Site Assessment Plan Amendment

Beacon Wind
Massachusetts Wind Energy Lease Area OCS-A 0520

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Amendment Version 1
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EXECUTIVE SUMMARY

Beacon Wind LLC (Beacon Wind) submitted a Site Assessment Plan (SAP) in support of the installation and operation of one Floating Light Detection and Ranging (Floating LiDAR) buoy, two current meter moorings, and two wave and metocean buoys (collectively referred to as Metocean Equipment), on December 8, 2020, with updated versions submitted April 27, 2021 and June 28, 2021. The SAP was approved by the Bureau of Ocean Energy Management (BOEM) on September 24, 2021 and the Metocean Equipment was deployed in Lease Area OCS-A 0520 (Lease Area) on November 10, 2021.

Beacon Wind intends to conduct additional site assessment activities in the Lease Area, which will consist of short-term deployment and subsequent removal of representative wind turbine/offshore substation foundation components (Foundation Testing). The Foundation Testing includes repeated tests of a single suction bucket within the Lease Area, at areas planned for eventual installation of wind turbines. The suction bucket will be similar to those considered within the Beacon Wind Construction and Operations Plan (COP) for the suction bucket jacket foundation, which may support wind turbines and/or offshore substations. The Foundation Testing will be conducted to further assess the site conditions and to gather information to support the engineering design of wind turbine and offshore substation foundations that would potentially be installed within the Lease Area.

This SAP Amendment is submitted to add the Foundation Testing to the approved activities under the previously submitted SAP, to be conducted during the site assessment term of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (Lease) and prior to approval of the COP for the Lease Area by BOEM. This SAP Amendment does not negate the information contained in the previously approved SAP and is not intended to affect the operations or eventual decommissioning of the Metocean Equipment. This SAP Amendment solely concerns the Foundation Testing.

This SAP Amendment has been prepared in accordance with 30 Code of Federal Regulations (CFR) §§ 585.105, 606, 610, and 611 (see Table 2-3), the *Guidelines for Information Requirements for a Renewable Energy SAP* issued by BOEM in June 2019, and the stipulations of the Lease (see Table 2-2). Prior to conducting the Foundation Testing, Beacon Wind will consult with applicable agencies as required. These activities will be conducted with additional requirements should they be stipulated in final permits to be issued. Beacon Wind plans to conduct the Foundation Testing following the approval of this SAP Amendment, no sooner than June 2023.

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Acronyms and Abbreviations

ASLF ..... ancient submerged landform
Beacon Wind ..... Beacon Wind LLC
BMP ..... best management practice
BP ..... BP Wind Energy North America Inc.
BOEM ..... Bureau of Ocean Energy Management
BSEE ..... Bureau of Safety and Environmental Enforcement
CFR ..... Code of Federal Regulations
CMECS ..... Coastal and Marine Ecological Classification Standard
CO ..... carbon monoxide
COP ..... Construction and Operations Plan
CVA ..... Certified Verification Agent
DMA ..... dynamic management area
EFH ..... Essential Fish Habitat
EA ..... Environmental Assessment
ESA ..... Endangered Species Act
FONSI ..... Finding of No Significant Impact
ft ..... feet
ft^2 ..... square feet
GHG ..... greenhouse gas
ha ..... hectare(s)
HAP ..... hazardous air pollutant
HSEQ ..... health, safety, environment, and quality
km ..... kilometer(s)
km/hr ..... kilometers per hour
LiDAR ..... Light Detection and Ranging
m ..... meter
m^2 ..... square meter
m^3 ..... cubic meter
MMPA ..... Marine Mammal Protection Act
nm ..... nautical mile(s)
NAAQS ..... National Ambient Air Quality Standards
NGI ..... Norwegian Geotechnical Institute
NHPA ..... National Historic Preservation Act
NOAA ..... National Oceanic and Atmospheric Administration
NOAA Fisheries ... National Marine Fisheries Service
NO_2 ..... nitrogen dioxide
NO_x ..... nitrogen oxide
NTL ..... notice to lessees
OCS ..... Outer Continental Shelf
PAPE ..... Preliminary Area of Potential Effects
PDC ..... project design criteria
$PM_{2.5}$ ..... particulate matter less than 2.5 microns in diameter
PM_{10} ..... particulate matter less than 10 microns in diameter
PSO ..... Protected Species Observer
ROV ..... remotely operated vehicle
RPS ..... RPS Group
SAP ..... Site Assessment Plan
SMA ..... Seasonal Management Area
SO_2 ..... sulfur dioxide
U.S. ..... United States
U.S.C. ..... United States Code
USCG ..... United States Coast Guard
VOC ..... volatile organic compounds
yd^3 ..... cubic yard

1.0 Introduction

1.1 Project Overview 585.610 (a)(1) and Study Objectives 585.610 (a)(6)

Beacon Wind LLC (Beacon Wind) intends to conduct site assessment activities in Lease Area OCS-A 0520 (Lease Area), which will consist of short-term deployment and subsequent removal of representative wind turbine/offshore substation foundation components (Foundation Testing).

The Foundation Testing areas are contained within the Lease Area[1] as defined under the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (Lease). The Lease was awarded to Equinor Wind on December 14, 2018, with an effective date of April 1, 2019. On September 10, 2020, Equinor Wind and BP Wind Energy North America Inc. (BP) announced a transaction in which BP will acquire a 50 percent ownership interest in holding companies that will own the Empire Wind and the Beacon Wind offshore wind projects.[2] Related to the transaction, Equinor Wind submitted an application to the Bureau of Ocean Energy Management (BOEM) to assign Lease OCS-A 0520 to Beacon Wind on December 10, 2020. BOEM approved the Lease assignment on January 27, 2021.

Beacon Wind submitted a Site Assessment Plan (SAP) in support of the installation and operation of one Floating Light Detection and Ranging (Floating LiDAR) buoy, two current meter moorings, and two wave and metocean buoys (collectively referred to as Metocean Equipment), on December 8, 2020, with updated versions submitted April 27, 2021 and June 28, 2021. The SAP was approved by BOEM on September 24, 2021, and the Metocean Equipment was deployed in on November 10, 2021.

This SAP Amendment is submitted to add the Foundation Testing to the approved activities under the previously submitted SAP, to be conducted during the site assessment term of the Lease and prior to approval of the Construction and Operations Plan (COP) for the Lease Area by BOEM. This SAP Amendment does not negate the information contained in the previously approved SAP and is not intended to affect the operations or eventual decommissioning of the Metocean Equipment. This SAP Amendment solely concerns the Foundation Testing.

The Foundation Testing includes repeated tests of a single suction bucket within the Lease Area, at areas planned for eventual installation of wind turbines. The suction bucket will be similar to those considered within the COP for the suction bucket jacket foundation, which may support wind turbines and/or offshore substations. The Foundation Testing will be conducted to gather information to support the engineering design of wind turbine and offshore substation foundations that would potentially be installed within the Lease Area. The objectives of Foundation Testing are for Beacon Wind to:

- Conduct site assessment across a variety of Lease Area locations, which will build upon existing foundation feasibility data and assessments;
- Collect site-specific data to ground-truth suction bucket penetration calculations;
- Investigate the need and effectiveness of measures to minimize environmental impacts during installation (e.g., bucket design specifications, optimal suction pressure for installation, etc.); and

[1] The Lease Area is defined by Addendum A of BOEM Lease No. OCS-A 0520, Section II. Description of the Lease Area. The total acreage of the Lease Area is approximately 128,811 acres. The Lease Area is depicted in its entirety in Figure 1-1 of this SAP.
[2] See Press Release, Equinor ASA, Equinor partners with BP in US offshore wind to capture value and create platform for growth (Sept. 10, 2020), https://www.equinor.com/en/news/2020-09-offshore-wind.html.

- Gain valuable suction bucket deployment experience to assist in planning an efficient installation campaign.

Beacon Wind will work with Norwegian Geotechnical Institute (NGI), which specializes in design and installation of suction bucket foundations in offshore wind applications. Suction bucket foundations are an alternative foundation design to traditional pile-driven foundations. This technology secures a steel bucket-shaped foundation by penetrating the sediment and pumping out water from within the bucket to create an area of reduced pressure against the seafloor. Due to reduced noise, depth disturbance, and time for installation and removal of these foundation types relative to pile-driven foundations, suction bucket designs can have advantages over pile-driven designs.

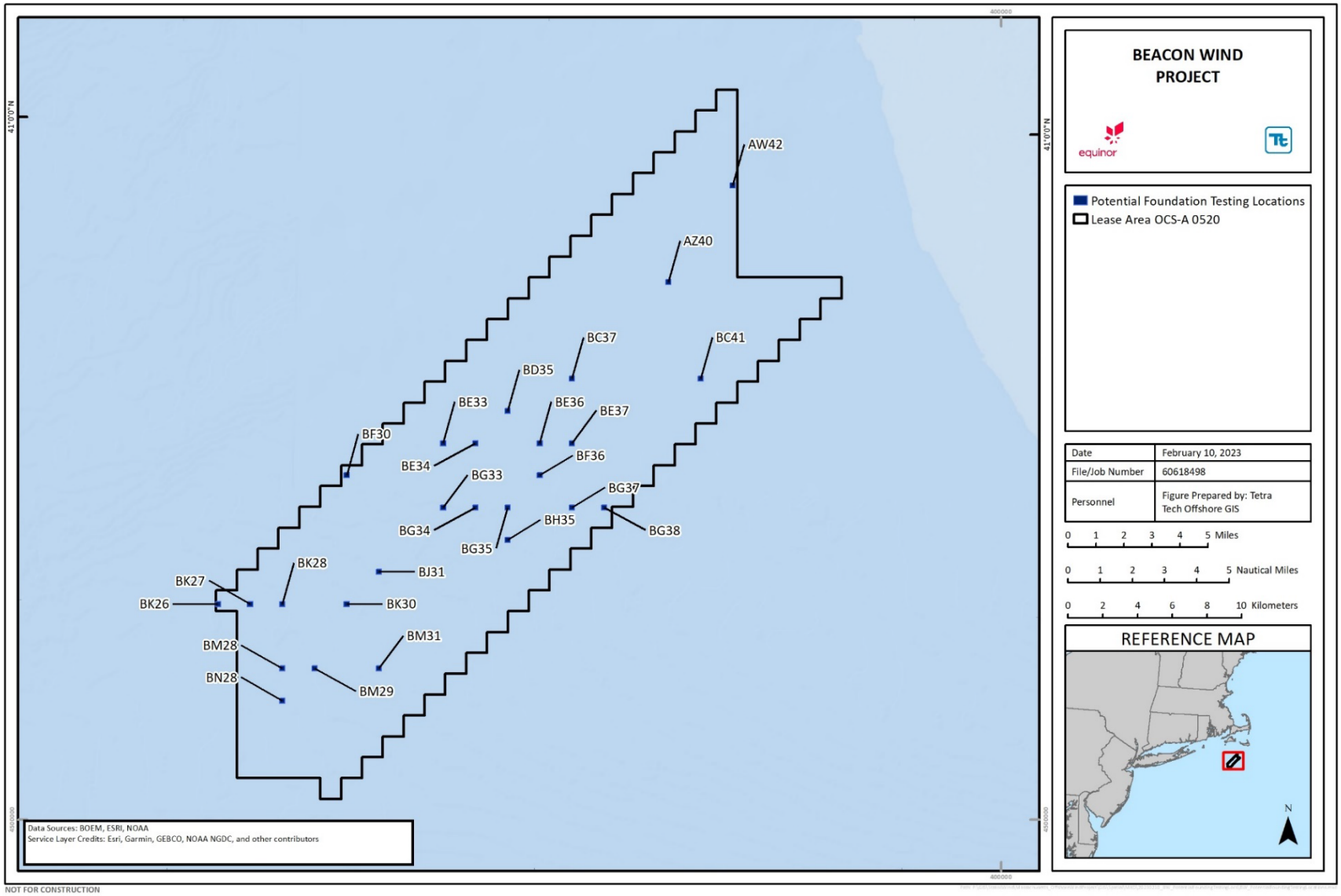
The Foundation Testing will be conducted at-sea during a single effort over a period of approximately 10-15 days in the Lease Area. Up to 35 total trials will occur at up to 26 sites across the Lease Area (see Figure 1-1), where the suction bucket and associated monitoring equipment will be deployed and subsequently retrieved, in succession. No foundation materials or other survey equipment will be detached from the vessel or remain in-water for a period exceeding the suction bucket trial periods at each site. Each foundation trial is expected to take an estimated six to nine hours, including three to five hours for deployment (lowering and seabed penetration) and three to four hours for removal (reverse penetration, lifting, potential cleaning and lifting onboard). The vessel will utilize dynamic positioning; therefore, no anchors or jack-up legs will be used. No equipment will be left in-water at the conclusion of the Foundation Testing activities. Because of this, impacts of the Foundation Testing are expected to be short-term and temporary and will be limited to the small areas where Foundation Testing is planned to occur (see Section 4 for discussion of the Affected Environment and potential impacts).

