



United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

MAR 23 2016

Mr. John Warren
Director
Commonwealth of Virginia
Department of Mines, Minerals and Energy
1100 Bank Street, 8th Floor
Richmond, Virginia 23219

Dear Mr. Warren:

This letter serves to inform you that the Bureau of Ocean Energy Management (BOEM) has approved the Research Activities Plan (RAP) submitted on April 21, 2015 by the Department of Mines, Minerals and Energy (DMME), subject to the enclosed conditions of approval pursuant to 30 C.F.R. § 585.628(f)(1). In conjunction with RAP approval and pursuant to 30 C.F.R. § 585.200(b) and Section 6 of Renewable Energy Lease OCS-A 0497, the project easement requested in the RAP is also hereby granted. Enclosed are updated copies of Addenda A and D depicting the project easement for Renewable Energy Research Lease OCS-A 0497.

Please note that approval of your RAP does not constitute approval of 24-hour dynamic positioning thruster use during cable-laying activities, as proposed in your RAP. Section 8.1 of the enclosed conditions of approval provides information about the steps necessary to obtain approval for 24-hour dynamic positioning thruster use. Additionally, approval of this RAP does not constitute approval to decommission facilities to a depth of one meter, as proposed in the RAP. Such a request should be submitted as a component of the decommissioning application required pursuant to 30 C.F.R. § 585.906.

In order to maintain compliance with the approved RAP, you must submit annual reports certifying compliance with the enclosed conditions of approval, pursuant to 30 C.F.R. § 585.633(b). These reports are due annually starting on December 31, 2016.

Along with the RAP, DMME submitted a Certified Verification Agent (CVA) nomination for DNV GL to review and certify the Facility Design Report and Fabrication and Installation Report, as required by 30 C.F.R. §§ 585.701 and 702. BOEM has reviewed the CVA nomination and hereby approves DNV GL as DMME's CVA as part of the RAP approval pursuant to 30 C.F.R. § 585.706(e).

This letter constitutes a final BOEM decision that may be appealed pursuant to 30 C.F.R. § 585.118, 30 C.F.R. Part 590, and 43 C.F.R. Part 4, Subpart E.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

Conditions of Research Activities Plan Approval

Lease Number OCS-A 0497

The Lessee's rights to conduct activities under the approved Research Activities Plan (RAP) are subject to the following conditions. The Lessor reserves the right to impose additional conditions incident to any future approval of any modifications to the RAP.

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1 APPLICABLE REGULATIONS AND LEASE TERMS

- 1.1 Construction and Operations Plan Requirements. Pursuant to and in accordance with research lease OCS-A 0497, activities performed under the Lessee's RAP must comply with all applicable requirements in 30 CFR Part 585 including, but not limited to, those applicable to Construction and Operations Plans (COP) in 30 CFR 585.620 through 585.628. Approval of the Lessee's RAP does not: (i) grant more rights to the Lessee than those typically granted by Lessor through the COP approval process, or (ii) relieve the Lessee of its decommissioning obligations set forth in Subpart I of 30 CFR 585.
- 1.2 Compliance with the Approved RAP. Pursuant to the terms of research lease OCS-A 0497, the Lessee must conduct activities in accordance with the approved RAP, as well as any conditions of approval contained herein, except as provided in the applicable regulations in 30 CFR Part 585.

2 TECHNICAL CONDITIONS

2.1 Unexploded Ordnance (UXO) and/or Discarded Military Munitions (DMM)

Investigation. The Lessee, by itself or through its designated operator, must investigate the area of potential disturbance for the presence of UXO/DMM and evaluate the risk according to the As Low As Reasonably Practical (ALARP), risk mitigation principle.¹ The ALARP risk mitigation principle consists of up to five phases:

1. Desk top study (DTS)
2. Investigation surveys to determine presence of objects
3. Identification surveys to determine the nature of the identified objects
4. UXO removal and/or construction re-routing
5. Installation

2.1.1 UXO/DMM DTS. The Lessee, by itself or through its designated operator, must submit a DTS to the Lessor for review and approval, disapproval, or approval with modifications. The DTS must be submitted no later than the date the Fabrication and Installation Report (FIR) is submitted to the Lessor, and must include an evaluation of installation risk based on: the proposed construction methodologies, entire project footprint, areas of potential disturbance (anchorage areas, turbine and scour protection, cable route, etc.), probability of UXO/DMM presence, and mobility of sediments and UXO/DMM. The DTS must also identify the specific types of UXO/DMM that qualify as munitions of concern and potential mitigation strategies such as removal and re-routing. Finally, the DTS must provide specific recommendations for the Investigation Survey, as appropriate, including:

- 2.1.1.1 Areas to be surveyed,
- 2.1.1.2 Survey line spacing and sensor heights,
- 2.1.1.3 Width of the survey corridor,
- 2.1.1.4 Minimum iron content for targets,
- 2.1.1.5 Details about the testing and proofing of survey methods, and
- 2.1.1.6 A request for a waiver of the requirements included in 2.1.2 through 2.1.5, if the Lessee, by itself or through its designated operator, does not believe further UXO/DMM study is necessary to ensure safe construction and installation activities.

¹ ALARP is a term that is used in the context of safety-critical processes (<http://www.hydro-international.com/content/article/managing-uxo-risk-in-offshore-and-renewables-projects-2>).

2.1.2 UXO/DMM Investigation Survey Plan. Unless a waiver request is approved pursuant to 2.1.1.6, the Lessee, by itself or through its designated operator, must submit an Investigation Survey Plan to the Lessor for review and approval, disapproval, or approval with modifications. The Investigation Survey Plan must describe the areas that need further investigation as discussed in the approved DTS. The Investigation Survey Plan must include information on the proposed survey vessel, equipment, methodologies, and schedule for the Investigation Survey of the areas identified, and must provide the anticipated date of submittal of its UXO/DMM Investigation Survey Report to the Lessor.

If the Investigation Survey Plan is not consistent with the recommendations included in the DTS, the Investigation Survey Plan must discuss in detail the deviations and the rationale behind them.

2.1.3 UXO/DMM Investigation Survey Report. Unless a waiver request is approved pursuant to 2.1.1.6, the Lessee, by itself or through its designated operator, must submit an Investigation Survey Report for Lessor review and approval, disapproval, or approval with modifications prior to the installation of facilities in the Investigation Survey area. This report must include the following:

- 2.1.3.1 A detailed discussion of utilized methodologies;
- 2.1.3.2 A summary and detailed description of the findings;
- 2.1.3.3 A separate list of those findings that identify any conditions different from those anticipated and discussed in the DTS;
- 2.1.3.4 Recommendations for the Identification Survey methods and equipment, if appropriate;
- 2.1.3.5 A statement that the installation methods and UXO/DMM mitigation strategies discussed in the FIR and the DTS are suitable given the results of the Investigation Survey. Alternatively, the Lessee, by itself or through its designated operator, may submit a detailed discussion of alternative installation methods and/or UXO/DMM mitigation strategies that have been determined to be appropriate given the results of the Investigation Survey; and
- 2.1.3.6 A request for a waiver of the requirements included in 2.1.4 through 2.1.5, if the Lessee, by itself or through its designated operator, does not believe further UXO/DMM study is necessary to ensure safe construction and installation activities in the Investigation Survey area.

- 2.1.4 UXO/DMM Identification Survey Plan. Unless a waiver request is approved pursuant to 2.1.1.6 or 2.1.3.6, the Lessee, by itself or through its designated operator, must submit an Identification Survey Plan to the Lessor for review and approval, disapproval, or approval with modifications. The Identification Survey Plan must describe the areas that need further investigation as discussed in the approved DTS and the approved Investigation Survey Report. The Identification Survey Plan must include information on the proposed survey vessel, equipment, methodologies, and schedule for the Identification Survey of the areas identified; and must provide the anticipated date of submittal of its UXO/DMM Identification Survey Report to the Lessor. If the Identification Survey Plan is not consistent with the recommendations included in the DTS and Investigation Survey Report, the Identification Survey Plan must discuss in detail the deviations and the rationale behind them.
- 2.1.5 UXO/DMM Identification Survey Report. Unless a waiver request is approved pursuant to 2.1.1.6 or 2.1.3.6, the Lessee, by itself or through its designated operator, must submit an Identification Survey Report for Lessor review and approval, disapproval, or approval with modifications prior to the installation of facilities in the Identification Survey area. This report must include the following:
- 2.1.5.1 A detailed discussion of utilized methodologies;
 - 2.1.5.2 A summary and detailed description of the findings;
 - 2.1.5.3 A separate list of findings that identify conditions different from those anticipated and discussed in the DTS and the Investigation Survey Report; and
 - 2.1.5.4 A statement that the installation methods and UXO/DMM mitigation strategies discussed in the FIR, DTS, and/or Investigation Survey Report are suitable given the results of the Identification Survey. Alternatively, the Lessee, by itself or through its designated operator, may submit a detailed discussion of alternative installation methods and/or UXO/DMM mitigation strategies that have been determined to be appropriate given the results of the Identification Survey.
- 2.1.6 UXO/DMM Survey Results Implementation. The Lessee, by itself or through its designated operator, must implement the approved mitigation methods identified in the DTS and/or the Survey Report(s). Additionally, if the Lessee identifies alternative installation strategies in its approved Survey Report(s) that differ from those provided in its FIR, then the Lessee must implement those alternative installation strategies.
- 2.2 Decommissioning Depth. The Lessee, by itself or through its designated operator, must decommission facilities to a depth of 15 feet (4.6 m) below the mudline, as set forth in 30 CFR 585.910, unless otherwise authorized by the Lessor pursuant to Subpart I of 30 CFR 585.

