

## Unsolicited Application for a Section 238 Research Lease by the Virginia Department of Mines, Minerals and Energy

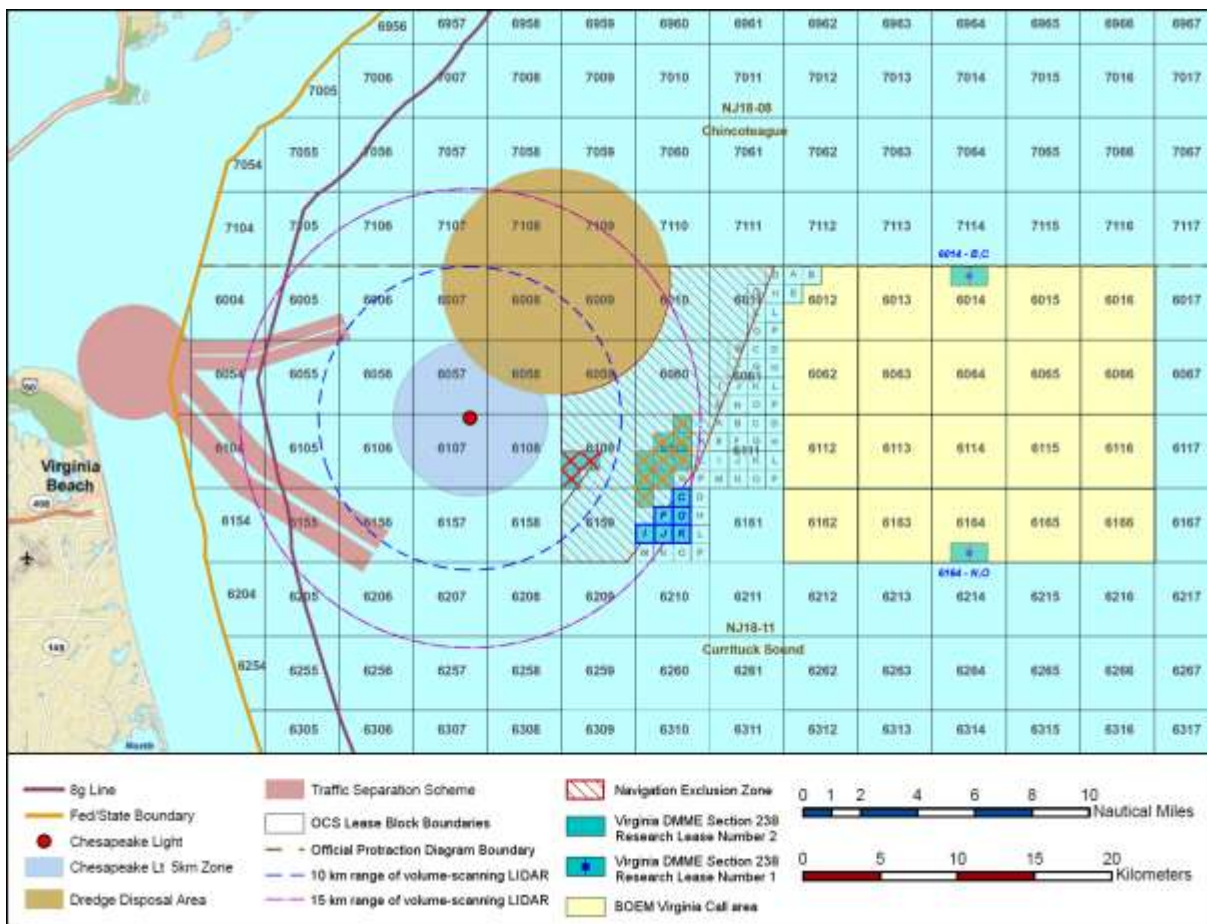
### *Research Lease Number 2 for Turbine Testing near the Virginia Call Area*

This is the second unsolicited lease application submitted by the Department of Mines, Minerals and Energy (DMME), a state government agency of the Commonwealth of Virginia, to the Bureau of Ocean Energy Management (BOEM) of the United States Department of Interior, for a research lease in Federal waters off Virginia, as allowed by 30 CFR, Part 285, Section 238. The information provided below conforms to the general requirements for unsolicited lease applications as specified by 30 CFR, Part 285, Section 230, with the exception that there is no acquisition fee for a *research* lease, as indicated by 30 CFR, Part 285, Section 238, paragraph (g).

This is the newer of two applications that supersede the DMME application of 06 September 2011, which has been divided into two applications. The first is for Research Lease Number 1, for two metocean platforms in the Virginia Call Area. The second (this application) is for Research Lease Number 2, primarily for turbine testing, but also for testing metocean and environmental monitoring equipment.

#### **(a) Area Requested for Lease**

The DMME is requesting a Section 238 research lease for six (6) sub-blocks mapped in Figure 1 and listed in Table 1. These six sub-blocks could be used for siting up to six test turbines.



**Figure 1.** Map showing six sub-blocks in this research lease application. Red and orange “X” symbols indicate Turbine Testing sub-blocks withdrawn from the DRAFT and REVISED applications, respectively.

**Table 1. List of Sub-Blocks Constituting Virginia’s Proposed Research Lease Number 2**

<b>Protraction Diagram Name</b>	<b>Protraction Diagram Number</b>	<b>Research Purpose</b>	<b>Block Number</b>	<b>Sub-Block Letter</b>
Currituck Sound	NJ18-11	Turbine Testing	6160	C, F, G, I, J, K

**(b) General Description of Objectives and Facilities**

This Section 238 research lease application proposes six sub-blocks to be leased for the siting of up to six demonstration turbines for testing advanced offshore wind technologies. In addition, this site may host one metocean and environmental monitoring platform for pre-and post-construction monitoring of wind velocities, water levels, waves, avian activities, and maritime vessel traffic in and around this lease.

