(Fe), lead (Pb), or tin (Sn), in small amounts (up to one percent by nominal weight). Phosphor copper is frequently produced to JIS H2501 and ASTM B–644, Alloy 3A standards or higher; however, merchandise covered by this investigation includes all phosphor copper, regardless of whether the merchandise meets, fails to meet, or exceeds these standards.

Merchandise covered by this investigation is currently classified in the Harmonized Tariff Schedule of the United States (HTSUS) under subheading 7405.00.1000. This HTSUS subheading is provided for convenience and customs purposes; the written description of the scope of this investigation is dispositive.

[FR Doc. 2016–07801 Filed 4–4–16; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE435

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Site Characterization Surveys Off the Coast of Massachusetts

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments.

SUMMARY: NMFS has received an application from DONG Energy Massachusetts (U.S.) LLC (DONG Energy) for an Incidental Harassment Authorization (IHA) to take marine mammals, by harassment, incidental to high-resolution geophysical (HRG) and geotechnical survey investigations associated with marine site characterization activities off the coast of Massachusetts in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS–A 0500) (the Lease Area). Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an IHA to DONG Energy to incidentally take, by Level B harassment only, small numbers of marine mammals during the specified activities.

DATES: Comments and information must be received no later than May 5, 2016.

ADDRESSES: Comments on DONG Energy's IHA application (the application) should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. The mailbox address for providing email comments is *itp.fiorentino@noaa.gov.* Comments sent via email, including all attachments, must not exceed a 25-megabyte file size. NMFS is not responsible for comments sent to addresses other than those provided here.

Instructions: All comments received are a part of the public record and will generally be posted to *http://www.nmfs.noaa.gov/pr/permits/incidental/* without change. All Personal Identifying Information (for example, name, address, etc.) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: John Fiorentino, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of the application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.nmfs.noaa.gov/pr/permits/incidental/.* In case of problems accessing these documents, please call the contact listed above.

National Environmental Policy Act (NEPA)

The Bureau of Ocean Energy Management (BOEM) prepared an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), to evaluate the issuance of wind energy leases covering the entirety of the Massachusetts Wind Energy Area (including the OCS–A 0500 Lease Area), and the approval of site assessment activities within those leases (BOEM, 2014). NMFS intends to adopt BOEM's EA, if adequate and appropriate. Currently, we believe that the adoption of BOEM's EA will allow NMFS to meet its responsibilities under NEPA for the issuance of an IHA to DONG Energy for HRG and geotechnical survey investigations in the Lease Area. If necessary, however, NMFS will supplement the existing analysis to ensure that we comply with NEPA prior to the issuance of the final IHA. Comments on this proposed IHA will be considered in the development of any additional NEPA analysis or documents (*i.e.,* NMFS' own EA) should they be deemed necessary. BOEM's EA is available on the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/energy_other.htm.*

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.''

Except with respect to certain activities not pertinent here, the MMPA defines ''harassment'' as: Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

On December 4, 2015, NMFS received an application from DONG Energy for the taking of marine mammals incidental to Spring 2016 geophysical survey investigations off the coast of Massachusetts in the OCS–A 0500 Lease Area, designated and offered by the U.S. Bureau of Ocean Energy Management (BOEM), to support the development of an offshore wind project. NMFS determined that the application was adequate and complete on January 27, 2016. On January 20, 2016, DONG Energy submitted a separate request for the taking of marine mammals incidental to proposed geotechnical

survey activities within the Lease Area scheduled for Fall 2016. On February 26, 2016, DONG Energy submitted a revision to the take request for the geotechnical activities and an addendum requesting that the two IHA requests be processed as a single application and IHA. NMFS determined that the combined application was adequate and complete on February 26, 2016.

The proposed geophysical survey activities would occur for 4 weeks beginning in early May 2016, and geotechnical survey activities would take place in September 2016 and last for approximately 6 days. The following specific aspects of the proposed activities are likely to result in the take of marine mammals: Shallow and medium-penetration sub-bottom profiler (chirper and sparker) and equipment positioning system (also referred to as acoustic positioning system, or pinger) use during the HRG survey, and dynamically positioned (DP) vessel thruster use in support of geotechnical survey activities. Take, by Level B Harassment only, of individuals of 9 species of marine mammals is anticipated to result from the specified activities.

Description of the Specified Activity

Overview

DONG Energy's proposed activities discussed here are based on its February 26, 2016, final IHA application. DONG Energy proposes to conduct a geophysical and geotechnical survey in the Lease Area to support the characterization of the existing seabed and subsurface geological conditions in the Lease Area. This information is necessary to support the siting and design of up to two floating light and detection ranging buoys (FLIDARs) and up to two metocean monitoring buoys, as well as to obtain a baseline assessment of seabed/sub-surface soil conditions in the DONG Energy Massachusetts Lease Area to support the siting of the proposed wind farm.

Dates and Duration

HRG surveys are anticipated to commence in early May 2016 and will last for approximately 30 days, including estimated weather down time. Geotechnical surveys requiring the use of the DP drill ship will take place in September 2016, at the earliest, and will last for approximately 6 days excluding weather downtime.

Specified Geographic Region

DONG Energy's survey activities will occur in the approximately 187,532-acre Lease Area designated and offered by the U.S. Bureau of Ocean Energy Management (BOEM), located approximately 14 miles (mi) south of Martha's Vineyard, Massachusetts, at its closest point (see Figure 1–1 of the IHA application). The Lease Area falls within the Massachusetts Wind Energy Area (MA WEA; Figure 1–1 of the IHA application). An evaluation of site assessment activities within the MA WEA was fully assessed in the BOEM Environmental Assessment (EA) and associated Finding of No Significant Impact (BOEM, 2014). A Biological Opinion on site assessment activities within the MA WEA was issued by NMFS' Greater Atlantic Regional Fisheries Office (formerly Northeast Regional Office) to BOEM in April 2013.

Detailed Description of Activities

High-Resolution Geophysical Survey Activities

Marine site characterization surveys will include the following HRG survey activities:

- Depth sounding (multibeam depth sounder) to determine water depths and general bottom topography;
- Magnetic intensity measurements for detecting local variations in regional magnetic field from geological strata and potential ferrous objects on and below the bottom;
- Seafloor imaging (sidescan sonar survey) for seabed sediment classification purposes, to identify natural and man-made acoustic targets resting on the bottom as well as any anomalous features;
- Subsea equipment positioning using ultra-short baseline (USBL) acoustic positioning systems (pingers);
- Shallow penetration sub-bottom profiler (chirper) to map the near surface stratigraphy (top 0–5 meter [m] soils below seabed); and
- Medium penetration sub-bottom profiler (sparker) to map deeper subsurface stratigraphy as needed (soils down to 75–100 m below seabed).

The HRG surveys are scheduled to begin, at the earliest, on May 1, 2016. Table 1 identifies the representative survey equipment that is being considered in support of the HRG survey activities. The make and model of the listed HRG equipment will vary depending on availability, but will be finalized as part of the survey preparations and contract negotiations with the survey contractor, and therefore the final selection of the survey equipment will be confirmed prior to the start of the HRG survey program. Only the make and model of the HRG equipment may change, not the types of equipment or the addition of equipment with characteristics that might have effects beyond (*i.e.,* resulting in larger ensonified areas) those considered in this proposed IHA. None of the proposed HRG survey activities will result in the disturbance of bottom habitat in the Lease Area.

TABLE 1—SUMMARY OF REPRESENTATIVE DONG ENERGY HRG SURVEY EQUIPMENT

HRG equipment	Operating frequencies	Source level	Source depth	Beamwidth (degree)	Pulse duration (millisec)
iXBlue GAPS equipment positioning system (pinger).	22–30 kHz	192 dB_{RMS}	2–5 m below surface.	180	1
Sonardyne Scout USBL equipment positioning system (pinger).	35–50 kHz	187 dB_{RMS}	2–5 m below surface.	180	1
Edgtech 4125 Sidescan Sonar [1]	400/900/1600 kHz	205 dB_{RMS}	1–2 m below surface.	50	0.6 to 4.9
Klein 3000H Sidescan Sonar [1]	445/900 kHz	242 dB_{RMS}	3–8 m above seafloor.	.2	0.0025 to 0.4
GeoPulse Sub-bottom Profiler (chirper)	1.5 to 18 kHz	208 dB_{RMS}	3–8 m above seafloor.	55	0.1 to 1
Geo-Source 200/800 (sparker)	50 to 5000 Hz	221 dB_{RMS}/217 dB_{RMS}.	1–2 m below surface.	110	1 to 2
SeaBat 7125 Multibeam Sonar [2]	400 kHz	220 dB_{peak}	1–3 m below surface.	2	0.03 to .3

TABLE 1—SUMMARY OF REPRESENTATIVE DONG ENERGY HRG SURVEY EQUIPMENT—Continued

HRG equipment	Operating frequencies	Source level	Source depth	Beamwidth (degree)	Pulse duration (millisec)
EM 2040 Multibeam Sonar [2]	400 kHz	207 dB_{RMS}	1–3 m below surface.	1.5	0.05 to 0.6

[1] It should be noted that only one of the representative sidescan sonars would be selected for deployment.
[2] It should be noted that only one of the representative multibeam sonars would be selected for deployment.

The HRG survey activities will be supported by a vessel approximately 98 to 180 feet (ft) in length and capable of maintaining course and a survey speed of approximately 4 knots while transiting survey lines. HRG survey activities across the Lease Area will generally be conducted at 900-meter (m) line spacing (total survey line approximately 1,800 km). Up to two FLIDARs would be deployed within the Lease Area, and up to three potential locations for FLIDAR deployment will be investigated. At the three potential FLIDAR deployment locations the survey will be conducted along a tighter 30-m line (total survey line approximately 2 km) spacing to meet the BOEM requirements as set out in the July 2015 Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant and Archeological and Historic Property Information to 30 CFR part 585.

Given the size of the Lease Area (187,532 acres), to minimize cost, the duration of survey activities, and the period of potential impact on marine species, DONG Energy has proposed conducting survey operations 24 hours per day. Based on 24-hour operations, the estimated duration of the survey activities would be approximately 30 days (including estimated weather down time).

Both NMFS and BOEM have advised that the deployment of HRG survey equipment, including the use of intermittent, impulsive sound-producing equipment operating below 200 kilohertz (kHz) (*e.g.,* sub-bottom profilers), has the potential to cause acoustic harassment to marine mammals. Based on the frequency ranges of the equipment to be used in support of the HRG survey activities (Table 1) and the hearing ranges of the marine mammals that have the potential to occur in the Lease Area during survey activities (Table 2), only the equipment positioning systems (iXBlue GAPS and Sonardyne Scout USBL) and the sub-bottom profilers (GeoPulse Sub-bottom Profiler and Geo-Source 200 and 800) fall within the established marine mammal hearing ranges and have the potential to result in Level B harassment of marine mammals.

The equipment positioning systems use vessel-based underwater acoustic positioning to track equipment (in this case, the sub-bottom profiler) in very shallow to very deep water. Using pulsed acoustic signals, the systems calculate the position of a subsea target by measuring the range (distance) and bearing from a vessel-mounted transceiver to a small acoustic transponder (the acoustic beacon, or pinger) fitted to the target. Equipment positioning systems (either the iXBlue GAPS or Sonardyne Scout) will be operational at all times during HRG survey data acquisition (i.e, concurrent with the sub-bottom profiler operation). Sub-bottom profiling systems identify and measure various marine sediment layers that exist below the sediment/water interface. A sound source emits an acoustic signal vertically downwards into the water and a receiver monitors the return signal that has been reflected off the sea floor. Some of the acoustic signal will penetrate the seabed and be reflected when it encounters a boundary between two layers that have different acoustic impedance. The system uses this reflected energy to provide information on sediment layers beneath the sediment-water interface. A GeoPulse, or similar model, shallow penetration sub-bottom profiler will be used to map the near surface stratigraphy of the Lease Area. The shallow penetration sub-bottom profiler is a precisely controlled hull/pole mounted ''chirp'' system that emits high-energy sounds with a pulse duration of 0.1 to 1 millisecond (ms) at operating frequencies of 1.5 to 18 kHz and is used to penetrate and profile the shallow (top 0–5 m soils below seabed) sediments of the seafloor. A Geo-Source 200/800, or similar model, medium-penetration sub-bottom profiler (sparker) will be used to map deeper subsurface stratigraphy in the Lease Area as needed (soils down to 75–100 m below seabed). The sparker is towed from a boom arm off the side of the survey vessel and emits a downward pulse with a duration of 1 to 2 ms at an operating frequency of 50 to 5000 Hz.

Geotechnical Survey Activities

Marine site characterization surveys will involve the following geotechnical survey activities:

- Sample boreholes to determine geological and geotechnical characteristics of sediments;
- Deep cone penetration tests (CPTs) to determine stratigraphy and in-situ conditions of the deep surface sediments;
- Shallow CPTs to determine stratigraphy and in-situ conditions of the near surface sediments; and
- Vibracoring to determine geological and geotechnical characteristics of the near surface sediments.

It is anticipated that the geotechnical surveys will take place no sooner than September 2016. The geotechnical survey program will consist of up to 4 deep sample bore holes and adjacent 4 deep CPTs both to a depth of approximately 131 ft to 164 ft (40 m to 50 m) below the seabed, as well as 15 shallow CPTs, and 15 adjacent vibracores, both up to 20 ft (6 m) below seabed.

The investigation activities are anticipated to be conducted from a 250-ft to 350-ft (76 m to 107 m) dynamically positioned (DP) drill ship. DP vessel thruster systems maintain their precise coordinates in waters through the use of automatic controls. These control systems use variable levels of power to counter forces from current and wind. Operations will take place over a 24-hour period to ensure cost, the duration of survey activities, and the period of potential impact on marine species are minimized. Based on 24-hour operations, the estimated duration of the geotechnical survey activities would be approximately 6 days excluding weather downtime. Estimated weather downtime is approximately 4 to 5 days.

Field studies conducted off the coast of Virginia (Tetra Tech, 2014; Kalapinski and Varnik, 2015) to determine the underwater noise produced by borehole drilling and CPTs confirm that these activities do not result in underwater noise levels that harmful or harassing to marine mammals (*i.e.,* do not exceed NMFS' current Level A and Level B harassment thresholds for marine mammals).