- 2.3 Safety Management System (SMS). Pursuant to 30 CFR 585.811, the Lessee, by itself or through its designated operator, must provide a SMS to the Lessor and demonstrate that the SMS is fully functional prior to beginning activities described in the Lessee's approved RAP. In addition to the requirements listed in 30 CFR 585.810, the SMS must include detailed information that demonstrates compliance with the requirements identified in 2.3.1 and 2.3.2.
- 2.3.1 Diving Safety Program. The Lessee, by itself or through its designated operator, must ensure that the diving safety program in its SMS is conducted in accordance with the U.S. Coast Guard (USCG) regulations for Commercial Diving Operations at 46 CFR Part 197, Subpart B.
- 2.3.2 Fall Protection Program. The Lessee, by itself or through its designated operator, must ensure that the fall protection program in the SMS complies with ANSI/ASSE Z-359.2, *Minimum Requirements for a Comprehensive Managed Fall Protection Program*.
- 2.4 Oil Spill Response Plan (OSRP). The Lessee, by itself or through its designated operator, must submit an OSRP to the Bureau of Safety and Environmental Enforcement (BSEE) containing the terms prescribed for an OSRP in 30 CFR Part 254. The Lessee, by itself or through its designated operator, must submit the approved OSRP to the Lessor prior to the construction of any facilities proposed in the RAP.

3 CONDITIONS FOR CULTURAL RESOURCE PROTECTION

- 3.1 No Impact without Approval. The Lessee, by itself or through its designated operator, must not knowingly impact a potential archaeological resource without the Lessor's prior approval.
- 3.2 Avoidance of Identified Resources. The Lessee, by itself or through its designated operator, must avoid two potential historic period archaeological resources, identified as CR001 (44VB0376) and LA001 (44VB0377) in the RAP, which were interpreted from their geophysical signatures to be possible shipwrecks. The avoidance area must extend a minimum of 50 meters (m) (164 feet (ft)), measured from the center point of each identified resource.
- 3.3 Coordination with Virginia Army National Guard. The Lessee, by itself or through its designated operator, must minimize direct and visual (indirect) impacts of its proposed onshore switch cabinet on historic properties associated with Camp Pendleton through coordination with the Virginia Department of Military Affairs – Virginia Army National Guard (VaARNG) with respect to location, size, scale, materials, color, and screening of the cabinet. The Lessee, by itself or through its designated operator, must propose means to VaARNG that will minimize the impacts of the onshore switch cabinet, and these proposed means must be considered acceptable by the VaARNG. Alternatively, the Lessee, by itself or through its designated operator, must notify the Lessor that it is unable to reach agreement with the VaARNG, at which point the Lessor will reopen consultations under Section 106 of the National Historic Preservation Act in order to facilitate resolution. The present VaARNG point of contact for this project is Susan Smead, VaARNG Cultural Resources Program Manager, susan.e.smead.nfg@mail.mil, 434-298-6411.
- 3.4 Post-Review Discovery Clauses. If, while conducting activities under the RAP, the Lessee, by itself or through its designated operator discovers a 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), prehistoric artifacts, or relict landforms, etc. within the project area, the Lessee, by itself or through its designated operator, must:
 - 3.4.1 Immediately halt seafloor/bottom-disturbing activities within the area of discovery;
 - 3.4.2 Notify the Lessor within 24 hours of discovery;
 - 3.4.3 Notify the Lessor in writing via report to the Lessor within 72 hours of its discovery;
 - 3.4.4 Keep the location of the discovery confidential and take no action that may adversely affect the archaeological resource until the Lessor has made an evaluation and instructs the Lessee, by itself or its designated operator, on how to proceed, including when activities may recommence; and

3.4.5 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)). The Lessee, by itself or its designated operator, must do this if: (1) the site has been impacted by the Lessee's project activities; and/or (2) impacts to the site or to the area of potential effect cannot be avoided. If investigations indicate that the resource is potentially eligible for listing in the National Register of Historic Places, the Lessor will instruct the Lessee, by itself or its designated operator, as to how to protect the resource or how to mitigate adverse effects to the site. If the Lessor incurs costs in protecting the resource, under Section 110(g) of the National Historic Preservation Act, the Lessor may charge the Lessee, by itself or its designated operator, reasonable costs for carrying out preservation responsibilities under the OCS Lands Act (30 CFR 585.802(c-d)).

4 CONDITIONS FOR AVIAN AND BAT PROTECTION

4.1 Lighting Requirements

- 4.1.1 The Lessee, by itself or through its designated operator, will use only red flashing strobe-like lights for aviation obstruction lights (as described in Section 3.2.3.2 of the revised Virginia Offshore Wind Technology Advancement Project on the Atlantic Outer Continental Shelf Offshore Virginia Environmental Assessment - OCS EIS/EA BOEM 2015-031 (hereinafter, the revised EA), and must ensure that these aviation obstruction lights emit infrared energy within 675 - 900 nanometers wavelength to be compatible with Department of Defense night vision goggle equipment.
- 4.1.2 Any lights used to aid to marine navigation by the Lessee or its designated operator during construction, operations and decommissioning must meet USCG requirements for private aids to navigation [https://www.uscg.mil/forms/cg/CG_2554.pdf].
- 4.1.3 For lighting not described in Section 4.1.1 or 4.1.2 above, the Lessee, by itself or through its designated operator, must use such lighting only when necessary, and the lighting must be hooded downward and directed when possible to reduce upward illumination and the illumination of adjacent waters.

4.2 Anti-perching Devices. The Lessee, by itself or through its designated operator, must install anti-perching devices on both WTGs in order to minimize the attraction of birds to the WTGs and reduce the potential for collisions.

4.3 Monitoring Requirements.

- 4.3.1 Post-Construction Monitoring Plan. As a part of its RAP, the Lessee submitted a *Bird and Bat Post-Construction Monitoring Plan (March 2015)* (Monitoring Plan) to the Lessor. The Lessee, by itself or through its designated operator, will coordinate with the Lessor, U.S. Fish and Wildlife Service (USFWS) and Virginia Department of Game and Inland Fisheries (VDGIF) on the contents of the Monitoring Plan and as necessary prior to its implementation. For the first full year after commencement of operations, the Monitoring Plan must also include:
 - 4.3.1.1 Thermal imaging/infrared camera monitoring to estimate collision and avoidance rates of birds. These cameras must be mounted on both WTGs, and must sample during the spring (early April to the end of May) and fall (mid-August to the end of October) migration periods and during the winter (mid-January to mid-March);
 - 4.3.1.2 Boat-based avian surveys, in order to estimate bird density and to compare to pre-construction estimates; and
 - 4.3.1.3 Acoustic monitoring of bat activity. Acoustic monitoring devices must be mounted on both WTGs during the spring (mid-April to mid-June) and fall (mid-August to the end of October) migration periods.

- 4.3.2 Monitoring Plan Revisions. Following delivery of the comprehensive monitoring report (see Section 4.3.3.2 below), the Lessee, by itself or through its designated operator, will discuss the following with BOEM, USFWS and VDGIF: the monitoring results; the potential need for reasonable revisions to the Monitoring Plan, including technical refinements and/or additional monitoring; and the potential need for any additional efforts to reduce impacts. If, after this discussion, the Lessor determines that reasonable revisions to the Monitoring Plan are necessary, the Lessor may require the Lessee to modify the Monitoring Plan and comply with the modified Monitoring Plan. If the reported monitoring results deviate substantially from the impact analysis included in the revised EA (Section 3.2.3.2), the Lessor may impose additional, relevant requirements on the Lessee to address these impacts.
- 4.3.3 Reporting Requirements for Avian and Bat Species.
- 4.3.3.1 Monthly Progress Reports. The Lessee, by itself or through its designated operator, will provide monthly progress reports on post-construction avian and bat monitoring to BOEM, USFWS, and VDGIF during the first full year that the project is operational. The progress report must include a summary of all work performed, an explanation of all overall progress, and any technical problems encountered.
- 4.3.3.2 Monitoring Report. The Lessee, by itself or through its designated operator, will submit to the Lessor a comprehensive monitoring report within 120 calendar days of completion of the last boat-based avian and/or bat survey. The report must include all data, analyses, and summaries regarding ESA-listed and non-ESA-listed birds and bats.
- 4.3.3.3 Annual Report and Carcass Reporting. By January 31 of each year, the Lessee, by itself or through its designated operator, must provide BOEM, USFWS and VDGIF a report documenting any dead birds or bats found on vessels and structures during construction, operations and decommissioning. Each report must contain the following information: the name of species, date found, location, a picture to confirm species identity (if possible), and any other relevant information. The Lessee, by itself or through its designated operator, must report carcasses with Federal or research bands to the USGS Bird Band Laboratory (<https://www.pwrc.usgs.gov/bbl/>).
- 4.3.3.4 Raw Data. The Lessee, by itself or through its designated operator, must store the raw data from all avian and bat surveys and monitoring activities according to accepted archiving practices. Such data must remain accessible to the Lessor and USFWS, upon request, for the duration of the lease.

5 CONDITIONS RELATING TO MARINE PROTECTED SPECIES AND ESSENTIAL FISH HABITAT

5.1 General Requirements.

5.1.1 The conditions provided in Section 5 supersede those provided in Section 4.1 of Addendum “C” of research lease OCS-A 0497. In the event that the NMFS ESA Section 7 Biological Opinion for the Virginia Offshore Wind Technology Advancement Project (issued March 16, 2016) (the "Biological Opinion") is updated or amended, the Lessor reserves the right to amend the applicable terms and conditions herein to conform to the updated or amended Biological Opinion.

5.1.2 Prior to conducting activities pursuant to the RAP, the Lessee, by itself or through its designated operator, must hold a briefing to establish responsibilities of each party involved in implementing the requirements specified in Sections 5 through 9 of these terms and conditions. During this briefing, the parties involved must define the chains of command, discuss communication procedures, provide an overview of monitoring procedures, and review operational procedures. This briefing must include all relevant personnel, crew members and protected species observers (PSOs). New personnel must be briefed as they join the work in progress.

5.1.3 The Lessee, by itself or through its designated operator, must ensure that all vessel operators and crew members, including PSOs, are familiar with, and understand, the requirements specified in Section 5 through Section 9 of these terms and conditions.

