



July 21, 2017

Dr. Jeffrey Payne, Director, *via e-mail*
Office of Ocean and Coastal Resource Management
National Ocean and Atmospheric Administration
1305 East-West Highway
Silver Spring, MD 20910

**Re: Comments on States' Unlisted Activity Review Requests for BOEM
Permit Nos. E14-004 & E14-005**

Dear Dr. Payne:

The International Association of Geophysical Contractors ("IAGC") appreciates the opportunity to comment on requests from Atlantic coastal states to review proposed Incidental Harassment Authorizations ("IHAs") for incidental take of marine mammals pursuant to geological and geophysical survey activities ("G&G activities") in the Mid- and South Atlantic as requested by WesternGeco and CGG (i.e., BOEM Permit Nos. E14-004 & E14-005). IAGC is the international trade association representing the industry that provides geophysical services (geophysical data acquisition, processing and interpretation, geophysical information ownership and licensing, associated services and product providers) to the oil and natural gas industry. IAGC member companies play an integral role in the successful exploration and development of offshore hydrocarbon resources through the acquisition and processing of geophysical data. IAGC members have expressed interest in conducting geophysical activities on the Atlantic OCS, and the current applicants with pending G&G permits before Bureau of Ocean Energy Management ("BOEM") and proposed IHAs before National Marine Fisheries Service ("NMFS") are IAGC members. We appreciate consideration of the comments set forth below.

Pursuant to 15 CFR 930.54, states may request the Office of Coastal Resource Management's ("OCRM") approval to review unlisted federally permitted activities, such as G&G activities (as Atlantic coastal states' previously sought and obtained review), with an assertion that the proposed activities' coastal effects are "reasonably foreseeable." The sole basis for OCRM's approval or disapproval of a state's request depends on "whether the proposed activity's coastal effects are reasonably foreseeable." Federal regulations define "coastal effect" as "any reasonably foreseeable effect on any coastal use or resource" resulting from the proposed activity.

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In their requests for review, the states assert concerns regarding presumed environmental effects to marine mammal populations as well as commercial and recreational activities. IAGC's members take concerns related to the potential impact of their surveys seriously and are committed to conducting their operations in an environmentally responsible manner. Experience shows that seismic activities, tourism, fisheries, and marine life can and do coexist successfully.¹ However, the proposed activity under review is NMFS' authorization of incidental take of marine mammals pursuant to the Marine Mammal Protection Act, *not* authorization of the underlying activity to conduct geophysical surveys which is permitted by BOEM. As such, OCRM's approval or disapproval of a state's request must be limited to whether NMFS' proposed authorization of incidental take of marine mammals poses reasonably foreseeable coastal effects. Atlantic coastal states, including Delaware and Maryland, previously sought and obtained review of pending BOEM permits to ensure consistency of the proposed G&G activities with their coastal uses and resources.

Further, there is a question whether the states have missed the window to make a consistency review request as the States' requests are arguably late and have been waived. 15 CFR 930.54(a)(1) requires the State agency to provide notification to "Federal agencies, applicants, and the Director . . . within 30 days from notice of the license or permit application, that has been submitted to the approving Federal agency, otherwise the State agency waives its right to review the unlisted activity." The 30-day window to make a consistency review request began when the IHA authorizations were submitted to, and deemed complete by, the NMFS Office of Protected Resources. In addition, the states had constructive notice of the requests when the IHA applications were made available to the public on NMFS' website.

According to the June 6, 2017 NMFS' Federal Register Notice of Proposed IHAs, WesternGeco submitted their initial request for authorization on March 3, 2015, with a revised request that NMFS determined "adequate and complete" on February 17, 2016, and constructive notice was provided by publication to NMFS' website in February 2016. CGG submitted its initial request for authorization on December 21, 2015, followed by revised versions with a final revision filed on May 26, 2016. *See* 82 Fed. Reg. 26,244 (June 6, 2017). It appears the initial publication CGG's request was provided on NMFS' website on June 1, 2017. Maryland and Delaware filed their requests for unlisted activity review on July 6, 2017, more than 30 days after constructive notice and publication of both requests for authorization on NMFS' website.