BOEM's 2014 Environmental Assessment for the Massachusetts Wind Energy Area (Offshore EA) assessed the foreseeable consequences of site assessment activities such as the installation of metocean fixed-bottom towers and/or buoys (BOEM 2014). While the proposed Foundation Testing activities described herein are not explicitly described in the site assessment activities discussed in the Offshore EA, the Foundation Testing is comparable in nature and scale to such activities and are expected to be generally equally or less impactful. Therefore, these proposed activities are consistent with Section 3.1.4 of the Offshore EA, with the selected concepts demonstrating lower impacts than the maximum case but acceptable concepts within the Offshore EA. Additional information is provided in Section 2.3 and Table 2-4.

Point of contact information for the Beacon Wind project is provided within Table 1-1. This SAP has been prepared in accordance with 30 Code of Federal Regulations (CFR) §§ 585.105, 606, 610, and 611 (see Table 2-3), the *Guidelines for Information Requirements for a Renewable Energy SAP* issued by BOEM in June 2019, and the stipulations of the Lease (see Table 2-2).

Beacon Wind has included copies of the final relevant agency authorizations as part of this SAP Amendment (see Appendix A). If additional agency authorizations become required, Beacon Wind will provide copies of these authorizations to BOEM prior to initiation of SAP Amendment activities. Foundation Testing activities will be conducted in compliance with additional requirements stipulated in the final permits.

Figure 1-1. Beacon Wind Potential Foundation Testing Locations



1.2 Authorized Representative and Designated Operator

As the Lease holder, Beacon Wind is also the Lease operator. The contact information for the Authorized Representative is as follows:

Table 1-1. Point of Contact Information 585.610 (a)(1)

Name of Authorized Representative	Scott Lundin
Title	Head of US Permitting and Environmental Affairs
Phone Number	617-655-3077
Email	SCLU@equinor.com
Address	Beacon Wind LLC 600 Washington Blvd, Stamford, CT 06902

1.3 Certified Verification Agent 585.610 (a)(9)

Pursuant to 30 CFR § 585.610(a)(9), BOEM may require a Certified Verification Agent (CVA) to certify to BOEM that installed facilities are designed to withstand the environmental and functional load conditions for the intended life of the facilities. The Foundation Testing is a temporary activity, and no facilities will be installed. No foundation materials or other survey equipment will be detached from vessels or remain in-water for a period exceeding the suction bucket trial periods at each site, and no equipment will be left in-water at the conclusion of the Foundation Testing activities.

The suction bucket will conform to a standard design that has been used successfully in many offshore environments. The manufacturer, Randaberg, has prior experience manufacturing suction buckets for multiple offshore projects which have been successfully installed overseas, including other projects operated by Equinor. The suction bucket deployment contractor, Global Maritime, has also successfully installed many of these suction buckets, including using the same vessel proposed for the Foundation Testing activities. Therefore, Beacon Wind requests a waiver from the Bureau of Safety and Environmental Enforcement (BSEE) from the CVA requirement per 30 CFR § 285.705(b)(1-3).

The project engineer will perform duties similar to those of a CVA. In addition, the suction bucket manufacturer will perform safety inspections of the suction bucket during and after manufacturing according to internationally recognized codes, including NORSOK. Beacon Wind and its contractors will perform an additional, separate quality and safety inspection of the suction bucket before the beginning of the Foundation Testing activities. Deployment procedures will follow applicable DNV Rules for Marine Operations. Additional inspections of the crane and associated equipment will be performed prior to the beginning of activities according to United Kingdom and Norwegian Rules for Vessel Cranes.

Health and safety plans are additionally described in Section 3.4 and Appendix B.

2.0 Conformance with Permits, Regulations, Commercial Lease, Regulatory Requirements, and the Environmental Assessment

2.1 Schedule 585.610 (a)(2)

Beacon Wind plans to proceed with Foundation Testing following the issuance of approval of this SAP Amendment, no earlier than June 2023 and no later than August 2024. The vessel will transit crew and equipment from Europe across the Atlantic Ocean over approximately 12 days to a port in eastern Canada, then transit to the Lease Area over 1-4 days. Support crew or others will be mobilized from U.S. ports and will meet the construction vessel at a determined location in the Lease Area prior to beginning activities. Testing activities in the Lease Area will be conducted over a period of approximately 10-15 days, plus additional days for poor weather or other potential delays. Once complete, crew and materials will transit back to their respective ports and demobilize.

2.2 Conformance with Permits, Regulations, Commercial Lease and Regulatory Requirements

The activities and equipment proposed in this SAP Amendment will be covered by the appropriate bond or other approved security, if necessary, as required by 30 CFR §§ 585.515 and 585.516. This information will be provided to BOEM prior to Foundation Testing.

Table 2-1 provides an overview of potentially applicable permits and approvals from pertinent agencies. Table 2-2 provides an overview of BOEM's stipulations in Addendum C of the Lease that are applicable to this SAP Amendment. Site Assessment Plan Requirements for Commercial Leases pursuant to 30 CFR §§ 585.105(a), 606(a), 610(a) and (b), and 611(a) and (b) are provided within Table 2-3.

Table 2-1. Permit Matrix

Permitting Agency	Applicable Permit or Approval	Statutory Basis	Regulations	Applicant Requirements
National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NOAA Fisheries)	Endangered Species Act (ESA) Section 7 Consultation	16 United States Code (U.S.C.) 1536	50 CFR 402	Pursuant to its obligations under Section 7 of the ESA, BOEM is required to consult with NOAA Fisheries prior to approval of any site assessment activities that may affect ESA-listed species that occur within the Lease Area. This consultation was completed prior to the issuance of the Lease during the BOEM Offshore EA process (NMFS 2013); BOEM may verify that the proposed activities are covered by this consultation.
	Magnuson-Stevens Fishery Conservation and Management	16 U.S.C. 1801	50 CFR 600	No applicant action required. BOEM will consult with NOAA Fisheries as necessary to complete the essential fish habitat assessment and determination based on details provided herein.

Permitting Agency	Applicable Permit or Approval	Statutory Basis	Regulations	Applicant Requirements
	Act Section 305(b) Consultation			
	Incidental Take Authorization	Marine Mammal Protection Act of 1972 (MMPA)	16 U.S.C. §§ 1361 et seq.	As detailed in Section , the Foundation Testing will not result in the harassment of marine mammals protected under the MMPA. Beacon Wind plans to request a Letter of Concurrence from NOAA Fisheries on this determination, which will be shared with BOEM.
U.S. Army Corps of Engineers, New England District	Nationwide Permit 6 – Survey Activities	Clean Water Act 33 U.S.C. 134	33 CFR 320 *et seq*.	No applicant action required. As described in Section 3, the proposed activities are within the Lease Area beyond 3 nautical miles (5.6 km) from shore and do not include installation of fixed structures.
United States Coast Guard (USCG)	Approval for Private Aids to Navigation	14 U.S.C. 81	33 CFR Part 66	No applicant action required. As described in Section 3, the proposed activities do not include installation of fixed structures that will require or provide navigation aid.
U.S. Department of Interior, BOEM	National Historic Preservation Act (NHPA) Section 106 Consultation	NHPA 16 U.S.C. 470	36 CFR Part 60, Part 800	No applicant action required. As shown in Appendix D, the Qualified Marine Archaeologist has found no submerged cultural resources within the proposed Foundation Testing sites. The Foundation Testing will avoid potential archaeological resources by a minimum of 164 ft (50 m).
U.S. Fish and Wildlife Service	Endangered Species Act Section 7 Consultation	16 U.S.C. 1536	50 CFR 402	No applicant action required. These consultations were completed prior to the issuance of the Lease during the BOEM Offshore EA.
Massachusetts Department of State, Division of Coastal Resources	Coastal Management Program Consistency Certification	Coastal Zone Management Act	15 CFR 930 Subpart C	No applicant action required. A final Coastal Zone Consistency Determination has been issued by BOEM for SAP activities in the Massachusetts Wind Energy Area.

Table 2-2. Conformance with the Commercial Renewable Energy Lease OCS-A 0520 Stipulations as Contained in Addendum C to the Lease

Lease OCS-A-0520 Addendum C Stipulation	Description	Compliance Statement
3.0 National Security and Military Operations		
3.1 Hold and Save Harmless	Whether compensation for such damage or injury might be due under a theory of strict or absolute liability or otherwise, the Lessee assumes all risks of damage or injury to persons or property, which occur in, on, or above the Outer Continental Shelf (OCS), to any persons or to any property of any person or persons in connection with any activities	Beacon Wind has and will comply with this stipulation.

Lease OCS-A-0520 Addendum C Stipulation	Description	Compliance Statement
	being performed by the Lessee in, on, or above the OCS, if such injury or damage to such person or property occurs by reason of the activities of any agency of the United States Government, its contractors, or subcontractors, or any of its officers, agents or employees, being conducted as a part of, or in connection with, the programs or activities of the individual military command headquarters (hereinafter "the appropriate command headquarters") listed in the contact information provided as an enclosure to this lease. Notwithstanding any limitation of the Lessee's liability in Section 9 of the Lease, the Lessee assumes this risk whether such injury or damage is caused in whole or in part by any act or omission, regardless of negligence or fault, of the United States, its contractors or subcontractors, or any of its officers, agents, or employees. The Lessee further agrees to indemnify and save harmless the United States against all claims for loss, damage, or injury in connection with the programs or activities of the command headquarters, whether the same be caused in whole or in part by the negligence or fault of the United States, its contractors, or subcontractors, or any of its officers, agents, or employees and whether such claims might be sustained under a theory of strict or absolute liability or otherwise.	
3.3 Electromagnetic Emissions	The Lessee, prior to entry into any designated defense operating area, warning area, or water test area, for the purpose of commencing survey activities undertaken to support SAP or COP submittal must enter into an agreement with the commander of the appropriate command headquarters to coordinate the electromagnetic emissions associated with such survey activities. The Lessee must ensure that all electromagnetic emissions associated with such survey activities are controlled as directed by the commander of the appropriate command headquarters.	Beacon Wind has and will comply with this stipulation.
4.0 Standard Operating Conditions, Archaeology, Geological and Geophysical Requirements		
4.1 Standard Operating Conditions		
4.1.1 General – Vessel Strike Avoidance Measures	The Lessee must ensure that all vessels conducting activities in support of plan (i.e., SAP and COP) submittal, including those transiting to and from local ports and the Lease Area, comply with the vessel-strike avoidance measures specified in stipulations 4.1.1.1 through 4.1.1.8.3, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk. This includes ensuring that all vessel operators and crew members, including Protected Species Observers (PSOs), are familiar with and understand the requirements specified in Addendum C of the Lease.	Beacon Wind has and will comply with this stipulation.
4.1.2 General – Marine Trash and Debris Prevention	The Lessee must ensure that vessel operators, employees, and contractors actively engaged in activity in support of a plan (i.e., SAP and COP) submittal are briefed on marine trash and debris awareness and elimination, as described in	Beacon Wind has and will comply with this stipulation.