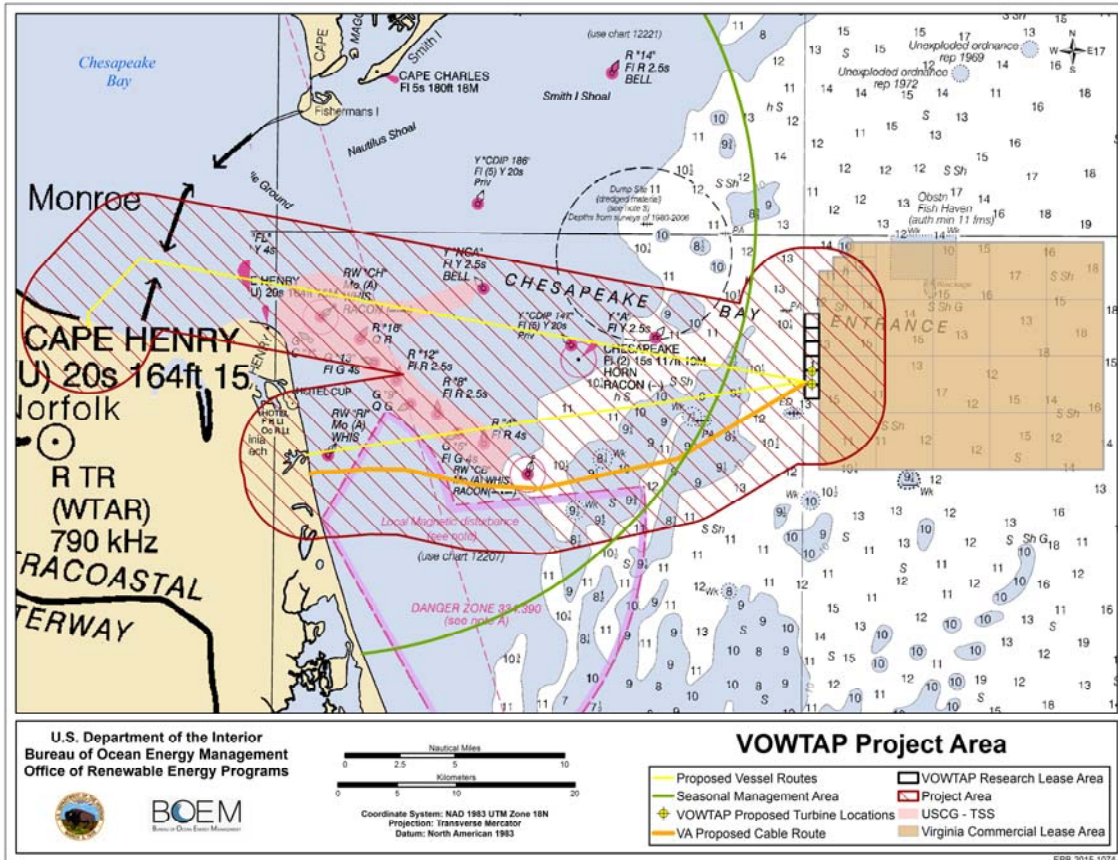
5.1.4 The Lessee, by itself or through its designated operator, must ensure that a copy of Section 5 through Section 9 of these terms and conditions are made available on every project-related vessel.

5.2 Requirements for Vessel Strike Avoidance. The Lessee, by itself or through its designated operator, must ensure that all vessels conducting activities pursuant to the RAP comply with the vessel strike avoidance measures specified below, except when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

5.2.1 The Lessee, by itself or through its designated operator, must ensure that vessel operators and crews maintain a vigilant watch for cetaceans, pinnipeds, and sea turtles and take the appropriate measures to avoid striking cetaceans, pinnipeds, and sea turtles.

5.2.2 The Lessee, by itself or through its designated operator, must ensure that all vessel operators comply with 10 knot (18.5 km/hr) speed restrictions in any Dynamic Management Area (DMA) and Seasonal Management Area (SMA) that is located within the project area. The project area, as depicted in the map in Section 5.2.3, is defined to include a 3 nautical mile buffer around: (1) vessel transit corridors to and from local ports; (2) research lease OCS-A 0497 area; and (3) the full length of the export cable route.

5.2.3 The Lessee, by itself or through its designated operator, must ensure that vessels 65 ft in length or greater, operate at speeds of 10 knots or less (≤ 18.5 km/hr) when they are operating between November 1 and April 30, in the project area, as defined in Section 5.2.2 and displayed in the map below.



5.2.4 The Lessee, by itself or through its designated operator, must ensure that all vessel operators reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of non-delphinoid cetaceans are observed near the vessel.

5.2.5 North Atlantic right whales.

5.2.5.1 The Lessee, by itself or through its designated operator, must ensure all vessels maintain a separation distance of 500 m (1,640 ft) or greater from any sighted North Atlantic right whale.

5.2.5.2 The Lessee, by itself or through its designated operator, must ensure that the following avoidance measures are taken if a vessel comes within 500 m (1,640 ft) of any North Atlantic right whale:

5.2.5.2.1. If underway, any vessel must steer a course away from the North Atlantic right whale at 10 knots (18.5 km/h) or less until the 500 m (1,640 ft) minimum separation distance has been established (unless 5.2.5.2.2 below applies).

5.2.5.2.2. If a North Atlantic right whale is sighted within 100 m (328 ft) of an underway vessel, the vessel operator must immediately reduce speed and promptly shift the engine to neutral. The vessel operator must not engage the engines until the North Atlantic right whale has moved beyond 100 m (328 ft), at which point the Lessee, by itself or through its designated operator, must comply with 5.2.5.2.1 above.

5.2.5.2.3. If a vessel is stationary, the vessel operator must not engage engines until the North Atlantic right whale has moved beyond 100 m (328 ft), at which point the Lessee, by itself or through its designated operator, must comply with 5.2.5.2.1 above.

5.2.6 Non-delphinoid cetaceans other than the North Atlantic right whale.

5.2.6.1 The Lessee, by itself or through its designated operator, must ensure all vessels maintain a separation distance of 100 m (328 ft) or greater from any sighted non-delphinoid cetacean.

5.2.6.2 The Lessee, by itself or through its designated operator, must ensure that the following avoidance measures are taken if a vessel comes within 100 m (328 ft) of any non-delphinoid cetacean:

5.2.6.2.1. If any non-delphinoid cetacean is sighted, the vessel underway must reduce speed and shift the engine to neutral, and must not engage the engines until the non-delphinoid cetacean has moved beyond 100 m (328 ft).

5.2.6.2.2. If a vessel is stationary, the vessel must not engage engines until the non-delphinoid cetacean has moved beyond 100 m (328 ft).

5.2.7 Delphinoid cetaceans and Pinnipeds.

5.2.7.1 The Lessee, by itself or through its designated operator, must ensure that vessels underway do not divert to approach any delphinoid cetacean and/or pinniped.

5.2.7.2 The Lessee, by itself or through its designated operator, must ensure that if a delphinoid cetacean and/or pinniped approaches any vessel underway, that vessel must avoid excessive speed or abrupt changes in direction to avoid injury to the delphinoid cetacean and/or pinniped.

5.2.8 Sea Turtles. The Lessee, by itself or through its designated operator, must ensure all vessels maintain a separation distance of 50 m (164 ft) or greater from any sighted sea turtle.

5.2.9 Marine Debris Prevention. The Lessee, by itself or through its designated operator, must ensure that vessel operators, employees, and contractors engaged in activities pursuant to the RAP are briefed on marine trash and debris awareness elimination as described in the BSEE NTL No. 2012-G01 (“Marine Trash and Debris Awareness and Elimination”). The Lessee, by itself or through its designated operator, must ensure that its employees and contractors are made aware of the environmental and socioeconomic impacts associated with marine trash and debris, as well as their responsibilities for ensuring that trash and debris are not intentionally or accidentally discharged into the marine environment. The above-referenced NTL provides information the Lessee, by itself or through its designated operator, may use for this awareness training.

6 CONDITIONS ON HIGH RESOLUTION GEOPHYSICAL SURVEYS

6.1 General requirements.

6.1.1 The conditions provided in Section 6 supersede those provided in Sections 4.3.1 to 4.3.6 of Addendum “C” of research lease OCS-A 0497.

6.1.2 The Lessee, by itself or through its designated operator, must ensure that all vessels conducting high resolution geophysical (HRG) survey activity pursuant to the RAP, where one or more acoustic sound source is operating at frequencies below 200 kHz, comply with the requirements specified in Section 6, except under extraordinary circumstances when the safety of the vessel or crew are in doubt or the safety of life at sea is in question.

6.2 Visibility. The Lessee, by itself or through its designated operator, must not conduct HRG surveys at any time when lighting or weather conditions (e.g., darkness, rain, fog, sea state) prevent visual monitoring of the HRG survey exclusion zone. This requirement may be modified, pursuant to 6.3.

6.3 Modification of Visibility Requirement. If the Lessee, by itself or through its designated operator, intends to conduct HRG survey operations at night or when visual observation is otherwise impaired, the Lessee, by itself or through its designated operator, must submit an alternative monitoring plan detailing the Lessee’s proposed alternative monitoring methodology (e.g., active or passive monitoring technologies) to the Lessor. The alternative monitoring plan must demonstrate the effectiveness of the methodology proposed to the Lessor’s satisfaction. The Lessor may, after consultation with the National Marine Fisheries Service (NMFS), decide to approve, approve with conditions, or disapprove the alternative monitoring plan.

6.4 PSO. The Lessee, by itself or through its designated operator, must ensure that the exclusion zone for all HRG surveys is monitored by NMFS-approved PSOs around the sound source. The number of PSOs must be sufficient to effectively monitor the exclusion zone at all times. In order to ensure effective monitoring, PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch, unless a different schedule is approved by the Lessor. PSOs must not work for more than 12 hours in a 24-hour period. PSO reporting requirements are provided in Section 9. The Lessee, by itself or through its designated operator, must provide to the Lessor a list of PSOs and their résumés no later than 45 calendar days prior to the scheduled start of surveys. The Lessee, by itself or through its designated operator, must provide the résumés of additional PSOs at least 15 calendar days prior to each PSO’s start date. The Lessor will send PSO résumés to NMFS for approval.