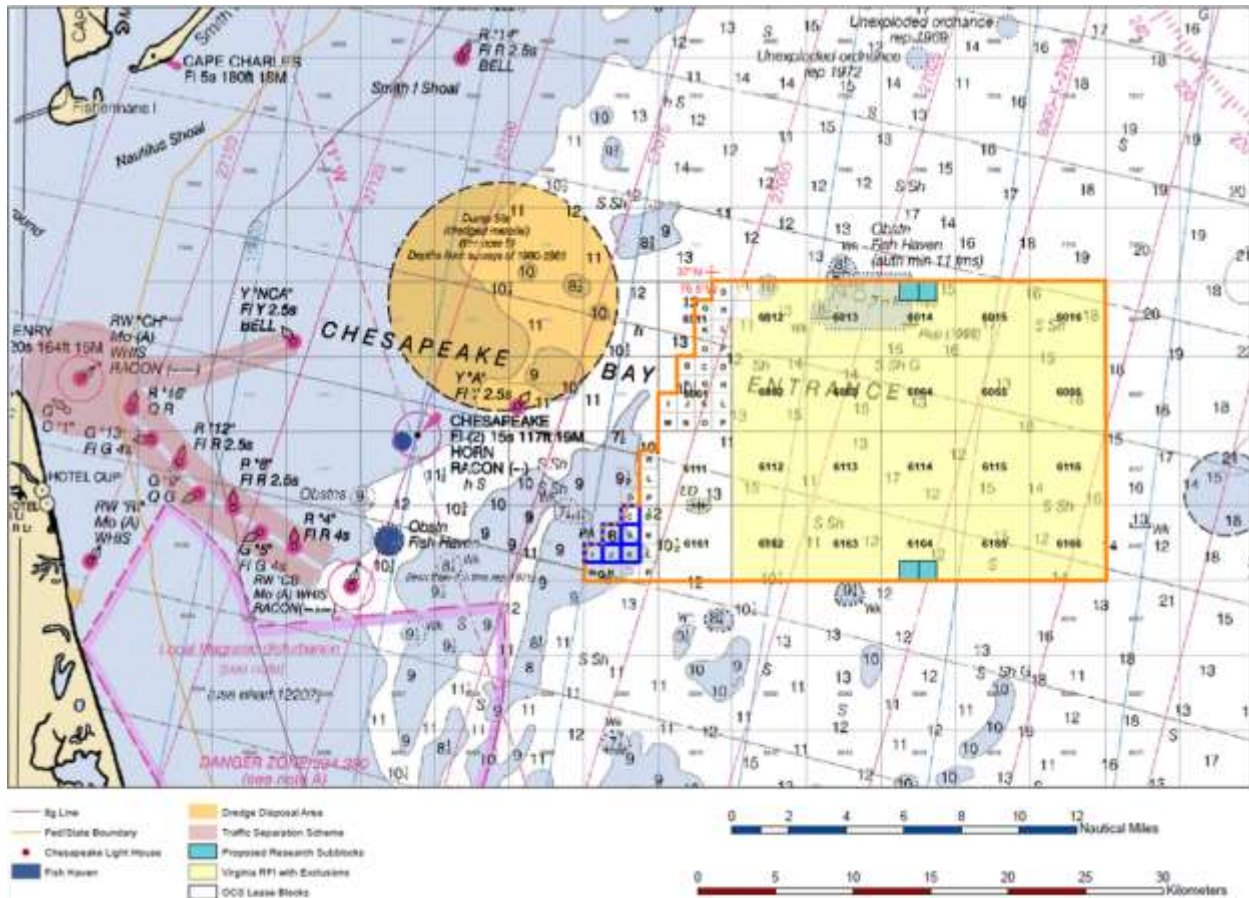
The metocean platform would be a prototype for two similar platforms to be sited on DMME Research Lease Number 1. Being identical in design and construction will enable economies of serial fabrication and offshore mobilization and demobilization for their installation. These two platforms would have identical equipment payloads, enabling quantity discounts in ordering of metocean and environmental monitoring equipment, and it’s important to test this equipment before placing quantity orders.

Data acquisition and analysis from this prototype platform will:

- (1) Measure wind direction at ten heights above sea level: 30 m, 45 m, 60 m, 75 m, 90 m, 105 m, 120 m, 135 m, 150 m, and 165 m, using a pulsed, vertical-profiling LIDAR (e.g. Leosphere WindCube or SgurrEnergy Galion), to characterize the wind shear across the span of a wind turbine rotor 120 m in diameter, located at a hub height of 90 to 105 m above sea level. A selected LIDAR unit would be tested against tall mast measurements by calibrated cup anemometers prior to installation on this platform.
- (2) Validate a volume-scanning LIDAR (e.g. the Lockheed-Martin WindTracer), which is anticipated to have a horizontal resolution of 100 m, a vertical resolution of 20 m, and a measurement range radius of 10 to 15 km. Validation data will be obtained by operating the volume-scanning LIDAR in “stare” mode and directing its focus onto a conventional anemometer mast on the Chesapeake Light Tower (as mapped in Figure 1).
- (3) Measure still-water levels (e.g. with waves removed) and waves at the turbine test site, using a water level and wave probe, such as a capacitance staff (e.g., RGR, Ltd. WG-50) or an ultrasonic rangefinder (e.g., General Acoustics e.K. LOG\_aLevel).
- (4) Monitor bird and bat activity across the Call area, using marine avian radar system operating in both the X-band and S-band, to provide data on the pre- and post-construction flight behavior of resident pelagic birds and migrating shore birds and passerines.
- (5) Monitor shipping vessel traffic density using an automatic identification system (AIS) tracker and data from the marine avian radar system, which will be ground-truthed by visual observers stationed on the Chesapeake Light Tower.

Additional equipment to be located near the prototype metocean platform include a directional wave measurement sensor, and an acoustic Doppler Current Profiler. Passive acoustic sensors also will be installed to monitor marine mammal activity and the level of background underwater infrasonic noise.

As shown in Figure 2, this research lease falls within the geographic scope of the BOEM Mid-Atlantic Final Environmental Assessment Alternative A for which BOEM had a Finding of No Significant Impact for lease issuance and site characterization activities,<sup>1</sup> which means that geotechnical borings can be undertaken as soon as the research lease is issued to DMME. This means that seabed conditions can be characterized this year, to support the design, fabrication, assembly, and installation of our intended prototype metocean platform in 2013.



**Figure 2.** Nautical chart with overlay of BOEM lease blocks and sub-blocks. DMME Section 238 Research Lease Number 2 (blue-bordered sub-blocks) falls within the geographic scope of Alternative A (orange border) for which the BOEM Mid-Atlantic Final Environmental Assessment (EA) has a Finding of No Significant Impact for site characterization, which means that met tower installation and geotechnical borings can be undertaken, as long as they conform to the technical scope of activities in the Final EA.

