenarios, and the most impactful design parameters may not be the same for all resources. A summary of Mayflower Wind’s PDE parameters is provided in Table C-1. Table C-2 details the full range of maximum-case design parameters for the proposed Project and which parameters are relevant to the analysis for each EIS Section in Chapter 3, *Affected Environment and Environmental Consequences*.

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Number of legs/discrete contact points with seabed per substructure	4				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
WTG Gravity-based Structure (COP Volume 1 Table 3-2)																				
Diameter of gravity-based structure at seabed (seabed centerline diameter) (maximum for 4-foundation gravity-based structure)	393.7 feet (120 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (maximum for 1-foundation gravity-based structure)	229.6 feet (70.0 meters)				X			X	X	X		X	X				X		X	
Footprint diameter across ^a (maximum for 4-foundation gravity-based structure)	696.2 feet (212.2 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 4				X			X	X	X		X	X				X		X	
Depth of penetration below seabed	29.6 feet (9 meters)				X			X	X	X		X	X				X		X	
Maximum total dredging volume of all locations combined for installation	111,973,203 ft ³ (3,170,728 m ³)				X			X	X	X		X	X				X		X	
OFFSHORE SUBSTATIONS																				
PARAMETERS PER OSP FOUNDATION STRUCTURE																				
Topside Offshore Substations																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Height of OSP topside above MLLW	344.5 feet (105 meters)			X	X							X	X				X	X		X
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option A Modular																				
OSP Monopile (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	52.5 feet (16.0 meters)				X			X	X	X		X	X				X		X	
Footprint diameter at mudline	52.5 feet (16.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	1				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	2.52 acres (1.02 hectares)				X			X	X	X		X	X				X		X	
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	14.7 feet (4.5 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 4 foundations and up to 2 piles per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	229.6 feet (70.0 meters)				X			X	X	X		X	X				X		X	
Distance between adjacent legs at seabed	116 feet (36 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	2.61 acres (1.05 hectares)				X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4 .1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
OSP Suction-Bucket Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter of suction bucket at seabed (seabed centerline diameter)	180.4 feet (55.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 4 foundations and 1 bucket per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Distance between adjacent legs at seabed	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	4.90 acres (1.98 hectares)				X			X	X	X		X	X				X		X	
OSP Gravity-based Structure (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (centerline diameter)	Not applicable				X			X	X	X		X	X				X		X	
Diameter of gravity-based structure at seabed [seabed centerline diameter]	229.6 feet (70 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed	Up to 4 foundations				X			X	X	X		X	X				X		X	
Depth of penetration below seabed	Not applicable				X			X	X	X		X	X				X		X	
Distance between adjacent legs at seabed	Not applicable				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	11.55 acres (4.67 hectares)				X			X	X	X		X	X				X		X	
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option B Integrated																				
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	213 feet x 105 feet (65 meters x 32 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	11.7 feet (3.57 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 6 foundations and up to 3 piles per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	277.2 feet (84.5 meters)				X			X	X	X		X	X				X		X	
Foundation diameter/leg spacing at mean sea level (MSL)	114.8–168.0 feet (35–50 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	7.54 acres (3.05 hectares)				X			X	X	X		X	X				X		X	
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option C DC Converter																				
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	279 feet x 197 feet (85 meters x 60 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	12.8 feet (3.9 meters)				X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Number of legs/discrete contact points with seabed	4 to 9 foundations and 1 to 3 piles / foundation = 4 to 27 piles				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	262.4 feet (80 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	9.79 acres (3.96 hectares)				X			X	X	X		X	X				X		X	