Important to note, CGG's proposed Atlantic 2D Seismic Program, shown in Figure 1 below, extends from Georgia to Virginia and consists of 53 lines in a 20 km (12

¹ *See, e.g.,* BOEM, *Final EIS for Gulf of Mexico OCS Oil and Gas Eastern Planning Area Lease Sales 225 and 226*, at 2-22 (2013) ("Within the [Central Planning Area], which is directly adjacent to the [Eastern Planning Area], there is a long-standing and well-developed OCS program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations.").

mi) by 20 km (12 mi) orthogonal grid totaling an area of 28,670 line-km and therefore does not cross the administrative territory of Maryland and Delaware. Seismic activities will be carried out a minimum of 80 km (50 mi) from shore in water depths ranging between 100 m (328 ft) to over 5,000 m (16,404 ft). Specifically, the survey area is around 104 km (64 mi) from Maryland's coast line and 134 km (84 mi) from Delaware's coast line.

I. DESCRIPTION OF PROPOSED ACTIVITY

A. NMFS' Authorization of Incidental Take of Marine Mammals

As part of the permitting process for data acquisition on the Atlantic OCS, IAGC members have applied for coverage, in the form of IHAs issued pursuant to the MMPA for any incidental harassment of marine mammals. As a prerequisite to incidental take authorization, the MMPA requires the permitting agency to find that the authorized take will have no more than a "negligible impact" on marine mammals. 16 U.S.C. § 1371(a)(5)(A), (D). Under the MMPA, NMFS has the authority to grant or deny, or to reasonably condition, marine mammal take authorizations. However, NMFS lacks any authority to establish any presumptive caps or limits on the underlying activities. *See* 16 U.S.C. § 1371(a)(5)(A)(i) (Secretary "shall allow" incidental taking that meets applicable statutory standards). The proposed action under consideration for potential state consistency review is the incidental take authorization and not the underlying proposed G&G activities in the Atlantic OCS. *See Center for Biological Diversity v. Kempthorne*, 588 F. 3d 701 (9th Cir. 2009) (MMPA incidental take authorization only authorize incidental take, not the underlying activity).

On June 6, 2017, NMFS published notice of proposed IHAs, including in response to the two requests from WesternGeco and CGG that are the subject of the state's activity review, for the take of marine mammals incidental to geophysical surveys in support of hydrocarbon exploration in the Atlantic Ocean. Based, in part, on the extensive record of agency findings, observational data, and research regarding the potential effects of seismic survey activities on marine mammals in the Gulf of Mexico, the Arctic, and Cook Inlet, in which no significant effects on any marine mammal species or stock has been observed, the IAGC concurs with NMFS's finding that the Proposed IHAs will have a negligible impact on marine mammal species and stocks. IAGC's incorporates by reference, and provide as an attachment, the comment letter dated July 21, 2017, in response to NMFS' request for comments on the proposed IHAs.

For over 40 years, the federal government and academic scientists have studied the potential impacts of G&G activities on marine mammal populations and have concluded that any such potential impacts are insignificant. This conclusion has been publicly reaffirmed on multiple occasions by BOEM:

To date, there has been no documented scientific evidence of noise from air guns used in geological and geophysical

(G&G) seismic activities adversely affecting marine animal populations or coastal communities. This technology has been used for more than 30 years around the world. It is still used in U.S. waters off of the Gulf of Mexico with no known detrimental impact to marine animal populations or to commercial fishing.

BOEM, Science Notes, <http://www.boem.gov/BOEM-Science-Note-August-2014/> (Aug. 22, 2014); *see also* BOEM, Science Notes, <https://www.boem.gov/BOEM-Science-Note-March-2015/> (Mar. 9, 2015) (there has been “no documented scientific evidence of noise from air guns used in geological and geophysical (G&G) seismic activities adversely affecting animal populations”). These statements accurately summarize the best available scientific information regarding the potential effects of G&G activities on marine mammals. There are no other data to the contrary.

Indeed, the history of formal assessments of offshore seismic activities demonstrates that levels of actual incidental take are far smaller than even the most balanced pre-operation estimates of incidental take.² More than four decades of