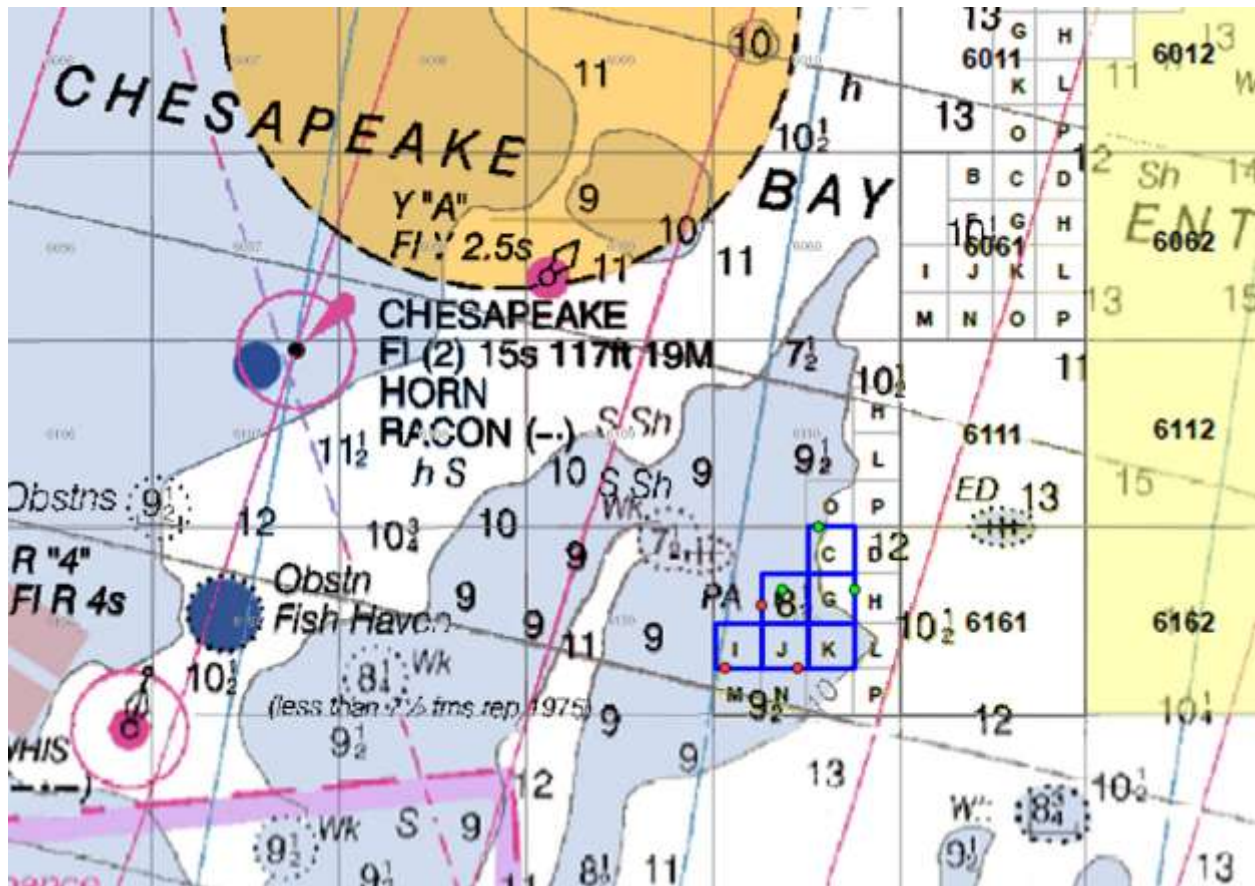
An important objective in siting test turbines within the requested sub-blocks is to minimize their potential hazard to maritime navigation. The eastern edge of this research lease is separated by a gap of 6 km (3.2 nautical miles) from the western border of the Virginia Wind Energy Area (WEA), to provide adequate sea room for barge traffic that uses deeper water to the east of the research lease as an inclement weather route. This site also is located well away from the natural deepwater navigation channel that trends southwest to northeast from the entrance to the Southern Approach of the Vessel Traffic Separation Scheme.

<sup>1</sup> Bureau of Ocean Energy Management, Office of Renewable Energy Programs. *Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New Jersey, Delaware, Maryland, and Virginia – Final Environmental Assessment*. BOEM 2012-003, January 2012.