Lease OCS-A-0520 Addendum C Stipulation	Description	Compliance Statement
	the BSEE NTL No. 2015-G03 (“Marine Trash and Debris Awareness and Elimination”) or any NTL that supersedes this NTL, except that the Lessor will not require the Lessee to post placards. The Lessee must ensure that these vessel operator employees and contractors receive training on the environmental and socioeconomic impacts associated with marine trash and debris and their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into the marine environment.	
4.2 Archaeological Requirements		
4.2.7 Post-Review Discovery Clauses	If the Lessee, while conducting geotechnical exploration or any other bottom-disturbing site characterization activities in support of plan (i.e., SAP and COP) submittal and after review of the location by a Qualified Marine Archaeologist under 4.2.4, discovers an unanticipated potential archaeological resource, such as the presence of a shipwreck (e.g., a sonar image or visual confirmation of an iron, steel, or wooden hull, wooden timbers, anchors, concentrations of historic objects, piles of ballast rock) or evidence of a pre-contact archaeological site (e.g. stone tools, pottery or other pre-contact artifacts) within the project area, the Lessee must: • Notify the Lessor within 24 hours of discovery; • Notify the Lessor in writing via report to the Lessor within 72 hours of discovery; • Conduct any additional investigations as directed by the Lessor to determine if the resource is eligible for listing in the National Register of Historic Places (30 CFR 585.802(b)).	Beacon Wind has and will comply with this stipulation.
4.3 Geological and Geophysical (G&G) Requirements		
4.3.1 – 4.3.7 G&G Requirements	The Lessee must ensure that all vessels conducting activity in support of a plan (i.e., SAP and COP) submittal comply with the geological and geophysical survey requirements specified in 4.3.1 to 4.3.7 except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk.	Beacon Wind has and will comply with this stipulation.

Table 2-3. Site Assessment Plan Requirements for Commercial Leases Pursuant to §585.105(a), 606(a), 610(a) and (b), and 611(b)

Requirement	Compliance Statement and Location Within SAP Amendment
§ 585.105(a)	
Design your projects and conduct all activities in a manner that ensures safety and will not cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components to the extent practicable; and take measures to prevent unauthorized discharge of pollutants including marine trash and debris into the offshore environment.	Beacon Wind will comply with this requirement, as evidenced in this SAP Amendment.
§ 585.606(a)	
1) The Project will conform to all applicable laws, regulations, and lease provisions.	Beacon Wind will comply with this requirement. See Table 2-1, Table 2-2, and Appendix A.
2) The Project will be safe.	Beacon Wind will comply with this requirement. Specifically, see Section 3.4.
3) The Project will not unreasonably interfere with other uses of the OCS, including national security or defence.	Beacon Wind will comply with this requirement. See Table 2-2 for specific activities to ensure compliance.
4) The Project will not cause undue harm or damage to natural resources; life; property; the marine, coastal, or human environment; or historical or archaeological resources.	See Section 4 for an analysis of site characteristics and potential impacts, and Sections 2.5 and 3.5 for Best Management Practices and mitigation and avoidance measures.
5) The Project will use best available and safest technology.	Beacon Wind will comply with this requirement. The health, safety, environment, and quality (HSEQ) manual and example plan are provided in Appendix B, along with vessel specifications.
6) The Project will use Best Management Practices.	Beacon Wind will comply with this requirement. Best management practices are described in Section 2.5.
7) The Project will use properly trained personnel.	Beacon Wind will ensure that all personnel meet the company's standard technical as well as HSEQ standards for the work being conducted. The HSEQ manual and example plan are provided in Appendix B.
§ 585.610(a)	
1) Contact Information.	See Section 1.2.
2) Site assessment concept.	See Section 2.7.
3) Designation of operator.	See Section 1.2.
4) Commercial lease stipulations and compliance.	See Section 2.2.
5) A location plat.	See Figure 1-1.
6) General structural and project design, fabrication and installation information.	See Section 2.7 and 3.1.
7) Deployment activities.	See Section 3.1.
8) Certified Verification Agent nomination.	See Section 1.3.
9) Reference information.	See Section 5.
10) Decommissioning and site clearance procedures.	See Section 3.6.
11) Air quality information.	See Section 4.8.

Requirement	Compliance Statement and Location Within SAP Amendment
12) A list of all federal, state, and local authorizations or approvals required to conduct site assessment activities on your lease.	See Table 2-1.
13) A list of agencies and persons with whom you have communicated, or with whom you will communicate, regarding potential impacts associated with your proposed activities.	See Appendix A.
14) Financial assurance information.	Activities proposed herein will be covered by an appropriate bond or other approved security, if required by BOEM. The proposed activities do not include installation of fixed structures.
§585.610(b)	
1) Geotechnical	See Section 4.1, Appendix C.
2) Shallow Hazards	See Section 4.1, Appendix C.
3) Archaeological Resources	See Section 4.2, Appendix D.
4) Geological Survey	See Section 4.1, Appendix C.
5) Biological Survey	See Section 4.3, Appendix E.
§ 585.611(b) Requirements	
1) Hazard information.	See Section 4.1 and 4.11.
2) Water quality.	See Section 4.7.
3) Biological resources	See Section 4.3, 4.4, 4.5, 4.6, and Appendix E.
4) Threatened or endangered species.	See Sections 4.4, 4.5, and Section 4.6.
5) Sensitive biological resources or habitats.	See Section 4.3 and 4.4.
6) Archaeological resources.	Section 4.2, Appendix D.
7) Socioeconomic resources.	See Section 4.9.
8) Coastal and marine uses.	See Section 4.10.
9) Consistency Certification.	See Section 2.4.

2.3 Conformance with Offshore Massachusetts Environmental Assessment

On June 3, 2014, BOEM issued a Finding of No Significant Impact (FONSI) based on a comprehensive Environmental Assessment, referred to herein as the “Offshore EA” (BOEM 2014). The Offshore EA analyzed the foreseeable consequences associated with issuing commercial leases within the Massachusetts Wind Energy Area, which is inclusive of the Lease Area (Figure 1-1), as well as the site assessment activities, such as the installation of metocean fixed-bottom towers and/or buoys. While the proposed Foundation Testing activities described herein are not explicitly described in the site assessment activities discussed in the Offshore EA, the Foundation Testing is comparable in nature and scale to such activities and are expected to be generally equally or less impactful. Therefore, these proposed activities are consistent with Section 3.1.4 of the Offshore EA, with the selected concepts demonstrating lower impacts than the maximum case, but acceptable concepts within the Offshore EA. Table 2-4 below provides a comparison of the information assessed in the Offshore EA and the relevant detail being proposed by Beacon Wind herein.

2.4 Consistency Determination

The Coastal Zone Management Act Regional Consistency Determination associated with the Offshore EA was carried out by BOEM to confirm that the potential leasing activities, site characterization surveys, and data collection structures are consistent with state policies. As the proposed Foundation Testing activities are consistent with the Offshore EA, the Regional Consistency Determination also applies to the activities proposed in this SAP Amendment.

Table 2-4. Comparison of Offshore EA and SAP Elements

Project Component	Assessed in Offshore EA	Proposed in Original SAP	Proposed in this SAP Amendment	Summary
Number of fixed structures	Up to 2 metocean buoys and 1 meteorological tower per lease area	1 RPS Floating LiDAR buoy, 2 RPS Wave and Met Buoys, 2 RPS Current Meter Moorings consisting of 6 CM-04 Acoustic Current Meters, and 6 Seabird SBE37 conductivity and temperature conductivity loggers.	No structures will remain fixed to the seafloor.	This SAP Amendment does not add any fixed structures to the previously approved SAP.
Area of seafloor disturbance (per site/trial)	Up to 162 acres (655,591 m^2) per bottom-founded feature, including all anchorages and appurtenances of support vessels.	Total area of mooring on seafloor, inclusive of both clump weights, chains, and wire ropes, is 67.8 ft^2 (6.3 m^2). No chain sweep expected. No vessel anchoring will take place during installation.	Approximately 0.028 acres (114 m^2), based on area of 39 ft (12 m) bucket diameter and 11 square foot (1 m^2) reference frame No vessel anchoring will take place during testing.	The per-site seafloor disturbance area of the proposed Foundation Testing is significantly below the range of expected disturbance from each bottom-founded feature discussed in the Offshore EA.
Total (cumulative) area of seafloor disturbance	Two structures per lease = 324 acres (131.1 ha) per lease	5 total buoy/mooring anchorages, for a total of 0.0078 acres (339 square feet; 31.5 m^2)	Approximately 0.986 acres (3,990 m^2), based on a conservative maximum of 35 tests	The cumulative Lease Area seafloor disturbance area of the proposed Foundation Testing, combined with the existing SAP activities, is below the range of expected disturbance from each bottom-founded feature discussed in the Offshore EA.
Maintenance	Monthly or quarterly	Every 6 months	No maintenance activities required	Foundation Testing will be a temporary activity and will not result in structures remaining in the water after completion of activities.
Installation and removal process	For buoy: materials carried or towed by vessel, buoy is lowered or placed over the final location, and mooring anchor is dropped. Decommissioning is the reverse of	The Metocean Facilities are towed by vessel, the mooring system is deployed, and anchor is lowered over the final location. Decommissioning is the reverse of installation.	The suction bucket is carried to the testing site, the reference frame is lowered, then the bucket is overboarded and lowered to the seabed. After self-penetration is complete, the suction pump assists the bucket to the desired penetration. Removal is the reverse of deployment: seawater is pumped into the suction bucket,	The Installation and subsequent removal processes for Foundation Testing are similar to what was proposed in the original SAP and assessed in the Offshore EA, except that no structures will be left post-installation (the suction bucket retrieved immediately after deployment). Unlike pile-driven foundations assessed in the

Project Component	Assessed in Offshore EA	Proposed in Original SAP	Proposed in this SAP Amendment	Summary
	installation. For tower: foundation would be installed by pile driving and scour protection will be installed around the foundation. For decommissioning, components would be cut at least 16 ft (5 m) below the mudline and scour protection would be removed by dredge.		the bucket Is lifted back onboard, and reference frame is lifted back onboard. This is repeated for each test.	Offshore EA, the Foundation Testing would not generate noise that could disturb marine mammals.
Installation and removal timeframe	For buoy: installation would take 3 days per buoy (1 day to install clump anchor and 2 days to install buoy). Decommissioning would take 1 day per buoy. For tower: total installation time would take 8 days to 10 weeks; decommissioning would take 1 week.	Installation up to seven days for all Metocean Facilities: three separate vessel trips, including transit. Decommissioning up to seven days for all Metocean Facilities: three separate vessel trips, including transit. Subject to weather.	Estimated 10-15 day total timeframe of testing activities in the Lease Area, up to 25 days including potential hold days. Additional time for mobilization and transit.	The timeframes proposed by Beacon Wind are similar to what was proposed in the SAP and assessed in the Offshore EA with a relatively short timeline of 10 total days.

2.5 Best Management Practices 585.610 (a)(4)

Best management practices (BMPs) are described in this section. Beacon Wind will use its standard internal project execution structure to manage activities described in the SAP. As further described in Section 3.4, SAP activities will be supported by a detailed HSEQ Plan. The HSEQ manual and example plan are provided in Appendix B.

In addition, Beacon Wind will use many of the BMPs identified in the *Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan* (BOEM 2019) and *Establishment of an OCS Alternative Energy and Alternate Use Program, Record of Decision, December 2007* (BOEM 2007). See Table 2-5 for a summary of these BMPs (numbering in Table 2-5 corresponds to the format of the noted 2019 SAP guidelines).

Additionally, Beacon Wind will adhere to the BOEM programmatic consultation with NOAA Fisheries, most recently revised as of November 22, 2021, detailing *Project Design Criteria (PDCs) and BMPs for Protected Species Associated with Offshore Wind Data Collection* (NMFS 2021). Table 2-6 provides an overview of the PDCs and BMPs within the programmatic consultation that are applicable to this SAP Amendment.