6.5 Observation Location. The Lessee, by itself or through its designated operator, must ensure that monitoring occurs from the highest available vantage point on the associated operational platform and allows for 360-degree scanning.

- 6.6 Optical Device Availability. The Lessee, by itself or through its designated operator, must ensure that reticle binoculars and other suitable equipment are available to each PSO to adequately perceive and monitor protected marine species within the exclusion zone during HRG surveys.
- 6.7 Establishment of Default Exclusion Zone. The Lessee, by itself or through its designated operator, must ensure a 200-meter radius, default exclusion zone for marine mammals and sea turtles. The Lessee, by itself or through its designated operator, may not use HRG survey devices that emit sound levels that exceed the 180 dB Level A harassment radius (200 meter) boundary without approval from the Lessor.
- 6.8 Field Verification of Exclusion Zone. The Lessee, by itself or through its designated operator, must conduct field verification of the exclusion zone for the HRG survey equipment operating below 200 kHz. The Lessee, by itself or through its designated operator, must take acoustic measurements at a minimum of two reference locations and in a manner that is sufficient to establish the following: source level (peak at 1 meter) and distance to the 207, 180, 166, 160, and 150 dB (RMS) re 1 μ Pa sound pressure level (SPL) isopleths as well as the 187 dB re 1 μ Pa cumulative sound exposure level (cSEL) and 206 dB_{peak}. The Lessee, by itself or through its designated operator, must take such sound measurements at the reference locations at two depths (i.e., a depth at mid-water and a depth at approximately 1 meter (3.28 ft) above the seafloor). Sound pressure levels must be measured in the field in dB re 1 μ Pa (RMS) and reported by the Lessee, by itself or through its designated operator, to the Lessor and NMFS (per Section 9.8). If, based on the results of this field verification, the Lessor determines that the exclusion zone does not encompass the 180 dB Level A harassment radius (and notifies the Lessor and NMFS per Section 9.11), the Lessor may impose additional, relevant requirements on the Lessee, or its designated operator, including but not limited to, expansion of this exclusion zone.
- 6.9 Modification of Exclusion Zone per Lessee Request. The Lessee, by itself or through its designated operator, may use the field verification results to request modification of the exclusion zone for the specific HRG survey equipment under consideration. The Lessee, by itself or through its designated operator, must base any proposed new exclusion zone radius on the largest safety zone configuration of the target Level A or Level B harassment acoustic threshold zone as defined by NMFS. The Lessee, by itself or through its designated operator, must use this modified zone for all subsequent use of field-verified equipment, but may periodically reevaluate the modified zone using the field verification procedures described in Section 6.8. The Lessee, by itself or through its designated operator, must obtain Lessor approval of any new exclusion zone before it is implemented.
- 6.10 HRG Survey Chesapeake Bay Seasonal Management Area (SMA) Right Whale Monitoring. The Lessee, by itself or through its designated operator, must ensure that between November 1 and April 30, vessel operators monitor National Marine Fisheries Service North Atlantic Right Whale reporting systems (e.g., the Early Warning System, Sighting Advisory System, and Mandatory Ship Reporting System) for the presence of North Atlantic right whales during HRG survey operations.

- 6.11 Dynamic Management Area (DMA) Shutdown Requirement. The Lessee, by itself or through its designated operator, must cease HRG survey activities within 24 hours of NMFS establishing a DMA in the HRG survey area. The Lessee, by itself or through its designated operator, may resume HRG surveys as soon as the DMA has expired.
- 6.12 Clearance of Exclusion Zone. The Lessee, by itself or through its designated operator, must ensure that active acoustic sound sources will not be activated until the PSO has reported the exclusion zone clear of all marine mammals and sea turtles for 60 minutes. If a marine mammal or sea turtle is observed, the PSO must note and monitor the position, relative bearing, and estimated distance to the animal until the animal dives or moves out of visual range of the PSO.
- 6.13 Electromechanical Survey Equipment Ramp Up. The Lessee, by itself or through its designated operator, must ensure that, when technically feasible, a “ramp up” of the electromechanical survey equipment occurs at the start or re-start of HRG survey activities. A ramp up must begin with the power of the smallest acoustic equipment for the HRG survey at its lowest power output. The power output must be gradually turned up and other acoustic sources added in a way such that the source level increases in steps not exceeding 6 dB per 5-minute period.
- 6.14 Shutdown for Non-Delphinoid Cetaceans and Sea Turtles. The Lessee, by itself or through its designated operator, must ensure that any time a non-delphinoid cetacean or sea turtle is observed within the exclusion zone, the PSO will notify the Dominion Construction Compliance Manager, Resident Engineer, or other authorized individual, and call for a shutdown of the electromechanical survey equipment. The vessel operator must comply immediately with such a call by the PSO. Any disagreement or discussion must occur only after shutdown. Subsequent restart of the electromechanical survey equipment may only occur following clearance of the exclusion zone (per Section 6.12) and implementation of ramp up procedures (per Section 6.13).
- 6.15 Power Down for Delphinoid Cetaceans and Pinnipeds. The Lessee, by itself or through its designated operator, must ensure that any time a delphinoid cetacean or pinniped is observed within the exclusion zone, the PSO will notify the Dominion Construction Compliance Manager, Resident Engineer, or other authorized individual, and call for a power down of the electromechanical survey equipment to the lowest power output that is technically feasible. The vessel operator must comply immediately with such a call by the PSO. Any disagreement or discussion must occur only after power down. Subsequent power up of the electromechanical survey equipment must use the ramp up provisions described in Section 6.13 and may occur after (1) the exclusion zone is clear of delphinoid cetaceans and pinnipeds or (2) a determination by the PSO after a minimum of 10 minutes of observation that the delphinoid cetacean or pinniped is approaching the vessel or towed equipment at a speed and vector that indicates voluntary approach to bow-ride or chase towed equipment.

6.16 Pauses in Electromechanical Survey Sound Source. If the electromechanical sound source shuts down for reasons other than encroachment into the exclusion zone by a non-delphinoid cetacean or sea turtle (for instance, mechanical or electronic failure), resulting in the cessation of the sound source for a period greater than 20 minutes, the Lessee, by itself or through its designated operator, must ensure that restart of the electromechanical survey equipment commences only after clearance of the exclusion zone (per Section 6.12) and implementation of ramp-up procedures (per Section 6.13). If the pause is 20 minutes or less, the equipment may be restarted as soon as practicable at its operational level as long as visual surveys were continued diligently throughout the silent period and the exclusion zone remained clear of marine mammals and sea turtles. If visual surveys were not continued diligently during the pause of 20 minutes or less, the Lessee, by itself or through its designated operator, must restart the electromechanical survey equipment following clearance of the exclusion zone (per Section 6.12) and implementation of ramp-up procedures (per Section 6.13).

7 CONDITIONS ON PILE DRIVING OF WIND TURBINE GENERATOR (WTG) INWARD BATTERED GUIDE STRUCTURE (IBGS) FOUNDATIONS

- 7.1 General. The Lessee, by itself or through its designated operator, must ensure that all vessels conducting activity pursuant to the RAP comply with the pile driving requirements specified in Section 7, except when the safety of the vessel or crew are in doubt or the safety of life at sea is in question. In addition, the Lessee, by itself or through its designated operator, must comply with the pile driving reporting requirements specified in Section 9. The 1,000 m (3,281 ft) and 1,700 m (5,577 ft) default exclusion zones are based upon the largest field of ensonification to the 180 dB (RMS) isopleths for the 600 kJ and 1000 kJ impact hammers, respectively, as reported in the RAP (RAP, 2015 Appendix M-2).
- 7.2 Visibility. The Lessee, by itself or through its designated operator, must not conduct pile driving for IBGS foundations at any time when lighting or weather conditions (e.g., darkness, rain, fog, sea state) prevent visual monitoring of the exclusion zones for IBGS foundation pile driving as specified below. This requirement may be modified, pursuant to 7.4.
- 7.3 Continuation of Pile Driving After Daylight Hours. If the driving of a pile commenced during daylight hours, then the Lessee, by itself or through its designated operator, may complete driving that pile after daylight hours. However, the Lessee, by itself or through its designated operator, may not start driving a new pile after daylight hours, unless allowed pursuant to an alternative monitoring plan as described in 7.4.
- 7.4 Modification of Visibility Requirement. If the Lessee, by itself or through its designated operator, intends to conduct pile driving for an IBGS foundation at night or when visual observation is otherwise impaired, the Lessee, by itself or through its designated operator, must submit an alternative monitoring plan detailing the Lessee's proposed alternative monitoring methodology (e.g., active or passive monitoring technologies) to the Lessor. The alternative monitoring plan must demonstrate the effectiveness of the methodology proposed to the Lessor's satisfaction. The Lessor may, after consultation with NMFS, decide to approve, approve with conditions, or disapprove the alternative monitoring plan.
- 7.5 PSO. The Lessee, by itself or through its designated operator, must ensure that the exclusion zone for all pile driving for an IBGS foundation is monitored by NMFS-approved PSOs around the sound source. The number of PSOs must be sufficient to effectively monitor the exclusion zone at all times. In order to ensure effective monitoring, PSOs must be on watch for no more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch, unless a different schedule is approved by the Lessor. PSOs must not work for more than 12 hours in a 24-hour period. PSO reporting requirements are provided in Section 9. The Lessee, by itself or through its designated operator, must provide to the Lessor a list of PSOs and their résumés no later than forty-five (45) calendar days prior to the scheduled start of IBGS foundation construction activity. The résumés of any additional PSOs must be provided fifteen (15) calendar days prior to each PSO's start date. The Lessor will send the PSO résumés to NMFS for approval.