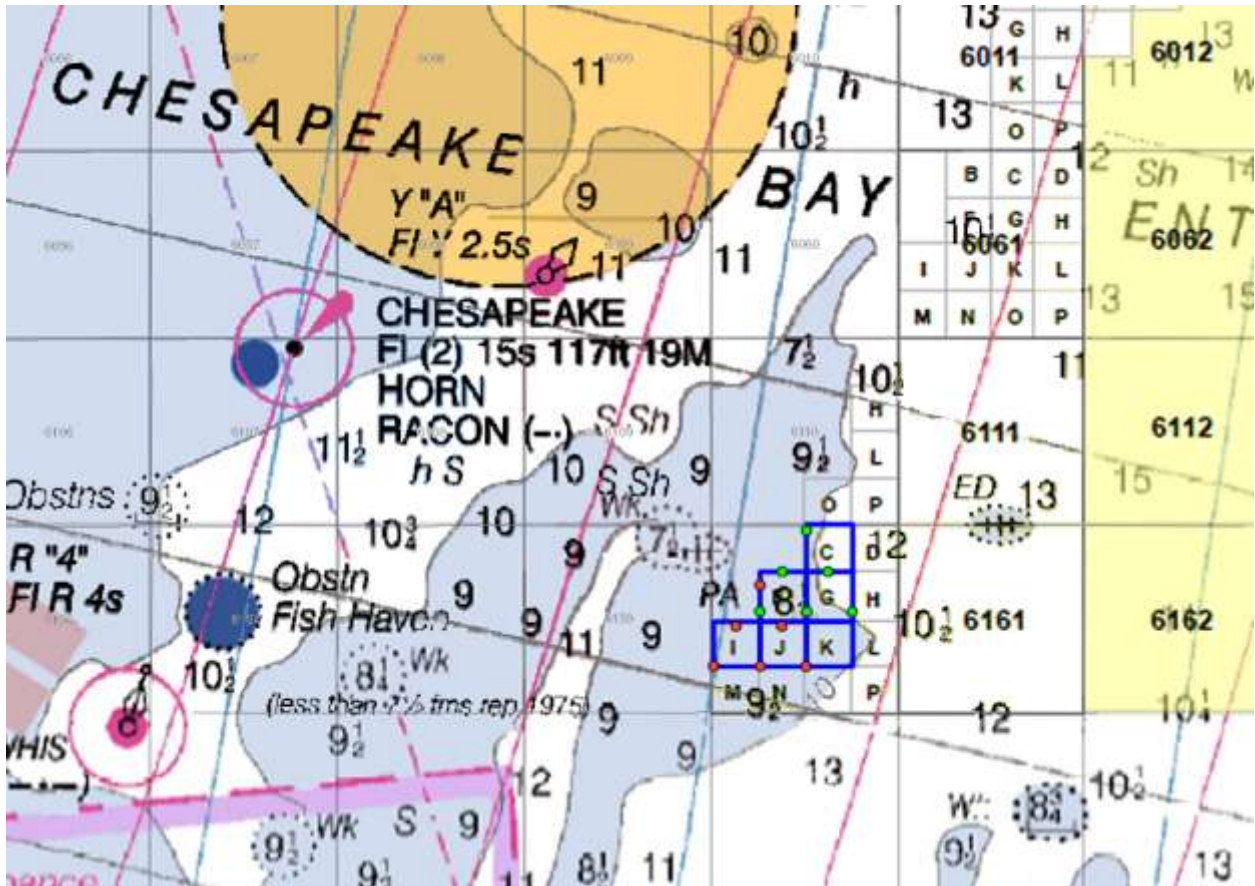


The Research Lease Number 2 site was identified by consensus after a series of meetings and conference calls among members of the BOEM Virginia Intergovernmental Task Force and maritime industry stakeholders in Hampton Roads that took place between November 2010 and March 2012, concurrent with the identification of the Virginia commercial offshore Wind Energy Area, for which BOEM issued a Call for Information and Nominations on 21 February 2012.

In order to convey the spatial scale of a demonstration project, Figures 3 and 4 illustrate the notional placement of three test turbines and six test turbines, respectively, showing how they can be moved around within the six lease blocks to further adjust their distance from important navigation routes. The three-turbine example illustrates a spacing of 1.8 km (0.97 nmi) between turbines, which corresponds to 12 rotor diameters for a 150-m diameter rotor. The six-turbine example illustrates a spacing of 1.2 km (0.65 nmi) between turbines, which corresponds to 8 rotor diameters.



**Figure 3.** Example of two alternative notional placements of three equally-spaced turbines on research lease, with a distance of 1.8 km (0.97 nmi) between turbines. The green circles show a 3-turbine array located as far to the north and east as possible within this six-block research lease; the red circles show a 3-turbine array located as far to the south and west as possible within this lease. Depth soundings are in fathoms, and blue shading indicates depths shallower than 10 fathoms (60 ft or 18.3 m).



**Figure 4.** Example of two alternative notional placements of six equally-spaced turbines on research lease, with a distance of 1.2 km (0.65 nmi) between turbines. The green circles show a 6-turbine array located as far to the north and east as possible within this six-block research lease; the red circles show a 6-turbine array located as far to the south and west as possible within this lease. Depth soundings are in fathoms, and blue shading indicates depths shallower than 10 fathoms (60 ft or 18.3 m).

### **(c) General Schedule of Proposed Activities**

A prototype metocean and environmental monitoring platform on Research Lease No. 2 will be used to test and validate the equipment that ultimately will be deployed on the two “production” platforms at midpoints of the north and south borders of the Virginia Call Area (i.e., the two pairs of sub-blocks that comprise Research Lease No. 1). For example, we would test the accuracy of a volume-scanning LIDAR for mapping the commercial Call Area, by first putting one within range of the existing anemometer on the Chesapeake Light Tower (CLT), in an oceanic environment. A coastal validation test would not be representative of that far offshore aerosol environment.

Those same two “production” platforms should have radar for monitoring baseline avian activity before commercial project construction can begin in the Virginia Call Area. There is a need to have trained avian observers on the CLT in order to correlate measured radar signatures on the prototype platform with the numbers and species of birds they observe from the CLT.

Likewise, the “production” platforms should have passive acoustic sensors for monitoring baseline marine mammal activity in the Virginia Call Area. And again the CLT would serve as a ground truth platform for trained marine mammal observers who can correlate measured sound signatures on the prototype platform with the numbers and species of whales or dolphins they observe from the CLT.

Therefore, Research Lease Number 2 is needed for short-term testing and validation of prototype metocean sensors and environmental monitoring equipment that will then be deployed long-term on “production” platforms located farther offshore on the sub-blocks of Research Lease Number 1. Before a prototype platform can be installed on Research Lease Number 2, geophysical surveys and geotechnical testing must be conducted.

During late summer 2012, it is anticipated that geophysical and geotechnical (G&G) characterization of Research Lease Number 2 can be conducted by “vessels of opportunity” that will be transiting from the Gulf of Mexico to commercial project site surveys off Delaware, New Jersey, or Massachusetts.

Once a G&G characterization is available, a prototype metocean and environmental monitoring platform could be installed on this research lease and begin collecting data by the summer of 2013, contingent upon BOEM acceptance of a General Activities Plan and assuming that the platform conforms to the scope of the final regional Mid-Atlantic Environmental Assessment, which covers the six sub-blocks in Research Lease Number 2. A one-year design & build timetable is based on the experience of the NaiKun offshore wind project in designing, permitting, and installing a somewhat similar metocean platform in six months, off the coast of British Columbia.

The prototype platform will need to be on Research Lease Number 2 for at least six months before there would be sufficient equipment testing and validation data to inform the design of a final metocean and environmental package for the two “production” platforms to be sited on Research Lease Number 1. We anticipate that these test and validation data also will help support the design and installation of one or more offshore wind turbines ... with the potential to eventually site six turbines ... as shown in Figures 3 and 4 of this application.

We anticipate that the schedule of activities to plan, design, construct, and operate test turbines on Research Lease Number 2 will be similar to the schedule of activities published by the U.S. Department of Energy (DOE) Funding Opportunity Announcement (FOA) for U.S. Offshore Wind Advanced Technology Demonstration Projects. DOE will announce awards by the end of September 2012.

If the Virginia team is successful, it would follow the schedule below, as outlined in the DOE FOA, leading to the construction and operation of two 6-MW offshore wind turbines by year-end 2017. If the Virginia team is not successful, DMME still believes this is a realistic schedule, but the activities will be contingent on identifying funding and industry partners to proceed with a turbine testing project.