Table 2-5. Best Management Practices

Best Management Practices	Location in SAP Amendment
1, 3. Minimize the area disturbed by pre-construction site monitoring and testing activities installation and consolidate necessary infrastructure requirements whenever practicable.	Section 3
2. Contact and consult with the appropriate affected federal, state, and local agencies early in the planning process.	Table 2-1
5. Conduct seafloor surveys to ensure that the project is sited to avoid or minimize impacts associated with seafloor instability and other hazards.	Section 4.1
7. Avoid locating facilities near known sensitive seafloor habitats.	Section 4.3
8. Avoid anchoring on sensitive seafloor habitats.	Section 4.3
9. Reduce scouring action by ocean currents around foundation and to seafloor topography by taking all reasonable measures and employing routine inspections to ensure structural integrity.	No equipment will be left on the seafloor.
10. Avoid the use of explosives that may impact fish or benthic organisms.	No explosives will be used for activities proposed.
13, 14, and 21 related to minimizing/avoiding vessel impacts to marine mammals and sea turtles.	Section 4.5
18. Use existing data to identify important, sensitive, and unique marine habitats in the vicinity of the project and design the deployment to avoid adverse impacts to these habitats.	Section 4.3
19. Minimize construction activities in areas containing anadromous fish during migration periods.	Section 4.4
20. Minimize seafloor disturbance during installation of the buoy.	No buoy is proposed. Seafloor disturbance will be minimized as the Foundation Testing will avoid the use of anchoring or jack-up legs.
26. Minimize perching opportunities.	No equipment will remain in the ocean to provide perching opportunities.
27. Comply with USCG lighting and marking requirements while using lighting technology that minimizes impacts to avian species.	No equipment will remain in the ocean that would require

Best Management Practices	Location in SAP Amendment
	marking or lighting. The vessel will comply with USCG lighting requirements.
31 and 32. Minimize potential conflicts with commercial and recreational fishing interests by working with commercial/recreational fishing entities and reviewing planned activities with potentially affected parties.	Section 3.3 and 4.9
33. Use practices and operating procedures that reduce the likelihood of vessel accidents and fuel spills.	The vessel will follow USCG requirements and marine debris best practices as described in Table 2-6.
34. Avoid impacts to the commercial fishing industry by marking the buoys with USCG-approved marking and lighting to ensure safe vessel operation.	No buoys or other equipment will remain in the ocean.
33. Avoid hard-bottom habitats, including seagrass communities and kelp beds.	Section 4.3
45. Prepare waste management plan, hazardous material plan, and an oil spill response plan.	The Foundation Testing will not install equipment that would require a backup generator or any other fuel dependent equipment. As such, no Oil Spill Response Plan or Oil Spill Response Measures will be required. The vessel will follow waste management requirements and marine debris best practices as described in Table 2-6.

Table 2-6. Conformance with PDCs and BMPs for Protected Species Associated with Offshore Wind Data Collection (NMFS 2021)

PDC and BMP Stipulation	Description	Compliance Statement
PDC 1. Avoid Live Bottom Features		
BMP 1.1	All vessel anchoring and any seafloor-sampling activities are restricted from seafloor areas with consolidated seabed features including pavement, scarp walls, and deep/cold-water coral reefs and shallow/mesophotic reefs as defined in the Coastal and Marine Ecological Classification Standard for geologic substrate classifications. All vessel anchoring and seafloor sampling must also occur at least 150 m from any known locations of threatened or endangered coral species. All sensitive live bottom habitats (eelgrass, cold-water corals, etc.) should be avoided as practicable. All vessels in coastal waters will operate in a manner to minimize propeller wash and seafloor disturbance and transiting vessels should follow deep-water routes (e.g., marked channels), as practicable, to reduce disturbance to sturgeon and sawfish habitat.	Beacon Wind will comply with this stipulation. No vessel anchoring is proposed.

PDC and BMP Stipulation	Description	Compliance Statement
PDC 3. Marine Debris Awareness and Elimination		
BMP 3.1 Marine Debris Awareness Training	The Lessee must ensure that vessel operators, employees, and contractors engaged in offshore activities pursuant to the approved COP complete marine trash and debris awareness training annually. The training consists of two parts: (1) viewing a marine trash and debris training video or slide show; and (2) receiving an explanation from management personnel that emphasizes their commitment to the requirements.	Beacon Wind will comply with this stipulation.
BMP 3.2 Training Compliance Report	By January 31 of each year, the Lessee must submit to the U.S. Department of the Interior (DOI) an annual report that describes its marine trash and debris awareness training process and certifies that the training process has been followed for the previous calendar year.	Beacon Wind will comply with this stipulation.
BMP 3.4	The Lessee must recover marine trash and debris that is lost or discarded in the marine environment while performing OCS activities when such incident is likely to: (a) cause undue harm or damage to natural resources, including their physical, atmospheric, and biological components, with particular attention to marine trash or debris that could entangle or be ingested by marine protected species; or (b) significantly interfere with OCS uses (e.g., because the marine trash or debris is likely to snag or damage fishing equipment, or presents a hazard to navigation). The Lessee must notify DOI within 48 hours when recovery activities are: (i) not possible because conditions are unsafe; or (ii) not practicable because the marine trash and debris released is not likely to result in any of the conditions listed in (a) or (b) above. Notwithstanding this notification, DOI may still order the Lessee to recover the lost or discarded marine trash and debris if DOI finds the reasons provided by the Lessee in the notification unpersuasive. If the marine trash and debris is located within the boundaries of a potential archaeological resource/avoidance area, or a sensitive ecological/benthic resource area, the Lessee must contact DOI for approval before conducting any recovery efforts. Recovery of the marine trash and debris should be completed as soon as practicable, but no later than 30 calendar days from the date on which the incident occurred. If the Lessee is not able to recover the marine trash or debris within 48 hours, the Lessee must submit a recovery plan to DOI explaining the recovery activities to recover the marine trash or debris (Recovery Plan). The Lessee must submit the Recovery Plan no later than 10 calendar days from the date on which the incident occurred. Unless DOI objects within 48 hours of the filing of the Recovery Plan, the Lessee can proceed with the activities described in the Recovery Plan. The Lessee must request and obtain approval of a time extension if recovery activities cannot be completed within 30 calendar days from the date on which the incident occurred. The Lessee must enact steps to	Beacon Wind will comply with this stipulation.

PDC and BMP Stipulation	Description	Compliance Statement
	prevent similar incidents and must submit a description of these actions to BOEM and BSEE within 30 calendar days from the date on which the incident occurred.	
PDC 5. Minimize Vessel Interactions with Protected Species		
BMP 5.1	Vessel captain and crew must maintain a vigilant watch for all protected species and reduce speed, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any listed species. The presence of a single individual at the surface may indicate the presence of submerged animals in the vicinity; therefore, precautionary measures should always be exercised. If pinnipeds or small delphinids of the following genera: Delphinus, Lagenorhynchus, Stenella, and Tursiops are visually detected approaching the vessel (i.e., to bow ride) or towed equipment, vessel speed reduction, course alteration, and shutdown are not required.	Beacon Wind will comply with this stipulation.
BMP 5.2	Anytime a survey vessel is underway (transiting or surveying), the vessel must maintain a 500 m minimum separation distance from ESA-listed species and a PSO must monitor a Vessel Strike Avoidance Zone (500 m or greater from any sighted ESA-listed species or other unidentified large marine mammal visible at the surface) to ensure detection of that animal in time to take necessary measures to avoid striking the animal. If the survey vessel does not require a PSO for the type of survey equipment used, a trained crew lookout may be used as required in 5.3. For monitoring around the autonomous surface vessels, regardless of the equipment it may be operating, a dual thermal/HD camera must be installed on the mother vessel facing forward and angled in a direction so as to provide a field of view ahead of the vessel and around the ASV. A dedicated operator must be able to monitor the real-time output of the camera on hand-held computer tablets. Images from the cameras must be able to be captured and reviewed to assist in verifying species identification. A monitor must also be installed in the bridge displaying the real-time images from the thermal/HD camera installed on the front of the ASV itself, providing a further forward view of the craft.	Beacon Wind will comply with this stipulation using a trained lookout. Vessels will not require a PSO as no survey equipment will be used outside the confines of the steel suction bucket.
5.2.1	Survey plans must include identification of vessel strike avoidance measures, including procedures for equipment shut down and retrieval, communication between PSOs/crew lookouts, equipment operators, and the captain, and other measures necessary to avoid vessel strikes while maintaining vessel and crew safety. If any circumstances are anticipated that may preclude the implementation of this PDC, they must be clearly identified in the survey plan and alternative procedures outlined in the plan to ensure minimum distances are maintained and vessel strikes can be avoided.	Beacon Wind will comply with this stipulation.

PDC and BMP Stipulation	Description	Compliance Statement
5.2.2	All vessel crew members must be briefed in the identification of protected species that may occur in the survey area and in regulations and best practices for avoiding vessel collisions. Reference materials must be available aboard all project vessels for identification of listed species. The expectation and process for reporting of protected species sighted during surveys must be clearly communicated and posted in highly visible locations aboard all project vessels, so that there is an expectation for reporting to the designated vessel contact (such as the lookout or the vessel captain), as well as a communication channel and process for crew members to do so.	Beacon Wind will comply with this stipulation.
5.2.3	A minimum separation distance of 500 m from all ESA-listed whales (including unidentified large whales) must be maintained around all surface vessels at all times.	Beacon Wind will comply with this stipulation.
5.2.4	If an ESA-listed whale or large unidentified whale is observed within 500 m of the forward path of any vessel, the vessel operator must steer a course away from the whale at 10 knots (18.5 km/hr) or less until the 500 m minimum separation distance has been established. Vessels may also shift to idle if feasible.	Beacon Wind will comply with this stipulation.
5.2.5	If a large whale is sighted within 200 m of the forward path of a vessel, the vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside of the vessel's path and beyond 500 m. If stationary, the vessel must not engage engines until the large whale has moved beyond 500 m.	Beacon Wind will comply with this stipulation.
5.2.6	If a sea turtle or manta ray is sighted at any distance within the operating vessel's forward path, the vessel operator must slow down to 4 knots and steer away (unless unsafe to do so). The vessel may resume normal vessel operations once the vessel has passed the individual.	Beacon Wind will comply with this stipulation.
5.2.7	During times of year when sea turtles are known to occur in the survey area, vessels must avoid transiting through areas of visible jellyfish aggregations or floating vegetation (e.g., sargassum lines or mats). In the event that operational safety prevents avoidance of such areas, vessels must slow to 4 knots while transiting through such areas.	Beacon Wind will comply with this stipulation.
5.2.8	Vessels operating in water depths with less than four feet of clearance between the vessel and the bottom should maintain speeds no greater than 4 knots to minimize risk of vessel strikes on sturgeon and sawfish.	Beacon Wind will comply with this requirement.
BMP 5.3	The Lessee must ensure a PSO or crew lookout is posted during all times to avoid interactions with ESA-listed species when a vessel is underway (transiting or surveying) by monitoring in all direction.	Beacon Wind will comply with this stipulation.

PDC and BMP Stipulation	Description	Compliance Statement
5.3.1	Visual observers monitoring the vessel separation distances from ESA-listed species can be either PSOs or crew members (if PSOs are not required). If the trained lookout is a vessel crew member, this must be their designated role and primary responsibility while the vessel is transiting. Any designated crew lookouts must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements. All observations must be recorded per reporting requirements in 8.	Beacon Wind will comply with this stipulation.
5.3.2	Regardless of monitoring duties, all crew members responsible for navigation duties must receive site-specific training on ESA-listed species sighting/reporting and vessel strike avoidance measures.	Beacon Wind will comply with this stipulation.
5.3.3	Vessels underway must not divert their course to approach any ESA-listed species and marine mammals.	Beacon Wind will comply with this stipulation.
BMP 5.4	Regardless of vessel size, vessel operators must reduce vessel speed to 10 knots (18.5 mph) or less while operating in any Seasonal Management Area (SMA) and Dynamic Management Area (DMA) or Slow Zone triggered by visual detections of North Atlantic right whales. An exception to this requirement is for vessels operating in areas within a portions of a visually designated DMA or Slow Zone where it is not reasonable to expect the presence of North Atlantic right whales (e.g., Long Island Sound, shallow harbors).	Beacon Wind will comply with this stipulation.
BMP 5.5	BOEM encourages increased vigilance through the required best management practices to minimize vessel interactions with protected species, by reducing speeds to 10 knots or less when operating within an acoustically triggered slow zone, and when feasible, avoid Slow Zones.	Beacon Wind will comply with this stipulation.
BMP 5.6	The Lessee must ensure all vessel operators check for information regarding mandatory or voluntary ship strike avoidance (SMAs and DMAs (or Slow Zones that are also designated as DMAs) and daily information regarding North Atlantic right whale sighting locations. These media may include, but are not limited to: NOAA weather radio, U.S. Coast Guard NAVTEX and channel 16 broadcasts, Notices to Mariners, the Whale Alert app, or WhaleMap website.	Beacon Wind will comply with this stipulation.
PDC 7. Protected Species Observers		
BMP 7.2	Crew members serving as lookouts when PSOs are not required must receive training on protected species identification, vessel strike minimization procedures, how and when to communicate with the vessel captain, and reporting requirements.	Beacon Wind will comply with this stipulation.