However, underwater continuous noise produced by the thrusters associated with the DP drill ship that will be used to support the geotechnical activities has the potential to result in Level B harassment of marine mammals.

Description of Marine Mammals in the Area of the Specified Activity

There are 38 species of marine mammals that potentially occur in the Northwest Atlantic Outer Continental Shelf (OCS) region (BOEM, 2014) (Table 2). The majority of these species are pelagic and/or northern species, or are so rarely sighted that their presence in the Lease Area is unlikely. Six marine mammal species are listed under the Endangered Species Act (ESA) and are known to be present, at least seasonally, in the waters of Southern New England: blue whale, fin whale, humpback whale, right whale, sei whale, and sperm whale. These species are highly migratory and do not spend extended periods of time in a localized area; the waters of Southern New England (including the Lease Area) are primarily used as a stopover point for these species during seasonal movements north or south between important feeding and breeding grounds. While the fin, humpback, and right whales have the potential to occur within the Lease Area, the sperm, blue, and sei whales are more pelagic and/or northern species, and though their presence within the Lease Area is possible, they are considered less common with regards to sightings. In particular, while sperm whales are known to occur occasionally in the region, their sightings are considered rare and thus their presence in the Lease Area at the time of the proposed activities is considered unlikely. Because the potential for sperm whale, blue whale, and sei whale to occur within the Lease Area during the marine survey period is unlikely, these species will not be described further in this analysis.

The following species are both common in the waters of the OCS south of Massachusetts and have the highest likelihood of occurring, at least seasonally, in the Lease Area: North Atlantic right whale (*Eubalaena glacialis*), humpback whale (*Megaptera novaeangliae*), fin whale (*Balaenoptera physalus*), minke whale (*Balaenoptera acutorostrata*), harbor porpoise (*Phocoena phocoena*), Atlantic white-sided dolphin (*Lagenorhynchus acutus*), short-beaked common dolphin (*Delphinus delphis*), harbor seal (*Phoca vitulina*), and gray seal (*Halichorus grypus*) (Right Whale Consortium, 2014).

Further information on the biology, ecology, abundance, and distribution of those species likely to occur in the Lease Area can be found in section 4 of the application, and the NMFS Marine Mammal Stock Assessment Reports (see Waring *et al.,* 2015), which are available online at: *http://www.nmfs.noaa.gov/pr/species/.*

TABLE 2—MARINE MAMMALS KNOWN TO OCCUR IN THE WATERS OF SOUTHERN NEW ENGLAND

Common name	Scientific name	NMFS status	Stock abundance	Stock
Toothed Whales (Odontoceti)				
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	N/A	48,819	W. North Atlantic.
Atlantic spotted dolphin	*Stenella frontalis*	N/A	44,715	W. North Atlantic.
Bottlenose dolphin	*Tursiops truncatus*	Northern coastal stock is Strategic [a].	11,548	W. North Atlantic, Northern Migratory Coastal.
Clymene Dolphin	*Stenella clymene*	N/A	Unknown	W. North Atlantic.
Fraser's Dolphin	*Lagenodelphis hosei*	N/A	Unknown	W. North Atlantic.
Pan-Tropical Spotted Dolphin	*Stenella attenuata*	N/A	3,333	W. North Atlantic.
Risso's dolphin	*Grampus griseus*	N/A	18,250	W. North Atlantic.
Rough-Toothed Dolphin	*Steno bredanensis*	N/A	271	W. North Atlantic.
Short-beaked common dolphin	*Delphinus delphis*	N/A	120,743	W. North Atlantic.
Striped dolphin	*Stenella coeruleoalba*	N/A	46,882	W. North Atlantic.
Spinner Dolphin	*Stenella longirostris*	N/A	Unknown	W. North Atlantic.
White-beaked dolphin	*Lagenorhynchus albirostris*	N/A	2,003	W. North Atlantic.
Harbor porpoise	*Phocoena phocoena*	N/A	79,833	Gulf of Maine/Bay of Fundy.
Killer whale	*Orcinus orca*	N/A	Unknown	W. North Atlantic.
Pygmy Killer Whale	*Feresa attenuata*	N/A	3,785	W. North Atlantic.
False killer whale	*Pseudorca crassidens*	Strategic	442	W. North Atlantic.
Long-finned pilot whale	*Globicephala melas*	N/A	26,535	W. North Atlantic.
Short-finned pilot whale	*Globicephala macrorhynchus*	N/A	21,515	W. North Atlantic.
Sperm whale	*Physeter macrocephalus*	Endangered	2,288	North Atlantic.
Pigmy sperm whale	*Kogia breviceps*	N/A	3,785 [b]	W. North Atlantic.
Dwarf sperm whale	*Kogia sima*	N/A	3,785 [b]	W. North Atlantic.
Cuvier's beaked whale	*Ziphius cavirostris*	N/A	6,532	W. North Atlantic.
Blainville's beaked whale	*Mesoplodon densirostris*	N/A	7,092 [c]	W. North Atlantic.
Gervais' beaked whale	*Mesoplodon europaeus*	N/A	7,092 [c]	W. North Atlantic.
True's beaked whale	*Mesoplodon mirus*	N/A	7,092 [c]	W. North Atlantic.
Sowerby's Beaked Whale	*Mesoplodon bidens*	N/A	7,092 [c]	W. North Atlantic.
Northern bottlenose whale	*Hyperoodon ampullatus*	N/A	Unknown	W. North Atlantic.
Melon-headed whale	*Peponocephala electra*	N/A	Unknown	W. North Atlantic.
Baleen Whales (Mysticeti)				
Minke whale	*Balaenoptera acutorostrata*	N/A	20,741	Canadian East Coast.
Blue whale	*Balaenoptera musculus*	Endangered	Unknown	W. North Atlantic.
Fin whale	*Balaenoptera physalus*	Endangered	1,618	W. North Atlantic.
Humpback whale	*Megaptera novaeangliae*	Endangered	823	Gulf of Maine.
North Atlantic right whale	*Eubalaena glacialis*	Endangered	465	W. North Atlantic.

TABLE 2—MARINE MAMMALS KNOWN TO OCCUR IN THE WATERS OF SOUTHERN NEW ENGLAND—Continued

Common name	Scientific name	NMFS status	Stock abundance	Stock
Sei whale	*Balaenoptera borealis*	Endangered	357	Nova Scotia.
Earless Seals (Phocidae)				
Gray seals	*Halichoerus grypus*	N/A	348,900	North Atlantic.
Harbor seals	*Phoca vitulina*	N/A	75,834	W. North Atlantic.
Hooded seals	*Cystophora cristata*	N/A	Unknown	W. North Atlantic.
Harp seal	*Phoca groenlandica*	N/A	Unknown	North Atlantic.

[a] A strategic stock is defined as any marine mammal stock: (1) For which the level of direct human-caused mortality exceeds the potential biological removal level; (2) which is declining and likely to be listed as threatened under the ESA; or (3) which is listed as threatened or endangered under the ESA or as depleted under the MMPA.

[b] This estimate may include both the dwarf and pygmy sperm whales.

[c] This estimate includes Gervais' and Blainville's beaked whales and undifferentiated *Mesoplodon* spp. beaked whales.

Sources: Waring *et al.,* 2015; Waring *et al.,* 2013; Waring *et al.,* 2011; Waring *et al.,* 2010; RI SAMP, 2011; Kenney and Vigness-Raposa, 2009; NMFS, 2012.

Potential Effects of the Specified Activity on Marine Mammals and Their Habitat

This section includes a summary and discussion of the ways that the types of stressors associated with the specified activity have been observed to impact marine mammals. This discussion may also include reactions that we consider to rise to the level of a take and those that we do not consider to rise to the level of a take (for example, with acoustics, we may include a discussion of studies that showed animals not reacting at all to sound or exhibiting barely measurable avoidance). This section is intended as a background of potential effects and does not consider either the specific manner in which this activity will be carried out or the mitigation that will be implemented, and how either of those will shape the anticipated impacts from this specific activity. The ''Estimated Take by Incidental Harassment'' section later in this document will include a quantitative analysis of the number of individuals that are expected to be taken by this activity. The ''Negligible Impact Analysis'' section will include the analysis of how this specific activity will impact marine mammals and will consider the content of this ''Potential Effects of the Specified Activity on Marine Mammals'' section, the ''Estimated Take by Incidental Harassment'' section, the ''Proposed Mitigation'' section, and the ''Anticipated Effects on Marine Mammal Habitat'' section to draw conclusions regarding the likely impacts of this activity on the reproductive success or survivorship of individuals, and from that on the affected marine mammal populations or stocks.

Background on Sound

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and is generally characterized by several variables. Frequency describes the sound's pitch and is measured in hertz (Hz) or kilohertz (kHz), while sound level describes the sound's intensity and is measured in decibels (dB). Sound level increases or decreases exponentially with each dB of change. The logarithmic nature of the scale means that each 10-dB increase is a 10-fold increase in acoustic power (and a 20-dB increase is then a 100-fold increase in power). A 10-fold increase in acoustic power does not mean that the sound is perceived as being 10 times louder, however. Sound levels are compared to a reference sound pressure (micro-Pascal) to identify the medium. For air and water, these reference pressures are ''re: 20 μPa'' and ''re: 1 μPa,'' respectively. Root mean square (RMS) is the quadratic mean sound pressure over the duration of an impulse. RMS is calculated by squaring all of the sound amplitudes, averaging the squares, and then taking the square root of the average (Urick, 1975). RMS accounts for both positive and negative values; squaring the pressures makes all values positive so that they may be accounted for in the summation of pressure levels. This measurement is often used in the context of discussing behavioral effects, in part because behavioral effects, which often result from auditory cues, may be better expressed through averaged units rather than by peak pressures.

Acoustic Impacts

HRG survey equipment use and use of the DP thruster during the geophysical and geotechnical surveys may temporarily impact marine mammals in the area due to elevated in-water sound levels. Marine mammals are continually exposed to many sources of sound. Naturally occurring sounds such as lightning, rain, sub-sea earthquakes, and biological sounds (*e.g.,* snapping shrimp, whale songs) are widespread throughout the world's oceans. Marine mammals produce sounds in various contexts and use sound for various biological functions including, but not limited to: (1) Social interactions; (2) foraging; (3) orientation; and (4) predator detection. Interference with producing or receiving these sounds may result in adverse impacts. Audible distance, or received levels of sound depend on the nature of the sound source, ambient noise conditions, and the sensitivity of the receptor to the sound (Richardson *et al.,* 1995). Type and significance of marine mammal reactions to sound are likely dependent on a variety of factors including, but not limited to, (1) the behavioral state of the animal (*e.g.,* feeding, traveling, etc.); (2) frequency of the sound; (3) distance between the animal and the source; and (4) the level of the sound relative to ambient conditions (Southall *et al.,* 2007).

When considering the influence of various kinds of sound on the marine environment, it is necessary to understand that different kinds of marine life are sensitive to different frequencies of sound. Current data indicate that not all marine mammal species have equal hearing capabilities (Richardson *et al.,* 1995; Southall *et al.,* 1997; Wartzok and Ketten, 1999; Au and Hastings, 2008).

Southall *et al.* (2007) designated ''functional hearing groups'' for marine mammals based on available behavioral data; audiograms derived from auditory evoked potentials; anatomical modeling; and other data. Southall *et al.* (2007) also estimated the lower and upper frequencies of functional hearing for each group. However, animals are less sensitive to sounds at the outer edges of their functional hearing range and are

more sensitive to a range of frequencies within the middle of their functional hearing range. Note that direct measurements of hearing sensitivity do not exist for all species of marine mammals, including low-frequency cetaceans. The functional hearing groups and the associated frequencies developed by Southall *et al.* (2007) were revised by Finneran and Jenkins (2012) and have been further modified by NOAA. Table 3 provides a summary of sound production and general hearing capabilities for marine mammal species (note that values in this table are not meant to reflect absolute possible maximum ranges, rather they represent the best known ranges of each functional hearing group). For purposes of the analysis in this document, marine mammals are arranged into the following functional hearing groups based on their generalized hearing sensitivities: high-frequency cetaceans, mid-frequency cetaceans, low-frequency cetaceans (mysticetes), phocids (true seals), and otariids (sea lion and fur seals). A detailed discussion of the functional hearing groups can be found in Southall *et al.* (2007) and Finneran and Jenkins (2012).

TABLE 3—MARINE MAMMAL FUNCTIONAL HEARING GROUPS

Functional hearing group	Functional hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 25 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, *Kogia,* river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*).	200 Hz to 180 kHz.
Phocid pinnipeds (underwater) (true seals)	75 Hz to 100 kHz.
Otariid pinnipeds (underwater) (sea lions and fur seals)	100 Hz to 48 kHz.

Adapted and derived from Southall *et al.* (2007).

* Represents frequency band of hearing for entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Functional hearing is defined as the range of frequencies a group hears without incorporating non-acoustic mechanisms (Wartzok and Ketten, 1999). This is ~60 to ~70 dB above best hearing sensitivity (Southall *et al.,* 2007) for all functional hearing groups except LF cetaceans, where no direct measurements on hearing are available. For LF cetaceans, the lower range is based on recommendations from Southall *et al.,* 2007 and the upper range is based on information on inner ear anatomy and vocalizations.

When sound travels (propagates) from its source, its loudness decreases as the distance traveled by the sound increases. Thus, the loudness of a sound at its source is higher than the loudness of that same sound a kilometer away. Acousticians often refer to the loudness of a sound at its source (typically referenced to one meter from the source) as the source level and the loudness of sound elsewhere as the received level (*i.e.,* typically the receiver). For example, a humpback whale 3 km from a device that has a source level of 230 dB may only be exposed to sound that is 160 dB loud, depending on how the sound travels through water (*e.g.,* spherical spreading [6 dB reduction with doubling of distance] was used in this example). As a result, it is important to understand the difference between source levels and received levels when discussing the loudness of sound in the ocean or its impacts on the marine environment.