OSP Gravity-based Structure (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter of gravity-based structure at seabed (seabed centerline diameter)	361 feet x 328 feet (110 x 100 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	4 to 9 foundations				X			X	X	X		X	X				X		X	
Depth of penetration below seabed	Not applicable				X			X	X	X		X	X				X		X	
Foundation diameter/leg spacing at mean sea level (MSL)	262.0–328.1 feet (80–100 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation ^a	10.90 acres (4.41 hectares)				X			X	X	X		X	X				X		X	
PERMANENT SEABED DISTURBANCE (COP Volume 1 Table 3-36; Table 3-37)																				
Monopile WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation ^a	2.52 acres (1.02 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations ^a	370.44 acres (149.94 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation ^a	2.61 acres (1.05 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations ^a	383.67 acres (154.35 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket OSP Substructures (COP Volume 1 Table 3-36)																				
Total permanent footprint per OSP foundation ^a	9.8 acres (3.7 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 2 OSP foundations ^a	19.6 acres (7.4 hectares)		X		X			X	X	X		X	X				X		X	
Suction Bucket Jacket WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation ^a	4.90 acres (1.98 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations ^a	720.30 acres (291.06 hectares)		X		X			X	X	X		X	X				X		X	
WTG Gravity Based Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation ^a	11.55 acres (4.67 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations ^a	1,697.85 acres (686.49 hectares)		X		X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Gravity Based OSP Substructures (COP Volume 1 Table 3-36)																				
Total permanent footprint per foundation ^a	10.9 acres (4.4 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 2 OSP foundations ^a	21.8 acres (8.8 hectares)		X		X			X	X	X		X	X				X		X	
TEMPORARY SEABED DISTURBANCE DURING CONSTRUCTION																				
Monopile WTG Substructures (COP Volume 1 Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	73.5 acres (29.4 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket WTG Substructures (Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	73.5 acres (29.4 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket OSP Substructures (COP Volume 1 Table 3-36; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 2 OSP foundations	1.0 acres (0.4 hectare)		X		X			X	X	X		X	X				X		X	
Suction Bucket Jacket WTG Substructures (COP Volume 1 Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.6 acre (0.3 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	88.2 acres (44.1 hectares)		X		X			X	X	X		X	X				X		X	
Gravity Base WTG Substructures (COP Volume 1 Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	1.0 acres (0.4 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	147.0 acres (58.8 hectares)		X		X			X	X	X		X	X				X		X	
Gravity Base OSP Substructures (COP Volume 1 Table 3-36; Table 3-38)																				
Disturbance Due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	1.5 acres (0.6 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 2 OSP foundations	3.0 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Installation Timeframe																				
Monopile																				
Approximate duration per foundation	4 hours	X	X	X	X	X		X	X	X		X					X		X	
Number of piles driven per day	2	X	X	X	X	X		X	X	X		X					X		X	
Piled Jacket																				
Approximate duration per foundation	2 hours	X	X	X	X	X		X	X	X		X					X		X	
Number of piles driven per day	8	X	X	X	X	X		X	X	X		X					X		X	
Temporary Seabed Disturbance During WTG Construction (COP Volume 1 Table 3-37; Table 3-38)																				
Area of seabed preparation per foundation monopile	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation pin-pile jacket	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation suction-bucket jacket	0.6 acre (0.3 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation gravity-base	1.0 acre (0.4 hectare)		X		X			X	X	X		X	X				X		X	
Area of disturbance per jack-up vessel (vessel spuds including all legs)	0.37 acre (0.15 hectare)		X		X			X	X	X		X	X				X		X	
Number of vessel visits per WTG location	6 to 8	X	X		X			X	X	X		X	X	X	X		X		X	