PDC and BMP Stipulation	Description	Compliance Statement
BMP 7.4	A minimum of one PSO (assuming PDC 5 is met) must be observing for listed species at all times that boomer, sparker, or bubble gun equipment is operating, or a minimum of one PSO or one Trained Lookout when the survey vessel is actively transiting during daylight hours (30 minutes prior to civil sunrise and through 30 minutes following civil sunset). The Lessee must include a PSO schedule showing that the number of PSOs used is sufficient to effectively monitor the affected area for the project (e.g., surveys) and record the required data. PSOs must not be on watch for more than 4 consecutive hours, with at least a 1-hour break after a 4-hour watch. PSOs must not work for more than 12 hours in any 24-hour period.	Boomer, sparker or bubble gun equipment is not proposed. A trained lookout will monitor the survey vessel while it is actively transiting during daylight hours.
BMP 7.5	Visual monitoring must occur from the most appropriate vantage point on the associated operational platform that allows for 360-degree visual coverage around the vessel. If 360-degree visual coverage is not possible from a single vantage point, multiple PSOs must be on watch to ensure such coverage.	Beacon Wind will comply with this stipulation to the extent applicable. Visual monitoring by the trained crew lookout during transit will occur from the most appropriate vantage point.
PDC 8. Reporting Requirements		
PDC 8	The Lessee must ensure that monthly reporting of survey activities is submitted to BOEM by the PSO provider on the 15th of each month for each vessel conducting survey work. The Lessee must submit final monthly reports to BOEM in coordination with PSO Providers within 90 calendar days following completion of a survey.	As the Foundation Testing is anticipated to last less than one month, a single final report will be provided to BOEM by Beacon Wind within 90 calendar days following the completion of survey activities.
BMP 8.2 Final Monitoring Report	The Lessee must submit a final monitoring report to BOEM and NMFS within 90 days after completion of yearly survey activities.	Beacon Wind will submit a final monitoring report to BOEM and NOAA Fisheries within 90 days after the completion of survey activities.

PDC and BMP Stipulation	Description	Compliance Statement
BMP 8.3 Reporting sightings of North Atlantic right whales	If a North Atlantic right whale is observed at any time by a PSO or project personnel during surveys or vessel transit, the Lessee or PSO must report sighting within two hours of occurrence when practicable and no later than 24 hours after occurrence. In the event of a sighting of a right whale that is dead, injured, or entangled, efforts must be made to make such reports as quickly as possible to the appropriate regional NOAA stranding hotline (from Maine-Virginia report sightings to 866-755-6622, and from North Carolina-Florida to 877-942-5343). Right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16 and through the WhaleAlert App (http://www.whalealert.org/).	Beacon Wind will comply with this stipulation.
BMP 8.4 Vessel Strike	In the event of a vessel strike of a protected species by any survey vessel, the Lessee must immediately report the incident to BOEM (renewable_reporting@boem.gov) and NMFS (nmfs.gar.incidental-take@noaa.gov) and the NOAA stranding hotline: From Maine-Virginia, report sightings to 866-755-6622, and from North Carolina-Florida to 877-942-5343.	Beacon Wind will comply with this stipulation.
BMP 8.5 Detected or Impacted Protected Species Reporting	The Lessee is responsible for reporting dead or injured protected species, regardless of whether they were observed during operations or due to Lessee activities. The Lessee must report any potential take, strikes, or dead/injured protected species caused by Project vessels to the NMFS Protected Resources Division (nmfs.gar.incidental-take@noaa.gov), NOAA Fisheries 24-hour Stranding Hotline number (866-755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at protectedspecies@bsee.gov) as soon as practicable, but no later than 24 hours from the time the incident took place (Detected or Impacted Protected Species Report). In the event that an injured or dead marine mammal or sea turtle is sighted, regardless of the cause, the Lessee must report the incident to the NMFS Protected Resources Division (nmfs.gar.incidental-take@noaa.gov), NMFS 24-hour Stranding Hotline number (866- 755-6622), BOEM (at renewable_reporting@boem.gov), and BSEE (at protectedspecies@bsee.gov)) as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours from the sighting (Protected Species Incident Report). Staff responding to the hotline call will provide any instructions for the handling or disposing of any injured or dead protected species by individuals authorized to collect, possess, and transport sea turtles.	Beacon Wind will comply with this stipulation.

2.6 Project Location 585.610 (a)(5)

The location of the proposed Foundation Testing sites will fall within the Beacon Wind Lease Area (Figure 1-1). At each site, activities will occur within a 984 x 984 ft (300 x 300 m) square, which is centered on the location for eventual installation of the proposed wind turbines under the COP. Each suction bucket test will be slightly offset, approximately 164 ft (50 m), from the eventual wind turbine location, and the

reference frame will be offset an additional 33 to 98 ft (10 to 30 m) from the suction bucket test location. An area of 984 x 984 ft (300 x 300 m) square was conservatively assessed to cover all Foundation Testing activities at each location, including the possibility of multiple tests at a single location.

Beacon Wind has included a conservative number of potential sites; therefore, not all sites will ultimately be selected for Foundation Testing. The coordinates for the locations under consideration are provided in Table 2-7.

Table 2-7. Location of Foundation Testing Sites

Wind Turbine Location Name	Latitude (Center of Foundation Testing area)	Longitude (Center of Foundation Testing area)	Minimum Water Depth (meters)	Maximum Water Depth (meters)
AW42	40.97132	-70.3722	-42.41	-41.71
AZ40	40.92075	-70.4151	-45.78	-44.94
BC41	40.87099	-70.3921	-48.80	-48.10
BC37	40.86989	-70.48	-52.69	-52.28
BD35	40.85264	-70.5235	-54.48	-53.94
BE33	40.83538	-70.5671	-52.81	-51.75
BE34	40.83567	-70.5451	-54.02	-52.28
BE36	40.83625	-70.5012	-55.21	-54.63
BE37	40.83654	-70.4792	-54.15	-53.62
BF30	40.81778	-70.6325	-55.99	-55.45
BF36	40.81957	-70.5008	-53.78	-52.62
BG33	40.80202	-70.5663	-55.03	-54.38
BG34	40.80232	-70.5443	-53.76	-53.18
BG35	40.80261	-70.5224	-53.44	-52.99
BG37	40.80318	-70.4785	-52.68	-51.95
BG38	40.80346	-70.4565	-52.69	-51.75
BH35	40.78593	-70.522	-53.39	-53.14
BJ31	40.76806	-70.6094	-57.60	-56.98
BK30	40.75108	-70.6309	-58.82	-58.32
BK28	40.75045	-70.6748	-60.40	-60.06
BK27	40.75013	-70.6967	-60.83	-60.12
BM28	40.71709	-70.6739	-60.78	-60.09
BM29	40.71741	-70.652	-60.25	-59.71
BM31	40.71803	-70.6082	-58.73	-58.31
BN28	40.70042	-70.6735	-61.08	-60.59
BK26	40.7498	-70.7186	-61.15	-60.53

2.7 Project Description, Design, and Implementation 585.610 (a)(6)

Beacon Wind will conduct trials of deployment and removal of a suction bucket in the Beacon Wind Lease Area (Foundation Testing). The Foundation Testing includes repeated tests of a single suction bucket at areas planned for eventual installation of wind turbines. The suction bucket will be similar to those considered within the COP for the suction bucket jacket foundation, which may support wind turbines and/or offshore substations.

The Foundation Testing will be conducted to gather information to support the engineering design of wind turbine and offshore substation foundations that would potentially be installed within the Lease Area. The objectives of Foundation Testing are for Beacon Wind to:

- Conduct site assessment across a variety of Lease Area locations, which will build upon existing foundation feasibility data and assessments;
- Collect site-specific data to ground-truth suction bucket penetration calculations;
- Investigate the need and effectiveness of measures to minimize environmental impacts during installation (e.g., bucket design specifications, optimal suction pressure for installation, etc.); and
- Gain valuable installation experience to assist in planning an efficient installation campaign.

Beacon Wind will work with NGI, which specializes in design and installation of suction bucket foundations in offshore wind applications. Suction bucket foundations are an alternative foundation design to traditional pile-driven foundations. This technology secures a steel bucket-shaped foundation by penetrating the sediment and pumping water from within the bucket to create an area of reduced pressure against the seafloor. Due to reduced noise, depth disturbance, and time for installation and removal of these foundation types relative to pile-driven foundations, suction bucket designs can have advantages over pile-driven designs.

The Foundation Testing will be conducted at-sea during a single approximately 10-15 day effort in the Lease Area. Up to 35 total trials will occur at up to 26 sites (see Figure 1-1) across the Lease Area, where the suction bucket and associated monitoring equipment will be deployed and subsequently retrieved, in succession. No foundation materials or other survey equipment will be detached from the vessel or remain in-water for a period exceeding the suction bucket trial periods at each site. The vessel will utilize dynamic positioning; therefore, no anchors or jack-up legs will be used. No equipment will be left in-water at the conclusion of the Foundation Testing activities.

2.7.1 Suction Bucket

The suction bucket that will be tested will be similar to those considered within the COP for the suction bucket jacket foundation. The Foundation Testing activities will test a single suction bucket for each test. The suction bucket jacket foundation considered for eventual installation to support a wind turbine would include three or four suction buckets, connected by a steel lattice (jacket) structure. Suction bucket jacket foundations to support an offshore substation would consist of a steel lattice structure with up to eight legs and four suction buckets, one at each corner leg. Additional information on these full foundations is provided in Section 3.3.1.2 of the COP.

The single suction bucket to be tested in the Foundation Testing will have a diameter of 30 to 39 ft (9 to 12 m), and a height of 36 to 39 ft (11 to 12 m). The walls of the suction bucket will be made of steel, with a thickness of 2.0 to 2.8 inches (50 to 70 millimeters). The total weight of the suction bucket will be approximately 200 tons.

The suction bucket will be designed to penetrate into the seafloor a maximum of between 33 and 39 ft (10 and 12 m) at full penetration. The proposed Foundation Testing sites have been characterized to a conservative penetration depth of 66 ft (20 m), which is the same depth as the maximum penetration for suction bucket jacket foundations in the COP; however, the Foundation Testing as designed will not penetrate to this full depth. The proposed depth is significantly less than that assessed in the Offshore EA, which assumes that metocean tower foundations would be pile-driven up to 100 ft (30 m) below the seafloor.

An Indicative drawing of a single suction bucket is shown in Figure 2-1. A representative photograph is shown in Figure 2-2 (the photographed suction bucket includes chains on the side which will not be present in the suction bucket used for the Foundation Testing).

Figure 2-1 Indicative Drawing of a Suction Bucket

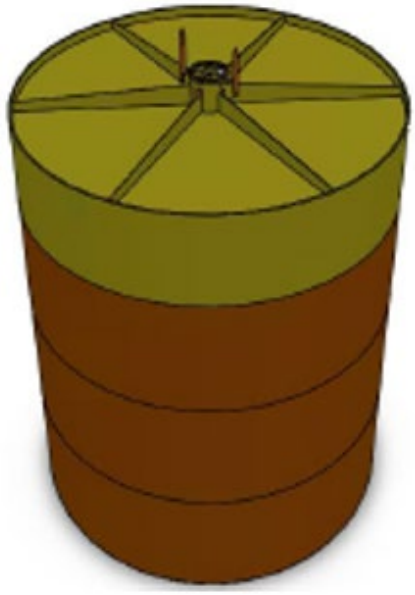


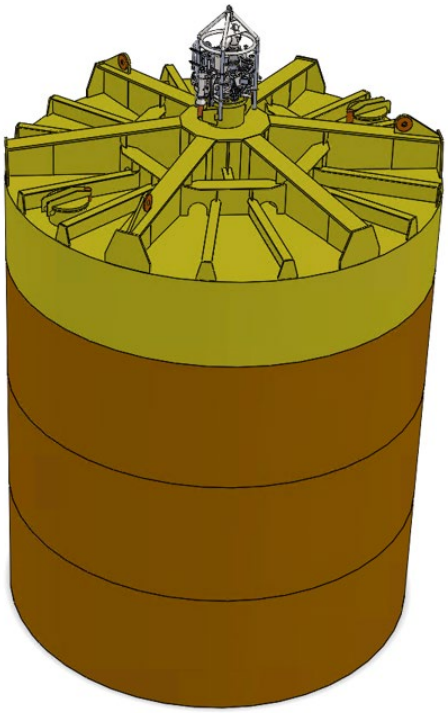
Figure 2-2 Representative Photograph of a Suction Bucket

2.7.2 Suction Pump

A low-flow suction pump will be mounted to the top of the suction bucket lid. During deployment, after the suction bucket has settled into the seafloor due to gravity (self-penetration), the suction pump will slowly remove water from within the bucket to create an area of reduced pressure against the seafloor, which will assist the suction bucket in completing penetration to the target depth. The suction pump is not expected to generate noise that would disturb marine mammals or other protected species (Koschinski, and Lüdemann 2020; Tougaard 2015; van den Akker and van der Veen 2013).