**Phase I:** DOE anticipates notifying applicants selected for a Phase I award by 31 August and making awards by 30 September 2012, subject to the availability of appropriations. Phase I conceivably could start as early as 01-Oct-2012, but based on previous DOE award-to-contract timelines, 01-Jan-2013 is more realistic. DOE anticipates five projects will be selected for Phase I, which has a performance period of approximately one year. Phase I activities will be directed towards the following outcomes:

- A 50% front-end engineering design (FEED) up to and including preliminary vendor quotes
- Identification of preliminary installation methods and identification of operating and maintenance systems suited to the site
- Initiation of all permitting or approval studies and illustration of a clear and realistic path to regulatory compliance and project completion including support for NEPA review
- Initiation of all necessary grid interconnection requirements, as well as any needed power off-take agreements. These include any applicable FERC interconnection requirements as well as any utility-specific requirements
- Succeeding in the DOE down-select from five to three projects at the end of Phase I

**Phase II:** Up to three projects will be selected for Phase II, which also has a performance period of approximately one year. Phase II activities will be directed towards the following outcomes:

- A 100% front-end engineering design (FEED) up to and including full vendor quotes from all suppliers and independent verification of all capital, O&M and regulatory costs and proposed schedule from a DOE-approved and applicant-financed third party
- Selection of detailed installation methods and selection of operating and maintenance systems suited to the site
- Completion of Federal agency NEPA process(es) and approval of a Construction and Operations Plan (COP) or equivalent in State Waters
- Completion of all necessary grid interconnection requirements, as well as any needed power off-take agreements. These include any applicable FERC interconnection requirements as well as any utility-specific requirements
- A successful project review at the end of Phase II

**Phases III through V:** Includes fabrication, installation and commissioning stages of the project and validation of operating performance, reliability and O&M costs. At the end of Phase V, the project will be generating power and delivering it to an electric power grid. The Phase III – V performance period will not exceed three years, and the project will be fully operational by year-end 2017.

#### **(d) Renewable Energy Resource and Environmental Conditions in Area of Interest**

As mapped by the most recent numerical modeling of this area by the National Renewable Energy Laboratory, the mean wind speed in the six sub-blocks of this proposed Research Lease Number 2 ranges from 8.0 to 8.5 m/s at an elevation of 90 m. A metocean extreme event analysis is now underway, but pending those results, the event that has produced the highest measured wind speed at the Chesapeake Light Tower during the 28-year period since measurements began there in 1984 is Hurricane Gloria, which passed offshore Virginia Beach on 26 September 1985, having a peak 10-minute average wind speed of 37.1 m/s (83 mph or 72 knots) at an elevation of 43.3 m (142 ft) above sea level, and a peak significant wave height of 6.2 m (20 ft). In 2003, Hurricane Isabel had a slightly lesser peak wind speed of 33.0 m/s (74 mph or 64 knots), but a slightly higher significant wave height of 6.34 m (21 ft).

Benthic habitat types, fish communities and other marine living resources have been mapped by the Nature Conservancy (TNC), as has commercial fishing effort based National Marine Fisheries Service (NMFS) vessel trip report data. Our proposed Section 238 lease does not coincide with any priority benthic habitat areas identified by TNC. Further, the NMFS data do not indicate that there would be major fisheries conflicts in this area. More study and stakeholder engagement, which are additional site characterization activities envisioned under this lease application, are needed to characterize the ecological resources in the local area encompassed within the proposed research lease.

### **(e) Conformance with State and Local Energy Planning Initiatives**

A letter from the Governor of the Commonwealth of Virginia, Robert F. McDonnell, supporting the original 06 September 2011 unsolicited application for a DMME Research Lease is resubmitted with this application as Appendix A. The second paragraph of this letter is printed below, with italicized, bracketed comments indicating references to activities now delineated in separate revised DMME research lease applications:

Activities to take place in the research lease areas, such as installation of data towers, along the edges of Virginia's commercial lease area [*referring to Lease Number 1*], could substantially reduce uncertainties in energy production estimates through earlier and more accurate wind measurements, and environmental data gathering, enabling our offshore wind resources, and the jobs associated with the offshore wind industry, to develop more quickly. Wind turbine test pads exposed to oceanic winds and waves installed (*sic*) would be used to demonstrate advanced offshore wind technologies [*referring to Lease Number 2*] that can lower the costs and reduce the risks associated with wind generation development.

This application also conforms to local energy assurance initiatives by the City of Virginia Beach, where having a source of power to the east, unconstrained by west-to-east bottlenecks in the transmission grid provides a more secure energy supply. This same energy reliability benefit also applies to regional Navy facilities, including four within the City limits of Virginia Beach. Moreover, Navy shore installations have been charged with an order from the Secretary of the Navy to obtain 50% of their electric power from new renewable energy sources by 2020.

Finally, the 2010 legislative session of the Virginia General Assembly passed a joint resolution that supports a goal of the development of 3,000 megawatts of offshore wind power by 2025.<sup>2</sup>

### **(f) Documentation of Lessee Qualifications**

In response to states' comments on the draft rule, which qualified only the U.S. Department of Energy (DOE) to establish and manage renewable energy research areas on the Outer Continental Shelf, the then-named Minerals Management Service broadened this provision to apply to States and other Federal agencies in addition to DOE. Therefore, this application is being submitted by the Virginia Department of Mines, Minerals and Energy, as a state government agency of the Commonwealth of Virginia.

This section demonstrates that the Virginia DMME is legally eligible, and has the technical and financial capabilities to conduct the activities to be authorized by a Section 238 renewable energy research lease on the Outer Continental Shelf (OCS) according to the provisions of 30 CFR 285.106 and 285.107.

#### **Legal Eligibility**

The DMME is one of 13 executive agencies under the Office of the Virginia Secretary of Commerce and Trade, a Cabinet-level office that oversees the economic, community and workforce development of the Commonwealth. The DMME serves a large and varied group of people, organizations and agencies throughout the Commonwealth. Through its six divisions, the agency regulates the mineral industry, provides mineral research and offers advice on wise use of energy and mineral resources. Its programs directly serve the citizens who live near mining operations, mining labor groups, other regulatory agencies, the educational community, the energy and mineral industries, and environmental, consumer and industry special-interest groups. The Department's mission is to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner in order to support a more productive economy in Virginia.

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<sup>2</sup> <http://lis.virginia.gov/cgi-bin/legp604.exe?111+ful+HJ605ER>



The Commonwealth already has successfully demonstrated its legal eligibility to hold a lease as defined in 30 CFR 285.112 and further explained in 30 CFR 285.106 and 107. Submitted as Appendix B of this application is a letter dated 14 Feb 2011, which states that BOEM recognizes DMME as legally qualified to acquire and hold a renewable energy lease or grant on the OCS, and indicates that the DMME legal qualification documents are contained in a file identified as AEAU Company Number 15014.

### **Technical Capability**

The Virginia Offshore Wind Development Authority (VOWDA) and the DMME will be directly involved in management of activities to be undertaken on the proposed research lease. VOWDA was created as a body corporate and a political subdivision of the Commonwealth<sup>3</sup> for the purposes of facilitating, coordinating, and supporting the development, either by the Authority or by other qualified entities, of the offshore wind energy industry, offshore wind energy projects, and associated supply chain vendors by collecting relevant metocean and environmental data, by identifying existing state and regulatory or administrative barriers to the development of the offshore wind energy industry, by working in cooperation with relevant local, state, and Federal agencies to upgrade port and other logistical facilities and sites to accommodate the manufacturing and assembly of offshore wind energy project components and vessels, and by ensuring that the development of such projects is compatible with other ocean uses and avian and marine resources, including both the possible interference with and positive effects on naval facilities and operations, NASA-Wallops Flight Facility operations, shipping lanes, recreational and commercial fisheries, and avian and marine species and habitats.