As sound travels from a source, its propagation in water is influenced by various physical characteristics, including water temperature, depth, salinity, and surface and bottom properties that cause refraction, reflection, absorption, and scattering of sound waves. Oceans are not homogeneous and the contribution of each of these individual factors is extremely complex and interrelated. The physical characteristics that determine the sound's speed through the water will change with depth, season, geographic location, and with time of day (as a result, in actual active sonar operations, crews will measure oceanic conditions, such as sea water temperature and depth, to calibrate models that determine the path the sonar signal will take as it travels through the ocean and how strong the sound signal will be at a given range along a particular transmission path). As sound travels through the ocean, the intensity associated with the wavefront diminishes, or attenuates. This decrease in intensity is referred to as propagation loss, also commonly called transmission loss.

As mentioned previously in this document, nine marine mammal species (seven cetaceans and two pinnipeds) are likely to occur in the Lease Area. Of the seven cetacean species likely to occur in the Lease Area, four are classified as low-frequency cetaceans (*i.e.,* minke whale, fin whale, humpback whale, and North Atlantic right whale), two are classified as mid-frequency cetaceans (*i.e.,* Atlantic white-sided dolphin and short-beaked common dolphin), and one is classified as a high-frequency cetacean (*i.e.,* harbor porpoise) (Southall *et al.,* 2007). A species' functional hearing group is a consideration when we analyze the effects of exposure to sound on marine mammals.

Hearing Impairment

Marine mammals may experience temporary or permanent hearing impairment when exposed to loud sounds. Hearing impairment is classified by temporary threshold shift (TTS) and permanent threshold shift (PTS). There are no empirical data for onset of PTS in any marine mammal; therefore, PTS-onset must be estimated from TTS-onset measurements and from the rate of TTS growth with increasing exposure levels above the level eliciting TTS-onset. PTS is presumed to be likely if the hearing threshold is reduced by ≥ 40 dB (that is, 40 dB of TTS). PTS is considered auditory injury (Southall *et al.,* 2007) and occurs in a specific frequency range and amount. Irreparable damage to the inner or outer cochlear hair cells may cause PTS; however, other mechanisms are also involved, such as exceeding the elastic limits of certain tissues and membranes in the middle and inner ears and resultant changes in the chemical composition of the inner ear fluids (Southall *et al.,* 2007). Given the higher level of sound and longer durations of exposure necessary to cause PTS as compared with TTS, it is considerably less likely that PTS would occur during the proposed HRG and geotechnical survey.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a loud sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises and a sound must be stronger in order to be heard. At least in terrestrial mammals, TTS can last from minutes or hours to (in cases of strong

TTS) days, can be limited to a particular frequency range, and can occur to varying degrees (*i.e.,* a loss of a certain number of dBs of sensitivity). For sound exposures at or somewhat above the TTS threshold, hearing sensitivity in both terrestrial and marine mammals recovers rapidly after exposure to the noise ends.

Marine mammal hearing plays a critical role in communication with conspecifics and in interpretation of environmental cues for purposes such as predator avoidance and prey capture. Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious. For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animals is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during a time when communication is critical for successful mother/calf interactions could have more serious impacts if it were in the same frequency band as the necessary vocalizations and of a severity that it impeded communication. The fact that animals exposed to levels and durations of sound that would be expected to result in this physiological response would also be expected to have behavioral responses of a comparatively more severe or sustained nature is also notable and potentially of more importance than the simple existence of a TTS.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin, beluga whale, harbor porpoise, and Yangtze finless porpoise) and three species of pinnipeds (northern elephant seal, harbor seal, and California sea lion) exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (*e.g.,* Finneran *et al.,* 2002 and 2010; Nachtigall *et al.,* 2004; Kastak *et al.,* 2005; Lucke *et al.,* 2009; Mooney *et al.,* 2009; Popov *et al.,* 2011; Finneran and Schlundt, 2010). In general, harbor seals (Kastak *et al.,* 2005; Kastelein *et al.,* 2012a) and harbor porpoises (Lucke *et al.,* 2009; Kastelein *et al.,* 2012b) have a lower TTS onset than other measured pinniped or cetacean species. However, even for these animals, which are better able to hear higher frequencies and may be more sensitive to higher frequencies, exposures on the order of approximately 170 dB rms or higher for brief transient signals are likely required for even temporary (recoverable) changes in hearing sensitivity that would likely not be categorized as physiologically damaging (Lucke *et al.,* 2009). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. There are no data available on noise-induced hearing loss for mysticetes (of note, the source operating characteristics of some of DONG Energy's proposed HRG survey equipment—*i.e.,* the equipment positioning systems—are unlikely to be audible to mysticetes). For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), and Finneran (2015).

Scientific literature highlights the inherent complexity of predicting TTS onset in marine mammals, as well as the importance of considering exposure duration when assessing potential impacts (Mooney *et al.,* 2009a, 2009b; Kastak *et al.,* 2007). Generally, with sound exposures of equal energy, quieter sounds (lower SPL) of longer duration were found to induce TTS onset more than louder sounds (higher SPL) of shorter duration (more similar to sub-bottom profilers). For intermittent sounds, less threshold shift will occur than from a continuous exposure with the same energy (some recovery will occur between intermittent exposures) (Kryter *et al.,* 1966; Ward, 1997). For sound exposures at or somewhat above the TTS-onset threshold, hearing sensitivity recovers rapidly after exposure to the sound ends; intermittent exposures recover faster in comparison with continuous exposures of the same duration (Finneran *et al.,* 2010). NMFS considers TTS as Level B harassment that is mediated by physiological effects on the auditory system; however, NMFS does not consider TTS-onset to be the lowest level at which Level B harassment may occur.

Animals in the Lease Area during the HRG survey are unlikely to incur TTS hearing impairment due to the characteristics of the sound sources, which include low source levels (208 to 221 dB re 1 µPa-m) and generally very short pulses and duration of the sound. Even for high-frequency cetacean species (*e.g.,* harbor porpoises), which may have increased sensitivity to TTS (Lucke *et al.,* 2009; Kastelein *et al.,* 2012b), individuals would have to make a very close approach and also remain very close to vessels operating these sources in order to receive multiple exposures at relatively high levels, as would be necessary to cause TTS. Intermittent exposures—as would occur due to the brief, transient signals produced by these sources—require a higher cumulative SEL to induce TTS than would continuous exposures of the same duration (*i.e.,* intermittent exposure results in lower levels of TTS) (Mooney *et al.,* 2009a; Finneran *et al.,* 2010). Moreover, most marine mammals would more likely avoid a loud sound source rather than swim in such close proximity as to result in TTS. Kremser *et al.* (2005) noted that the probability of a cetacean swimming through the area of exposure when a sub-bottom profiler emits a pulse is small—because if the animal was in the area, it would have to pass the transducer at close range in order to be subjected to sound levels that could cause temporary threshold shift and would likely exhibit avoidance behavior to the area near the transducer rather than swim through at such a close range. Further, the restricted beam shape of the sub-bottom profiler and other HRG survey equipment makes it unlikely that an animal would be exposed more than briefly during the passage of the vessel. Boebel *et al.* (2005) concluded similarly for single and multibeam echosounders, and more recently, Lurton (2016) conducted a modeling exercise and concluded similarly that likely potential for acoustic injury from these types of systems is negligible, but that behavioral response cannot be ruled out. Animals may avoid the area around the survey vessels, thereby reducing exposure. Any disturbance to marine mammals is likely to be in the form of temporary avoidance or alteration of opportunistic foraging behavior near the survey location.

It is possible that animals in the Lease Area may experience TTS during the use of DP vessel thrusters during the geotechnical survey due to the duration and nature of the noise (continuous, up to 6 days). However, the fact that the DP drill ship is stationary during the geotechnical survey activities makes it less likely that animals would remain in the area long enough to incur TTS. As is the case for the HRG survey activities, animals may avoid the area around the survey vessel, thereby reducing exposure. Any disturbance to marine mammals is more likely to be in the form of temporary avoidance or alteration of opportunistic foraging behavior near the survey location.

Masking

Masking is the obscuring of sounds of interest to an animal by other sounds, typically at similar frequencies. Marine mammals are highly dependent on

sound, and their ability to recognize sound signals amid other sound is important in communication and detection of both predators and prey (Tyack, 2000). Background ambient sound may interfere with or mask the ability of an animal to detect a sound signal even when that signal is above its absolute hearing threshold. Even in the absence of anthropogenic sound, the marine environment is often loud. Natural ambient sound includes contributions from wind, waves, precipitation, other animals, and (at frequencies above 30 kHz) thermal sound resulting from molecular agitation (Richardson *et al.,* 1995).

Background sound may also include anthropogenic sound, and masking of natural sounds can result when human activities produce high levels of background sound. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked. Ambient sound is highly variable on continental shelves (Thompson, 1965; Myrberg, 1978; Chapman *et al.,* 1998; Desharnais *et al.,* 1999). This results in a high degree of variability in the range at which marine mammals can detect anthropogenic sounds.

Although masking is a phenomenon which may occur naturally, the introduction of loud anthropogenic sounds into the marine environment at frequencies important to marine mammals increases the severity and frequency of occurrence of masking. For example, if a baleen whale is exposed to continuous low-frequency sound from an industrial source, this would reduce the size of the area around that whale within which it can hear the calls of another whale. The components of background noise that are similar in frequency to the signal in question primarily determine the degree of masking of that signal. In general, little is known about the degree to which marine mammals rely upon detection of sounds from conspecifics, predators, prey, or other natural sources. In the absence of specific information about the importance of detecting these natural sounds, it is not possible to predict the impact of masking on marine mammals (Richardson *et al.,* 1995). In general, masking effects are expected to be less severe when sounds are transient than when they are continuous. Masking is typically of greater concern for those marine mammals that utilize low-frequency communications, such as baleen whales, because of how far low-frequency sounds propagate.

Marine mammal communications would not likely be masked appreciably by the sub-profiler or pingers' signals given the directionality of the signal and the brief period when an individual mammal is likely to be within its beam. And while continuous sound from the DP thruster when in use is predicted to extend 3.4 km to the 120 dB threshold, the generally short duration of DP thruster use and low source levels, coupled with the likelihood of animals to avoid the sound source, would result in very little opportunity for this activity to mask the communication of local marine mammals for more than a brief period of time.

Non-Auditory Physical Effects (Stress)

Classic stress responses begin when an animal's central nervous system perceives a potential threat to its homeostasis. That perception triggers stress responses regardless of whether a stimulus actually threatens the animal; the mere perception of a threat is sufficient to trigger a stress response (Moberg, 2000; Sapolsky *et al.,* 2005; Seyle, 1950). Once an animal's central nervous system perceives a threat, it mounts a biological response or defense that consists of a combination of the four general biological defense responses: behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses.

In the case of many stressors, an animal's first and sometimes most economical (in terms of biotic costs) response is behavioral avoidance of the potential stressor or avoidance of continued exposure to a stressor. An animal's second line of defense to stressors involves the sympathetic part of the autonomic nervous system and the classical ''fight or flight'' response which includes the cardiovascular system, the gastrointestinal system, the exocrine glands, and the adrenal medulla to produce changes in heart rate, blood pressure, and gastrointestinal activity that humans commonly associate with ''stress.'' These responses have a relatively short duration and may or may not have significant long-term effect on an animal's welfare.

An animal's third line of defense to stressors involves its neuroendocrine systems; the system that has received the most study has been the hypothalamus-pituitary-adrenal system (also known as the HPA axis in mammals or the hypothalamus-pituitary-interrenal axis in fish and some reptiles). Unlike stress responses associated with the autonomic nervous system, virtually all neuro-endocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction (Moberg, 1987; Rivier, 1995), altered metabolism (Elasser *et al.,* 2000), reduced immune competence (Blecha, 2000), and behavioral disturbance. Increases in the circulation of glucocorticosteroids (cortisol, corticosterone, and aldosterone in marine mammals; see Romano *et al.,* 2004) have been equated with stress for many years.

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and distress is the biotic cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose a risk to the animal's welfare. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other biotic function, which impairs those functions that experience the diversion. For example, when mounting a stress response diverts energy away from growth in young animals, those animals may experience stunted growth. When mounting a stress response diverts energy from a fetus, an animal's reproductive success and its fitness will suffer. In these cases, the animals will have entered a pre-pathological or pathological state which is called ''distress'' (Seyle, 1950) or ''allostatic loading'' (McEwen and Wingfield, 2003). This pathological state will last until the animal replenishes its biotic reserves sufficient to restore normal function. Note that these examples involved a long-term (days or weeks) stress response exposure to stimuli.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses have also been documented fairly well through controlled experiments; because this physiology exists in every vertebrate that has been studied, it is not surprising that stress responses and their costs have been documented in both laboratory and free-living animals (for examples see, Holberton *et al.,* 1996; Hood *et al.,* 1998; Jessop *et al.,* 2003; Krausman *et al.,* 2004; Lankford *et al.,* 2005; Reneerkens *et al.,* 2002; Thompson and Hamer, 2000). Information has also been collected on the physiological responses

of marine mammals to exposure to anthropogenic sounds (Fair and Becker, 2000; Romano *et al.,* 2002; Wright *et al.,* 2008). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. In a conceptual model developed by the Population Consequences of Acoustic Disturbance (PCAD) working group, serum hormones were identified as possible indicators of behavioral effects that are translated into altered rates of reproduction and mortality.

Studies of other marine animals and terrestrial animals would also lead us to expect some marine mammals to experience physiological stress responses and, perhaps, physiological responses that would be classified as ''distress'' upon exposure to high frequency, mid-frequency and low-frequency sounds. For example, Jansen (1998) reported on the relationship between acoustic exposures and physiological responses that are indicative of stress responses in humans (for example, elevated respiration and increased heart rates). Jones (1998) reported on reductions in human performance when faced with acute, repetitive exposures to acoustic disturbance. Trimper *et al.* (1998) reported on the physiological stress responses of osprey to low-level aircraft noise while Krausman *et al.* (2004) reported on the auditory and physiology stress responses of endangered Sonoran pronghorn to military overflights. Smith *et al.* (2004a, 2004b), for example, identified noise-induced physiological transient stress responses in hearing-specialist fish (*i.e.,* goldfish) that accompanied short- and long-term hearing losses. Welch and Welch (1970) reported physiological and behavioral stress responses that accompanied damage to the inner ears of fish and several mammals.