² *See, e.g.,* BOEM, *Final EIS for Gulf of Mexico OCS Oil and Gas Eastern Planning Area Lease Sales 225 and 226*, at 2-22 (2013), <http://www.boem.gov/BOEM-2013-200-v1/> (“Within the CPA, which is directly adjacent to the EPA, there is a long-standing and well developed OCS Program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations.”); BOEM, *Final EIS for Gulf of Mexico OCS Oil and Gas Western Planning Area (WPA) Lease Sales 229, 233, 238, 246, and 248 and Central Planning Area (CPA) Lease Sales 227, 231, 235, 241, and 247*, at 4-203 (v.1) (2012), http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/BOEM-2012-019_v1.aspx (WPA); *id.* at 4-710 (v.2), http://www.boem.gov/Environmental-Stewardship/Environmental-Assessment/NEPA/BOEM-2012-019_v2.aspx (CPA) (“Although there will always be some level of incomplete information on the effects from routine activities under a WPA proposed action on marine mammals, there is credible scientific information, applied using acceptable scientific methodologies, to support the conclusion that any realized impacts would be sublethal in nature and not in themselves rise to the level of reasonably foreseeable significant adverse (population-level) effects.”); BOEM, *Final Supplemental EIS for Gulf of Mexico OCS Oil and Gas WPA Lease Sales 233 and CPA Lease Sale 231*, at 4-30, 4-130 (2013), http://www.boem.gov/uploadedFiles/BOEM/BOEM_Newsroom/Library/Publications/2013/BOEM%202013-0118.pdf (reiterating conclusions noted above); MMS, *Final Programmatic EA, G&G Exploration on Gulf of Mexico OCS*, at III-9, II-14 (2004), http://www.nmfs.noaa.gov/pr/pdfs/permits/mms_pea2004.pdf (“There have been no

worldwide seismic surveying and scientific research indicate that the risk of physical injury to marine life from seismic survey activities is extremely low. For example, as BOEM concludes in its GOM DPEIS, “within the GOM, there is a long-standing and well-developed OCS [oil and gas] Program (more than 50 years) and there are no data to suggest that activities from the previous OCS Program are significantly impacting marine mammal populations.” DPEIS at 4-77.³

In addition, a 2016 report from the National Academy of Sciences, Ocean Studies Board (the “NAS Report”),⁴ makes the following findings regarding marine sound from seismic acoustic sources:

documented instances of deaths, physical injuries, or auditory (physiological) effects on marine mammals from seismic surveys.”); *id.* at III-23 (“At this point, there is no evidence that adverse behavioral impacts at the local population level are occurring in the GOM.”); LGL Ltd., *Environmental Assessment of a Low-Energy Marine Geophysical Survey by the US Geological Survey in the Northwestern Gulf of Mexico*, at 30 (Apr.-May 2013), http://www.nmfs.noaa.gov/pr/pdfs/permits/usgs_gom_ea.pdf (“[T]here has been no specific documentation of TTS let alone permanent hearing damage, i.e., PTS, in free-ranging marine mammals exposed to sequences of airgun pulses during realistic field conditions.”); 75 Fed. Reg. 49,759, 49,795 (Aug. 13, 2010) (issuance of IHA for Chukchi Sea seismic activities (“[T]o date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to airgun pulses, even in the case of large airgun arrays.”)); MMS, *Draft Programmatic EIS for OCS Oil & Gas Leasing Program, 2007-2012*, at V-64 (Apr. 2007) (citing 2005 NRC Report), <http://www.boem.gov/Oil-and-Gas-Energy-Program/Leasing/Five-Year-Program/5and6-ConsultationPreparers-pdf.aspx> (MMS agreed with the National Academy of Sciences’ National Research Council that “there are no documented or known population-level effects due to sound,” and “there have been no known instances of injury, mortality, or population level effects on marine mammals from seismic exposure”).

³ See also RPS. 2015. Protected Species Mitigation and Monitoring Report: U.S. Geological Survey 2-D Seismic Reflection Scientific Research Survey Program: Mapping the U.S. Atlantic Seaboard Extended Continental Margin and Investigating Tsunami Hazards, in the northwest Atlantic Ocean, at 37-38, https://www.nsf.gov/geo/oce/envcomp/usgslangseth_2014iha_monrepphase2.pdf (“All potential marine mammal takes for both surveys combined (4) represents 0.02 percent of the total takes authorized for marine mammals for the survey.”) (emphasis added).

⁴ National Academies of Sciences, Engineering, and Medicine. 2016. *Approaches to Understanding the Cumulative Effects of Stressors on Marine Mammals*. Washington, DC: The National Academies Press. doi: 10.17226/23479. <https://www.nap.edu/download/23479#>. A copy of the NAS Report is provided as

- “The National Research Council report *Marine Mammal Populations and Ocean Noise* (NRC, 2005) noted that: ‘No scientific studies have conclusively demonstrated a link between exposure to sound and adverse effects on a marine mammal population.’ That statement is still true....” (NAS Report at 16);
- “Evidence of the effects of noise on marine mammal populations is largely circumstantial or conjectural” (NAS Report at 28);
- “The probability of marine mammals experiencing PTS [injury] from anthropogenic activities will likely be sufficiently low as to preclude any population-level effects” (NAS Report at 35);
- “Miller et al. (2009) conducted controlled approaches of a commercial seismic survey vessel to make pass-by’s of sperm whales in the Gulf of Mexico. The whales, which were exposed to received levels varying from 120-147 dBRMS at ranges varying from 1.4-12.8 km, did not change their direction of travel or behavioral state in response to exposure, but did decrease the energy they put into swimming and showed a trend for reduced foraging. Madsen et al. (2002) studied responses of sperm whales in Norwegian waters to seismic surveys at ranges > 20 km, and reported no responses at exposure ranging up to 123-130 dBRMS.” (NAS Report at 56).