- 7.6 Observation Location. The Lessee, by itself or through its designated operator, must ensure that monitoring occurs from the highest available vantage point on the associated operational platform and allows for 360-degree scanning.
- 7.7 Optical Device Availability. The Lessee, by itself or through its designated operator, must ensure that reticle binoculars and other suitable equipment are available to each PSO to adequately perceive and monitor protected species within the exclusion zone during construction activities.
- 7.8 Limitations on Pile Driving. The Lessee, by itself or through its designated operator, must ensure that no pile-driving activities occur from November 1 – April 30, or within an active Dynamic Management Area (DMA) as established by NMFS. Any pile driving activities outside of the DMA are required to remain at a distance such that received levels at these boundaries are no more than Level B harassment as determined by field verification or modeling.
- 7.9 Establishment of Exclusion Zone. The Lessee, by itself or through its designated operator, must ensure the establishment of default exclusion zones for marine mammals and sea turtles around each pile driving site based on the 180 dB isopleth. The specific exclusion zone requirements described below are based upon the type of hammer employed.
- 7.9.1 1000 kJ impact hammer. When the Lessee, by itself or through its designated operator, is operating a 1000 kJ impact hammer, the default exclusion zone is 1,700 m (5,577 ft). The 1,700 m (5,577 ft) exclusion zone must be monitored from two locations. At least two PSOs on simultaneous watch must be based at or near the sound source and will be responsible for monitoring out to 1,000 m (3,281 ft) from the sound source. At least two additional PSOs on simultaneous watch must be located on a separate vessel approximately 1,700 m (5,577 ft) from the pile hammer, and will be responsible for monitoring the area between 1,000 m (3,281 ft) to 1,700 m (5,577 ft) from the sound source.
- 7.9.2 600 kJ impact hammer. When the Lessee, by itself or through its designated operator, is operating a 600 kJ impact hammer, the default exclusion zone is 1,000 m (3,281 ft). The 1,000 m (3,281 ft) exclusion zone must be monitored from two locations. At least two PSOs on simultaneous watch must be based at or near the sound source and will be responsible for monitoring out to 500 m (1,641 ft) from the sound source. At least two additional PSOs on simultaneous watch must be located on a separate vessel approximately 1,000 m (3,281 ft) from the pile hammer and will be responsible for monitoring the area between 500 m (1,641 ft) to 1,000 m (3,281 ft) from the sound source.

- 7.10 Field Verification of Exclusion Zone. The Lessee, by itself or through its designated operator, must conduct acoustic monitoring of pile driving activities during the installation of each IBGS foundation requiring pile driving. Acoustic measurements must take place during the driving of the last half of a pile (deepest segment) for any given open-water pile installed for the first IBGS foundation. The Lessee, by itself or through its designated operator, must take acoustic measurements at a minimum of two reference locations that are sufficient to establish the following: source level (peak at 1 m) and distance to the 207, 180, 166, 160, and 150 dB re 1 μ Pa (RMS) SPL isopleths as well as the 187 dB re 1 μ Pa cSEL and 206 dB_{peak}. Such sound measurements must be taken at the reference locations at two depths (i.e., a depth at midwater and a depth at approximately 1m above the seafloor). Sound pressure levels must be measured in the field in dB re 1 μ Pa (RMS) and reported by the Lessee, by itself or through its designated operator, to the Lessor and NMFS (per Section 9.10). The Lessee, by itself or through its designated operator, must report the azimuthal bearing from the central pile to the receivers. Additionally, the Lessee, by itself or through its designated operator, must record the bearings from the central caisson to the strike surfaces of each IBGS pile, as well as the bearing from the central caisson to where each IBGS pile enters the ocean floor.
- 7.11 Modification of Exclusion Zone. The Lessee, by itself or through its designated operator, must submit results of the acoustic monitoring for field verification of the exclusion zone to the Lessor (per Section 9.10). Based on the results of this field verification:
- 7.11.1 If the Lessor determines that the exclusion zone does not encompass the 180 dB Level A harassment radius (and notifies the Lessor and NMFS per Section 9.11), the Lessor may impose additional, relevant requirements on the Lessee, including but not limited to, expansion of this exclusion zone.
- 7.11.2 The Lessee, by itself or through its designated operator, may modify the default exclusion zone for pile driving activities. The Lessee, by itself or through its designated operator, should use the results of its field verification in establishing any new exclusion zone, regardless of whether it is greater than or less than the default exclusion zone. Any new exclusion zone radius must be based on the most conservative measurement (i.e., the largest safety zone configuration) of the target (i.e. 180 dB or 160 dB) zone. The Lessee, by itself or through its designated operator, must obtain the Lessor's approval for any new exclusion zone before it may be implemented.
- 7.12 Clearance of Exclusion Zone. The Lessee, by itself or through its designated operator, must ensure that visual monitoring of the exclusion zone begins no less than 60 minutes prior to the start of any pile driving operations and continues for at least 60 minutes after pile driving operations cease, unless sighting conditions do not allow observation of the sea surface (e.g., fog, rain, darkness) (per Sections 7.2 and 7.3 above). If a marine mammal or sea turtle is observed, the PSO must note and monitor the position, relative bearing and estimated distance to the animal until the animal dives or moves out of visual range of the PSO. The PSO must continue to watch for additional marine mammals or sea turtles that may surface in the area. The Lessee, by itself or through its designated operator, must ensure that pile driving operations do not begin until the PSO has reported the exclusion zone clear of all marine mammals and sea turtles for at least 60 minutes.

- 7.13 Implementation of Soft Start. The Lessee, by itself or through its designated operator, must ensure that a “soft start” be implemented at the beginning of each pile installation. This will provide additional protection to marine mammals and sea turtles near the project area by allowing them to vacate the area prior to the commencement of pile driving activities. The Lessee, by itself or through its designated operator, must ensure the following at the beginning of all in-water pile driving activities or when pile driving has ceased for one hour or more: The impact hammer soft start requires 3 strike sets, with a 1-minute wait period between each strike set. The initial strike set will be at approximately 10 percent energy, the second strike set at approximately 25 percent energy and the third strike set at approximately 40 percent energy. The soft start procedure must last for at least 20 minutes. Strikes may continue at full operational power following the soft start period.
- 7.14 Shut Down for Marine Mammals and Sea Turtles. The Lessee, by itself or through its designated operator, must ensure that any time a marine mammal or sea turtle is observed within the exclusion zone, the PSO will notify the Dominion Construction Compliance Manager, Resident Engineer, or other authorized individual, and call for a shutdown of pile driving activity. Any disagreements should be discussed only after shutdown, unless such discussion relates to the safety of the timing of the cessation of the pile driving activity. Subsequent restart of the pile driving equipment may only occur following clearance of the exclusion zone of any marine mammal or sea turtle for at least 60 minutes. Thereafter, the Lessee, by itself or through its designated operator, must undertake a soft start prior to proceeding with pile driving operations (per Section 7.13).
- 7.15 Pauses in Pile Driving Activity. The Lessee, by itself or through its designated operator, must ensure that visual surveys are continued diligently during any pause in pile driving activity. If visual surveys are not able to be continued diligently during any pause in pile driving activity due to diminished lighting or weather conditions (e.g., darkness, rain, fog, sea state), the Lessee, by itself or through its designated operator, must restart the pile driving activity following clearance of the exclusion zone (per Section 7.12) and implementation of soft start procedures (per Section 7.13). If pile driving activity shuts down for reasons other than encroachment into the exclusion zone by a non-delphinoid cetacean or sea turtle (for instance, mechanical or electronic failure), resulting in the cessation of the sound source for a period of 60 minutes or more, the Lessee, by itself or through its designated operator, must ensure that restart of the pile driving activity commences only after clearance of the exclusion zone (per Section 7.12) and implementation of soft start procedures (per Section 7.13).

8 CONDITIONS FOR DYNAMIC POSITIONING (DP) THRUSTER USE

- 8.1 Visibility. In order for the Lessee, by itself or through its designated operator, to conduct DP thruster operations at night or when visual observation is otherwise impaired, it must submit an alternative monitoring plan detailing the Lessee's proposed alternative monitoring technologies (e.g., night vision optics and at-sea calibration exercises) to the Lessor. The alternative monitoring plan must demonstrate to the Lessor's satisfaction the effectiveness of the methodology proposed. The Lessor may, after consultation with NMFS, decide to approve, approve with conditions, or disapprove the alternative monitoring plan.
- 8.2 Establishment of Default Monitoring Zone. In order to minimize potential entrainment and/or acoustic impacts, the Lessee, by itself or through its designated operator, must ensure the establishment of a 50-meter radius monitoring zone for marine mammals and sea turtles. The Lessee, by itself or through its designated operator, must ensure that the monitoring zone is established and maintained from when the vessel initially leaves the dock and throughout the construction activity, and until the DP vessel returns to dock.
- 8.3 Field Verification of Monitoring Zone. The Lessee, by itself or through its designated operator, must conduct acoustic field verification of DP thrusters (per Section 9.2). The Lessee, by itself or through its designated operator, must take acoustic measurements sufficient to establish the following: source level (peak at 1 m) and distance to the 207, 180, 166, 160, 150 and 120 dB re 1 μ Pa (RMS) SPL isopleths as well as the 187 dB re 1 μ Pa cSEL and 206 dBpeak. Sound pressure levels must be measured in the field in dB re 1 μ Pa (RMS) and reported by the Lessee, by itself or through its designated operator, to the Lessor and NMFS (per Section 9.9). If, based on the results of this field verification, the Lessor determines that the monitoring zone does not encompass the 160 dB Level B harassment radius (and notifies the Lessee and NMFS per Section 9.11), the Lessor may impose additional, relevant requirements on the Lessee, including but not limited to, a requirement to expand this monitoring zone.
- 8.4 PSO. The Lessee, by itself or through its designated operator, must ensure that the monitoring zone during DP thruster use is monitored by NMFS-approved PSOs around the sound source. The number of PSOs must be sufficient to effectively monitor the monitoring zone at all times. In order to ensure effective monitoring, PSOs must not be on watch for more than 4 consecutive hours, with at least a 2-hour break after a 4-hour watch, unless a different schedule is approved by the Lessor. PSOs must not work for more than 12 hours in a 24-hour period. PSO reporting requirements are provided in Section 9. The Lessee, by itself or through its designated operator, must provide the Lessor with a list of PSOs and their résumés no later than 45 calendar days prior to the scheduled start of surveys. The résumés of any additional PSOs must be provided at least 15 calendar days prior to each PSO's start date. The Lessor will send the PSO résumés to NMFS for approval.