Hearing is one of the primary senses marine mammals use to gather information about their environment and to communicate with conspecifics. Although empirical information on the relationship between sensory impairment (TTS, PTS, and acoustic masking) on marine mammals remains limited, it seems reasonable to assume that reducing an animal's ability to gather information about its environment and to communicate with other members of its species would be stressful for animals that use hearing as their primary sensory mechanism. Therefore, we assume that acoustic exposures sufficient to trigger onset PTS or TTS would be accompanied by physiological stress responses because terrestrial animals exhibit those responses under similar conditions (NRC, 2003). More importantly, marine mammals might experience stress responses at received levels lower than those necessary to trigger onset TTS. Based on empirical studies of the time required to recover from stress responses (Moberg, 2000), we also assume that stress responses are likely to persist beyond the time interval required for animals to recover from TTS and might result in pathological and pre-pathological states that would be as significant as behavioral responses to TTS.

In general, there are few data on the potential for strong, anthropogenic underwater sounds to cause non-auditory physical effects in marine mammals. Such effects, if they occur at all, would presumably be limited to short distances and to activities that extend over a prolonged period. The available data do not allow identification of a specific exposure level above which non-auditory effects can be expected (Southall *et al.,* 2007). There is no definitive evidence that any of these effects occur even for marine mammals in close proximity to an anthropogenic sound source. In addition, marine mammals that show behavioral avoidance of survey vessels and related sound sources, are unlikely to incur non-auditory impairment or other physical effects. NMFS does not expect that the generally short-term, intermittent, and transitory HRG and geotechnical activities would create conditions of long-term, continuous noise and chronic acoustic exposure leading to long-term physiological stress responses in marine mammals.

Behavioral Disturbance

Behavioral responses to sound are highly variable and context-specific. An animal's perception of and response to (in both nature and magnitude) an acoustic event can be influenced by prior experience, perceived proximity, bearing of the sound, familiarity of the sound, etc. (Southall *et al.,* 2007). If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder, 2007; Weilgart, 2007).

Southall *et al.* (2007) reports the results of the efforts of a panel of experts in acoustic research from behavioral, physiological, and physical disciplines that convened and reviewed the available literature on marine mammal hearing and physiological and behavioral responses to human-made sound with the goal of proposing exposure criteria for certain effects. This peer-reviewed compilation of literature is very valuable, though Southall *et al.* (2007) note that not all data are equal, some have poor statistical power, insufficient controls, and/or limited information on received levels, background noise, and other potentially important contextual variables—such data were reviewed and sometimes used for qualitative illustration but were not included in the quantitative analysis for the criteria recommendations. All of the studies considered, however, contain an estimate of the received sound level when the animal exhibited the indicated response.

In the Southall *et al.* (2007) publication, for the purposes of analyzing responses of marine mammals to anthropogenic sound and developing criteria, the authors differentiate between pulse sounds (single and multiple) and non-pulse sounds.

The studies that address responses of low-frequency cetaceans to non-pulse sounds include data gathered in the field and related to several types of sound sources, including: vessel noise, drilling and machinery playback, low-frequency M-sequences (sine wave with multiple phase reversals) playback, tactical low-frequency active sonar playback, drill ships, and non-pulse playbacks. These studies generally indicate no (or very limited) responses to received levels in the 90 to 120 dB re: 1μPa range and an increasing likelihood of avoidance and other behavioral effects in the 120 to 160 dB range. As mentioned earlier, though, contextual variables play a very important role in the reported responses and the severity of effects do not increase linearly with received levels. Also, few of the laboratory or field datasets had common conditions, behavioral contexts, or sound sources, so it is not surprising that responses differ.

The studies that address responses of mid-frequency cetaceans to non-pulse sounds include data gathered both in the field and the laboratory and related to several different sound sources, including: pingers, drilling playbacks, ship and ice-breaking noise, vessel noise, Acoustic harassment devices (AHDs), Acoustic Deterrent Devices (ADDs), mid-frequency active sonar, and non-pulse bands and tones. Southall *et al.* (2007) were unable to come to a clear conclusion regarding the results of these

studies. In some cases animals in the field showed significant responses to received levels between 90 and 120 dB, while in other cases these responses were not seen in the 120 to 150 dB range. The disparity in results was likely due to contextual variation and the differences between the results in the field and laboratory data (animals typically responded at lower levels in the field).

The studies that address responses of high-frequency cetaceans to non-pulse sounds include data gathered both in the field and the laboratory and related to several different sound sources, including: pingers, AHDs, and various laboratory non-pulse sounds. All of these data were collected from harbor porpoises. Southall *et al.* (2007) concluded that the existing data indicate that harbor porpoises are likely sensitive to a wide range of anthropogenic sounds at low received levels (around 90 to 120 dB), at least for initial exposures. All recorded exposures above 140 dB induced profound and sustained avoidance behavior in wild harbor porpoises (Southall *et al.,* 2007). Rapid habituation was noted in some but not all studies.

The studies that address the responses of pinnipeds in water to non-pulse sounds include data gathered both in the field and the laboratory and related to several different sound sources, including: AHDs, various non-pulse sounds used in underwater data communication, underwater drilling, and construction noise. Few studies exist with enough information to include them in the analysis. The limited data suggest that exposures to non-pulse sounds between 90 and 140 dB generally do not result in strong behavioral responses of pinnipeds in water, but no data exist at higher received levels (Southall *et al.,* 2007).

The studies that address the responses of mid-frequency cetaceans to impulse sounds include data gathered both in the field and the laboratory and related to several different sound sources, including: small explosives, airgun arrays, pulse sequences, and natural and artificial pulses. The data show no clear indication of increasing probability and severity of response with increasing received level. Behavioral responses seem to vary depending on species and stimuli. Data on behavioral responses of high-frequency cetaceans to multiple pulses is not available.

The studies that address the responses of pinnipeds in water to impulse sounds include data gathered in the field and related to several different sources, including: small explosives, impact pile driving, and airgun arrays. Quantitative data on reactions of pinnipeds to impulse sounds is limited, but a general finding is that exposures in the 150 to 180 dB range generally have limited potential to induce avoidance behavior (Southall *et al.,* 2007).

Marine mammals are likely to avoid the HRG survey activity, especially the naturally shy harbor porpoise, while the harbor seals might be attracted to them out of curiosity. However, because the sub-bottom profilers and other HRG survey equipment operate from a moving vessel, and the maximum radius to the 160 dB harassment threshold is less than 400 m, the area and time that this equipment would be affecting a given location is very small. Further, once an area has been surveyed, it is not likely that it will be surveyed again, therefore reducing the likelihood of repeated HRG-related impacts within the survey area. And while the drill ship using DP thrusters will generally remain stationary during geotechnical survey activities, the short duration (up to six days) of the DP thruster use would likely result in only short-term and temporary avoidance of the area, rather than permanent abandonment, by marine mammals. Vessel traffic in the project area is relatively high and marine mammals are presumably habituated to noise from project vessels (DP thrusters).

We have also considered the potential for severe behavioral responses such as stranding and associated indirect injury or mortality from DONG Energy's use of HRG survey equipment, on the basis of a 2008 mass stranding of approximately one hundred melon-headed whales in a Madagascar lagoon system. An investigation of the event indicated that use of a high-frequency mapping system (12-kHz multibeam echosounder) was the most plausible and likely initial behavioral trigger of the event, while providing the caveat that there is no unequivocal and easily identifiable single cause (Southall *et al.,* 2013). The investigatory panel's conclusion was based on (1) very close temporal and spatial association and directed movement of the survey with the stranding event; (2) the unusual nature of such an event coupled with previously documented apparent behavioral sensitivity of the species to other sound types (Southall *et al.,* 2006; Brownell *et al.,* 2009); and (3) the fact that all other possible factors considered were determined to be unlikely causes. Specifically, regarding survey patterns prior to the event and in relation to bathymetry, the vessel transited in a north-south direction on the shelf break parallel to the shore, ensonifying large areas of deep-water habitat prior to operating intermittently in a concentrated area offshore from the stranding site; this may have trapped the animals between the sound source and the shore, thus driving them towards the lagoon system. The investigatory panel systematically excluded or deemed highly unlikely nearly all potential reasons for these animals leaving their typical pelagic habitat for an area extremely atypical for the species (*i.e.,* a shallow lagoon system). Notably, this was the first time that such a system has been associated with a stranding event. The panel also noted several site- and situation-specific secondary factors that may have contributed to the avoidance responses that led to the eventual entrapment and mortality of the whales. Specifically, shoreward-directed surface currents and elevated chlorophyll levels in the area preceding the event may have played a role (Southall *et al.,* 2013). The report also notes that prior use of a similar system in the general area may have sensitized the animals and also concluded that, for odontocete cetaceans that hear well in higher frequency ranges where ambient noise is typically quite low, high-power active sonars operating in this range may be more easily audible and have potential effects over larger areas than low frequency systems that have more typically been considered in terms of anthropogenic noise impacts. It is, however, important to note that the relatively lower output frequency, higher output power, and complex nature of the system implicated in this event, in context of the other factors noted here, likely produced a fairly unusual set of circumstances that indicate that such events would likely remain rare and are not necessarily relevant to use of lower-power, higher-frequency systems more commonly used for HRG survey applications. The risk of similar events recurring may be very low, given the extensive use of active acoustic systems used for scientific and navigational purposes worldwide on a daily basis and the lack of direct evidence of such responses previously reported.

Tolerance

Numerous studies have shown that underwater sounds from industrial activities are often readily detectable by marine mammals in the water at distances of many kilometers. However, other studies have shown that marine mammals at distances more than a few kilometers away often show no apparent response to industrial activities of various types (Miller *et al.,* 2005). This

is often true even in cases when the sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. Although various baleen whales, toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to underwater sound from sources such as airgun pulses or vessels under some conditions, at other times, mammals of all three types have shown no overt reactions (*e.g.,* Malme *et al.,* 1986; Richardson *et al.,* 1995; Madsen and Mohl, 2000; Croll *et al.,* 2001; Jacobs and Terhune, 2002; Madsen *et al.,* 2002; Miller *et al.,* 2005). In general, pinnipeds seem to be more tolerant of exposure to some types of underwater sound than are baleen whales. Richardson *et al.* (1995) found that vessel sound does not seem to strongly affect pinnipeds that are already in the water. Richardson *et al.* (1995) went on to explain that seals on haul-outs sometimes respond strongly to the presence of vessels and at other times appear to show considerable tolerance of vessels, and Brueggeman *et al.* (1992) observed ringed seals (*Pusa hispida*) hauled out on ice pans displaying short-term escape reactions when a ship approached within 0.16–0.31 mi (0.25–0.5 km). Due to the relatively high vessel traffic in the Lease Area it is possible that marine mammals are habituated to noise (*e.g.,* DP thrusters) from project vessels in the area.

Vessel Strike

Ship strikes of marine mammals can cause major wounds, which may lead to the death of the animal. An animal at the surface could be struck directly by a vessel, a surfacing animal could hit the bottom of a vessel, or a vessel's propeller could injure an animal just below the surface. The severity of injuries typically depends on the size and speed of the vessel (Knowlton and Kraus, 2001; Laist *et al.,* 2001; Vanderlaan and Taggart, 2007).

The most vulnerable marine mammals are those that spend extended periods of time at the surface in order to restore oxygen levels within their tissues after deep dives (*e.g.,* the sperm whale). In addition, some baleen whales, such as the North Atlantic right whale, seem generally unresponsive to vessel sound, making them more susceptible to vessel collisions (Nowacek *et al.,* 2004). These species are primarily large, slow moving whales. Smaller marine mammals (*e.g.,* bottlenose dolphin) move quickly through the water column and are often seen riding the bow wave of large ships. Marine mammal responses to vessels may include avoidance and changes in dive pattern (NRC, 2003).

An examination of all known ship strikes from all shipping sources (civilian and military) indicates vessel speed is a principal factor in whether a vessel strike results in death (Knowlton and Kraus, 2001; Laist *et al.,* 2001; Jensen and Silber, 2003; Vanderlaan and Taggart, 2007). In assessing records with known vessel speeds, Laist *et al.* (2001) found a direct relationship between the occurrence of a whale strike and the speed of the vessel involved in the collision. The authors concluded that most deaths occurred when a vessel was traveling in excess of 24.1 km/h (14.9 mph; 13 kts). Given the slow vessel speeds and predictable course necessary for data acquisition, ship strike is unlikely to occur during the geophysical and geotechnical surveys. Marine mammals would be able to easily avoid vessels and are likely already habituated to the presence of numerous vessels in the area. Further, DONG Energy shall implement measures (*e.g.,* vessel speed restrictions and separation distances; see *Proposed Mitigation Measures*) set forth in the BOEM Lease to reduce the risk of a vessel strike to marine mammal species in the Lease Area.

Anticipated Effects on Marine Mammal Habitat

There are no feeding areas, rookeries, or mating grounds known to be biologically important to marine mammals within the proposed project area. There is also no designated critical habitat for any ESA-listed marine mammals. NMFS' regulations at 50 CFR part 224 designated the nearshore waters of the Mid-Atlantic Bight as the Mid-Atlantic U.S. Seasonal Management Area (SMA) for right whales in 2008. Mandatory vessel speed restrictions are in place in that SMA from November 1 through April 30 to reduce the threat of collisions between ships and right whales around their migratory route and calving grounds.

Bottom disturbance associated with the HRG survey activities may include grab sampling to validate the seabed classification obtained from the multibeam echosounder/sidescan sonar data. This will typically be accomplished using a Mini-Harmon Grab with 0.1 m^2 sample area or the slightly larger Harmon Grab with a 0.2 m^2 sample area. Bottom disturbance associated with the geotechnical survey activities will consist of the 4 deep bore holes of approximately 3 to 4 inches (in; 7.6 to 10.1 centimeters [cm]) diameter, the 15 shallow CPTs of up to approximately 1 in (2.5 cm) in diameter, and the 4 deep CPTs of approximately 1 in (2.5 cm) in diameter. Impact on marine mammal habitat from these activities will be temporary, insignificant, and discountable.

Because of the temporary nature of the disturbance, the availability of similar habitat and resources (*e.g.,* prey species) in the surrounding area, and the lack of important or unique marine mammal habitat, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations.