Consistent with BOEM’s GOM-related findings and the NAS Report’s findings, there are well-documented examples of long-term exposures of acoustically sensitive species where no biologically significant chronic or cumulative impacts have occurred. For example, oil and gas seismic exploration activities have been regularly conducted in the Beaufort and Chukchi Seas of the Arctic Ocean for decades, with regular monitoring and reporting to NMFS under the auspices of MMPA incidental take authorizations issued since the early 1990s. During this lengthy period of acoustic exposures, and despite annual lethal takes by Alaska Natives engaged in subsistence activities, bowhead whales have consistently increased in abundance to the point that they are believed to have reached carrying capacity. Similarly, no effects of G&G activities have been observed in Arctic ice seal populations.⁵

Attachment ___ to this letter, for NMFS’s consideration and for inclusion in the administrative record.

⁵ See, e.g., 84 Fed. Reg. 25,829, 25,834 (May 1, 2012) (“Bowhead whales have continued to travel to the eastern Beaufort Sea each summer despite seismic exploration in their summer and autumn range for many years (Richardson *et al.* 1987), and their numbers have increased notably (Allen and Angliss 2010). Bowheads also have been observed over periods of days or weeks in areas ensounded repeatedly by seismic pulses (Richardson *et al.* 1987; Harris *et al.* 2007.”); *id.* at 25,837 (“There is no specific evidence that exposure to pulses of air-gun sound can cause PTS [physical injury] in any marine mammal, even with large arrays of air-guns.”); *id.* at 25,838 (“To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air-gun pulses, even in the case of large air-gun arrays.”); *id.* at 25,839 (“Thus, the proposed activity is not expected to have any habitat-related effects on

Finally, BOEM's Environmental Studies Program has spent more than \$50 million on protected species and sound-related research over more than four decades without finding evidence of adverse effects. See <http://www.boem.gov/BOEM-Science-Note-August-2014/> (*Science Notes*, Aug. 22, 2014) ("Since 1998, BOEM has partnered with academia and other experts to invest more than \$50 million on protected species and noise-related research."). The geophysical and oil and gas industries, the National Science Foundation, the U.S. Navy, and others have spent a comparable amount of money on researching potential impacts of anthropogenic sound on marine life and have found no evidence of biologically significant effects to populations. See www.soundandmarinelife.org; <https://www.nsf.gov/geo/oce/envcomp/>; <http://greenfleet.dodlive.mil/environment/lmr/>; see also <http://www.brahss.org.au/content/project.html>.

B. 2D Seismic Surveys – Towed Streamers

The proposed activity under review is the issuance of IHAs incidental to proposed 2D seismic surveys in the Atlantic OCS. Seismic surveys are the only feasible technology available to accurately image the subsurface before a single well is drilled. BOEM currently estimates that the Mid- and South Atlantic OCS holds at least 4.72 billion barrels of oil and 37.5 trillion cubic feet of natural gas. Although these estimates are impressive, it is widely believed that modern seismic imaging using the latest technology will enable BOEM to more accurately evaluate the Atlantic OCS resource base. The industry's advancements in geophysical technology – including seismic reflection and refraction, gravity, magnetics, and electromagnetic – will provide more realistic estimates of the potential resource. By utilizing these tools and by applying increasingly accurate and effective interpretation practices, IAGC's members can better locate and dissect prospective areas for exploration.