The suction pump (see Figure 2-3) will operate at a typical rate of approximately 392 yd^3/hour (300 m^3/hour). The removed water will be released immediately outside the suction bucket. The volume of seawater removed will be limited to the volume inside the suction bucket, with a maximum of 1,775 yd^3 (1,357 m^3) per test. At the completion of each test, the pump will reverse this process and slowly return the same volume of water to within the suction bucket to return the pressure inside the bucket to match the surrounding pressure and remove the bucket.

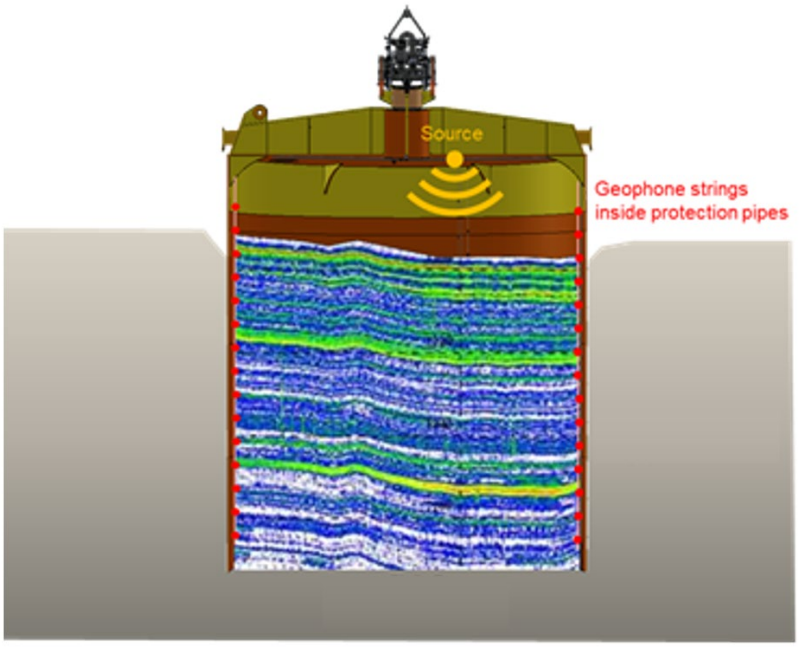
Figure 2-3 Indicative Drawing of a Suction Pump Mounted atop a Suction Bucket



2.7.3 Measurement Equipment

To monitor the soil plug on the inside of the suction bucket and gather data to assist in refining future foundation engineering, measurement equipment will be deployed inside the suction bucket during testing. Geophone strings will be mounted inside protection pipes along the inside walls of the suction bucket to receive acoustic data. Imaging equipment will be mounted on the inside of the lid of the suction bucket, as shown on Figure 2-4. This imaging equipment may consist of sonar, echo sounder, and/or sub-bottom profiler equipment. The acoustic outputs of this equipment will be contained within the suction bucket and are not expected to travel outside the steel walls of the bucket. The measurement equipment is therefore not expected to be a source of disturbance for marine mammals or other protected species.

Figure 2-4 Indicative Drawing of Measurement Equipment



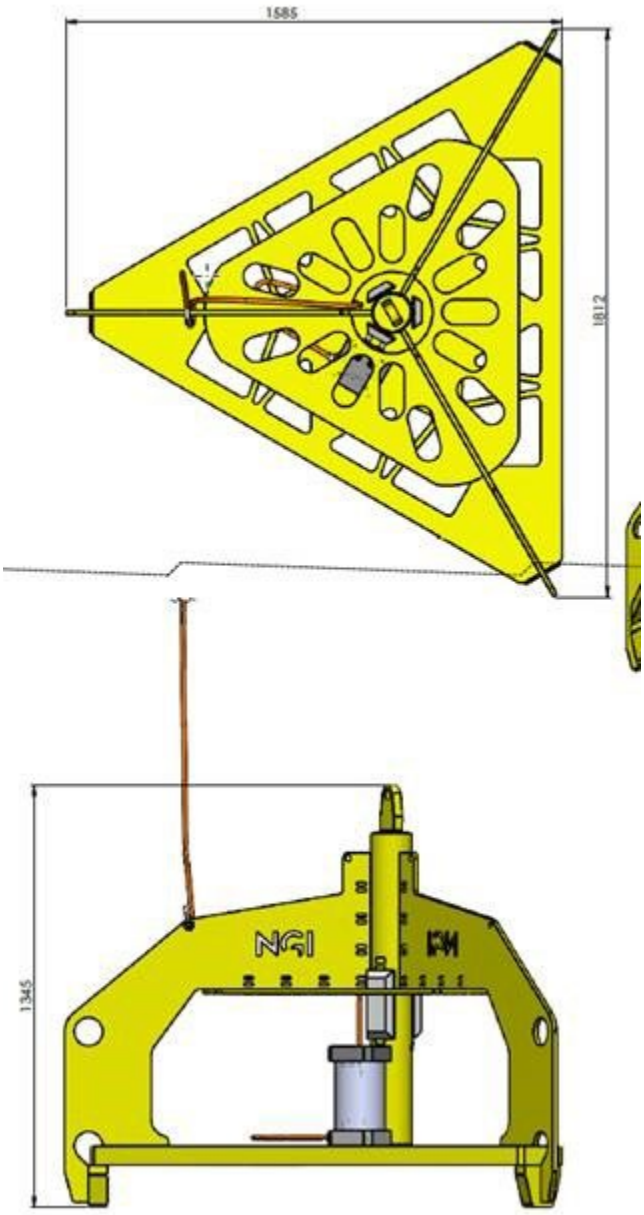
The Foundation Testing may also use up to two remotely operated vehicles (ROVs) to assist in positioning the precise location of the suction bucket tests, as well as to observe and gather data on the process of penetration and recovery. The ROVs will be suspended in the water column and will not touch or rest on the seafloor. The ROVs will be controlled from on board the vessel and will navigate via hydraulic propellers or thrusters that do not generate significant underwater noise.

2.7.4 Reference Frame

Prior to lowering the suction bucket to the seafloor, a reference frame (see Figure 2-5) will be lowered to the seafloor to assist the vessel lowering the suction bucket onto the targeted location and ensure accurate suction bucket positioning. The reference frame will be located between 33 and 98 ft (10 and 30 m) away from the targeted suction bucket location. The reference frame is made of steel with a maximum weight of approximately 1,100 pounds (500 kilograms). The footprint of the reference frame is approximately 11 ft^2 (1 m^2).

The reference frame will be directly lowered from the vessel onto the seabed and will rest atop the seabed without moving for the duration of the suction bucket trial. The edge studs of the reference frame may penetrate the top approximately 2 inches (5 centimeters) of the seabed. Upon completion of each trial, the reference frame will be raised vertically back onto the vessel.

Figure 2-5 Top and Side View of a Representative Reference Frame



3.0 Deployment, Removal, and Site Clearance 585.610 (a)(7) and 585.610 (a)(11)

Foundation Testing activities are expected to occur over approximately 10-15 days, barring weather delays. Equipment will be fabricated and transported from Europe, and vessels and crew will be mobilized from Europe, Canada, and/or the U.S. Additional transit time is expected to take approximately 13-16 days in either direction.

3.1 Foundation Testing Procedure

Once the construction vessel arrives at each Foundation Testing location, it will be positioned using dynamic positioning technology, without the use of anchors or jack-up legs. The reference frame will first be lowered to the seabed to ensure accurate suction bucket positioning. The suction bucket will then be over-boarded via crane over the side of the vessel, lowered to the seabed, and allowed to penetrate the seabed under its own weight. The attached suction pump will then pump water from inside the bucket, which will be slowly released immediately outside the suction bucket, at a typical flow rate of 392 yd^3/hour (300 m^3/hour), resulting in penetration of the foundation to its target depth of 33 to 39 ft (10 to 12 m) below the seabed.

Once the suction bucket deployment is complete, retrieval will be initiated. The suction bucket will be extracted by reversing the suction pump to pump water into the bucket. The onboard crane will lift it from the seabed to the surface. If sticky soil is present at the site and becomes attached to the surface of the foundation walls, it will be cleaned under the water prior to lifting back onboard. Once clean, the bucket will be lifted back on the vessel deck, followed by lifting and onboarding of the reference frame. Each foundation trial is expected to take an estimated six to nine hours, including three to five hours for deployment (lowering and seabed penetration) and three to four hours for removal (reverse penetration, lifting, potential cleaning and lifting onboard). After all equipment is onboard and secure, the vessel will transit to the next trial location and the above process will be repeated.

3.2 Vessel

The Foundation Testing will use a single large vessel, equipped with a crane rated to a minimum of 300-ton capacity. The vessel Deep Explorer or similar is proposed for this effort, which has previously been used to successfully install suction buckets for European projects. Vessel specifications are provided in Appendix B.

3.3 Notifications and Reporting

Beacon Wind will notify BOEM, United States Fleet Forces N46, the United States Army Corps of Engineers, and the United States Coast Guard (USCG) prior to mobilization to perform Foundation Testing activities. Written notice via email will be provided to the appropriate contact at Fleet Forces Command prior to mobilization to avoid potential conflicts with military operations. Beacon Wind will update Fleet Forces Command on the testing schedule following approval of the SAP Amendment and detailed planning.

Additionally, Beacon Wind will notify mariners, fishermen, and other users of the area by submitting a request to the USCG for publication of a Local Notice to Mariners at least two weeks prior to the start of the in-water work. This notice will include the contact names for the vessel, local fisheries liaison officer, channels of communication, and the duration of the work. Copies of all USCG communications will be provided to BOEM as required. Additionally, in accordance with standard maritime practices, the vessel captain(s) will broadcast via VHF radio on Marine Channel 16 notification to mariners of their position and limited mobility during Foundation Testing activities. Beacon Wind also provides a continual live Automatic Identification System (AIS) feed of vessel activity within and around the Lease Area, which can be accessed at https://www.beaconwind.com/environment-sustainability/mariners-fisheries/ along with additional information on Beacon Wind's ongoing coordination with mariners and fisheries.

Within 30 days of completing Foundation Testing, Beacon Wind will notify BOEM in writing. Per Lease stipulation 2.2.1, Beacon Wind will continue to submit a semi-annual progress report to BOEM every six months for the duration of the site assessment term

3.4 Health and Safety Including Accidents and Procedures

To ensure the safety of the Foundation Testing, the suction bucket manufacturer will perform safety inspections of the suction bucket during and after manufacturing according to internationally recognized codes, including NORSOK. The manufacturer, Randaberg, has prior experience manufacturing suction buckets for multiple offshore projects which have been successfully installed overseas, including other projects operated by Equinor. The suction bucket deployment contractor, Global Maritime, has also successfully installed many of these suction buckets, including using the same vessel proposed for the Foundation Testing activities.

Beacon Wind and its contractors will perform an additional, separate quality and safety inspection of the suction bucket before the beginning of the Foundation Testing activities. Additional inspections of the crane and associated will be performed prior to the beginning of activities according to UK and Norwegian Rules for Vessel Cranes.