Temporary Seabed Disturbance During OSP Construction (COP Volume 1 Table 3-36; Table 3-38)																				
Area of seabed preparation per foundation pin-pile jacket	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation gravity base	1.5 acre (0.6 hectare)		X		X			X	X	X		X	X				X		X	
Number of vessel visits per OSP location	4	X	X		X			X	X	X		X	X	X	X		X		X	
Temporary Seabed Disturbance During WTG/OSP Construction (COP Volume 1 Table 3-38)																				
Total jack-up vessel spud seabed footprint area (149 WTG/OSP locations)	441.8 acres (178.8 hectares)		X		X			X	X	X		X	X				X		X	
INTERARRAY and EXPORT CABLES																				
Interarray Cable (COP Volume 1 Table 3-12; Table 3-30)																				
Cable diameter	8 inches		X		X	X		X	X	X		X	X				X	X		
Nominal cable voltage (AC)	72.5 kV				X			X	X	X										
Number of WTGs per interarray cable string	1 to up to 9				X								X	X			X	X		
Seabed preparation (assumes boulder removal and grapnel run over entire length)	99 acres (40 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (assumed 19.7 feet [6 meters] of surface impact around each cable)	1,186 acres (480 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable protection (assumes mattresses or rock placement at cable crossings and as needed; assumes 10 percent of the interarray cable will require additional protection; a 19.7-foot (6-meter)-wide rock berm would be constructed along these cable sections)	122 acres (50 hectares)		X		X	X						X	X	X			X	X	X	
Total area disturbed	1,408 acres (570 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	

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Interarray cable length	497.1 miles (800 kilometers)	X			X	X		X	X	X		X	X	X			X	X	X	
Target burial depth	8.2 feet (2.5 meters)				X	X		X	X	X		X	X				X	X	X	
Number of cable/pipeline crossings	Up to 10				X													X		
Offshore Export Cable (COP Volume 1 Table 3-29; Table 3-14) – Falmouth																				
Number of export cables	Up to 5	X	X		X	X		X	X	X		X	X	X		X	X	X	X	
Nominal cable voltage	345 kV (HVAC) ±525 kV (HVDC)				X			X	X	X										
Burial depth	13.1 feet (4 meters)				X	X		X	X	X		X	X				X	X	X	
Export cable diameter (excluding cable protection)	13.8 inches (350.0 millimeters)		X		X	X		X	X	X		X	X				X	X		
Maximum Length of export cable	434.9 miles (700 kilometers)	X	X		X	X		X	X	X		X	X				X	X		
Length of Offshore cable corridor	87.0 miles (140 kilometers)		X		X	X		X	X	X		X	X				X	X		
Export cable corridor width	3,280.8 feet (1,000 meters)		X		X	X		X	X	X		X	X				X	X		
Number of cable/pipeline crossings (COP Volume 1 Table 3-15)	Up to 9				X													X		
Typical separation distance of export cable	328 feet (100 meters)		X		X	X						X	X				X	X		
Seabed preparation (per cable) (assumes suction hopper dredger over 5 percent of route; boulder field clearance 10 percent of route; grapnel run over the entire route)	138 acres (56 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (per cable) (assumes surface impact of 19.7 feet [6 meters] around each cable)	186 acres (75 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable protection (per cable) (an estimated 10 percent of the route will require additional cable protection. It is assumed that a 19.7 foot- (6 meter)-wide rock berm will be constructed)	27 acres (11 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Total seabed disturbance area (per cable)	351 acres (142 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Total seabed disturbance area (5 cables)	1,753 acres (709 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Offshore Export Cable (COP Volume 1 Table 3-29; Table 3-14) – Brayton Point																				
Number of export cable bundles (each bundle consisting of two power cables and one communication cable)	Up to 2	X	X		X	X		X	X	X		X	X	X		X	X	X	X	
Nominal cable voltage (HVDC)	±320 kV				X			X	X	X										
Export cable diameter (excluding cable protection)	6.9 inches (175.0 millimeters)		X		X	X		X	X	X		X	X				X	X		
Burial depth	13.1 feet (4 meters)				X	X		X	X	X		X	X				X	X	X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Maximum length of export cable	744 miles (1,200 kilometers)	X	X		X	X		X	X	X		X	X				X	X		
Length of Offshore cable corridor	124 miles (200 kilometers)		X		X	X		X	X	X		X	X				X	X		
Export cable corridor width	2,300 feet (700 meters)		X		X	X		X	X	X		X	X				X	X		
Number of cable/pipeline crossings (COP Volume 1 Table 3-15)	Up to 16				X													X		
Typical separation distance of export cable	164 feet (50 meters)		X		X	X						X	X				X	X		