For the energy industry, modern seismic imaging reduces risk by increasing the likelihood that exploratory wells will successfully tap hydrocarbons and decreasing the number of wells that need to be drilled in a given area, reducing associated safety and environmental risks and the overall footprint for exploration. The use of modern seismic technology is similar to ultrasound technology—a non-invasive mapping technique built upon the simple properties of sound waves. Because survey activities are temporary and

prey species that could cause significant or long-term consequences for individual marine mammals or their populations."); 75 Fed. Reg. 49,760, 49,795 (Aug. 13, 2010) ("To date, there is no evidence that serious injury, death or stranding by marine mammals can occur from exposure to air-gun pulses, even in the case of large air-gun arrays."); see also Reichmuth, C., Ghoul, A., Sills, J., Rouse, A. and B. Southall. 2016. Low-frequency temporary threshold shift not observed in spotted or ringed seals exposed to single air gun impulses, *J. Acoust. Soc. Am.*, 140: 2646-2658 ("There was no evidence that these single seismic exposures altered hearing – including in the highest exposure condition, which matched previous predictions of temporary threshold shift (TTS) onset The absence of observed TTS confirms that regulatory guidelines (based on M-weighting) for single impulse noise exposures are conservative for seals.").

transitory, it is the least intrusive and most cost-effective means to understanding where recoverable oil and gas resources likely exist in the Mid- and South Atlantic OCS.

To carry out these surveys, marine vessels use acoustic arrays, most commonly as a set of compressed air chambers, to create seismic pulses. A predominantly low-frequency sound pulse is generated by releasing compressed air into the water as the vessel is moving. The pulses are bounced off the layers of rock beneath the ocean floor. The returning sound waves are detected and recorded by hydrophones that are spaced along a series of cables that are towed behind the survey ship. Seismologists then analyze the information with computers to visualize the features that make up the underground structure of the ocean floor. Once the data is processed, geophysicists interpret it and integrate other geoscientific information to make assessments of where oil and gas reservoirs may be accumulated. Based largely on this information, exploration companies will decide where, or if, to conduct further exploration for oil and gas.

Two-dimensional surveys are so-called because they only provide a 2D cross-sectional image of the Earth's structure. These surveys are typically used for geologic research, initial exploration of a new region, and to determine data quality in an area before investing in a 3D survey. 2D towed-streamer surveys are acquired with a single vessel usually towing a single air source array and a single streamer cable. The streamer is a polyurethane-jacketed cable containing several hundred to several thousand sensors, most commonly hydrophones. The air source array directs energy downward towards the ocean floor. An integrated navigational system is used to keep track of where the air sources are activated, the positions of the streamer cable, and the depth of the streamer cable. The end of the cable is tracked with global positioning system (GPS) satellites, and tail buoys are attached at the end. Radar reflectors are routinely placed on tail buoys for detection by other vessels, and automatic identification system (AIS) devices are also routinely integrated into the tail buoys.

Ships conducting 2D surveys are typically 30-90 m (100-300 ft) long and tow a single-source array 200-300 m (656-984 ft) behind them approximately 5-10 m (16-33 ft) below the sea surface. The source array often consists of three subarrays, with six to twelve air source elements each, and measures approximately 12.5-18 m (41-60 ft) long and 16-36 m (52-118 ft) wide. Following behind the source array by 100-200 m (328-656 ft) is a single streamer approximately 5 to 12 or more km (3.1-7.5 mi) long. The ship tows this apparatus at a speed of approximately 3 to 5 knots. Approximately every 10-15 seconds (i.e., a distance of 23-35 m [75-115 ft] for a vessel traveling at 4.5 kn [8.3 km/hr]), the air source array is activated. The actual time between activations varies depending on ship speed and the desired spacing.

Typical spacing between ship-track lines for 2D surveys, which is also the spacing between adjacent streamer line positions, is greater than a kilometer. Lines can transect each other and can be parallel, oblique or perpendicular to each other. 2D towed-streamer surveys are normally regional, covering a large area of ocean so that

activity is not always limited to a particular area. 2D surveys can provide high resolution imaging with tight line spacing intervals in shallow areas.

2D surveys can cover a larger area with less data density in less detail, resulting in a lower cost per area covered. Geophysical contractors often have proprietary methods of data acquisition that may vary depending on their seismic target and data-processing capabilities, making each contractor's dataset unique. While surveying, and after a prescribed ramp-up of the output of the array to full-operation intensity, a vessel will travel along a linear track for a period of time until a full line of data is acquired. Upon reaching the end of the track, the ship takes typically 2 - 6 hr to turn around and start along another track, varying depending on the spacing between track lines, the length of track lines, and the objectives of a specific survey. Some 2D surveys might include only a single long line. Others may have numerous lines, with line spacings of 2 km in some cases, and 10 km in other cases. Data acquisition generally takes place day and night and may continue for days, weeks, or months, depending on the size of the survey area. Data acquisition is not, however, continuous. A typical seismic survey experiences approximately 20 to 30 percent of non-operational downtime due to a variety of factors, including technical or mechanical problems, standby for weather or other interferences, and performance of mitigation measures (e.g., ramp-up, pre-survey visual observation periods, and shutdowns).