- 8.5 Observation Location. The Lessee, by itself or through its designated operator, must ensure that monitoring occurs from the highest available vantage point on the associated operational platform and allows for 360-degree scanning.
- 8.6 Optical Device Availability. The Lessee, by itself or through its designated operator, must ensure that reticle binoculars and other suitable equipment are available to each PSO to adequately perceive and monitor protected marine species within the monitoring zone during DP thruster use.
- 8.7 Chesapeake Bay Seasonal Management Area (SMA) Right Whale Monitoring. The Lessee, by itself or through its designated operator, must ensure that during DP thruster use between November 1 and April 30, vessel operators monitor National Marine Fisheries Service North Atlantic Right Whale reporting systems (e.g., the Early Warning System, Sighting Advisory System, and Mandatory Ship Reporting System) for the presence of North Atlantic right whales.
- 8.8 DP Thruster Ramp Up. The Lessee, by itself or through its designated operator, must ensure that, when technically feasible, a “ramp up” of the DP thrusters occurs at the start or re-start of DP thruster use. The ramp up must begin with the power output gradually increased such that power output begins at the minimum output possible and doubles in 5-minute periods, once the monitoring zone is clear of any marine mammal and/or sea turtle for at least 30 minutes.
- 8.9 Implementation of Power Down for Marine Mammals and Sea Turtles. The Lessee, by itself or through its designated operator, must ensure that any time a marine mammal or sea turtle is observed within the monitoring zone, the PSO notifies the Construction Compliance Manager, Resident Engineer, or other authorized individual. The PSO must then call for a power down of the DP thrusters, as long as such a power down would be technically feasible and would not cause damage to equipment and facilities being installed. Power down of the DP thrusters to the minimum output possible must occur as soon as it is safe to do so. Any disagreement or discussion should occur only after power down, unless such discussion relates to the safety of the timing of the power down of the DP thrusters. Following the clearance of the monitoring zone of any marine mammal and/or sea turtle for at least 60 minutes, the Lessee, by itself or through its designated operator, must follow ramp up procedures in Section 8.8 above in order to power up the DP thrusters to full operational power.

9 REPORTING REQUIREMENTS FOR MARINE PROTECTED SPECIES AND ESSENTIAL FISH HABITAT

- 9.1 General. The Lessee, by itself or through its designated operator, must ensure compliance with the reporting requirements in Section 9 for activities conducted pursuant to the RAP, and must use the contact information provided as Attachment 1, or updated contact information as provided by the Lessor, in fulfilling these requirements.
- 9.2 DP Thruster Plan for Field Verification of the Monitoring Zone. No later than 45 calendar days prior to the commencement of the required DP thruster field verification activities, the Lessee, by itself or through its designated operator, must submit to the Lessor a plan for verifying the sound source levels of DP thrusters. The Lessee, by itself or through its designated operator, must obtain the Lessor's approval of the plan prior to conducting field verification activities.
- 9.3 HRG Plan for Field Verification of the Exclusion Zone. No later than 45 calendar days prior to the commencement of the required field verification activities, the Lessee, by itself or through its designated operator, must submit a plan to the Lessor for verifying the sound source levels of any electromechanical survey equipment operating at frequencies below 200 kHz. The Lessee, by itself or through its designated operator, must obtain the Lessor's approval of the plan prior to conducting field verification activities.
- 9.4 Pre-Commencement and Completion of Pile Driving Notifications. The Lessee, by itself or through its designated operator, must notify the Lessor and NMFS at least 24 hours prior to the initial commencement of pile driving activities, and again within 24 hours of the completion of all pile driving activities.
- 9.5 PSO Reports. The Lessee, by itself or through its designated operator, must ensure that the PSOs record all observations of protected species using standard marine mammal observer data collection protocols. The list of required data elements for these reports is provided as Attachment 2. Reports of any ESA-listed species observed, including Atlantic sturgeon, must be submitted to the Lessor and NMFS within 30 calendar days of the observation.
- 9.6 Reporting Injured or Dead Protected Species. The Lessee, by itself or through its designated operator, must ensure that sightings of any injured or dead protected species (e.g., marine mammals, sea turtles, or Atlantic sturgeon) are reported to the Lessor, NMFS, and the NMFS Northeast Regional Stranding Hotline within 24 hours of sighting, regardless of how the injury or death was caused. The Lessee, by itself or through its designated operator, must use the form provided as Attachment 3 to report the sighting or incident. If the Lessee or operator's activity is responsible for the injury or death, the Lessee, by itself or through its designated operator, must ensure that its vessel assists in any salvage effort as requested by NMFS. If possible, the Lessee, by itself or through its designated operator, must collect and preserve (refrigerate or freeze) any dead sea turtle or Atlantic sturgeon specimens until disposal procedures are discussed with NMFS.
- 9.7 Reporting Observed Impacts to Protected Species

- 9.7.1 The Lessee, by itself or through its designated operator, must report any observed takes of listed marine mammals, sea turtles or sturgeon resulting in injury or mortality within 24 hours to the Lessor and NMFS.
- 9.7.2 The Lessee, by itself or through its designated operator, must report any observations concerning any impacts on ESA-listed marine mammals, sea turtles, or Atlantic sturgeon to the Lessor and NMFS Northeast Region's Stranding Hotline within 48 hours.
- 9.7.3 The Lessee, by itself or through its designated operator, must record injuries or mortalities using the form provided as Attachment 3.
- 9.8 Field Verification of Exclusion Zone Reporting for HRG Survey Equipment. The Lessee, by itself or through its designated operator, must report the results of the HRG survey field verification to the Lessor and NMFS (a) prior to the HRG equipment being used for project-related activities, and (b) within 7 calendar days of the commencement of HRG survey field verification activities. The Lessee, by itself or through its designated operator, must include in its report a preliminary interpretation of the results for all sound sources, which will include details of the operating frequencies, sound pressure levels (RMS), received cSELs, and frequency bands covered, as well as associated latitude/longitude positions, ranges, depths and bearings between sound sources and receivers.
- 9.9 Field Verification of Monitoring Zone Reporting for DP Thruster Use. The Lessee, by itself or through its designated operator, must report the results of the DP thruster use field verification to the Lessor and NMFS within 7 calendar days of the commencement of the field verification activities. The Lessee, by itself or through its designated operator, must include in its report a preliminary interpretation of the results for all sound sources, which will include details of the operating frequencies, sound pressure levels (RMS), received cSELs, and frequency bands covered, as well as associated latitude/longitude positions, ranges, depths and bearings between sound sources and receivers.
- 9.10 Acoustic Monitoring for Field Verification of Exclusion Zone Reports for Pile Driving. The Lessee, by itself or through its designated operator, must ensure that the results of acoustic monitoring of the last half of the pile (deepest segment) for any given open-water pile installed for the first IBGS foundation are submitted to the Lessor and NMFS within 24 hours of installation. Results of the field verification conducted during the installation of the first IBGS foundation must be reported to the Lessor and NMFS (a) within 7 calendar days of the commencement of field verification activities, and (b) before the installation of the second IBGS foundation. The Lessee, by itself or through its designated operator, must include in its report a preliminary interpretation of the results for each pile installation, which for all sound sources will include details of the operating frequencies, sound pressure levels (RMS), received cSELs and frequency bands covered, as well as associated latitude/longitude positions, ranges, depths and bearings between sound sources and receivers.
- 9.11 Required Modification of Exclusion or Monitoring Zone Notification. The Lessee, by itself or through its designated operator, must notify the Lessor and NMFS within 24 hours of receiving any acoustic monitoring results indicating that any exclusion zones do not cover the 180 dB Level A harassment threshold or the DP thruster monitoring zone does

not cover the 160 dB Level B harassment threshold. The Lessee, by itself or through its designated operator, may only modify an exclusion zone or monitoring zone with written approval from the Lessor.

- 9.12 Final Technical Report for DP Thruster Use and Observations. The Lessee, by itself or through its designated operator, must provide to the Lessor and NMFS a final technical report of the observation data recorded during DP thruster use monitoring within 120 calendar days of final DP thruster use. The report must include full documentation of methods and monitoring protocols, summarize the data collected during monitoring, estimate the number of listed marine mammals and sea turtles that may have been taken during DP thruster use, and provide an interpretation of the results and effectiveness of all monitoring tasks. The report must also include the results and analysis of the data collected during the sound source field verification of the DP thrusters.
- 9.13 Final Technical Report for WTG Construction and Observations. The Lessee, by itself or through its designated operator, must provide the Lessor and NMFS a final technical report within 120 calendar days of completion of the pile driving and other construction activities. The report must include full documentation of methods and monitoring protocols, summarize the data recorded during monitoring, estimate the number of listed marine mammals and sea turtles that may have been taken during construction activities, and provide an interpretation of the results and effectiveness of all monitoring tasks. The report must also include the results and analysis of the sound source field verification data collected during pile driving activity.
- 9.14 Marine Mammal Protection Act Authorization(s). If the Lessee, by itself or through its designated operator, obtains an authorization pursuant to section 101(a)(5) of the Marine Mammal Protection Act for conducting activities pursuant to the RAP, then the Lessee, by itself or through its designated operator, must provide to the Lessor a copy of the authorization prior to commencing such activities.