Beacon Wind will implement a Project-specific HSEQ Plan to ensure the health and safety of all personnel involved in the Foundation Testing activities. The project-specific plan will be prepared in accordance with Beacon Wind's standard corporate HSEQ policies and procedures. The HSEQ Plan will also address emergency response and reporting requirements. The suction bucket deployment contractor's HSEQ manual is provided in Appendix B. An example HSEQ Plan from a similar project, which includes the use of suction buckets (also called suction anchors), is also provided in Appendix B. The deployment contractor will develop a similar, Project-specific HSEQ Plan prior to the initiation of Foundation Testing, which will be implemented during the proposed activities. This Project-specific HSEQ Plan can be provided to BOEM upon request once completed.

3.5 Mitigation Measures and Avoidance Plans 585.610 (a)(8)

All whales, dolphins, and porpoises are federally protected under the Marine Mammal Protection Act of 1972. In addition, some large whale species in the area, as well as sea turtles and some fish species, are listed as threatened or endangered under the Endangered Species Act of 1973 (ESA).

The Lease contains specific stipulations to minimize risk to marine species that must be followed. Foundation Testing will not require pile driving; accordingly, mitigations to reduce adverse impacts on protected species from pile driving do not apply to this testing activity. All activities associated with the Foundation Testing will comply with the applicable Lease stipulations, summarized in Table 2-2.

Additionally, Beacon Wind will employ BMPs identified in the *PDCs and BMPs for Protected Species Associated with Offshore Wind Data Collection* (NMFS 2021), *Guidelines for Information Requirements for a Renewable Energy Site Assessment Plan* (BOEM 2019), and *Establishment of an OCS Alternative Energy and Alternate Use Program, Record of Decision, December 2007* (BOEM 2007), as described in Section 2.5.

In addition, all vessels, regardless of length, must observe a 10-knot speed restriction in specific areas designated by NOAA Fisheries for the protection of North Atlantic right whales, the Block Island Sound Seasonal Management Area (in effect from November 1 through April 30); and any Dynamic Management Areas when in effect.

3.6 Site Clearance Survey (Decommissioning)

The Foundation Testing is not expected to result in any trash or bottom debris. However, Beacon Wind will ensure that the seafloor has been cleared of all obstructions created by activities on the Lease. This will be accomplished via photo documentation of all deployed and retrieved equipment. Additionally, to

confirm that all equipment was retrieved from the site, Beacon Wind will carry out one of the following: photographic bottom survey, high resolution sidescan, or sector-scanning sonar survey.

Because the Foundation Testing is a temporary activity and no facilities will be installed, Beacon Wind understands that no decommissioning application or decommissioning notice is required under 30 CFR §§ 285.905-908 (previously §§ 585.905-908), and this SAP Amendment serves as the application to deploy and subsequently remove the suction bucket during testing.

4.0 Affected Environment, Potential Impacts, and Mitigation 585.611 (b)

The following sections describe the affected environment, impacts and proposed mitigation measures for various resources. The analysis focuses on the maximum area of potential disturbance associated with the deployment and retrieval of the single suction bucket at multiple locations during the Foundation Testing. An area of 984 ft by 984 ft (300 by 300 m), with a depth of 66 ft (20 m) below the seafloor, was assessed at each of 26 potential sites (see Figure 1-1).

4.1 Geological Investigation 585.610 (b)(4), 585.611 (b)(1) and Coastal Habitats/Shallow Hazards 585.610 (b)(2), 585.611 (b)(1)

A Geological Site Characterization Report for the Foundation Testing locations is provided within Appendix C. The data and analysis within the Geological Site Characterization Report are the same as those within the Marine Site Investigation Report provided to BOEM in October 2022 in support of COP submittal. The Site Characterization Report presents this data focused on the 26 potential Foundation Testing sites (see Figure 1-1) to support BOEM's review of this SAP Amendment.

4.2 Archaeological Resources 585.610 (b)(3), 585.611 (b)(1)(6)

An Archaeological Site Characterization Report is provided as Appendix D. The Preliminary Area of Potential Effects (PAPE) assessed consists of a square measuring 984 ft by 984 ft (300 by 300 m) with a depth of 66 ft (20 m) below the seafloor at each of 26 potential Foundation Testing sites.

AECOM served as the Project Qualified Marine Archaeologist to assist BOEM with its obligations under Section 106 of the NHPA. AECOM analyzed high-resolution geophysical data including gradiometer, side-scan sonar, and sub-bottom profiler datasets. The data assessed within the Archaeological Site Characterization Report are the same as those within the Marine Archaeological Resource Assessment provided to BOEM in October 2022 in support of COP submittal. The Site Characterization Report presents this data focused on the 26 potential Foundation Testing sites (see Figure 1-1) to support BOEM's review of this SAP Amendment.

AECOM reviewed four magnetic anomalies, 23 acoustic contacts, and sub-bottom datasets within the PAPE. None of the magnetic anomalies or acoustic contacts are indicative of submerged cultural resources or ancient submerged landforms (ASLFs). AECOM recommends no further archaeological work at the 26 test installation locations within the PAPE.

In accordance with 30 CRF § 585.802 and Addendum C § 4.3.7 of the Lease, if an unanticipated archaeological resource is discovered during Foundation Testing operations, seafloor-disturbing activities will immediately halt within the area of discovery. Beacon Wind will comply with the notification requirements in its unanticipated archaeological resources discovery plan.

4.3 Benthic Resources 585.611 (b)(3-5)

A Benthic Characterization Report for the proposed testing sites is provided as Appendix E. The data presented within the Benthic Characterization Report are the same as those presented in support of COP submittal and are presented here focused on the 26 potential Foundation Testing sites to support BOEM's review of this SAP Amendment.

Videographic data displayed a seabed characterized by softbottom substrate composed primarily of finer grain sizes. No potential areas or species of concern were identified. The benthic video showed a relatively productive biological assemblage with numerous burrows, bioturbation, polychaete/amphipod tubes, and macrobenthos. The CMECS Biotic Component was classified to the lowest practical identification level based on the drop camera benthic video with verification from the grab camera and faunal analyses (Appendix E). The entire Lease Area was classified as Benthic/Attached Biota, Faunal Bed, and Soft Sediment Fauna and the majority of the Lease Area was further subclassified into the Biotic Group of Small Tube Building Fauna.

Numerous fish species were observed. Overall results of the Beacon Wind benthic biological surveys in the Lease Area are consistent with the findings of previous independent studies. Additional detail is provided in Appendix E.

Potential impacts to benthic resources and Essential Fish Habitat (EFH) are discussed in Section 4.4 below.

4.4 Finfish, Essential Fish Habitat and Threatened and Endangered Species 585.611 (b)(3-5)

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Section 4 of the revised Offshore EA describes the affected environment and potential impacts to fisheries that may result from site assessment activity. The information in BOEM (2014) is incorporated by reference and not repeated.

ESA-listed fish species that may occur in the Lease Area include Atlantic sturgeon (*Acipenser oxyrhincus*), oceanic whitetip shark (*Carcharhinus longimanus*), and the giant manta ray (*Manta birostris*). Critical habitat for the Atlantic sturgeon was designated in August 2017, after the Revised Offshore EA was released. However, no critical habitat was designated within the Lease Area (NOAA 2017a). BOEM's analysis in the Offshore EA is applicable and the determination that the proposed activity is not likely to adversely affect Atlantic sturgeon is appropriate. The oceanic whitetip shark and the manta ray were listed as threatened under the ESA after the Revised Offshore EA was released (NMFS 2018a, and NMFS 2018b). These large mobile elasmobranchs will be assumed present in the Lease Area; they are expected to behave much like other more common sharks, skates, and rays by avoiding areas of human activity and noise. BMPs implemented for other fish and protected species would also be protective of the oceanic whitetip shark and manta ray. The proposed activity would have no effects to t these threatened species.

The NOAA EFH mapper identifies no Habitat Areas of Particular Concern (HAPC) within the Lease Area. Beacon Wind has also completed an EFH Technical Report in support of the COP (COP Appendix T). Most of the species assessed as having EFH present in the Offshore EA were confirmed to have EFH overlapping the Lease Area. Three species were identified in Beacon Wind's report but were not present in the 2014 Offshore EA: Atlantic cod (*Gadus morhua*), American plaice (*Hippoglossoides platessoides*), and clearnose skate (*Raja eglanteria*). Seven species identified in the 2014 Offshore EA did not have overlapping EFH with the Lease Area: basking shark (*Cetorhinus maximus*), porbeagle (*Lamna nasus*),

longbill spearfish (*Tetrapturus pfluegeri*), cobia (*Rachycentron canadum*), Spanish mackerel (*Scomberomorus maculatus*), and king mackerel (*Scomberomorus cavalla*).

Impacting factors associated with Foundation Testing are localized and of a short duration. These primarily include disturbance of the seabed from contact and suction penetration of the suction bucket and contact of reference frame being lowered from the construction vessel. Fish or filter-feeding organisms may be affected by increased turbidity caused by the sediment plume from seabed contact, penetration, and foundation removal. Fish could also potentially become crushed under the suction bucket or reference frame or become trapped inside the bucket once it reaches the sea floor, which would result in injury or mortality. However, fish are generally expected to flee the area as the foundation materials approach the seafloor at a slow, controlled rate (less than 13 inches [30 centimeters] per second); thus, direct contact or trapping of mobile individuals is unlikely. The suction pump will operate at a typical rate of approximately 392 yd^3/hour (300 m^3/hour), with a maximum displaced volume of 1,775 yd^3 (1,357 m^3) per test; loss of ichthyoplankton due to entrainment would not be detectable against the background loss to existing vessels. Additionally, impacts from increased turbidity are expected to be temporary, and the benthic environment is expected to return to existing conditions shortly after completion of each trial.

Maximum total temporary seabed disturbance for each trial, inclusive of the suction bucket and the reference frame, would be approximately 0.028 acres (114 m^2). Importantly, the maximum extent of disturbance will not occur simultaneously, as only a single suction bucket will be used for trials throughout the Lease Area. BMPs implemented for other fish and protected species would also be protective of species with overlapping EFH. Therefore, BOEM's analysis in the Offshore EA still applies, as the proposed activity would not adversely affect these additional EFH species.

Beacon Wind has committed to implementing all applicable Lease stipulations, which include implementing BMPs during site assessment activities to minimize impacts on fisheries, including species protected under the ESA.

Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed site assessment activity.

4.5 Marine Mammals and Sea Turtles 585.611 (b)(4)

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Section 4.2.2 of the Offshore EA provides details on the species and seasonal occurrence of marine mammals and sea turtles that may be present during the proposed activity and is incorporated by reference and not repeated.

There are up to 38 marine mammal species (cetaceans and pinnipeds) that may occur (year-round or seasonally) in the Beacon Wind Lease Area, all of which are protected by the MMPA. Of those 38 marine mammal species, there are five large whale species that are also listed as endangered under the ESA:

- Fin whale (*Balaenoptera physalus*);
- Sei whale (*Balaenoptera borealis*);
- Blue whale (*Balaenoptera musculus*);
- North Atlantic right whale (*Eubalaena glacialis*); and
- Sperm whale (*Physeter macrocephalus*)

Five species of sea turtles listed as threatened or endangered under the ESA may occur in the North Atlantic waters within the Beacon Wind Lease Area: the leatherback (*Dermochelys coriacea*), loggerhead

(Northwest Atlantic Ocean DPS, *Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), green (North Atlantic DPS, *Chelonia mydas*), and hawksbill (*Eretmochelys imbricata*). Among these, the leatherback, loggerhead (Northwest Atlantic Ocean DPS), Kemp's ridley, and green (North Atlantic DPS) are likely to occur in the Lease Area and surrounding waters seasonally, while the Hawksbill is considered rare in the Lease Area.

Beacon Wind has reviewed publicly available literature and data published since submittal of the Beacon Wind SAP and since the Offshore EA and FONSI were issued (see references in Section 5.3). There is no substantive new information that would change BOEM's analysis and conclusion that site assessment activity is not anticipated to result in any significant or population-level effects to marine mammals or sea turtles. These conclusions apply to the proposed Foundation Testing activities.

The proposed activities include temporary positioning of construction vessels in various locations throughout the Lease Area, which will perform the suction bucket foundation installation and removal trials at each site.