Mitigation

In order to issue an incidental take authorization under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (where relevant).

Proposed Mitigation Measures

With NMFS' input during the application process, and as per the BOEM Lease, DONG Energy is proposing the following mitigation measures during site characterization surveys utilizing HRG survey equipment and use of the DP thruster. The mitigation measures outlined in this section are based on protocols and procedures that have been successfully implemented and resulted in no observed take of marine mammals for similar offshore projects and previously approved by NMFS (ESS, 2013; Dominion, 2013 and 2014).

Marine Mammal Exclusion Zones

Protected species observers (PSOs) will monitor the following exclusion/monitoring zones for the presence of marine mammals:

- A 400-m exclusion zone during HRG surveys when the sub-bottom profiler is in operation (this exceeds the estimated Level B harassment isopleth).
- A 200-m exclusion zone during HRG surveys when all other equipment (*i.e.,* equipment positioning systems) is in operation (this exceeds the estimated Level B harassment isopleth).
- A 3,500-m monitoring zone during the use of DP thrusters during geotechnical survey activities (this exceeds the Level B harassment isopleth).

The radial distances from the sound sources for these exclusion/monitoring

zones were derived from acoustic modeling (see Appendix A of the application) and cover the area for both the Level A and Level B harassment zones (*i.e.,* the 190/180 dB and 160 dB isopleths, respectively) when HRG survey equipment is in use, and the Level B harassment zone (the 120 dB isopleth) when DP thrusters are in use; DP thrusters will not produce sound levels at 180 dB re 1 µPa (rms). Acoustic modeling of the HRG survey equipment and DP thrusters was completed based on a version of the U.S. Naval Research Laboratory's Range-dependent Acoustic Model (RAM) and BELLHOP Gaussian beam ray-trace propagation model (Porter and Liu, 1994). BELLHOP and RAM are widely used by sound engineers and marine biologists due to its adaptability to describe highly complex acoustic scenarios. RAM is based on the parabolic equation (Collins, 1993) method using the split-step Padé algorithm for improved numerical accuracy and efficiency in solving range dependent acoustic problems and has been extensively benchmarked (Collins *et al.,* 1996). The BELLHOP algorithm is based on a beam-tracing methodology and provides better accuracy by accounting for increased sound attenuation due to volume absorption at higher frequencies and allowing for source directivity components. The modeling methodologies employed calculate transmission loss based on a number of factors including the distance between the source and receiver along with basic ocean sound propagation parameters (*e.g.,* depths, bathymetry, sediment type, and seasonal sound speed profiles). For each sound source, modeling was performed along transects originating out from the source along compass points (45°, 90°, 135°, 180°, 225°, 270°, 315°, and 360°) and propagated horizontally. The received sound field within each radial plane was then sampled at various ranges and depths from the source with fixed steps. The received sound level at a given location along a given transect was then taken as the maximum value that would occur over all samples within the water column. These values were then summed across frequencies to provide broadband received levels at the MMPA Level A and B harassment criteria. The representative area ensonified to the MMPA Level B threshold for each of the pieces of HRG survey equipment and for the DP thruster use represents the zone within which take of a marine mammal could occur. The distances to the Level A and Level B harassment criteria were used to support the estimate of take as well as the development of the monitoring and/or mitigation measures. The complete acoustic modeling assessment can be found in Appendix A of the application. Radial distance to NMFS' Level A and Level B harassment thresholds are summarized in Tables 4 and 5.

TABLE 4—MODELED DISTANCES TO MMPA THRESHOLDS FOR MARINE MAMMALS DURING HRG SURVEY

HRG Equipment	Marine mammal level A harassment 180 dB_{RMS} re 1 µPa (m)*	Marine mammal level B harassment 160 dB_{RMS} re 1 µPa (m)
ixBlue GAPS (pinger)	< 10	25
Sonardyne Scout USBL (pinger)	0	25
GeoPulse Sub-bottom Profiler (chirper)	30	75
Geo-Source 800 (sparker)	80	250
Geo-Source 200 (sparker)	90	380

* Distances to NMFS' 190 dB level A harassment threshold for pinnipeds are smaller.

TABLE 5—MODELED DISTANCES TO MMPA THRESHOLDS FOR MARINE MAMMALS DURING GEOTECHNICAL SURVEY USING DP THRUSTERS

Survey equipment	Marine mammal level A harassment 180 dB_{RMS} re 1 µPa (m)	Marine mammal level B harassment 120 dB_{RMS} re 1 µPa (m)
DP Thrusters—at 38 m depth	N/A	2,875
DP Thrusters—at 44 m depth	N/A	3,225
DP Thrusters—at 54 m depth	N/A	3,400

Visual monitoring of the established exclusion zone(s) for the HRG and geotechnical surveys will be performed by qualified and NMFS-approved PSOs, the resumes of whom will be provided to NMFS for review and approval prior to the start of survey activities. Observer qualifications will include direct field experience on a marine mammal observation vessel and/or aerial surveys in the Atlantic Ocean/Gulf of Mexico. An observer team comprising a minimum of four NMFS-approved PSOs and two certified Passive Acoustic Monitoring (PAM) operators (PAM operators will not function as PSOs), operating in shifts, will be stationed aboard either the survey vessel or a dedicated PSO-vessel. PSOs and PAM operators will work in shifts such that no one monitor will work more than 4 consecutive hours without a 2-hour break or longer than 12 hours during any 24-hour period. During daylight hours the PSOs will rotate in shifts of 1 on and 3 off, while during nighttime operations PSOs will work in pairs. The PAM operators will also be on call as necessary during daytime operations should visual observations become impaired. Each PSO will monitor 360 degrees of the field of vision.

PSOs will be responsible for visually monitoring and identifying marine mammals approaching or within the established exclusion zone(s) during survey activities. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine

mammals as well as to communicate and enforce the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate. PAM operators will communicate detected vocalizations to the Lead PSO on duty, who will then be responsible for implementing the necessary mitigation procedures. A mitigation and monitoring communications flow diagram has been included as Appendix B in the IHA application.

PSOs will be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Reticulated binoculars will also be available to PSOs for use as appropriate based on conditions and visibility to support the siting and monitoring of marine species. Digital single-lens reflex camera equipment will be used to record sightings and verify species identification. During night operations, PAM (see *Passive Acoustic Monitoring* requirements below) and night-vision equipment in combination with infrared video monitoring will be used (Additional details and specifications of the night-vision devices and infrared video monitoring technology will be provided under separate cover by the DONG Energy Survey Contractor once selected.). Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting.

The PSOs will begin observation of the exclusion zone(s) at least 60 minutes prior to ramp-up of HRG survey equipment. Use of noise-producing equipment will not begin until the exclusion zone is clear of all marine mammals for at least 60 minutes, as per the requirements of the BOEM Lease.

If a marine mammal is detected approaching or entering the 200-m or 400-m exclusion zones during the HRG survey, or the 3,500-m monitoring zone during DP thrusters use, the vessel operator would adhere to the shutdown (during HRG survey) or powerdown (during DP thruster use) procedures described below to minimize noise impacts on the animals.

At all times, the vessel operator will maintain a separation distance of 500 m from any sighted North Atlantic right whale as stipulated in the *Vessel Strike Avoidance* procedures described below. These stated requirements will be included in the site-specific training to be provided to the survey team.

Vessel Strike Avoidance

The Applicant will ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these species. Survey vessel crew members responsible for navigation duties will receive site-specific training on marine mammal and sea turtle sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures will include the following, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- All vessel operators will comply with 10 knot (<18.5 km per hour [km/h]) speed restrictions in any Dynamic Management Area (DMA). In addition, all vessels operating from November 1 through July 31 will operate at speeds of 10 knots (<18.5 km/h) or less.
- All survey vessels will maintain a separation distance of 500 m or greater from any sighted North Atlantic right whale.
- If underway, vessels must steer a course away from any sited North Atlantic right whale at 10 knots (<18.5 km/h) or less until the 500 m minimum separation distance has been established. If a North Atlantic right whale is sited in a vessel's path, or within 100 m to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines will not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 m.
- All vessels will maintain a separation distance of 100 m or greater from any sighted non-delphinoid (*i.e.,* mysticetes and sperm whales) cetaceans. If 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 outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel will not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m.
- All vessels will maintain a separation distance of 50 m or greater from any sighted delphinoid cetacean. Any vessel underway will remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway reduces vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or abeam (*i.e.,* moving away and at a right angle to the centerline of the vessel) of the underway vessel.
- All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped.

The training program will be provided to NMFS for review and approval prior to the start of surveys. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew members understand and will comply with the necessary requirements throughout the survey event.

Seasonal Operating Requirements

Between watch shifts, members of the monitoring team will consult the NMFS North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. The proposed survey activities will, however, occur outside of the seasonal management area (SMA) located off the coast of Massachusetts and Rhode Island. The proposed survey activities will also occur in May/June and September, which is outside of the seasonal mandatory speed restriction period for this SMA (November 1 through April 30).

Throughout all survey operations, the Applicant will monitor the NMFS North Atlantic right whale reporting systems for the establishment of a DMA. If NMFS should establish a DMA in the Lease Area under survey, within 24 hours of the establishment of the DMA the Applicant will work with NMFS to shut down and/or alter the survey activities to avoid the DMA.

Passive Acoustic Monitoring

As per the BOEM Lease, alternative monitoring technologies (*e.g.,* active or passive acoustic monitoring) are required if a Lessee intends to conduct geophysical surveys at night or when visual observation is otherwise impaired. To support 24-hour HRG survey operations, DONG Energy will use certified PAM operators with experience reviewing and identifying recorded marine mammal vocalizations, as part of the project monitoring during nighttime operations to provide for optimal acquisition of species detections at night, or as needed during periods when visual observations may be impaired. In addition, PAM systems shall be employed during daylight hours to support system calibration and PSO and PAM team coordination, as well as in support of efforts to evaluate the effectiveness of the various mitigation techniques (*i.e.,* visual observations during day and night, compared to the

PAM detections/operations). Given the range of species that could occur in the Lease Area, the PAM system will consist of an array of hydrophones with both broadband (sampling mid-range frequencies of 2 kHz to 200 kHz) and at least one low-frequency hydrophone (sampling range frequencies of 10 Hz to 30 kHz). Monitoring of the PAM system will be conducted from a customized processing station aboard the HRG survey vessel. The on-board processing station provides the interface between the PAM system and the operator. The PAM operator(s) will monitor the hydrophone signals in real time both aurally (using headphones) and visually (via the monitor screen displays). DONG Energy proposes the use of PAMGuard software for 'target motion analysis' to support localization in relation to the identified exclusion zone. PAMGuard is an open source and versatile software/hardware interface to enable flexibility in the configuration of in-sea equipment (number of hydrophones, sensitivities, spacing, and geometry). PAM operators will immediately communicate detections/vocalizations to the Lead PSO on duty who will ensure the implementation of the appropriate mitigation measure (*e.g.,* shutdown) even if visual observations by PSOs have not been made.

Ramp-Up

As per the BOEM Lease, a ramp-up procedure will be used for HRG survey equipment capable of adjusting energy levels at the start or re-start of HRG survey activities. A ramp-up procedure will be used at the beginning of HRG survey activities in order to provide additional protection to marine mammals near the Lease Area by allowing them to vacate the area prior to the commencement of survey equipment use. The ramp-up procedure will not be initiated during daytime, night time, or periods of inclement weather if the exclusion zone cannot be adequately monitored by the PSOs using the appropriate visual technology (*e.g.,* reticulated binoculars, night vision equipment) and/or PAM for a 60-minute period. A ramp-up would begin with the power of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. The power would then be gradually turned up and other acoustic sources added such that the source level would increase in steps not exceeding 6 dB per 5-minute period. If marine mammals are detected within the HRG survey exclusion zone prior to or during the ramp-up, activities will be delayed until the animal(s) has moved outside the monitoring zone and no marine mammals are detected for a period of 60 minutes.

Shutdown and Powerdown

HRG Survey—The exclusion zone(s) around the noise-producing activities HRG survey equipment will be monitored, as previously described, by PSOs and at night by PAM operators for the presence of marine mammals before, during, and after any noise-producing activity. The vessel operator must comply immediately with any call for shutdown by the Lead PSO. Any disagreement should be discussed only after shutdown.

As per the BOEM Lease, if a non-delphinoid (*i.e.,* mysticetes and sperm whales) cetacean is detected at or within the established exclusion zone (200-m exclusion zone during equipment positioning systems use; 400-m exclusion zone during the operation of the sub-bottom profiler), an immediate shutdown of the HRG survey equipment is required. Subsequent restart of the electromechanical survey equipment must use the ramp-up procedures described above and may only occur following clearance of the exclusion zone for 60 minutes. These are extremely conservative shutdown zones, as the 200 and 400-m exclusion radii exceed the distances to the estimated Level B harassment isopleths (Table 4).

As per the BOEM Lease, if a delphinoid cetacean or pinniped is detected at or within the exclusion zone, the HRG survey equipment (including the sub-bottom profiler) must be powered down to the lowest power output that is technically feasible. Subsequent power up of the survey equipment must use the ramp-up procedures described above and may occur after (1) the exclusion zone is clear of a delphinoid cetacean and/or pinniped for 60 minutes 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.

If the HRG sound source (including the sub-bottom profiler) shuts down for reasons other than encroachment into the exclusion zone by a marine mammal including but not limited to a mechanical or electronic failure, resulting in in the cessation of sound source for a period greater than 20 minutes, a restart for the HRG survey equipment (including the sub-bottom profiler) is required using the full ramp-up procedures and clearance of the exclusion zone of all cetaceans and pinnipeds for 60 minutes. If the pause is less than 20 minutes, 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 cetaceans and pinnipeds. If the visual surveys were not continued diligently during the pause of 20 minutes or less, a restart of the HRG survey equipment (including the sub-bottom profiler) is required using the full ramp-up procedures and clearance of the exclusion zone for all cetaceans and pinnipeds for 60 minutes.