Seabed preparation (per cable bundle) (boulder field clearance 10 percent of route; grapnel run over the entire route)	65 acres (26 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (per cable bundle) (assumes surface impact of 19.7 feet [6 meters] around each cable)	242 acres (98 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable protection (per cable bundle) (an estimated 15 percent of the route will require additional cable protection. It is assumed that a 19.7-foot (6-meter)-wide rock berm will be constructed)	56 acres (23 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Seabed disturbance area (per cable bundle)	363 acres (147 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Total seabed disturbance area (2 cables bundles)	727 acres (294 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Onshore Components Falmouth (COP Volume 1 Table 3-18; Table 3-19; Table 3-34; Table 3-39)																				
Landfall locations	Worcester Avenue; Shore Street; or Central Park		X	X		X	X				X		X	X	X	X			X	X
Landfall transition method	horizontal directional drilling (HDD)		X	X	X	X	X				X		X			X				
Number of sea to shore HDDs	Up to 4		X	X	X	X	X				X		X			X				
Area of disturbance per HDD	0.1 acre (0.04 hectare)		X	X		X	X				X		X			X				
Total area of HDD disturbance	0.4 acre (0.16 hectare)		X	X		X	X				X		X			X				
Onshore substation locations	Lawrence Lynch or Cape Cod Aggregates		X	X		X	X				X		X	X	X	X			X	X
Maximum distance from landfall to substation (Shore Street to Cape Cod Aggregates)	6.4 miles (10.25 kilometers)		X	X		X	X				X		X			X				
Number of Onshore export power cables	3 to 12		X	X		X	X				X		X			X				
Number of Onshore communications cables	1 to 5		X	X		X	X				X		X			X				
Number of Onshore continuity cables	1 to 4		X	X		X	X				X		X			X				
Approximate cable diameter	5.59 inches (142 millimeters)		X	X		X	X				X		X			X				
Nominal cable voltage (HVAC)	345 kV		X	X		X	X				X		X			X				
Transition joint bay (4 transition joint bays)	0.066 acre (0.027 hectare)		X	X		X	X				X		X			X				
Maximum case duct bank (direct buried duct bank arrangement 12 ducts)	10 acres (4 hectares)		X	X		X	X				X		X			X				

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Buried splice vault (installed)	0.4 acre (0.2 hectare)		X	X		X	X				X		X			X				
Maximum case landfall construction	0.91 acre (0.37 hectare)		X	X		X	X				X		X			X				
Trench excavation area along duct bank route	12.4 acres (5 hectares)		X	X		X	X				X		X			X				
Splice vault work area (20 locations; 0.5 acre per location)	10 acres (4 hectares)		X	X		X	X				X		X			X				
Onshore substation (HVAC)	26 acres (10.5 hectares)		X	X		X	X				X		X			X				
Alternate Falmouth underground transmission line	18.86 acres (7.6 hectares)		X	X		X	X				X		X			X				
Onshore Components Brayton Point (COP Volume 1 Table 3-18; Table 3-20; Table 3-35; Table 3-39)																				
Landfall locations	East Brayton Point / West Brayton Point		X	X		X	X				X		X	X	X	X			X	X
Landfall transition method	HDD		X	X	X	X	X				X		X			X				
Number of sea to shore HDDs	Up to 12		X	X	X	X	X				X		X			X				
Area of disturbance per HDD	0.3 acre (0.12 hectare)		X	X		X	X				X		X			X				
Total area of HDD disturbance	1.20 acres (0.48 hectare)		X	X		X	X				X		X			X				
Onshore substation location	Existing National Grid Substation		X	X		X	X				X		X	X	X	X			X	X
Maximum length of onshore cable to Brayton Point	3,940 feet (1,200 meters)		X	X		X	X				X		X			X				
Maximum length of onshore cable at intermediate landfall on Aquidneck Island	3 miles (4.8 kilometers)		X	X		X	X				X		X			X				
Maximum distance from landfall to converter station (Western Brayton Point)	0.6 mile (1.0 kilometers)		X	X		X	X				X		X			X				
Number of Onshore export power cables	1 to 4		X	X		X	X				X		X			X				
Number of Onshore communications cables	1 to 2		X	X		X	X				X		X			X				
Approximate cable diameter	5.9 inches (150 millimeters)		X	X		X	X				X		X			X				
Nominal cable voltage (HVDC)	±320 kV		X	X		X	X				X		X			X				
Maximum case duct bank (split duct bank, 4 power conduits)	1.8 acres (0.7 hectare)		X	X		X	X				X		X			X				
Buried transition joint bays and splice vaults (installed)	0.14 acre (0.06 hectare)		X	X		X	X				X		X			X				
Landfall construction area	3 acres (1.2 hectares)		X	X		X	X				X		X			X				
Trench excavation area along duct bank route (split duct bank installation)	2.7 acres (1.1 hectares)		X	X		X	X				X		X			X				
Buried transition and splice vault work area	0.11 acre (0.05 hectare)		X	X		X	X				X		X			X				
Converter station (HVDC)	10 acres (4.0 hectares)		X	X		X	X				X		X			X				
Alternate Brayton Point underground transmission line	0.2 acre (0.10 hectare)		X	X		X	X				X		X			X				

^a Footprint includes combined area of foundation, scour protection, and mud mats