The following key personnel would be directly involved on the Commonwealth of Virginia's technical management team for this project, including six VOWDA Board members, one DMME employee, and one VCERC researcher. Their names, titles, and descriptions of relevant experience are given below, and their resumes are included in Appendix C of this application.

#### ***Arthur W. Moye Jr.***

Executive Vice President, Virginia Maritime Association  
VOWDA Board Chair

Arthur W. Moye Jr is Executive Vice President of the Virginia Maritime Association, which, with its almost 500 members, serves as the "Voice of the Port." Mr. Moye also serves as the Executive Vice President of the Hampton Roads Shipping Association, whose purpose is to negotiate and maintain the collective bargaining agreement with the International Longshoremen's Association (ILA). Prior to his current position, he has served as an Officer and Director for both organizations during his 30 years in the maritime industry employed with one of the Port's stevedoring companies. Mr. Moye is well positioned to facilitate meetings with maritime interests during preparation of our General Activities Plan, which will help ensure that the detailed siting of our proposed test turbines do not create a hazard to navigation.

#### ***Joan Bondareff***

Of Counsel, Blank Rome LLP  
VOWDA Board Vice Chair

Joan M. Bondareff has more than 30 years of experience successfully managing programs and personnel, including eight years of Congressional legislative experience, with oversight of Coast Guard and transportation programs. She has served as Chief Counsel of a federal agency, Senior Counsel to a House Committee, and Environment and Energy Team Leader of a major Washington, DC consulting firm. Ms. Bondareff drafted legislation on several environmental and maritime subjects, including the Oil Pollution Act of 1990, Coastal Zone Management Act Reauthorization Amendments of 1990, the National Maritime Heritage Act, the Antarctic Conservation Act, and the Abandoned Shipwreck Act. She also obtained a \$6 million federal grant for a Mid-West regional port in 2010.

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<sup>3</sup> <http://lis.virginia.gov/cgi-bin/legp604.exe?000+cod+67-1201>

***Mary Doswell***

Senior Vice President, Alternative Energy Solutions Dominion Resources  
VOWDA Board member

Dominion is one of the nation's largest producers and transporters of energy, with a portfolio of approximately 28,200 megawatts of generation, 11,000 miles of natural gas transmission, gathering and storage pipeline and 6,300 miles of electric transmission lines. Dominion operates the nation's largest natural gas storage system with 947 billion cubic feet of storage capacity and serves retail energy customers in 15 states.

Dominion has considerable experience with design, construction, and operation of marine energy projects, including a marine liquefied natural gas (LNG) terminal in the Chesapeake Bay, several hydroelectric power stations, and a variety of underwater power cables for transmission and distribution over a wide range of voltages. A summary of Dominion's marine project experience is included in Appendix D of this application.

In November 2010, Dominion completed its Virginia Offshore Wind Integration Study for VOWDA, which evaluated grid impacts if offshore wind total nameplate capacities of 2,700 and 4,500 MW were connected to its Landstown 230 kV substation in south Virginia Beach. This preliminary study estimated that, absent transmission infrastructure upgrades, the addition of this new generation likely would result in thermal overloads during the "shoulder" seasons of spring and fall, when demand was at 80% of its summer peak and the offshore wind projects were generating at full capacity. The study estimated that these overloads could be avoided by investing between \$30 million (to interconnect 2,700 MW) and \$70 million (to interconnect 4,500 MW) in onshore 230 kV line upgrades.<sup>4</sup>

Dominion also has completed a Trunk Line Transmission Study, to evaluate options for an offshore, high-voltage trunk line that would support multiple offshore wind projects in the Virginia Wind Energy Area. The scope of this study included an evaluation of AC vs. HVDC configurations; offshore cable reliability, operation and maintenance issues; power flow and grid balancing considerations, and the approximate cost of building such a shared offshore transmission infrastructure.

***Lisa Johnson***

Senior Vice President and Chief Operating Officer at Old Dominion Electric Cooperative  
VOWDA Board member

ODEC is a generation-and-transmission cooperative that provides wholesale power to its 11 member electric distribution cooperatives serving consumer-members in Virginia, Maryland and Delaware. ODEC or one of its member Distribution Cooperatives on the Virginia Eastern Shore currently owns, operates and maintains electric supply infrastructure in a marine environment, specifically five underwater cables ranging in voltage from 15 kV to 69kV.

***Brian Redmond***

Principal, CP Energy Group LLC  
VOWDA Board member

During his career Mr. Redmond has negotiated, financed and successfully closed transactions with an aggregate value of over \$6 billion where he was responsible for securing debt and equity and for negotiating the underlying project agreements for both renewable and conventional energy assets. In addition, Mr. Redmond has extensive experience representing sponsors, equity investors, and lenders in the development, operation, acquisition and disposition of energy projects. He serves on the Board of Directors for Deepwater Wind Holdings, LLC, a leading company in the development of offshore wind projects, Noble Environmental Power, which owns over 750MW of operating wind projects, and Centragas Pipeline S.C.A., which owns a 300 mile gas pipeline in The Republic of Colombia.

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<sup>4</sup> [www.dmme.virginia.gov/DE/VOWDA/DominionOffShoreWindStudyReport.pdf](http://www.dmme.virginia.gov/DE/VOWDA/DominionOffShoreWindStudyReport.pdf)

***Ron Ritter***

Retired Senior Vice President of Earl Industries, LLC  
VOWDA Board member

In addition to repairing, maintaining, and modernizing structural, electrical, and mechanical systems on board U.S. Navy and commercial ships, Earl Industries' divisions and affiliated companies are leaders in electrical power generation and distribution systems. Specifically, Earl's wholly owned subsidiary, Earl Integrated Power and Controls, is an industry leader in electrical control panels, switchboards, power distribution, and full-scale automation systems. Also, Earl's affiliated company, Earl Energy, has designed and deployed power generation systems for the U.S. Defense Department that utilize alternative energy sources such as solar and wind energy, to supply electrical power to forward deployed troops.