10 ADDITIONAL CONDITIONS FOR ESSENTIAL FISH HABITAT REPORTING AND CONSERVATION

- 10.1 Foundation Monitoring Reports. The Lessee, by itself or through its designated operator, must provide the Lessor with a visual inspection report within 45 calendar days of each foundation inspection. The visual inspections will be carried out at 6-month intervals for the first year after the foundations are installed and at 12-month intervals thereafter, as described in Section 3.6.1 of the RAP. The visual inspection reports must include the type and thickness of marine growth on each foundation and on the seabed within 5 m of each pile and central caisson, identified to the lowest taxonomic group possible.
- 10.2 Foundation Scour Monitoring Reports. The Lessee, by itself or through its designated operator, must provide the Lessor with a foundation scour monitoring report within 45 calendar days following each scour inspection. As described in Section 3.6.1 of the RAP, the initial scour inspection will be carried out within 6 months of commissioning, and subsequent inspections will be carried out at intervals of 1, 2, 5, and 10 years after commissioning, or after a major storm event.
- 10.3 Inter-array and Export Cable Monitoring Reports. The Lessee, by itself or through its designated operator, must provide the Lessor with an inter-array and export cable monitoring report within 45 calendar days following each inter-array and export cable inspection. As described in Section 3.6.3 of the RAP, the initial inter-array and export cable inspection will be carried out at intervals of 6 months and 1 year after installation, and subsequent inspections will be carried out every 2 years or after a major storm event.
- 10.4 Cable Protection Measure Report. If the Lessee, by itself or through its designated operator, determines that cable protection measures are necessary, it must consider utilizing measures that minimize impacts to essential fish habitat (e.g., cable protection measures with the smallest footprint practicable). Should the Lessee, by itself or through its designated operator, determine that it is necessary to implement cable protection measures, it must provide to the Lessor a written description of the cable protection measures implemented, including an explanation of the essential fish habitat impact minimization measures considered and/or utilized.

11 CONDITIONS RELATED TO NAVIGATIONAL SAFETY

- 11.1 Pre-Construction Briefing. The Lessee, by itself or through its designated operator, must provide the Lessor and the USCG a pre-construction briefing at least 120 calendar days prior to the commencement of any construction or installation activities. The briefing must include, at a minimum:
 - 11.1.1 Weekly Schedule. A detailed weekly schedule on construction and installation activities from commencement to project operations;
 - 11.1.2 Communication Capabilities. Capabilities to be maintained by the Lessee or its designated operator to communicate with the Lessor, USCG, and mariners in the vicinity of the WTGs;
 - 11.1.3 Installation Monitoring. Capabilities to be maintained by the Lessee or its designated operator to continuously monitor its transportation, construction, installation and maintenance vessels, project related facilities as necessary, and the local marine traffic in the vicinity of the leased area; and
 - 11.1.4 Mitigation. All planned mitigations to minimize any adverse impact to navigation while construction is ongoing.
- 11.2 Private Aids to Navigation. The Lessee, by itself or through its designated operator, must file an application with the commander of the USCG Fifth District to establish private aids to navigation for each WTG, and must provide the approved private aid to navigation to the Lessor prior to the construction or installation of any facilities. The information submitted in the application must include, at a minimum, details for sound signals, RACON, and/or Automatic Identification System (AIS).
- 11.3 Maintenance Schedule. The Lessee, by itself or through its designated operator, must submit to the Lessor and USCG a WTG maintenance schedule 30 days after construction is completed and on an annual basis thereafter. Modifications to the schedule must be provided to the Lessor and the USCG three weeks prior to implementing the changes.
- 11.4 Monthly Report. During construction, the Lessee, by itself or through its designated operator, must provide the Lessor and the USCG a monthly report, which includes at a minimum:
 - 11.4.1 Complaints. Any complaints (either written or oral) received from boaters, fishers, commercial vessel operators, or other mariners regarding impacts to navigation safety allegedly caused by vessels or other equipment associated with the project;
 - 11.4.2 Response to Complaints. Description of any remedial actions undertaken by the Lessee, by itself or through its designated operator, in response to complaints received; and
 - 11.4.3 Current Construction Status. The current construction status of the project, including any changes to the construction schedule or process from what was described in the pre-construction briefing required in Section 11.1 and/or any previous monthly report.

- 11.5 Correspondence. Within 90 calendar days of receipt, the Lessee, by itself or through its designated operator, must submit to the USCG copies of any correspondence from other federal, state, or local agencies that relate to navigation safety.
- 11.6 Location Plat. No later than 7 calendar days after completing construction, the Lessee, by itself or through its designated operator, must submit a plat indicating the final cable route and WTG locations to the National Ocean Service, Nautical Data Branch, with a completed "Permit/Public Notice Completion Report." This submission is intended to give the Nautical Data Branch the information needed to add the turbines and cable route to the appropriate nautical charts. Presently, the Nautical Data Branch can be reached at 301-713-2737 or ocs.ndb@noaa.gov.
- 11.7 Mariner Information Sheets. The Lessee, by itself or through its designated operator, must provide mariner information sheets on its project website at least [30] days before construction is commenced. These sheets should include the location of the turbines, blade clearance above sea level, and other project specifications relevant to navigation.
- 11.8 Emergency Shutdown. The Lessee, by itself or through its designated operator, must ensure that the WTGs are equipped with control mechanisms that enable the control room operator to shut down either or both of the WTG rotors within two minutes of initiating shutdown procedures. The Lessee, by itself or through its designated operator, must immediately comply with any emergency shutdowns ordered by the USCG. The Lessee or its designated operator may resume operations only upon notification from the USCG.
- 11.9 Emergency Response Manual. The Lessee, by itself or through its designated operator, must ensure that the emergency response manual to address non-routine events, prepared pursuant to Section 6.2.5 of the Navigational Risk Assessment provided as Appendix R of the RAP, includes, at a minimum:
- 11.9.1 Standard Operating Procedures. Method(s) for establishing and testing WTG rotor shutdown, notifying the USCG of mariners in distress and/or potential/actual search and rescue (SAR) incidents, notifying the USCG of any events or incidents that may impact maritime safety or security, and complying with a shutdown ordered by the USCG.
- 11.9.2 Staffing. Number of personnel intended to staff the control center; hours of operation; job qualification requirements; initial, on-the-job, and refresher training requirements.
- 11.9.3 Communications. Control center capabilities to communicate with the USCG and any mariners in the vicinity of the WTGs.
- 11.9.4 Monitoring. Measures the control center will implement to continuously maintain situational awareness at each of the WTGs during an emergency.

12 CONDITION RELATED TO ELECTROMAGNETIC EMISSIONS

Prior to entry into any designated defense operating area, warning area, or water test area for the purpose of carrying out any activity under the RAP, the Lessee, by itself or through its designated operator, must enter into an agreement with the commander of the appropriate command headquarters to coordinate the electromagnetic emissions associated with such activities. The Lessee, by itself or through its designated operator, must ensure that all electromagnetic emissions associated with such activities are controlled as directed by the commander of the appropriate command headquarters.

13 MODIFICATIONS

The Lessee, by itself or through its designated operator, may request a modification of a term in the RAP or these conditions of approval. The Lessor will review this request and determine whether the modification requires a revision to the RAP under 30 CFR § 585.634. If the Lessor determines that the requested modification does not require a revision to the RAP, the Lessor will provide a written response to the Lessee and its designated operator approving, approving with conditions, or disapproving the modification. This written response will become a part of the approved RAP.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OCEAN ENERGY MANAGEMENT

Lease Number OCS-A 0497

Attachment 1 to Conditions of Research Activities Plan Approval

CONTACT INFORMATION FOR REPORTING REQUIREMENTS

The following contact information must be used for the reporting and coordination requirements specified in the Conditions of RAP Approval:

Department of Defense Coordination

United States Fleet Forces (USFF) Command, N46
1562 Mitscher Ave, Suite 250
Norfolk, VA 23551
(757) 836-6206

Reporting Injured or Dead Protected Species

NOAA Fisheries Northeast Region's Stranding Hotline: 866-755-6622
Observed dead sea turtles and/or Atlantic Sturgeon: Fax: (978) 281-9394 or e-mail:
incidental.take@noaa.gov; renewable_reporting@boem.gov

All other reporting requirements

Bureau of Ocean Energy Management
Environment Branch for Renewable Energy
Phone: 703-787-1340
Email: renewable_reporting@boem.gov

National Marine Fisheries Service
Northeast Regional Office, Protected Resources Division
Section 7 Coordinator
Phone: 978-281-9328
Email: incidental.take@noaa.gov; brian.d.hopper@noaa.gov

Vessel operators may send a blank email to ne.rw.sightings@noaa.gov for an automatic response listing of all current DMAs.

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Attachment 2 to Conditions of Research Activities Plan Approval

REQUIRED DATA ELEMENTS FOR PROTECTED SPECIES OBSERVER REPORTS

DMME and/or Dominion must ensure that the protected species observer record all observations of protected species using standard marine mammal observer data collection protocols. The list of required data elements for these reports is provided below:

- 1) Vessel name;
- 2) Observer names and affiliations;
- 3) Date;
- 4) Time and latitude/longitude when visual survey began;
- 5) Time and latitude/longitude when visual survey ended; and
- 6) Average environmental conditions during visual surveys including:
 - a) Wind speed and direction;
 - b) Sea state (glassy, slight, choppy, rough, or Beaufort scale);
 - c) Swell (low, medium, high, or swell height in meters); and
 - d) Overall visibility (poor, moderate, good);
- 7) Species (or identification to lowest possible taxonomic level);
- 8) Certainty of identification (sure, most likely, best guess);
- 9) Total number of animals;
- 10) Number of juveniles;
- 11) Description (as many distinguishing features as possible of each individual seen, including length, shape, color and pattern, scars or marks, shape and size of dorsal fin, shape of head, and blow characteristics);
- 12) Direction of animal's travel relative to the vessel (preferably accompanied by a drawing);
- 13) Behavior (as explicit and detailed as possible; note any observed changes in behavior);
- 14) Activity of vessel when sighting occurred.

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Attachment 3 to Conditions of Research Activities Plan Approval

Incident Report: Protected Species Injury or Mortality

Photographs/Video should be taken of all injured or dead animals.