II. MARINE MAMMALS

More than four decades of worldwide seismic surveying and scientific research indicate that the risk of direct physical injury to marine mammals is extremely low, and currently there is no scientific evidence demonstrating biologically significant negative impacts on marine life populations. *See, e.g., 77 Fed. Reg. 25,829, 25,838 (May 1, 2012) (issuance of IHA for Beaufort Sea seismic activities ("To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air-gun pulses, even in the case of large air-gun arrays."); DEIS for Gulf of Mexico OCS Eastern Planning Areas Lease Sales 225 and 226 (BOEM 2013-0116) ("Within the [Gulf of Mexico Central Planning Area],...there is a long-standing and well-developed OCS Program (more than 50 years); there are no data to suggest that activities from the preexisting OCS Program are significantly impacting marine mammal populations."); LGL Ltd., Environmental Assessment of a Low-Energy Marine Geophysical Survey in the Northwestern Gulf of Mexico, at 30 (Apr.- May 2013) ("[T]here has been no specific documentation of [temporary threshold shift] let alone permanent hearing damage, i.e., [permanent threshold shift], in free-ranging marine mammals exposed to sequences of airgun pulses during realistic field conditions.")*.

While seismic operations can be detected at great distances under certain oceanographic conditions and locations, so can sound waves generated by earthquakes

and baleen whale calls.⁶ The deep sound channel in the Atlantic OCS, often cited for the notion that sound from seismic operations can be detected outside of a survey's established exclusion zone, does not extend onto the continental shelf off the mid-Atlantic region. Furthermore, marine animals would need to be present in the deep sound channel to receive the higher levels of sound in the deep sound channel and few species dive that deep in the Atlantic sites of interest; this is especially true for the baleen whale species of greatest concern. Seismic sound is expected to decline to ambient levels within tens of kilometers, not thousands. The seismic air source array is engineered to direct its energy downward, rather than laterally, which the National Marine Fisheries Service admits is in itself a mitigation measure.⁷ In addition, seismic energy sources are predominantly low frequency, below the hearing range of many marine species. For any sound that is transmitted horizontally, the signal strength decreases rapidly and even in these unusual circumstances, is at such low frequency that it does not cause injury to marine mammals. Sound that is below 100 dB in water – even if it travels hundreds or thousands of km – is about the equivalent to a whisper, since normal baseline sound levels in the ocean, at frequencies below 200-300 HZ, are generally 80-90 dB (in some areas such as the busy ports of the Atlantic coast, ambient sound may be as high as 110-120 dB due to ship noise).⁸

What evidence there is of potential behavioral disturbance from seismic operations suggests minor and transitory effects, such as temporarily leaving the survey area, and these effects “have not been linked to negative impacts on populations.”⁹ Nevertheless, industry funds independent research to further our understanding of the effects of seismic surveys on marine life. This is helping to remove uncertainties about possible effects of seismic surveys.

⁶ Nieuirkirk, SL, Mellinger DK, Moore SE, Klinck K, Dziak RP, and Goslin J. 2012. Sounds from airguns and fin whales recorded in the mid-Atlantic Ocean, 1999-2009. *J Acoust Soc Am* 131(2):1102-1112; Munk W, Worcester P, and Wunsch C. 1995. *Ocean Acoustic Tomography*. Cambridge U Press, Cambridge, UK.

⁷ *New Jersey v. National Science Foundation*, 3:14-cv-0429 (US Dist. Ct. New Jersey), Federal Defendants' Brief in Opposition to Plaintiffs' Motion for Declaratory and Injunctive Relief at 25 (July 7, 2014).

⁸ Richardson WJ, Greene Jr. CR, Malme CI, and Thomson DH. 1995. *Marine Mammals and Noise*. Academic Press, NY. See also Acoustic Ecology Institute, *Seismic Surveys at Sea: The contributions of airguns to ocean noise*. August 2005 (An air source array with a source level of 200 – 230 dB “drops quickly to under 180 dB (usually within 50- 500 m depending on source level and local conditions), and continues to drop more gradually over the next few kilometers, until leveling off at somewhere near 100 dB.”); IAGC. 2014. *Fundamentals of Sound in the Marine Environment* (Due to the different environmental properties of water and air, “62 dB must be subtracted from any sound measurement under water to make it equal to the same sound level in the air.”), available at: <http://www.iagc.org/files/5043/>; University of Rhode Island, *Sound levels of common sounds in air re 20 µPa*, 2013, available at: <http://www.dosits.org/science/soundsinthesea/airwater>.