Geotechnical Survey (DP Thrusters)—During geotechnical survey activities, a constant position over the drill, coring, or CPT site must be maintained to ensure the integrity of the survey equipment. Any stoppage of DP thruster during the proposed geotechnical activities has the potential to result in significant damage to survey equipment. Therefore, during geotechnical survey activities if marine mammals enter or approach the established 120 dB isopleth monitoring zone, the Applicant shall reduce DP thruster to the maximum extent possible, except under circumstances when reducing DP thruster use would compromise safety (both human health and environmental) and/or the integrity of the equipment. Reducing thruster energy will effectively reduce the potential for exposure of marine mammals to sound energy. After decreasing thruster energy, PSOs will continue to monitor marine mammal behavior and determine if the animal(s) is moving towards or away from the established monitoring zone. If the animal(s) continues to move towards the sound source then DP thruster use would remain at the reduced level. Normal use will resume when PSOs report that the marine mammals have moved away from and remained clear of the monitoring zone for a minimum of 60 minutes since the last sighting.

Mitigation Conclusions

NMFS has carefully evaluated DONG Energy's mitigation measures in the context of ensuring that we prescribe the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;

• The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

• The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed here:

• Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

• A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of activities that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

• A reduction in the number of times (total number or number at biologically important time or location) individuals would be exposed to received levels of activities that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

• A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels of activities that we expect to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing the severity of harassment takes only).

• Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.

• For monitoring directly related to mitigation—an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means of effecting the least practicable impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth, ''requirements pertaining to the monitoring and reporting of such taking.'' The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

1. An increase in our understanding of the likely occurrence of marine mammal species in the vicinity of the action, *i.e.,* presence, abundance, distribution, and/or density of species.

2. An increase in our understanding of the nature, scope, or context of the likely exposure of marine mammal species to any of the potential stressor(s) associated with the action (*e.g.* sound or visual stimuli), through better understanding of one or more of the following: The action itself and its environment (*e.g.,* sound source characterization, propagation, and ambient noise levels); the affected species (*e.g.,* life history or dive pattern); the likely co-occurrence of marine mammal species with the action (in whole or part) associated with specific adverse effects; and/or the likely biological or behavioral context of exposure to the stressor for the marine mammal (*e.g.,* age class of exposed animals or known pupping, calving, or feeding areas).

3. An increase in our understanding of how individual marine mammals respond (behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible, *e.g.,* at what distance or received level).

4. An increase in our understanding of how anticipated individual responses, to individual stressors or anticipated combinations of stressors, may impact either: The long-term fitness and survival of an individual; or the population, species, or stock (*e.g.,* through effects on annual rates of recruitment or survival).

5. An increase in our understanding of how the activity affects marine mammal habitat, such as through effects on prey sources or acoustic habitat (*e.g.,* through characterization of longer-term contributions of multiple sound sources to rising ambient noise levels and assessment of the potential chronic effects on marine mammals).

6. An increase in understanding of the impacts of the activity on marine mammals in combination with the impacts of other anthropogenic activities or natural factors occurring in the region.

7. An increase in our understanding of the effectiveness of mitigation and monitoring measures.

8. An increase in the probability of detecting marine mammals (through improved technology or methodology), both specifically within the safety zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals.

Proposed Monitoring Measures

DONG Energy submitted a marine mammal monitoring and reporting plan as part of the IHA application. The plan may be modified or supplemented based on comments or new information received from the public during the public comment period.

Visual Monitoring—Visual monitoring of the established Level B harassment zones (400-m radius for sub-bottom profiler and 200-m radius for equipment positioning system use during HRG surveys [note that these are the same as the mitigation exclusion/shutdown zones established for HRG survey sound sources]; 3,500-m radius during DP thruster use [note that this is the same as the mitigation powerdown zone established for DP thruster sound sources]) will be performed by qualified and NMFS-approved PSOs (see discussion of PSO qualifications and requirements in *Marine Mammal Exclusion Zones* above).

The PSOs will begin observation of the monitoring zone during all HRG survey activities and all geotechnical operations where DP thrusters are employed. Observations of the monitoring zone will continue throughout the survey activity and/or while DP thrusters are in use. PSOs will be responsible for visually monitoring and identifying marine mammals approaching or entering the established monitoring zone during survey activities.

Observations will take place from the highest available vantage point on the survey vessel. General 360-degree scanning will occur during the monitoring periods, and target scanning by the PSO will occur when alerted of a marine mammal presence.

Data on all PSO observations will be recorded based on standard PSO collection requirements. This will

include dates and locations of construction operations; time of observation, location and weather; details of the sightings (*e.g.,* species, age classification [if known], numbers, behavior); and details of any observed ''taking'' (behavioral disturbances or injury/mortality). The data sheet will be provided to both NMFS and BOEM for review and approval prior to the start of survey activities. In addition, prior to initiation of survey work, all crew members will undergo environmental training, a component of which will focus on the procedures for sighting and protection of marine mammals. A briefing will also be conducted between the survey supervisors and crews, the PSOs, and the Applicant. The purpose of the briefing will be to establish responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures.

Acoustic Field Verification — As per the requirements of the BOEM Lease, field verification of the exclusion/monitoring zones will be conducted to determine whether the proposed zones correspond accurately to the relevant isopleths and are adequate to minimize impacts to marine mammals. The details of the field verification strategy will be provided in a Field Verification Plan no later than 45 days prior to the commencement of field verification activities.

DONG Energy must conduct field verification of the exclusion zone (the 160 dB isopleth) for HRG survey equipment and the powerdown zone (the 120 dB isopleth) for DP thruster use for all equipment operating below 200 kHz. DONG Energy must take acoustic measurements at a minimum of two reference locations and in a manner that is sufficient to establish source level (peak at 1 meter) and distance to the 180 dB and 160 dB isopleths (the Level A and B harassment zones for HRG surveys) and 120 dB isopleth (the Level B harassment zone) for DP thruster use. Sound measurements must be taken 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).

DONG Energy may use the results from its field-verification efforts to request modification of the exclusion/monitoring zones for the HRG or geotechnical surveys. Any new exclusion/monitoring zone radius proposed by DONG Energy must be based on the most conservative measurements (*i.e.,* the largest safety zone configuration) of the target Level A or Level B harassment acoustic threshold zones. The modified zone must be used for all subsequent use of field-verified equipment. DONG Energy must obtain approval from NMFS and BOEM of any new exclusion/monitoring zone before it may be implemented and the IHA shall be modified accordingly.

Proposed Reporting Measures

The Applicant will provide the following reports as necessary during survey activities:

- The Applicant will contact NMFS and BOEM within 24 hours of the commencement of survey activities and again within 24 hours of the completion of the activity.
- As per the BOEM Lease: Any observed significant behavioral reactions (*e.g.,* animals departing the area) or injury or mortality to any marine mammals must be reported to NMFS and BOEM within 24 hours of observation. Dead or injured protected species are reported to the NMFS Greater Atlantic Regional Fisheries Office Stranding Hotline (800–900–3622) within 24 hours of sighting, regardless of whether the injury is caused by a vessel. In addition, if the injury of death was caused by a collision with a project related vessel, the Applicant must ensure that NMFS and BOEM are notified of the strike within 24 hours. The Applicant must use the form included as Appendix A to Addendum C of the Lease to report the sighting or incident. If The Applicant is responsible for the injury or death, the vessel must assist with any salvage effort as requested by NMFS. Additional reporting requirements for injured or dead animals are described below (*Notification of Injured or Dead Marine Mammals*).
- *Notification of Injured or Dead Marine Mammals*—In the unanticipated event that the specified HRG and geotechnical activities lead to an injury of a marine mammal (Level A harassment) or mortality (*e.g.,* ship-strike, gear interaction, and/or entanglement), DONG Energy would immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources and the NOAA Greater Atlantic Regional Fisheries Office (GARFO) Stranding Coordinator. The report would include the following information:
  - Time, date, and location (latitude/longitude) of the incident;
  - Name and type of vessel involved;
  - Vessel's speed during and leading up to the incident;
  - Description of the incident;
  - Status of all sound source use in the 24 hours preceding the incident;
  - Water depth;
  - Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
  - Description of all marine mammal observations in the 24 hours preceding the incident;
  - Species identification or description of the animal(s) involved;
  - Fate of the animal(s); and
  - Photographs or video footage of the animal(s) (if equipment is available).

  Activities would not resume until NMFS is able to review the circumstances of the event. NMFS would work with DONG Energy to minimize reoccurrence of such an event in the future. DONG Energy would not resume activities until notified by NMFS.

  In the event that DONG Energy discovers an injured or dead marine mammal and determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition), DONG Energy would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources and the GARFO Stranding Coordinator. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Applicant to determine if modifications in the activities are appropriate.

  In the event that DONG Energy discovers an injured or dead marine mammal and determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), DONG Energy would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Greater Atlantic Regional Fisheries Office Regional Stranding Coordinator, within 24 hours of the discovery. DONG Energy would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS. DONG Energy can continue its operations under such a case.
- Within 90 days after completion of the marine site characterization survey activities, a technical report will be provided to NMFS and BOEM that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the

number of marine mammals that may have been taken during survey activities, and provides an interpretation of the results and effectiveness of all monitoring tasks. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS.

• In addition to the Applicant's reporting requirements outlined above, the Applicant will provide an assessment report of the effectiveness of the various mitigation techniques, *i.e.,* visual observations during day and night, compared to the PAM detections/operations. This will be submitted as a draft to NMFS and BOEM 30 days after the completion of the HRG and geotechnical surveys and as a final version 60 days after completion of the surveys.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, the MMPA defines ''harassment'' as: Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Project activities that have the potential to harass marine mammals, as defined by the MMPA, include underwater noise from operation of the HRG survey sub-bottom profilers and equipment positioning systems, and noise propagation associated with the use of DP thrusters during geotechnical survey activities that require the use of a DP drill ship. Harassment could take the form of temporary threshold shift, avoidance, or other changes in marine mammal behavior. NMFS anticipates that impacts to marine mammals would be in the form of behavioral harassment and no take by injury, serious injury, or mortality is proposed. NMFS does not anticipate take resulting from the movement of vessels associated with construction because there will be a limited number of vessels moving at slow speeds over a relatively shallow, nearshore area.

The basis for the take estimate is the number of marine mammals that would be exposed to sound levels in excess of NMFS' Level B harassment criteria for impulsive noise (160 dB re 1 μPa (rms) and continuous noise (120 dB re 1 μPa (rms.)). NMFS' current acoustic exposure criteria for estimating take are shown in Table 6 below. DONG Energy's modeled distances to these acoustic exposure criteria are shown in Tables 4 and 5. Details on the model characteristics and results are provided in the hydroacoustic modeling assessment found in Appendix A of the DONG Energy IHA application. As discussed in the application and in Appendix A, modeling took into consideration sound sources using the loudest potential operational parameters, bathymetry, geoacoustic properties of the Lease Area, time of year, and marine mammal hearing ranges. Results from the hydroacoustic modeling assessment showed that estimated maximum critical distance to the 160 dB re 1 μPa (rms) MMPA threshold for all water depths for the HRG survey sub-bottom profilers (the HRG survey equipment with the greatest potential for effect on marine mammal) was approximately 380 m from the source (see Table 4), and the estimated maximum critical distance to the 120 dB re 1 μPa (rms) MMPA threshold for all water depths for the drill ship DP thruster was approximately 3,400 m from the source (see Table 5). DONG Energy and NMFS believe that these estimates represent the worst-case scenario and that the actual distances to the Level B harassment threshold may be shorter.

TABLE 6—NMFS' CURRENT ACOUSTIC EXPOSURE CRITERIA

Non-explosive sound		
Criterion	Criterion definition	Threshold
Level A Harassment (Injury)	Permanent Threshold Shift (PTS) (Any level above that which is known to cause TTS).	180 dB re 1 μPa-m (cetaceans)/190 dB re 1 μPa-m (pinnipeds) root mean square (rms).
Level B Harassment	Behavioral Disruption (for impulse noises)	160 dB re 1 μPa-m (rms).
Level B Harassment	Behavioral Disruption (for continuous noise)	120 dB re 1 μoPa-m (rms).

DONG Energy estimated species densities within the proposed project area in order to estimate the number of marine mammal exposures to sound levels above the 120 dB Level B harassment threshold for continuous noise (*i.e.,* DP thrusters) and the 160 dB Level B harassment threshold for intermittent, impulsive noise (*i.e.,* pingers and sub-bottom profiler). Research indicates that marine mammals generally have extremely fine auditory temporal resolution and can detect each signal separately (*e.g.,* Au *et al.,* 1988; Dolphin *et al.,* 1995; Supin and Popov, 1995; Mooney *et al.,* 2009b), especially for species with echolocation capabilities. Therefore, it is likely that marine mammals would perceive the acoustic signals associated with the HRG survey equipment as being intermittent rather than continuous, and we base our takes from these sources on exposures to the 160 dB threshold.

The data used as the basis for estimating species density (''D'') for the Lease Area are sightings per unit effort (SPUE) taken from Kenney and Vigness-Raposa (2009). SPUE (or, the relative abundance of species) is derived by using a measure of survey effort and number of individual cetaceans sighted. Species density (animals per km^2) can be computed by dividing the SPUE value by the width of the marine mammal survey track, and numbers of animals can be computed by multiplying the species density by the size of the geographic area in question (km^2). SPUE allows for comparison between discrete units of time (*i.e.,* seasons) and space within a project area (Shoop and Kenney, 1992). SPUE calculated by Kenney and Vigness-Raposa (2009) was derived from a number of sources including: (1) North Atlantic Right Whale Consortium database; (2) CeTAP (CeTAP, 1982); (3) sightings data from the Coastal Research and Education Society of Long Island, Inc. and Okeanos Ocean Research Foundation; (4) the Northeast Regional Stranding network (marine mammals); and (5) the NOAA Northeast Fisheries Science Center's Fisheries Sampling Branch (Woods Hole, MA).

The Northeast Navy Operations Area (OPAREA) Density Estimates (DoN, 2007) were also used in support for estimating take for seals, which represents the only available comprehensive data for seal abundance. However, abundance estimates for the

Southern New England area includes breeding populations on Cape Cod, and therefore using this dataset alone will result in a substantial over-estimate of take in the Project Area. However, based on reports conducted by Kenney and Vigness-Raposa (2009), Schroeder (2000), and Ronald and Gots (2003), harbor seal abundance off the Southern New England coast in the vicinity of the survey is likely to be approximately 20 percent of the total abundance. In addition, because the seasonality of, and habitat use by, gray seals roughly overlaps with harbor seals, the same abundance assumption of 20 percent of the southern New England population of gray seals can be applied when estimating abundance. Per this data, take due to Level B harassment for harbor seals and gray seals has been calculated based on 20 percent of the Northeast Navy OPAREA Density Estimates.