Observer's full name: _____

Reporter's full name: _____

Species Identification: _____

Name and type of platform: _____

Date animal observed: _____ Time animal observed: _____

Date animal collected: _____ Time animal collected: _____

Environmental conditions at time of observation (i.e. tidal stage, Beaufort Sea State, weather):

Water temperature (°C) and depth (m/ft) at site: _____

Describe location of animal and events 24 hours leading up to, including and after, the incident (incl. vessel speeds, vessel activity and status of all sound source use): _____

Photograph/Video taken: YES / NO If Yes, was the data provided to NMFS? YES / NO
(Please label *species, date, geographic site* and *vessel name* when transmitting photo and/or video)

Date and Time reported to NMFS Stranding Hotline: _____

Sturgeon Information: *(please designate cm/m or inches and kg or lbs)*

Species: _____

Fork length (or total length): _____ Weight: _____

Condition of specimen/description of animal: _____

Fish Decomposed: NO SLIGHTLY MODERATELY SEVERELY
Fish tagged: YES / NO If Yes, please record all tag numbers.
Tag #(s): _____
Genetic samples collected: YES / NO
Genetics samples transmitted to: _____ on ____ / ____ /201....

Sea Turtle Species Information: (please designate cm/m or inches)

Species: _____ Weight (kg or lbs): _____
Sex: Male Female Unknown
How was sex determined?: _____
Straight carapace length: _____ Straight carapace width: _____
Curved carapace length: _____ Curved carapace width: _____
Plastron length: _____ Plastron width: _____
Tail length: _____ Head width: _____
Condition of specimen/description of animal: _____

Existing Flipper Tag Information

Left: _____ Right: _____
PIT Tag#: _____

Miscellaneous:

Genetic biopsy collected: YES NO Photographs taken: YES NO

Turtle Release Information:

Date: _____ Time: _____
Latitude: _____ Longitude: _____
State: _____ County: _____

Remarks: (note if turtle was involved with tar or oil, gear or debris entanglement, wounds, or mutilations, propeller damage, papillomas, old tag locations, etc.) _____

Marine Mammal information: *(please designate cm/m or ft/inches)*

Length of marine mammal (note direct or estimated): _____

Weight *(if possible, kg or lbs)*: _____

Sex of marine mammal (if possible): _____

How was sex determined?: _____

Confidence of Species Identification: SURE UNSURE BEST GUESS

Description of Identification characteristics of marine mammal: _____

Genetic samples collected: YES / NO

Genetic samples transmitted to: _____ on ____ / ____ /201....

Fate of marine mammal: _____

Description of Injuries Observed: _____

Other Remarks/Drawings: _____

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ADDENDUM “A”
Revised March 23, 2016

DESCRIPTION OF LEASED AREA AND LEASE ACTIVITIES

Lease Number OCS-A 0497

I. Lessor and Lessee Contact Information

Lessee Company Number: 15014

(a) Lessor’s Contact Information

	Lease Representative	Operations Representative
Title	Program Manager	Same as Lease Representative
Address	U.S. Department of the Interior Bureau of Ocean Energy Management 45600 Woodland Road (VAM-OREP) Sterling, VA 20166	
Phone	(703) 787-1300	
Fax	(703) 787-1708	
Email	renewableenergy@boem.gov	

(b) Lessee’s Contact Information

	Lease Representative	Operations Representative
Name	John Warren	Same as Lease Representative
Title	Director	
Address	Commonwealth of Virginia, Department of Mines, Minerals and Energy 1100 Bank Street, 8th Floor Richmond VA 23219	
Phone	(804) 692-3238	
Fax	(804) 692-3216	
Email	john.warren@dmme.virginia.gov	

II. Description of Leased Area

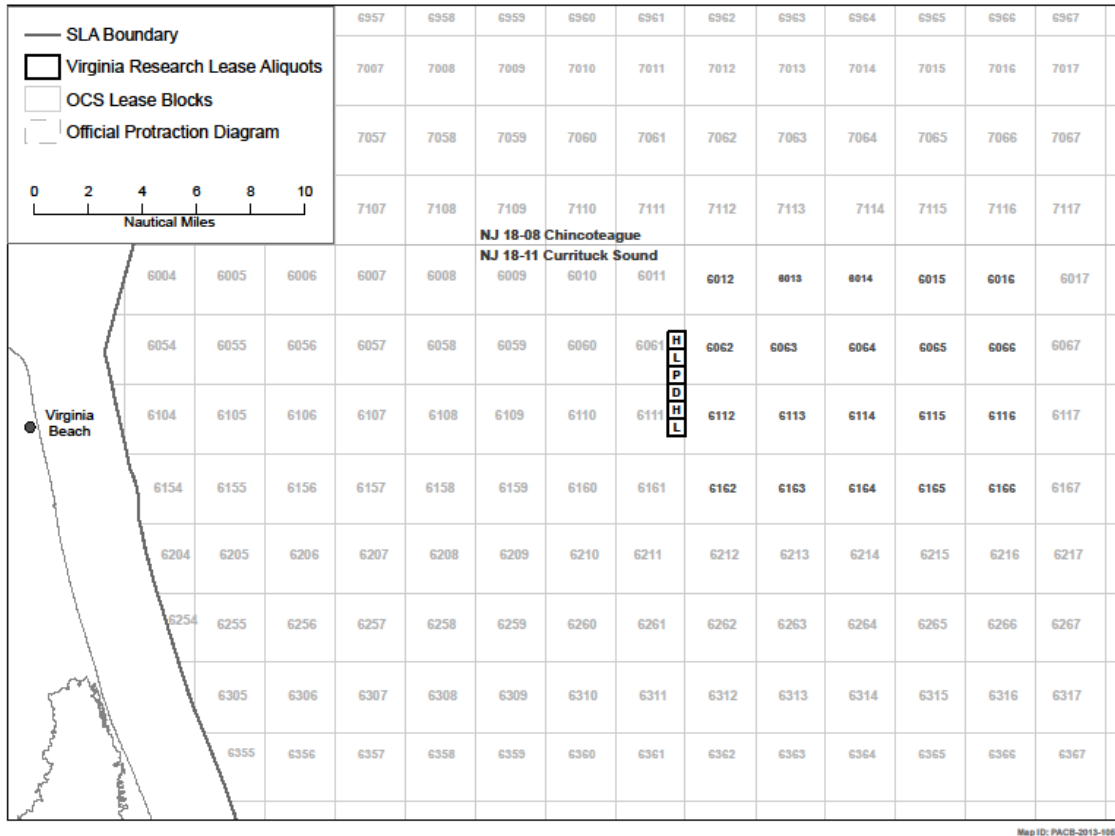
The leased area is defined as the Blocks described below and the project easement described in Addendum “D.” Any reference to “leased area” in Lease Number OCS-A 0497 should be interpreted to also include the project easement.

The leased area is subject to later adjustment, in accordance with applicable regulations (e.g., contraction, relinquishment).

The following Blocks or portions of Blocks lying within Official Protraction Diagram Currituck Sound NJ18-11, are depicted on the map below and comprise 2,135 acres, more or less.

- 1) Block 6061, SE1/4 of NE1/4; E1/2 of SE1/4
- 2) Block 6111, E1/2 of NE1/4; NE1/4 of SE1/4

For the purposes of these calculations, a full Block is 2,304 hectares. The acreage of a hectare is 2.471043930.



III. Renewable Energy Resource

Wind

IV. Description of the Project

A research project to generate energy using wind turbine generators and conduct any associated resource assessment activities, as well as install associated offshore substation platforms, inter-array cables, and subsea export cables, located on the OCS in the leased area east of Virginia Beach, Virginia.

V. Description of Project Easement

The project easement associated with this lease is described in Addendum “D.”

U.S. DEPARTMENT OF THE INTERIOR
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ADDENDUM “D”

PROJECT EASEMENT

Lease Number OCS-A 0497
Granted: March 23, 2016

This project easement is subject to all Terms and Conditions of Research Lease OCS-A 0497 executed March 23, 2015 as applicable; the Research Activities Plan (RAP); the Terms and Conditions of Research Activities Plan Approval issued March 23, 2016; and any subsequent revisions, amendments, or supplements to the same. The project easement consists of a 200-foot wide corridor within which the transmission cable for the project described in the RAP will be located. The corridor will be approximately 24 statute miles long.

The Blocks or portions of Blocks containing the 200-foot wide corridor are depicted on the map below. The project easement consists of an area 100 feet to either side of the centerline. The centerline of the ROW can be determined by interconnecting the points indicated by the centerline coordinates. Coordinates for the centerline follow an order from west to east (points 1-21) and are provided in X, Y (eastings, northings) UTM Zone 18N, NAD83 and geographic (longitude, latitude), NAD83. The project easement includes 578 acres more or less.

Point Number	UTM X (easting)	UTM Y (northing)	Longitude	Latitude
1	419429.54	4075220.79	-75.903387	36.819418
2	421812.97	4075195.70	-75.876663	36.819392
3	421823.09	4075195.25	-75.876550	36.819389
4	421833.15	4075194.12	-75.876437	36.819379
5	421843.12	4075192.32	-75.876325	36.819364
6	427806.01	4073901.68	-75.809351	36.808204
7	427813.68	4073900.23	-75.809265	36.808192
8	427821.40	4073899.18	-75.809178	36.808183
9	427829.17	4073898.53	-75.809091	36.808177
10	433131.55	4073595.02	-75.749625	36.805831
11	433141.57	4073594.78	-75.749513	36.805830
12	433151.58	4073595.21	-75.749401	36.805834
13	433161.54	4073596.31	-75.749289	36.805845
14	433171.40	4073598.07	-75.749179	36.805861
15	444823.82	4076082.07	-75.618738	36.829004
16	444833.36	4076084.43	-75.618631	36.829026
17	444842.73	4076087.42	-75.618526	36.829053
18	444851.89	4076091.01	-75.618424	36.829086
19	444860.79	4076095.19	-75.618324	36.829124
20	444869.39	4076099.95	-75.618228	36.829168
21	455600.00	4082501.38	-75.498275	36.887437