***Cathie France***

DMME Deputy Director for Energy Policy  
Lead support staff for VOWDA Board

Ms. France managed the permitting process for the construction of a 24-inch steel natural gas pipeline that was built underneath the Hampton Roads Harbor. The project required permits from the Army Corps of Engineers, the Virginia Marine Resources Commission, easements through Baylor Grounds controlled by the Virginia General Assembly, and local land use permits from the onshore localities on either side of the waterways. As part of the permitting process, Ms. France managed stakeholder outreach and the accommodation of many of other interests in the harbor, including discussions with the Virginia Maritime Association, the Virginia Port Authority and the Virginia Pilots' Association.

Ms. France also is DMME's technical manager of two DMME-funded contracts for test planning and site pre-development activities on Virginia's advanced technology demonstration project sites in state waters. This ongoing experience well qualifies DMME for managing similar activities on our proposed research lease in Federal waters.

The first DMME-funded project, led by the Virginia Tech Advanced Research Institute (VT-ARI) has two tasks directly relevant to the design and installation of metocean measurement and environmental monitoring platforms on the Virginia Research Lease Number 1 proposed herein. The first of these has identified three new designs for rapidly relocatable meteorological mast substructures and foundations. The second relevant task has produced a series of Meteorological Tower Placement Reports for VOWDA, the first in December 2010<sup>5</sup> and an update in October 2011,<sup>6</sup> with a final anticipated in June 2011. These reports describe the types of metocean data needed to inform and accelerate commercial offshore wind project development in the Virginia Wind Energy Area, catalogue the various metocean data sources that are now available on Virginia's outer continental shelf, and provide an overview of the state-of-the-art in offshore wind resource assessment, including LIDAR measurement systems.

The second DMME-funded project, led by James Madison University (JMU), is scoped to characterize foundation conditions at the wind turbine test pad sites; to characterize the wind resource and metocean design environment at these sites, to engage regulatory stakeholders and perform due diligence on environmental and community acceptability, and to prepare the documentation that would be needed to proceed with permitting of the proposed test pad sites. On 22 Feb 2012, BOEM requested a status report on this second project, which DMME provided as a Technical Capability Addendum on 14 Mar 2012. This correspondence and Addendum are included as Appendix E to this application.

The JMU project includes three Virginia-based companies as subcontractors, all with considerable marine project experience: Fugro Atlantic, WeatherFlow, and Timmons Group. Fugro Atlantic is performing geological and geotechnical site characterization of possible turbine test pad sites in state waters, and has

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<sup>5</sup> [ww.dmme.virginia.gov/DE/VOWDA/MeteorologicalTowerPlacementReport.pdf](http://ww.dmme.virginia.gov/DE/VOWDA/MeteorologicalTowerPlacementReport.pdf)

<sup>6</sup> [www.dmme.virginia.gov/DE/VOWDA/MetTowerUpdateReport.pdf](http://www.dmme.virginia.gov/DE/VOWDA/MetTowerUpdateReport.pdf)

considerable experience in European offshore wind projects, as well as recently completing an analysis of offshore wind foundations and scour potential in a study funded by BOEM's Technology Assessment & Research Program ([www.BOEM.gov/tarprojects/656.htm](http://www.BOEM.gov/tarprojects/656.htm)). WeatherFlow is performing wind resource assessment of possible turbine test pad sites in state waters, as well as developing a numerical model that can be used for forecasting meteorological conditions at each of these sites, as well as in the Virginia Wind Energy Area, which can inform the planning the installation and servicing of test turbines on the proposed Virginia Research Lease Number 2. Timmons Group is convening regulatory stakeholder meetings and gathering all required documentation to support permit applications for possible turbine test pad sites in state waters, including required Federal permits such as those issued by the Corps of Engineers under Section 10 of the Rivers and Harbors Act (regulating installation of structures in navigable waterways) and Section 404 of the Clean Water Act (regulating dredge and fill activities, such as might occur in gravity base foundation preparation or anti-scour rubble deposition).

### ***George Hagerman***

Senior Research Associate, Virginia Tech Advanced Research Institute  
Director of Research, Virginia Coastal Energy Research Consortium (VCERC)  
BOEM Virginia Task Force member

George Hagerman has over 30 years experience researching renewable ocean energy systems, including offshore wind power, wave power, tidal current energy, and ocean thermal energy conversion. Hagerman currently is principal investigator for the DMME contract with the Virginia Tech Advanced Research Institute, which is described on the previous page. The DMME has a long history of collaborating and financially supporting wind energy research by Mr. Hagerman and others at Virginia universities.

As VCERC Director of Research, he coordinated the work at five universities to support a feasibility-level reference baseline design and cost estimate for a hypothetical offshore wind project off Virginia. He also was principal author of *Virginia Offshore Wind Studies, July 2007 to March 2010, Final Report*. His present focus areas are resource assessment, metocean extreme event analysis, site characterization, and energy cost modeling.

Mr. Hagerman has been invited to brief Federal and state regulatory agencies, and to testify before legislative committees of the U.S. Congress and the Virginia General Assembly. In 2009, the Minerals Management Service recognized his service with an Offshore Leadership Award.

### **Financial Capability**

***Financing plan for lease acquisition and initial site characterization activities:*** As stated in 30 CFR, Part 285, Section 238, paragraph (g), there is no acquisition cost for a research lease, but the lease holder does need to finance the cost of obtaining all required Federal authorizations, including BOEM approval of a General Activities Plan (GAP) and the cost of performing site characterization activities.

BOEM will require that the lease holder provide the results of a number of surveys with its GAP, including a shallow hazards survey (30 CFR 285.626 (a)(1)), a geological survey (30 CFR 285.616(a)(2)), a geotechnical survey (30 CFR 285.626(a)(4)), an archaeological resource survey (30 CFR 285.626(a)(5)), and biological surveys (30 CFR 285.626(a)(3)). BOEM will not consider approving a lease holder's GAP if the required survey information is not included. Therefore, we must budget for these surveys to be conducted between lease issuance and GAP submittal.

We anticipate a BOEM finding of no significant impact for metocean data platform construction and installation on sub-blocks 6014-B, 6014-C, 6164-N, and 6164-O of our proposed research lease, as these fall within the geographic scope of the BOEM Final Environmental Assessment for the Mid-Atlantic Wind Energy Areas, which indicates that the installation of such platforms is likely to be authorized by the U.S. Army Corps of Engineers under its Nationwide Permit 5 for scientific measurement devices.



Thus we anticipate no permitting costs for obtaining Corps of Engineers authority to construct and install metocean data platforms on DMME Research Lease Number 1.