⁹ BOEM, *The Science Behind the Decision: Answers to Frequently Asked Questions about the Atlantic Geological and Geophysical Activities Programmatic Environmental Impact Statement*, August 22, 2014.

III. SEA TURTLES, FISH & INVERTEBRATES¹⁰

The proposed activity requested for state consistency review, the authorization of the incidental take of marine mammals, does not cover the take or in any way affect sea turtles, fish or invertebrates. Regardless, the best available science indicates that seismic surveys, even in preexisting active OCS programs in the Gulf of Mexico, do not result in any significant impact to sea turtles. *See supra* note 1 at 2-23 (“no significant cumulative impacts to sea turtles would be expected as a result of the proposed exploration activities when added to the impacts of past, present, or reasonably foreseeable oil and gas development in the area, as well as other ongoing activities in the area”); BOEM, *Final EIS for Gulf of Mexico OCS Oil and Gas Western Planning Area Lease Sales 229, 233, 238, 246, and 248 and Central Planning Area (CPA) Lease Sales 227, 231, 235, 241, and 247*, at 4-235, 4-741 (“[T]here are no data to suggest that routine activities from the preexisting OCS Program are significantly impacting sea turtle populations.”). Furthermore, sea turtles are not as sensitive to sound as marine mammal species. *See* PEIS, Appx. I. Regardless, seismic surveys shutdown for sea turtles detected within a designated exclusion zone and work with NMFS to employ any necessary protective measures.

Marine seismic surveys have been conducted since the 1950s and experience shows that fisheries and seismic activities can and do coexist. There has been no observation of direct physical injury or death to free-ranging fish caused by seismic survey activity, and there is no conclusive evidence showing long-term or permanent displacement of fish. Any impacts to fish from seismic surveys are short-term, localized and are not expected to lead to significant impacts on a population scale.

As discussed in detail above, seismic vessels move along a survey tract in the water creating a line of seismic impulses. As the seismic vessel is in motion, each signal is short in duration, local and transient. Fish will often react to these pulses by temporarily swimming away from the seismic air source. Since seismic surveys are a moving sound source, impacts on fish are inherently local and short-term. While some studies have shown that various life stages of fish and invertebrate can be physically affected by exposure to seismic surveys, in all of these cases, the subjects were very close

¹⁰ For more information, *see* Science for Environment Policy, Future Brief: Underwater Noise, European Commission, June 2013: <http://ec.europa.eu/environment/integration/research/newsalert/pdf/FB7.pdf>; “Stocks at a Glance – Status of Stocks” 2011, U.S. Department of Commerce, NOAA: www.nmfs.noaa.gov/stories/2012/05/05_14; Boeger, W.A., Pie, M.R., Ostrensky, A., Cardoso, M.F., 2006. The Effect of Exposure to Seismic Prospecting on Coral Reef Fishes; Brazil. *J. Oceanogr.* 54, 235-239; 3D marine seismic survey, no measurable effects on species richness or abundance of a coral reef associated fish community. *Mar. Pollut. Bull.* (2013), <http://dx.doi.org/10.1016/j.marpolbul.2013.10.031>; Hassel, A., Knutsen, T., Dalen, J., Skaar, K., Lokkeborg, S., Misund, O.A., Osten, O., Fonn, M., Haugland, E.K., 2004. Influence of seismic shooting on the lesser sand eel. *ICES J. Mar. Sci.* 61, 1165-1173; Pena, H., Handegard, N.O. and Ona, E. 2013. Feeding herring schools do not react to seismic air gun surveys. *ICES J. Mar. Sci.* <http://icesjms.oxfordjournals.org/content/70/6/1174.short?rss=1>; Saetre, R. and E. Ona, 1996. Seismic investigations and damages on fish eggs and larvae; an evaluation of possible effects on stock level. *Fisken og Havet* 1996:1-17, 1-8.

to the seismic source or subjected to exposures that are virtually impossible to occur under natural conditions. In addition, many marine crustaceans such as horseshoe crabs congregate in bays and nearshore areas where seismic activities are not proposed to occur.