Estimated takes were calculated by multiplying the species density (per 100 km^2) by the zone of influence (ZOI), multiplied by the number of days of the specified activity. A detailed description of the acoustic modeling used to calculate zones of influence is provided in the acoustic modeling assessment found in Appendix A of the DONG Energy IHA application (also see the discussion in the ''Mitigation'' section above).

DONG Energy used a ZOI of 23.6 m^2 (61 km^2) and a conservative survey period of 30 days, which includes estimated weather downtime, to estimate take from use of the HRG survey equipment during geophysical survey activities. The ZOI is based on the worst case (since it assumes the higher powered GeoSource 200 sparker will be operating all the time) ensonified area of 380 m, and a maximum survey trackline of 49 mi (79 km) per day. Based on the proposed HRG survey schedule (May 2016), take calculations were based on the spring seasonal species density as derived from seasonal SPUE data reported in Kenney and Vigness-Raposa (2009) and seasonal OPAREA density estimates (DoN, 2007). The resulting take estimates (rounded to the nearest whole number) are presented in Table 7.

TABLE 6—ESTIMATED LEVEL B HARASSMENT TAKES FOR HRG SURVEY ACTIVITIES

Species	Density for Spring (Number/100 km^2)	Calculated take (Number)	Requested take authorization (Number)	Percentage of stock potentially affected
North Atlantic Right Whale	0.06	1.03	1	0.215
Humpback Whale	0.11	2.04	2	0.243
Fin Whale	0.37	6.72	7	0.433
Minke Whale	0.12	2.24	2	0.010
Common Dolphin	2.15	39.38	39	0.001
Atlantic White-sided Dolphin	1.23	22.45	22	0.045
Harbor Porpoise	0.47	8.52	9	0.011
Harbor Seal [1]	9.74	35.66	36	0.047
Gray Seal [1]	14.16	51.83	52	0.015

[1] Density values were derived using 20 percent of the number estimated from DoN (2007) density values.

DONG Energy used a ZOI of 9.8 m^2 (25.4 km^2) and a maximum DP thruster use period of 6 days to estimate take from use of the DP thruster during geotechnical survey activities. The ZOI represents the worst-case ensonified area across the three representative water depths within the Lease Area (125 ft, 144 ft, and 177 ft [38 m, 44 m, and 54 m]). Based on the proposed geotechnical survey schedule (September 2016), take calculations were based on the fall seasonal species density as derived from seasonal abundance data reported in Kenney and Vigness-Raposa (2009) and seasonal OPAREA density estimates (DoN, 2007) (Table 7). The resulting take estimates (rounded to the nearest whole number) based upon these conservative assumptions for common and Atlantic white-sided dolphins are presented in Table 8. These numbers are based on 6 days and represent only 0.011 and 0.022 percent of the stock for these 2 species, respectively. Take calculations for North Atlantic right whale, humpback whale, fin whale, minke whale, harbor porpoise, gray seal, and harbor seal are at or near zero (refer to the DONG Energy application); therefore, no takes for these species are requested or proposed for authorization.

TABLE 7—ESTIMATED LEVEL B HARASSMENT TAKES FOR GEOTECHNICAL SURVEY ACTIVITIES

Species	Density for Fall (Number/100 km^2)	Calculated take (Number)	Requested take authorization (Number)	Percentage of stock potentially affected
Common Dolphin	8.21	12.5	13	0.011
Atlantic White-sided Dolphin	7.46	11	11	0.022

DONG Energy's requested take numbers are provided in Tables 6 and 7 and this is also the number of takes NMFS is proposing to authorize. DONG Energy's calculations do not take into account whether a single animal is harassed multiple times or whether each exposure is a different animal. Therefore, the numbers in Tables 6 and 7 are the maximum number of animals that may be harassed during the HRG and geotechnical surveys (*i.e.,* DONG Energy assumes that each exposure event is a different animal). These estimates do not account for prescribed mitigation measures that DONG Energy would implement during the specified activities and the fact that shutdown/powerdown procedures shall be implemented if an animal enters the Level B harassment zone (160 dB and 120 dB for HRG survey equipment and DP thruster use, respectively), further

reducing the potential for any takes to occur during these activities.

Analysis and Determinations

Negligible Impact

Negligible impact is ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival'' (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes, alone, is not enough information on which to base an impact determination, as the severity of harassment may vary greatly depending on the context and duration of the behavioral response, many of which would not be expected to have deleterious impacts on the fitness of any individuals. In determining whether the expected takes will have a negligible impact, in addition to considering estimates of the number of marine mammals that might be ''taken,'' NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, and the status of the species.

As discussed in the ''Potential Effects'' section, permanent threshold shift, masking, non-auditory physical effects, and vessel strike are not expected to occur. There is some potential for limited TTS; however, animals in the area would likely incur no more than brief hearing impairment (*i.e.,* TTS) due to generally low SPLs—and in the case of the HRG survey equipment use, highly directional beam pattern, transient signals, and moving sound sources—and the fact that most marine mammals would more likely avoid a loud sound source rather than swim in such close proximity as to result in TTS or PTS. Further, once an area has been surveyed, it is not likely that it will be surveyed again, therefore reducing the likelihood of repeated impacts within the project area.

Potential impacts to marine mammal habitat were discussed previously in this document (see the ''Anticipated Effects on Habitat'' section). Marine mammal habitat may be impacted by elevated sound levels and some sediment disturbance, but these impacts would be temporary. Feeding behavior is not likely to be significantly impacted, as marine mammals appear to be less likely to exhibit behavioral reactions or avoidance responses while engaged in feeding activities (Richardson *et al.,* 1995). Prey species are mobile, and are broadly distributed throughout the Lease Area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance, the availability of similar habitat and resources in the surrounding area, and the lack of important or unique marine mammal habitat, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or their populations. Furthermore, there are no feeding areas, rookeries, or mating grounds known to be biologically important to marine mammals within the proposed project area. A biologically important feeding area for North Atlantic right whale encompasses the Lease Area (LaBrecque, *et al.,* 2015); however, there is no temporal overlap between the BIA (effective March–April; November–December) and the proposed survey activities (May–June; October). ESA-listed species for which takes are proposed are North Atlantic right, humpback, and fin whales. Recent estimates of abundance indicate a stable or growing humpback whale population, while examination of the minimum number alive population index calculated from the individual sightings database for the years 1990–2010 suggests a positive and slowly accelerating trend in North Atlantic right whale population size (Waring *et al.,* 2015). There are currently insufficient data to determine population trends for fin whale) (Waring *et al.,* 2015). There is no designated critical habitat for any ESA-listed marine mammals within the Lease Area, and none of the stocks for non-listed species proposed to be taken are considered ''depleted'' or ''strategic'' by NMFS under the MMPA.

The proposed mitigation measures are expected to reduce the number and/or severity of takes by (1) giving animals the opportunity to move away from the sound source before HRG survey equipment reaches full energy; (2) reducing the intensity of exposure within a certain distance by reducing the DP thruster power; and (3) preventing animals from being exposed to sound levels reaching 180 dB during HRG survey activities (sound levels in excess of 180 dB are not anticipated for DP thruster use). Additional vessel strike avoidance requirements will further mitigate potential impacts to marine mammals during vessel transit to and within the Study Area.

DONG Energy did not request, and NMFS is not proposing, take of marine mammals by injury, serious injury, or mortality. NMFS expects that most takes would be in the form of short-term Level B behavioral harassment in the form of brief startling reaction and/or temporary vacating of the area, or decreased foraging (if such activity were occurring)—reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.,* Southall *et al.,* 2007). This is largely due to the short time scale of the proposed activities, the low source levels and intermittent nature of many of the technologies proposed to be used, as well as the required mitigation.

NMFS concludes that exposures to marine mammal species and stocks due to DONG Energy's HRG and geotechnical survey activities would result in only short-term (temporary and short in duration) and relatively infrequent effects to individuals exposed, and not of the type or severity that would be expected to be additive for the very small portion of the stocks and species likely to be exposed. Given the duration and intensity of the activities, and the fact that shipping contributes to the ambient sound levels in the surrounding waters (vessel traffic in this area is relatively high; some marine mammals may be habituated to this noise), NMFS does not anticipate the proposed take estimates to impact annual rates of recruitment or survival. Animals may temporarily avoid the immediate area, but are not expected to permanently abandon the area. Major shifts in habitat use, distribution, or foraging success, are not expected.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from DONG Energy's proposed HRG survey and DP thruster use during geotechnical survey activities will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

The requested takes proposed to be authorized for the HRG and geotechnical surveys represent 0.215 percent of the Western North Atlantic (WNA) stock of North Atlantic right

whale, 0.243 percent of the Gulf of Maine stock of humpback whale, 0.433 percent of the WNA stock of fin whale, 0.010 percent of the Canadian East Coast stock of minke whale, 0.040 percent of the WNA stock of short-beaked common dolphin, 0.068 percent of the WNA stock of Atlantic white-sided dolphin, 0.011 percent of the Gulf of Maine/Bay of Fundy stock of harbor porpoise, 0.047 percent of the WNA stock of harbor seal, and 0.015 percent of the North Atlantic stock of gray seal. These take estimates represent the percentage of each species or stock that could be taken by Level B behavioral harassment and are extremely small numbers (less than 1 percent) relative to the affected species or stock sizes. Further, the proposed take numbers are the maximum numbers of animals that are expected to be harassed during the project; it is possible that some of these exposures may occur to the same individual. Therefore, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Within the project area, fin, humpback, and North Atlantic right whale are listed as endangered under the ESA. Under section 7 of the ESA, BOEM consulted with NMFS on commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York and New Jersey Wind Energy Areas. NOAA's GARFO issued a Biological Opinion concluding that these activities may adversely affect but are not likely to jeopardize the continued existence of fin whale, humpback whale, or North Atlantic right whale. NMFS is also consulting internally on the issuance of an IHA under section 101(a)(5)(D) of the MMPA for this activity. Following issuance of the DONG Energy IHA, the Biological Opinion may be amended to include an incidental take exemption for these marine mammal species, as appropriate.

National Environmental Policy Act

BOEM prepared an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), to evaluate the issuance of wind energy leases covering the entirety of the Massachusetts Wind Energy Area (including the OCS–A 0500 Lease Area), and the approval of site assessment activities within those leases (BOEM, 2014). NMFS intends to adopt BOEM's EA, if adequate and appropriate. Currently, we believe that the adoption of BOEM's EA will allow NMFS to meet its responsibilities under NEPA for the issuance of an IHA to DONG Energy for HRG and geotechnical survey investigations in the Lease Area. If necessary, however, NMFS will supplement the existing analysis to ensure that we comply with NEPA prior to the issuance of the final IHA. BOEM's EA is available on the Internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental/energy_other.htm.*

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to DONG Energy for HRG survey activities and use of DP vessel thrusters during geotechnical survey activities from May 2016 through April 2017, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. The proposed IHA language is provided next.

This section contains a draft of the IHA itself. The wording contained in this section is proposed for inclusion in the IHA (if issued).

DONG Energy Massachusetts (U.S.) LLC (DONG Energy) (One International Place, 100 Oliver Street, Suite 1400, Boston, MA 02110) is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107, to harass marine mammals incidental to high-resolution geophysical (HRG) and geotechnical survey investigations associated with marine site characterization activities off the coast of Massachusetts in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS–A 0500) (the Lease Area).

1. This Authorization is valid from May 1, 2016 through April 30, 2017.

2. This Authorization is valid only for HRG and geotechnical survey investigations associated with marine site characterization activities, as described in the Incidental Harassment Authorization (IHA) application.

3. The holder of this authorization (Holder) is hereby authorized to take, by Level B harassment only, 33 Atlantic white-sided dolphins (*Lagenorhynchus acutus*), 52 short-beaked common dolphins (*Delphinus delphis*), 9 harbor porpoises (*Phocoena phocoena*), 2 minke whales (*Balaenoptera acutorostrata*), 7 fin whales (*Balaenoptera physalus*), 2 humpback whales (*Megaptera novaeangliae*), 1 North Atlantic right whales (*Eubalaena glacialis*), 52 gray seals (*Halichoerus grypus*), and 36 harbor seals (*Phoca vitulina*) incidental to HRG survey activities using sub-bottom profilers and equipment positioning systems, and dynamic positioning (DP) vessel thruster use during geotechnical activities.

4. The taking of any marine mammal in a manner prohibited under this IHA must be reported immediately to NMFS' Greater Atlantic Regional Fisheries Office (GARFO), 55 Great Republic Drive, Gloucester, MA 01930–2276; phone 978–281–9300, and NMFS' Office of Protected Resources, 1315 East-West Highway, Silver Spring, MD 20910; phone 301–427–8401.

5. The Holder or designees must notify NMFS' GARFO and Headquarters at least 24 hours prior to the seasonal commencement of the specified activity (see contact information in 4 above).

6. The holder of this Authorization must notify the Chief of the Permits and Conservation Division, Office of Protected Resources, or her designee at least 24 hours prior to the start of survey activities (unless constrained by the date of issuance of this Authorization in which case notification shall be made as soon as possible) at 301–427–8401 or to *John.Fiorentino@noaa.gov.*

7. Mitigation Requirements

The Holder is required to abide by the following mitigation conditions listed in 7(a)–(f). Failure to comply with these conditions may result in the modification, suspension, or revocation of this IHA.

(a) *Marine Mammal Exclusion Zones:* Protected species observers (PSOs) shall monitor the following zones for the presence of marine mammals:

- A 400-m exclusion zone during HRG surveys when the sub-bottom profiler is in operation.
- A 200-m exclusion zone during HRG surveys when all other equipment (*i.e.,* equipment positioning systems) is in operation.
- A 3,500-m monitoring zone during the use of DP thrusters during geotechnical survey.
- At all times, the vessel operator shall maintain a separation distance of 500 m from any sighted North Atlantic right whale as stipulated in the *Vessel Strike Avoidance* procedures described below.