Section 328 of the Clean Air Act Amendments of 1990 (CAAA 1990) directs the U.S. Environmental Protection Agency (EPA) to regulate Outer Continental Shelf (OCS) sources that may affect the air quality of any state. Under 40 CFR Part 55, such OCS sources would include meteorological platforms and any vessels used to construct, install, service, or decommission such platforms, and any vessels conducting seafloor boring or geotechnical testing. This applies to OCS air emissions sources located within 25 nautical miles (nm) of a state's seaward boundary. Virginia's state boundary is located 3 nm offshore, and so this EPA regulation would NOT apply to vessels located on the proposed sites for our metocean data platforms or to any diesel generators on the platforms themselves, as sub-blocks 6014-B, 6014-C, 6164-N, and 6164-O are located more than 28 nm offshore.

Section 328 of the CAAA 1990 also treats emissions from vessels that are servicing or associated with the operations of OCS facilities as direct emissions from the OCS source when those vessels are at the source or en route to or from the source while within 25 nm of the source. As noted above, this would not apply to vessels while working at the proposed met tower sites, but it would apply to a large portion of their routes to and from the sites. Therefore, we must budget for a Clean Air Act permit from EPA Region 3.

Acoustic emissions during geophysical surveys and any pile driving activities for the metocean data platforms will require Incidental Harassment Authorization (IHA) from the National Marine Fisheries Service under the Marine Mammals Protection Act as amended in 1994. Since that time, the IHA program has been increasingly used for short-term activities that might inadvertently harass marine mammals. This program allows authorizations to be issued in 120 days.

The total cost for the above-described surveys and two authorizations (Clean Air Act permit for vessel emissions and IHA for temporary noise effects on marine mammals) is estimated by industry sources familiar with BOEM's geological, geophysical, and archeological survey guidance to be \$5 million. DMME and VOWDA have access to several mechanisms for financing the cost of these initial activities and subsequent phases of research lease development.

***Financing mechanisms for initial site characterization and subsequent phases:*** DMME has the authority to make and enter into all contracts and agreements necessary or incidental to the performance of its duties and the execution of its powers, including, but not limited to, contracts with the private sector, the United States, other state agencies and governmental subdivisions of the Commonwealth. The department also is authorized, consistent with Federal funding rules, to distribute energy-related Federal funds as grants or as loans to other state or non-state agencies for use in financing energy-related projects.

To support late-phase development and wind energy supply chain growth, the Commonwealth of Virginia has created financial incentives for manufacturing companies that create new jobs and renewable sources of energy generation. The Clean Energy Manufacturers Incentive Grant, for instance, can provide grants up to \$36 million to manufacturers that invest at least \$50 million and create 200 jobs. Wind energy suppliers can qualify if they invest \$10 million and create 30 jobs.

VOWDA was created specifically to accelerate offshore wind development off of Virginia's coast and granted powers to provide and facilitate financing to support that mission. The Authority may establish public-private partnerships and share costs with developers for the following activities: the installation and operation of wind resource and other metocean equipment, including light detection and ranging equipment, meteorological measurement towers, data collection platforms, the collection of avian and marine environmental data, the upgrade of port facilities and other logistical equipment sites to accommodate the manufacturing and assembly of offshore wind energy project components and vessels that will support the construction and operations of offshore wind energy projects.

The Virginia Resources Authority (VRA) has the authority to lend to local governments and to state-created authorities, such as VOWDA. Since its inception, VRA has funded more than 875 projects across the Commonwealth exceeding \$4.2 billion of investment, an average of \$4.8 million per project. Financing solutions include revolving fund loans at below-market interest rates and bonds backed by the moral obligation of the Commonwealth.

The Virginia Public Building Authority (VPBA) also provides financing for State projects, facilities and obligations that have been approved by the Governor and General Assembly. The VPBA is a political subdivision of the Commonwealth, authorized to issue bonds under the Virginia Public Building Authority Act of 1981 (the "Act"). The Authority was created by the Act for the purpose of financing, refinancing, constructing, improving, furnishing, maintaining, acquiring and operating public buildings for the use of the Commonwealth; and financing or refinancing capital projects that benefit the Commonwealth and any of its agencies, instrumentalities and political subdivisions. VPBA financed about \$16 million in infrastructure improvements to the Virginia Commercial Space Flight Authority and Mid-Atlantic Regional Spaceport at Wallops Island.

***Impeccable credit:*** Virginia has held its AAA bond rating for 70 years, longer than any other state. A state's bond rating serves as a measure of a state's financial and administrative status. Virginia's AAA bond rating, the best rating possible, is a reflection of the confidence placed in the Commonwealth's fiscal health. Virginia has earned the highest possible rating with three organizations. The Commonwealth's credit worthiness is rated as AAA by Standard and Poor's, Aaa by Moody's Investors Service, and AAA by Fitch Ratings.

The Pew Center on the States awarded Virginia the top overall grade for government performance in 2005 (along with Utah) and again in 2008 (along with Utah and Washington) based on their assessment of how well the state managed its people, money, infrastructure, and information. Virginia has long been recognized as one of the best-managed states in the nation according to these and similar criteria.

There have been no significant, relevant and adverse legal or regulatory actions taken against DMME in the last five years.

DMME has not filed for bankruptcy or been a target in other adverse financial proceedings with the last five years.

**g) Regulation and Oversight of Activities**

As required by CFR 30, Part 285, Section 238, Paragraph (d), the BOEM Director and the Governor of Virginia, or their authorized representatives, will negotiate the terms and conditions of any renewable energy lease, right-of-use (RUE), or right-of-way (ROW) grant that may be issued in response to this unsolicited application.

The framework for such negotiations, and standard terms and conditions of such leases, RUEs, or ROW grants may be set forth in a memorandum of agreement (MOA) or other agreement between BOEM and the Commonwealth of Virginia. The MOA will include the agreement of Virginia to assure that all of the Commonwealth's contractors and subcontractors will comply with these regulations, other applicable Federal laws, and all terms and conditions of such leases or grants.

**CERTIFICATION**

THAT I, Conrad T. Spangler, III, am authorized to bind the Commonwealth of Virginia Department of Mines, Minerals and Energy (DMME) in any matter related to the acquisition and operation of leases, right-of-way grants, or right-of-use and easement grants for activities that produce or support production, transportation, or transmission of energy from sources other than oil and gas on the OCS, to agree upon the terms of and to execute and deliver any instrument or agreement, including any application, bid, lease, plan, rights-of-way grant, rights-of-use and easement grant, bond or other financial assurance instrument, assignment, designation of operator, relinquishment, amendment, abandonment, power of attorney (including the revocation thereof), and any other paper related to such a lease, right-of-way, right-of-use, and easement.

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[signature] Conrad T. Spangler, III, Director  
Commonwealth of Virginia Department of Mines, Minerals and Energy

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[date]