Beacon Wind has committed to implementing all applicable Lease stipulations, which include BMPs for all site assessment activities in order to further reduce the potential for interactions with or impacts on marine wildlife. Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed Foundation Testing activity.

The Foundation Testing would not generate noise that could disturb marine mammals. No pile driving is required for the Foundation Testing, and no drilling or vibratory driving is proposed. A suction pump will be used to remove water from inside the suction bucket to assist penetration into the seafloor and subsequently replace the water to release the suction bucket; this suction pump will operate at a low flow rate and is not expected to generate noise that would disturb marine mammals or other protected species (Koschinski, and Lüdemann 2020; Tougaard 2015; van den Akker and van der Veen 2013). Noise will be limited to the dynamic positioning thrusters on the vessel, which will be similar to typical vessel traffic in the area. Geophysical equipment would be operated only within the suction bucket, and noise from this equipment is expected to be entirely contained within the bucket.

Potential benthic impacts of the Foundation Testing which may affect available prey resources are described in Section 4.4. Impacts will be temporary and localized, and the seafloor will be allowed to return to previous conditions.

Beacon Wind will implement all applicable Lease stipulations to further reduce the potential for interactions with or impacts on marine wildlife. Beacon Wind will also adhere to the applicable BMPs in the BOEM programmatic consultation with NOAA Fisheries (NMFS 2021). No harassment of marine mammals is anticipated.

4.6 Avian and Bat Resources

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Sections 4.4.2.1 and 4.4.2.2 of the Offshore EA provide details on the species and seasonal occurrence of avian and bat resources that may be present during the proposed activity and is incorporated by reference and not repeated. Beacon Wind has reviewed currently available literature and data (see Section 5.4) regarding avian and bat resources in the region and has determined that there is no substantive new information that would change BOEM's analysis or apply differently to the proposed Foundation Testing activities. The Offshore EA's conclusion that site assessment activity is not anticipated to result in any significant or population-level effects to avian and bat resources is applicable.

4.7 Water Quality 585.611 (b)(2)

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Beacon Wind has reviewed currently available literature and data (see Section 5.5) regarding water quality in the region and has determined that there is no substantive new information that would change BOEM's analysis. The results of the Offshore EA and BOEM's analysis and conclusion that site assessment activities are not anticipated to result in any significant impact to water quality is applicable to Foundation Testing activities. As described in the Offshore EA Section 4.2.1.4, the routine activities associated with site characterization would result in minor water quality impacts due to vessel operational discharges such as bilge and ballast water, sanitary waste, and trash and debris. Discharges of these materials are expected to be minimal, and while significant release of waste may compromise water quality, coastal and ocean circulation would disperse, and biodegrade discharges quickly.

The expected seabed disturbance caused by suction bucket trials would impact water quality similarly to the site characterization and metocean station and buoy deployment activities. Increased turbidity from sediment plumes from seabed contact, penetration, and foundation removal by the suction bucket and reference frame are expected to be slightly larger and more frequent than those caused by buoy deployment due to the relatively larger diameter of the suction bucket and because deployment and removal will occur several times. However, the Foundation Testing will not require scour protection, or subsequent removal by dredge, as assessed for metocean towers in the Offshore EA. The localized sediment plumes will occur in individual testing locations in the Lease Area, and thus are not expected to cause cumulative or long-lasting impacts.

Beacon Wind has committed to implementing all applicable Lease stipulations, which include BMPs for all site assessment activities, in order to further reduce the potential for impacts on water quality. Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed site assessment activity.

4.8 Air Quality

The closest point of land to the proposed site assessment activity is approximately 22 statute miles (35 km) northeast of the Lease Area on Nantucket, Massachusetts (Nantucket County). The geographic area included in a National Ambient Air Quality Standards (NAAQS) designation is limited to areas that are either within a state or territory's actual area, or that are within 3 nautical miles of a state or territory's seaward boundary. The entire Lease Area is more than 3 nautical miles from the seaward boundary of Massachusetts.

Impacts to air quality are regulated under various federal laws including the Clean Air Act, Outer Continental Shelf Lands Act, and National Environmental Policy Act; however, the Foundation Testing is a temporary site assessment activity which is not considered an OCS source of emissions, and which does not trigger any applicable requirements in the General Conformity Regulations under 40 CFR Part 93.

Air monitoring for NAAQS compliance is not conducted on Nantucket Island but a monitoring station is located on Martha's Vineyard in Dukes County. Dukes County is presently designated as unclassifiable for attainment for criteria pollutants with the exception of ozone. Other relevant existing data can also include the ambient background concentrations of regulated air pollutants, as measured by continuous ambient monitoring stations in onshore locations near the Lease Area. However, data from ambient monitoring stations are generally only considered when conducting dispersion modeling of a project's air emissions and since the Foundation Testing is a short-term temporary activity, there is no need for air emissions modeling. In addition, the U.S. Environmental Protection Agency has designated Massachusetts as an unclassifiable/attainment area for the new one-hour nitrogen dioxide (NO_2) NAAQS,

which was promulgated in 2010, pending the collection of additional monitoring data. A similar designation is expected for the one-hour sulfur dioxide (SO_2) NAAQS. Massachusetts is designated as unclassifiable or attainment for all other NAAQS. Finally, all of Massachusetts is within the Northeast Ozone Transport Region as designated by the Clean Air Act.

Potential emission sources for the Foundation Testing would be limited to a single vessel. The vessel associated with these activities would emit criteria air pollutants (nitrogen oxide [NO_X], carbon monoxide [CO], sulfur dioxide [SO_2], particulate matter less than 10 microns in diameter [PM_{10}], particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), and volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and greenhouse gases (GHGs). The vessel would emit pollutants both in federal waters while traveling to and from Lease Area, and during the Foundation Testing activity. The vessel for Foundation Testing will transit from Europe across the Atlantic Ocean over approximately 12 days to a port in eastern Canada (Halifax of St. John's), then transit to the Lease Area. The vessel may briefly cross into state waters as it transits from Canada to the Lease Area. Impacts from pollutant emissions associated with this vessel would likely be localized within the immediate vicinity of the site assessment activity.

It Is anticipated that the Foundation Testing would each be completed over a period of approximately 10-15 days over a single vessel trip. The activities may be paused during the mobilization during unfavorable weather, in which case, the vessel would remain within the Lease Area under dynamic positioning. Therefore, the air emissions inventory conservatively assumes 25 vessel days within the Lease Area. A summary of the air emission estimates is presented in Table 4-1, and the detailed emission calculations and assumptions are presented in Appendix F, and reviewed literature is available in Section 5.6.

Table 4-1. Beacon Wind Foundation Testing Air Emissions Summary

Activity	VOC (tons)	NOx (tons)	CO (tons)	PM/PM_{10} (tons)	$PM_{2.5}$ (tons)	SO_2 (tons)	HAPs (tons)	GHG (tons CO_2e)
Vessel Transit	0.18	0.24	0.46	0.02	0.02	0.04	0.02	61.46
Vessel Non-Transit Activities	12.51	16.25	31.28	1.17	1.07	2.51	1.03	4,167.67
Suction Pump Engine	8.21E-03	0.30	0.22	1.30E-02	1.26E-02	2.70E-04	9.30E-04	29.80
Total Project Lifetime Emissions	**12.71**	**16.79**	**31.96**	**1.20**	**1.10**	**2.54**	**1.05**	**4,258.92**

Emissions associated with the site assessment activity would be minor based on the estimate of less than 50 tons per year of NO_X and VOCs, 100 tons per year of the other criteria air pollutants, and 25 tons per year of HAPs or 10 tons per year of any individual HAP. The majority of these emissions would occur within the Lease Area and therefore would not affect local onshore air quality in Massachusetts. Additionally, since the emissions are associated with mobile sources, an OCS air permit for these activities will not be required.

4.9 Social and Economic Resources 585.611 (b)(7)

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Section 4.2.3 of the Offshore EA provides details on the affected environment and potential impacts to socioeconomic resources that may result from site assessment activity and is incorporated by reference

and not repeated. In addition, currently available socioeconomic literature has been reviewed (See Section 5.7).

BOEM (2014) considered impacts to demographics and employment, environmental justice, recreation and tourism, commercial and recreational fishing, and visual resources. BOEM's analysis in the Offshore EA concluded that impacts would be negligible (visual resources) or negligible to minor (demographics and employment, recreation and tourism, and commercial and recreational fishing), and also concluded that the site assessment activities would have no disproportionately high and adverse human health or environmental effects on minority or low-income populations (i.e., environmental justice impacts) (BOEM 2014). The proposed Foundation Testing activities are expected to have similarly minimal impacts on these resources.

Beacon Wind has reviewed currently available literature and data (See Section 5.2) regarding fisheries in and near the area and has determined that no new substantive information has become available that warrants revision of the analysis in BOEM (2014). While stock assessments for fisheries resources are regularly updated, the description of species assemblages in the Revised Offshore EA are considered representative of current conditions. Differential impacts may occur with regards to the minor fishery benefits caused by fish aggregation around deployed site assessment equipment, such as buoys or metocean stations, described in the Offshore EA. The proposed Foundation Testing activities are not expected to cause fish aggregation and are not likely to have similar positive impacts, as the suction bucket will be deployed and subsequently removed in a single effort.

Lease Stipulation 4.1.3 requires that Beacon Wind develop a publicly available Fisheries Communications Plan that describes the strategies that Beacon Wind intends to use for communicating with fisheries stakeholders prior to and during activities in support of the submission of a plan. The Fisheries Communications Plan presents Beacon Wind's proposed approach to outreach with the fishing industry in relation to the development of the Project. Information for mariners on the Beacon Wind survey activities is available online at https://www.beaconwind.com/environment-sustainability/mariners-fisheries/. The lead Fisheries Liaison Officer for the Project is:

Elizabeth Marchetti
emarc@equinor.com
(401) 954-2902

Beacon Wind has committed to implementing all applicable Lease stipulations. Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed site assessment activity.

4.10 Coastal and Marine Uses 585.611 (b)(8)

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Section 4 of the Offshore EA provides details on the affected environment and potential impacts to coastal and marine uses that may result from the proposed site assessment activity and is incorporated by reference.

Beacon Wind has reviewed currently available literature and data (see Section 5.8) regarding coastal and marine uses off the coast of Massachusetts and determined that there is no substantive new information that would change BOEM's analysis. The results of the Offshore EA and BOEM's analysis and conclusion that site assessment activities are not anticipated to result in any significant impact to coastal and marine uses is applicable to the proposed Foundation Testing.

Beacon Wind has committed to implementing all applicable Lease stipulations. Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed site assessment activity.

4.11 Meteorological and Oceanographic Hazards

As demonstrated in Section 2, the Foundation Testing activities proposed herein by Beacon Wind are similar or less impactful than the activity considered by BOEM in the Offshore EA (BOEM 2014). Sections 4.3.2 of the Offshore EA provide details on the affected environment and potential impacts to meteorological and oceanographic hazards that may result from the proposed site assessment activity and is incorporated by reference.

Beacon Wind has reviewed currently available literature and data (see Section 5.9) regarding coastal and marine uses off the coast of Massachusetts and has determined that there is no substantive new information that would change BOEM's analysis. The results of the Offshore EA and BOEM's analysis and conclusion that the proposed activity is not anticipated to result in any significant impact to meteorological and oceanographic hazards is applicable.

Beacon Wind has committed to implementing all applicable Lease stipulations. Beacon Wind will comply with any additional stipulations as set forth in permits or approvals in support of the proposed site assessment activity.

5.0 References 585.610 (a)(10)

5.1 General

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Appendix A	Agency Consultations
Appendix B Specifications	Health, Safety, Environment, and Quality Manual, Example Plan, and Vessel *(Contains Privileged or Confidential Information – Provided Under Separate Cover)*
Appendix C	Geological Site Characterization Report *(Contains Privileged or Confidential Information – Provided Under Separate Cover)*
Appendix D	Archaeological Site Characterization Report *(Contains Privileged or Confidential Information – Provided Under Separate Cover)*
Appendix E	Benthic Characterization Report *(Contains Privileged or Confidential Information – Provided Under Separate Cover)*
Appendix F	Air Quality Emissions Calculations