Sounds from active acoustic sound sources such as seismic surveys may result in fish temporarily moving away from the sound source, potentially causing a localized reduction in fish catch in close proximity to the seismic source. There is no conclusive evidence, however, showing long-term or permanent displacement of fish. Similar seismic surveys conducted for research in the Atlantic OCS in the past did not result in any noticeable effects on commercial or recreational fish catches (based on a review of NMFS data from months surveys were conducted and noting “there was absolutely no evidence of harm to marine species” nor fish).¹¹ During seismic surveys, a vessel exclusion zone is maintained around the survey vessel and its towed streamer arrays to avoid interruption of commercial fishing operations, including setting of fishing gear.

A recent report published in *Nature Ecology & Evolution* (22 June 2017, Volume 1; Article Number 0195) purports to demonstrate, but does not prove the conclusion that seismic survey air sources negatively impact zooplankton. The small sample size, variability in the baseline and experimental data, and the large number of speculative conclusions that appear inconsistent with the data collected over a two-day period undermine confidence in the reported values for the degree of impact. Both statistically and methodologically, this project falls short of what would be needed to provide a convincing case for adverse effects from geophysical survey operations.

In addition, because the sound output from a seismic survey is immediate and local, there is no contaminate residue or destruction of habitat. However, prior to G&G permit approval in the Atlantic OCS, site-specific environmental assessments will include an Essential Fish Habitat (“EFH”) assessment to determine whether the specific activity and location would cause a significant adverse effect to fisheries and EFH.

IV. MITIGATION MEASURES

IAGC supports implementation of mitigation measures that are commensurate to the potential risk and supported by the best available science, and its members comply with mitigation and monitoring measures required after BOEM and NMFS conduct site-specific environmental assessments. Measures commonly used by the seismic industry including timing seismic surveys to avoid known areas of biological significance, such as whale foraging or breeding areas or avoiding seasonal marine life occurrences and known migration areas, such as the North Atlantic Right Whale time-area closures identified in the Final Programmatic Environmental Impact Statement for Proposed G&G Activities in the Mid- and South Atlantic OCS (“PEIS”). See 79 Fed. Reg. 13,074 (Mar. 7, 2014). Before a seismic survey begins, visual monitoring is undertaken to check for the presence

¹¹ See, *supra*, note 3 at 25-26, citing Exhibit D, Higgins Decl. ¶ 21, Exhibit D, Mountain Decl. ¶ 8.

of marine mammals and other marine species within a specific precautionary, or exclusion zone, often using dedicated marine mammal observers (MMOs) or protected species observers (PSOs). Soft-start, or ramp-up, procedures provide a gradual build-up of the seismic sound source and allow marine life to swim away before starting the survey. Further monitoring may be conducted using passive acoustic monitoring technology (PAM), which may detect vocalizing marine mammals during periods of low visibility. In the event marine mammals are detected in the exclusion zone, seismic operations will not begin for a certain time period until the marine mammal moves away. Similarly, a seismic survey will shut down if the marine mammal is observed entering the exclusion zone once operations have begun.

The mitigation measures implemented in the Atlantic OCS will be similar, if not more stringent, than measures previously employed by the industry. And in these past surveys, there have been no observations of injury, death, or stranding to marine life. Conservative acoustic thresholds adopted by the agencies and preventative mitigation measures are intended to prevent any potential impact to marine life. Subsequent environmental impact assessment specific to each pending G&G permit will satisfy NEPA, MMPA and ESA requirements, including evaluation of essential fish habitat and avoidance of disturbance to “special areas, such as sensitive benthic (seafloor) biological communities, national marine sanctuaries, historic and prehistoric sites, and cable or other infrastructure.”¹² Extensive mitigation and monitoring efforts will ensure any significant impacts will be avoided and seismic activities will have no more than a negligible impact on marine mammal stocks.

Thank you for the opportunity to comment on requests from Atlantic coastal states to review proposed Incidental Harassment Authorizations for the incidental take of marine mammals pursuant to proposed G&G activities in the mid- and south Atlantic OCS. IAGC may submit supplemental comments as additional state requests are filed. Should you wish to discuss our submission in more detail please do not hesitate to contact myself or Dustin Van Liew, Director – Regulatory & Governmental Affairs (dustin.vanliew@iagc.org).

Yours sincerely,



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¹² BOEM. Record of Decision, Atlantic OCS Proposed Geological and Geophysical Activities, Mid-Atlantic and South Atlantic Planning Areas, Final Programmatic Environmental Impact Statement, at 2 (August 11, 2014). In addition, BOEM’s Record of Decision and PEIS outlines guidance to prevent discharge of trash and marine debris and requires coordination with Department of Defense and NASA to avoid conflicts with military operations.

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