Visual monitoring of the established exclusion zone(s) shall be performed by

qualified and NMFS-approved protected species observers (PSOs). An observer team comprising a minimum of four NMFS-approved PSOs and two certified Passive Acoustic Monitoring (PAM) operators, operating in shifts, shall be stationed aboard either the survey vessel or a dedicated PSO-vessel. PSOs shall be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Reticulated binoculars will also be available to PSOs for use as appropriate based on conditions and visibility to support the siting and monitoring of marine species. Digital single-lens reflex camera equipment shall be used to record sightings and verify species identification. During night operations, PAM (see *Passive Acoustic Monitoring* requirements below) and night-vision equipment in combination with infrared video monitoring shall be used. The PSOs shall begin observation of the exclusion zone(s) at least 60 minutes prior to ramp-up of HRG survey equipment. Use of noise-producing equipment shall not begin until the exclusion zone is clear of all marine mammals for at least 60 minutes. If a marine mammal is seen approaching or entering the 200-m or 400-m exclusion zones during the HRG survey, or the 3,500-m monitoring zone during DP thrusters use, the vessel operator shall adhere to the shutdown/powerdown procedures described below to minimize noise impacts on the animals.

(b) *Ramp-Up:* A ramp-up procedure shall be used for HRG survey equipment capable of adjusting energy levels at the start or re-start of HRG survey activities. The ramp-up procedure shall not be initiated during daytime, night time, or periods of inclement weather if the exclusion zone cannot be adequately monitored by the PSOs using the appropriate visual technology (*e.g.,* reticulated binoculars, night vision equipment) and/or PAM for a 60-minute period. A ramp-up shall begin with the power of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. The power shall then be gradually turned up and other acoustic sources added such that the source level would increase in steps not exceeding 6 dB per 5-minute period. If marine mammals are sighted within the HRG survey exclusion zone prior to or during the ramp-up, activities shall be delayed until the animal(s) has moved outside the monitoring zone and no marine mammals are sighted for a period of 60 minutes.

(c) *Shutdown and Powerdown*

HRG Survey—The exclusion zone(s) around the noise-producing activities HRG survey equipment will be monitored, as previously described, by PSOs and at night by PAM operators for the presence of marine mammals before, during, and after any noise-producing activity. The vessel operator must comply immediately with any call for shutdown by the Lead PSO. If a non-delphinoid (*i.e.,* mysticetes and sperm whales) cetacean is detected at or within the established exclusion zone (200-m exclusion zone during equipment positioning systems use; 400-m exclusion zone during the operation of the sub-bottom profiler), an immediate shutdown of the HRG survey equipment is required. Subsequent restart of the electromechanical survey equipment must use the ramp-up procedures described above and may only occur following clearance of the exclusion zone for 60 minutes. If a delphinoid cetacean or pinniped is detected at or within the exclusion zone, the HRG survey equipment must be powered down to the lowest power output that is technically feasible. Subsequent power up of the survey equipment must use the ramp-up procedures described above and may occur after (1) the exclusion zone is clear of a delphinoid cetacean and/or pinniped for 60 minutes 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. If the HRG sound source shuts down for reasons other than encroachment into the exclusion zone by a marine mammal including but not limited to a mechanical or electronic failure, resulting in in the cessation of sound source for a period greater than 20 minutes, a restart for the HRG survey equipment is required using the full ramp-up procedures and clearance of the exclusion zone of all cetaceans and pinnipeds for 60 minutes. If the pause is less than 20 minutes, 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 cetaceans and pinnipeds. If the visual surveys were not continued diligently during the pause of 20 minutes or less, a restart of the HRG survey equipment is required using the full ramp-up procedures and clearance of the exclusion zone for all cetaceans and pinnipeds for 60 minutes.

Geotechnical Survey (DP Thrusters)—During geotechnical survey activities if marine mammals enter or approach the established 120 dB isopleth monitoring zone, the Holder shall reduce DP thruster to the maximum extent possible, except under circumstances when reducing DP thruster use would compromise safety (both human health and environmental) and/or the integrity of the equipment. After decreasing thruster energy, PSOs shall continue to monitor marine mammal behavior and determine if the animal(s) is moving towards or away from the established monitoring zone. If the animal(s) continues to move towards the sound source then DP thruster use shall remain at the reduced level. Normal use shall resume when PSOs report that the marine mammals have moved away from and remained clear of the monitoring zone for a minimum of 60 minutes since the last sighting.

(d) *Vessel Strike Avoidance:* The Holder shall ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these protected species. Survey vessel crew members responsible for navigation duties shall receive site-specific training on marine mammal sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures shall include the following, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- All vessel operators shall comply with 10 knot (<18.5 km per hour [km/h]) speed restrictions in any Dynamic Management Area (DMA). In addition, all vessels operating from November 1 through July 31 shall operate at speeds of 10 knots (<18.5 km/h) or less.
- All survey vessels shall maintain a separation distance of 500 m or greater from any sighted North Atlantic right whale.
- If underway, vessels must steer a course away from any sited North Atlantic right whale at 10 knots (<18.5 km/h) or less until the 500 m minimum separation distance has been established. If a North Atlantic right whale is sited in a vessel's path, or within 100 m to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines shall not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 m.
- All vessels shall maintain a separation distance of 100 m or greater

from any sighted non-delphinoid (*i.e.,* mysticetes and sperm whales) cetacean. If 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 outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel shall not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m.

- All vessels shall maintain a separation distance of 50 m or greater from any sighted delphinoid cetacean. Any vessel underway shall remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway shall reduce vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or abeam of the underway vessel.
- All vessels shall maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped.

(e) *Seasonal Operating Requirements:* Between watch shifts members of the monitoring team shall consult the NMFS North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. The proposed survey activities shall occur outside of the seasonal management area (SMA) located off the coast of Massachusetts and Rhode Island and outside of the seasonal mandatory speed restriction period for this SMA (November 1 through April 30). Throughout all survey operations, the Holder shall monitor the NMFS North Atlantic right whale reporting systems for the establishment of a DMA. If NMFS should establish a DMA in the Lease Area under survey, within 24 hours of the establishment of the DMA the Holder shall work with NMFS to shut down and/or altered the survey activities to avoid the DMA.

(f) *Passive Acoustic Monitoring:* To support 24-hour survey operations, the Holder shall include PAM as part of the project monitoring during the geophysical survey during nighttime operations, or as needed during periods when visual observations may be impaired. In addition, PAM systems shall be employed during daylight hours to support system calibration and PSO and PAM team coordination, as well as in support of efforts to evaluate the effectiveness of the various mitigation techniques (*i.e.,* visual observations during day and night, compared to the PAM detections/operations).

The PAM system shall consist of an array of hydrophones with both broadband (sampling mid-range frequencies of 2 kHz to 200 kHz) and at least one low-frequency hydrophone (sampling range frequencies of 10 Hz to 30 kHz). The PAM operator(s) shall monitor the hydrophone signals in real time both aurally (using headphones) and visually (via the monitor screen displays). PAM operators shall communicate detections/vocalizations to the Lead PSO on duty who shall ensure the implementation of the appropriate mitigation measure.

8. Monitoring Requirements

The Holder is required to abide by the following monitoring conditions listed in 8(a)–(b). Failure to comply with these conditions may result in the modification, suspension, or revocation of this IHA.

(a) *Visual Monitoring*—Protected species observers (refer to the PSO qualifications and requirements for *Marine Mammal Exclusion Zones* above) shall visually monitor the established Level B harassment zones (400-m radius during sub-bottom profiler use and 200-m radius for equipment positioning system use during HRG surveys; 3,500-m radius during DP thruster use). The observers shall be stationed on the highest available vantage point on the associated operating platform. PSOs shall estimate distance to marine mammals visually, using laser range finders or by using reticle binoculars during daylight hours. During night operations, PSOs shall use night-vision binoculars. Data on all PSO observations will be recorded based on standard PSO collection requirements. This will include dates and locations of survey operations; time of observation, location and weather; details of the sightings (*e.g.,* species, age classification [if known], numbers, behavior); and details of any observed ''taking'' (behavioral disturbances or injury/mortality). In addition, prior to initiation of survey work, all crew members will undergo environmental training, a component of which will focus on the procedures for sighting and protection of marine mammals.

(b) *Acoustic Field Verification*—Field verification of the exclusion/monitoring zones shall be conducted to determine whether the proposed zones correspond accurately to the relevant isopleths and are adequate to minimize impacts to marine mammals. The Holder shall conduct field verification of the exclusion/monitoring zone (the 160 dB isolpleth) for HRG survey equipment and the monitoring/powerdown zone (the 120 dB isopleth) for DP thruster use for all equipment operating below 200 kHz. The Holder shall take acoustic measurements at a minimum of two reference locations and in a manner that is sufficient to establish source level (peak at 1 meter) and distance to the 180 dB and 160 dB isopleths (the Level A and B harassment zones for HRG surveys) and 120 dB isopleth (the Level B harassment zone) for DP thruster use. Sound measurements shall be taken 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). The Holder may use the results from its field-verification efforts to request modification of the exclusion/monitoring zones for the HRG or geotechnical surveys. Any new exclusion/monitoring zone radius proposed by the Holder shall be based on the most conservative measurements (*i.e.,* the largest safety zone configuration) of the target Level A or Level B harassment acoustic threshold zones. The modified zone shall be used for all subsequent use of field-verified equipment. The Holder shall obtain approval from NMFS and BOEM of any new exclusion/monitoring zone before it may be implemented and the IHA shall be modified accordingly.

9. Reporting Requirements

The Holder shall provide the following reports as necessary during survey activities:

(a) The Holder shall contact NMFS (301–427–8401) and BOEM (703–787–1300) within 24 hours of the commencement of survey activities and again within 24 hours of the completion of the activity.

(b) Any observed significant behavioral reactions (*e.g.,* animals departing the area) or injury or mortality to any marine mammals shall be reported to NMFS and BOEM within 24 hours of observation. Dead or injured protected species shall be reported to the NMFS Greater Atlantic Regional Fisheries Office Stranding Hotline (800–900–3622) within 24 hours of sighting, regardless of whether the injury is caused by a vessel. In addition, if the injury of death was caused by a collision with a project related vessel, the Holder shall ensure that NMFS and BOEM are notified of the strike within 24 hours. The Holder shall use the form included as Appendix A to Addendum C of the Lease to report the sighting or incident. If the Holder is responsible for the injury or death, the vessel must assist with any salvage effort as requested by NMFS.

Additional reporting requirements for injured or dead animals are described

below (*Notification of Injured or Dead Marine Mammals*).

(c) *Notification of Injured or Dead Marine Mammals.*

(i) In the unanticipated event that the specified HRG and geotechnical survey activities lead to an injury of a marine mammal (Level A harassment) or mortality (*e.g.,* ship-strike, gear interaction, and/or entanglement), the Holder shall immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, 301–427–8401, and the NOAA Greater Atlantic Regional Fisheries Office (GARFO) Stranding Coordinator, 978–281–9300. The report shall include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.,* wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the event. NMFS would work with the Holder to minimize reoccurrence of such an event in the future. The Holder shall not resume activities until notified by NMFS.

(ii) In the event that the Holder discovers an injured or dead marine mammal and determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.,* in less than a moderate state of decomposition), the Holder shall immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, 301–427–8401, and the GARFO Stranding Coordinator, 978–281–9300. The report shall include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with the Holder to determine if modifications in the activities are appropriate.

(iii) In the event that the Holder discovers an injured or dead marine mammal and determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.,* previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Holder shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, 301–427–8401, and the NMFS Greater Atlantic Regional Fisheries Office Regional Stranding Coordinator, 978–281–9300, within 24 hours of the discovery. The Holder shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting.

(d) Within 90 days after completion of the marine site characterization survey activities, a technical report shall be provided to NMFS and BOEM that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the number of marine mammals that may have been taken during survey activities, and provides an interpretation of the results and effectiveness of all monitoring tasks. Any recommendations made by NMFS shall be addressed in the final report prior to acceptance by NMFS.

(e) In addition to the Holder's reporting requirements outlined above, the Holder shall provide an assessment report of the effectiveness of the various mitigation techniques, *i.e.,* visual observations during day and night, compared to the PAM detections/operations. This shall be submitted as a draft to NMFS and BOEM 30 days after the completion of the HRG and geotechnical surveys and as a final version 60 days after completion of the surveys.

10. This Authorization may be modified, suspended, or withdrawn if the Holder fails to abide by the conditions prescribed herein or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

11. A copy of this Authorization and the Incidental Take Statement must be in the possession of each vessel operator taking marine mammals under the authority of this Incidental Harassment Authorization.

12. The Holder is required to comply with the Terms and Conditions of the Incidental Take Statement corresponding to NMFS' Biological Opinion.

Request for Public Comments

NMFS requests comment on our analysis, the draft authorization, and any other aspect of the Notice of Proposed IHA for DONG Energy's proposed high-resolution geophysical and geotechnical survey investigations associated with marine site characterization activities off the coast of Massachusetts in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS–A 0500). Please include with your comments any supporting data or literature citations to help inform our final decision on DONG Energy's request for an MMPA authorization.

Dated: March 30, 2016.

Wanda Cain,

Acting Deputy Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2016–07712 Filed 4–4–16; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XE554

Magnuson-Stevens Act Provisions; General Provisions for Domestic Fisheries; Application for Exempted Fishing Permits

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; request for comments.

SUMMARY: The Assistant Regional Administrator for Sustainable Fisheries, Greater Atlantic Region, NMFS, has made a preliminary determination that an Exempted Fishing Permit application contains all of the required information and warrants further consideration. This Exempted Fishing Permit would allow one commercial fishing vessel to fish outside of the limited access scallop regulations in support of research conducted by the National Fisheries Institute that is investigating scallop incidental mortality in the scallop dredge fishery.

Regulations under the Magnuson-Stevens Fishery Conservation and Management Act require publication of this notification to provide interested parties the opportunity to comment on applications for proposed Exempted Fishing Permits.

DATES: Comments must be received on or before April 20, 2016.

ADDRESSES: You may submit written comments by any of the following methods: