



August 28, 2015

VIA EMAIL (ITP.Laws@NOAA.gov)

Jolie Harrison
Chief, Permits and Conservation Division Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910

Re: Comments on Incidental Harassment Authorization Applications for the Incidental Taking of Marine Mammals During Geophysical Surveys in the Atlantic Ocean

Dear Ms. Harrison:

This letter provides the comments of the International Association of Geophysical Contractors (“IAGC”), the American Petroleum Institute (“API”), and the National Ocean Industries Association (“NOIA”) (collectively, the “Associations”) in response to the National Marine Fisheries Service’s (“NMFS”) request for comments on four pending Incidental Harassment Authorization (“IHA”) applications for geophysical surveys in the outer continental shelf (“OCS”) of the Atlantic Ocean. We appreciate this opportunity to preliminarily comment on the pending applications, and we strongly support geophysical surveying in the Mid- and South Atlantic OCS, which furthers our common interest in the safe and responsible development of domestic oil and gas reserves.

I. THE ASSOCIATIONS

IAGC is the international trade association representing geophysical services companies that support and provide critical data to the oil and natural gas industry. IAGC members (including companies engaged in geophysical data acquisition, processing and interpretation, geophysical information ownership and licensing, and associated services and product providers) 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 all three of the seismic survey IHA applicants are IAGC members.

API is a national trade association representing over 625 member companies involved in all aspects of the oil and natural gas industry. API's members include producers, refiners, suppliers, pipeline operators, and marine transporters, as well as service and supply companies that support all segments of the industry. API and its members are dedicated to meeting environmental requirements, while economically developing and supplying energy resources for consumers.

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the U.S. OCS. The NOIA membership comprises more than 325 companies engaged in a variety of business activities, including seismic surveying, production, drilling, engineering, marine and air transport, offshore construction, equipment manufacture and supply, telecommunications, finance and insurance, and renewable energy.

II. COMMENTS

A. Approval of IHA applications for Atlantic surveys is consistent with the MMPA and furthers Congressional directives to develop oil and gas reserves in the OCS.

The Marine Mammal Protection Act ("MMPA"), 16 U.S.C. §§ 1361-1407, provides mechanisms for the authorization of the incidental taking of small numbers of marine mammals. 16 U.S.C. § 1371(a)(5)(A)(i); 50 C.F.R. § 216.107. To issue an incidental take authorization, NMFS must find that the proposed activity (i) is limited to a "specified geographical region," (ii) would result in the incidental take of "small numbers" of marine mammals, and (iii) have no more than a "negligible impact" on a marine mammal species or stock. 16 U.S.C. § 1371(a)(5)(A). NMFS has a long and successful history of issuing such authorizations for seismic surveys in the Beaufort and Chukchi Seas, and in Cook Inlet, Alaska.

NMFS's authorization of marine mammal take incidental to exploratory activities in the Atlantic OCS is consistent with the Outer Continental Shelf Lands Act ("OCSLA"), which mandates the "expeditious and orderly development" of the OCS "subject to environmental safeguards," such as those provided under the MMPA. 43 U.S.C. § 1332(3). The U.S. Bureau of Ocean Energy Management ("BOEM") currently estimates that the Mid- and South Atlantic OCS holds at least 4.72 billion barrels of oil and 37.51 trillion cubic feet of natural gas.¹ Although these estimates are impressive, it is widely believed that modern seismic imaging—the only feasible technology that accurately creates a subsurface image before a well is drilled—will aid in better locating and dissecting prospective areas for exploration and provide more realistic estimates of the potential resource. The pending geophysical survey proposals will facilitate the safe and orderly development of oil and gas reserves in the Mid- and South Atlantic OCS.

¹ See <http://www.boem.gov/Assessment-of-Oil-and-Gas-Resources-2014-Update/>.

Seismic modeling not only helps to delineate reserves, it also significantly reduces environmental 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. This reduces the overall environmental impact of oil and gas development by limiting the footprint of exploration. Because survey activities are temporary and transitory, they are 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.

In addition, more than four decades of worldwide seismic surveying and scientific research indicate that the risk of physical injury to marine life from seismic survey activities is extremely low. Currently, there is no scientific evidence demonstrating biologically significant negative impacts to marine life from seismic surveying. As stated by BOEM in its August 22, 2014, *Science Note*:

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.

<http://www.boem.gov/BOEM-Science-Note-August-2014/>.

Finally, it bears mention that IAGC, API, and the oil and gas industry fund independent research to further our understanding of the potential effects of seismic surveys on marine animals including mammals. This helps to reduce uncertainties about the possible effects of seismic surveys. Some of this research, in addition to other frequently cited references regarding the effects of sound on marine life, is reviewed in the annotated bibliography included as Attachment A to the April 29, 2015 comment letter of IAGC, API, and NOIA (which is included in the Appendix attached hereto).

B. The best available science demonstrates that seismic surveys do not cause Level A harassment and, therefore, authorization of Level A harassment is not required.

Under the MMPA, Level A harassment is defined as “any act of pursuit, torment, or annoyance which . . . has the potential to injure a marine mammal or marine mammal stock in the wild.” 16 U.S.C. § 1362(18)(A)(i) (emphasis added); *see also* 50 C.F.R. § 216.3. In addition, NMFS is required to base marine mammal incidental take authorizations on the “best scientific evidence available.” 50 C.F.R. § 216.102(a). We are aware of no scientific evidence demonstrating that seismic activities have resulted in the injury of marine mammals. To the contrary, the history of incidental take authorizations for offshore seismic activities shows that seismic operations have negligible impacts to individual marine mammals and to marine

mammal stocks, and that levels of actual incidental take (Level B) are far smaller than even the most balanced pre-operation estimates of incidental take.²

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 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”).

Given this well-established scientific record, the Associations firmly take the position that the authorization of Level A harassment incidental to seismic surveys is not consistent with the best available science and, therefore, is not warranted or appropriate. In this context, the Associations note that one of the four Atlantic IHA applications requests authorization for Level A harassment. For the reasons stated above and below, the Associations disagree with the projections of Level A harassment set forth in that application.

As a general matter, the Level A take estimates described in the application improperly equate projected received sound levels to take. Potential exposure to certain sound levels does not necessitate that injury may occur. For example, the application estimates 9,017 Level A takes of bottlenose dolphins based only on potential exposures. However, even if 9,017 exposures to 180 dB SPL rms occurs, the best available science demonstrates that temporary threshold shift (“TTS”) will not occur to bottlenose dolphins at this level of exposure. *See infra* § II.C.1. Moreover, it is well-accepted that the assumption that exposure to 180 dB SPL rms causes injury to marine mammals is incorrect and contrary to the best available science.³ NMFS is not bound by this outdated acoustic criteria and, instead, must determine the potential type and levels of take that are “reasonably likely” or “reasonably expected” to occur based on the best scientific evidence available. 50 C.F.R. §§ 216.102(a), 216.103.⁴

More specifically, the subject IHA application appears to contain a number of incorrect assumptions that contribute to incorrect estimates of Level A harassment. Some of these assumptions are as follows:

- The application does not take into account the fact that many, if not all, animals will react to sound and leave an area before they enter areas with sounds levels exceeding the threshold that NMFS assumes will result in Level A harassment. The models used in the application do not appear to incorporate animal behaviors, such as avoidance to “ramping up” sound sources, which would substantially reduce the

³ See Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene, Jr., C.R., Kastak, D., Ketten, D.R., Miller, J.H., Nachtigall, P.E., Richardson, W.J., Thomas, J.A., and Tyack P.L. 2007. Marine mammal noise exposure criteria: Initial scientific recommendations. *Aquatic Mammals*, 33:411-521; Finneran, J.J., and Jenkins, A.K. 2012. Criteria and thresholds for U.S. Navy acoustic and explosive effects analysis. San Diego, California: SPAWAR Systems Center Pacific.

⁴ In fact, NMFS has used other criteria as the basis for recent MMPA incidental take authorizations. *See* 80 Fed. Reg. 46,112, 46,148-49 (Aug. 3, 2015); 80 Fed. Reg. 13,264, 13,280-81 (Mar. 13, 2015).

estimated number of exposures (which, in any event, do not equate to take, as described above).⁵

- The application assumes that Level A take will occur beyond 500 meters from the sound source, but does not propose to power down or shut down operations for detections beyond 500 meters. It is well-established that marine mammal observations can be made well past 500 meters and seismic operators have a longstanding history of successfully employing power down and shut down procedures for marine mammal observations beyond 500 meters and, thereby, avoiding exposure at levels that NMFS incorrectly assumes will result in Level A harassment.
- The application appears to make overly conservative assumptions in its source characterization, which result in abnormally large acoustic propagation ranges. In some cases, these assumed acoustic propagation ranges are more than double the size of the ranges calculated in the other two seismic survey applications, which increases the assumed affected area by a factor of four.⁶

Finally, except for very limited exceptions,⁷ incidental take authorizations have been issued for seismic survey operations for only Level B harassment, not Level A harassment. The extensive record from these authorizations, including substantial monitoring documentation, demonstrates that commonly employed avoidance and mitigation measures (that are less stringent than those proposed in the pending applications) are effective in avoiding Level A harassment and minimizing the amount of Level B harassment. Again, we are aware of no information demonstrating that seismic survey operations have resulted in documented Level A harassment. Based on the extensive scientific record, multiple agency findings, and well-documented monitoring records, the Associations firmly take the position that (1) with the use of

⁵ See, e.g., *Issuance of IHA to Apache Alaska Corp. for Seismic Survey in Cook Inlet*, 79 Fed. Reg. 13,626, 13,636-37 (Mar. 11, 2014); *Issuance of IHA to TGS-Nopec for Seismic Survey in Chukchi Sea*, 78 Fed. Reg. 51,147, 51,160 (Aug. 20, 2013).

⁶ We note that the applicant may correct these, and other, assumptions by submitting a revised IHA application for NMFS's consideration. Such a revised application would appropriately request authorization for only Level B harassment and propose mitigation measures that effectively avoid Level A harassment.

⁷ See, e.g., 80 Fed. Reg. 40,016 (July 13, 2015) (SAExploration IHA for Beaufort Sea survey); 77 Fed. Reg. 65,060 (Oct. 24, 2012) (ION Geophysical IHA for Beaufort Sea and Chukchi Sea survey). In both of these instances, the applicant requested authorization for only Level B harassment, but NMFS nonetheless authorized Level A harassment in the IHA.

proper mitigation measures, seismic survey operations can and do avoid Level A harassment; and (2) the authorization of Level A take incidental to seismic survey operations is therefore not warranted or appropriate.

C. Mitigation programs are effective in limiting and preventing the incidental take of marine mammals.

The best available scientific data and information demonstrate that mitigation programs can effectively minimize and avoid the incidental take of marine mammals as a result of offshore geophysical survey operations. Insofar as we are aware, no seismic activities that have received MMPA incidental take authorizations have caused impacts beyond a temporary change in behavior and there are no known injuries, mortalities, or other adverse consequences to any marine mammal species or stocks.

The majority of IHA applications currently under consideration by NMFS incorporate some of the mitigation measures recommended in the preferred alternative of BOEM's Atlantic Geological and Geophysical Activities Programmatic Environmental Impact Statement ("PEIS").⁸ The Associations commented in detail on these proposed measures. *See* Appendix. For the reasons stated in our previous comment letters, some of the measures proposed by BOEM are not consistent with the best available science and/or are unnecessarily overbroad. Notably, however, BOEM has stated that it will not apply those measures uniformly, but rather will apply certain mitigation measures to fit specific circumstances. We encourage NMFS to also apply only those mitigation measures that are appropriate for specific circumstances and that result in the least practicable adverse impact. Although the IHA applicants are free to voluntarily propose some of the mitigation measures recommended by BOEM, we restate below the reasons why some of those measures are either overly broad or not based on the best available science. We also adopt by reference our previous comments with respect to mitigation measures (*see* Appendix).

1. Exclusion zones

All of the IHA applicants commit to using exclusion zones to prevent marine mammal exposure to sound pressure levels of 180 dB re 1 μ Pa rms or more for cetaceans and 190 dB re 1 μ Pa rms for pinnipeds. Although the PEIS recommends a minimum exclusion zone of 500 m, exclusion zones should be based on the best available science and modeling, and if that modeling demonstrates that exclusion zones of less than 500 meters are warranted, then there is no basis for arbitrarily requiring a minimum exclusion zone of 500 m. This flexibility is consistent with both NMFS's and BOEM's commitments to adaptive management.

⁸ *See* Record of Decision, BOEM PEIS, available at <http://www.boem.gov/Record-of-Decision-Atlantic-G-G/>. The full PEIS, including appendices, is available at <http://www.boem.gov/BOEM-2014-001-v1/>.

The applicants also commit to shutting down seismic arrays where marine mammals are detected in the exclusion zone. The PEIS contains one exception to its proposed mandatory shut down policy—for dolphins that voluntarily enter the exclusion zone. Although this measure is adopted by multiple IHA applicants, we would like to emphasize, for reasons stated in our previous comments, that any shutdown for dolphins that enter the exclusion zone is unwarranted. A recently published study that investigated whether bottlenose dolphin exposure to seismic air pulse at cumulative sound exposure levels of 185-196 dB re 1 $\mu\text{Pa}^2\text{-s}$ results in a noise-induced TTS found that, even at that level of exposure, there was no evidence of TTS.⁹ Additionally, observation reports continue to indicate that there is no significant difference between the frequency of dolphin sightings and acoustic detections during seismic operations, whether the source is active or silent.¹⁰ In sum, mandatory dolphin shutdown mitigation measures, even when the animal does not “voluntarily” enter the exclusion zone, would broadly and substantially impact seismic operations without any corresponding environmental benefit and without any scientific support.

2. Buffer zones between concurrent surveys

Generally, the IHA applicants propose 40 km buffer zones between seismic operations (as recommended in the PEIS), and one applicant proposes a 60 km buffer zone between concurrent surveys. Consistent with our comments on the PEIS, we reiterate here that the best available scientific information does not support buffer zones of 40 km. This measure was not included in NMFS’s Biological Opinion (associated with the PEIS), and BOEM has offered no evidence to support its underlying assumption that marine mammals would utilize the “corridor” that the separation requirement is designed to create. Indeed, in its Record of Decision, BOEM acknowledges “uncertainty about [the] effectiveness of this measure.” Record of Decision at 6.

The IHA applicants are, of course, free to propose mitigation buffer zones that are appropriate for their specific surveys, and to the extent they propose the 40 km buffer zone recommended in the PEIS, they are agreeing to mitigation measures that go above and beyond what is necessary based upon the best available scientific information. The Associations also wish to clarify that they do not support the proposal for 60 km buffer zones, which clearly are not required based on the extensive scientific record. As stated in previous comments, the

⁹ Finneran J.J., Schlundt C.E., Branstetter, B.K., Trickey, J.S., Bowman, V., and Jenkins, K. Effects of multiple impulses from a seismic air gun on bottlenose dolphin hearing and behavior. 137 J. Acoust. Soc. Am. 1634-46 (April 2015).

¹⁰ See Barkaszi, M.J., M. Butler, R. Compton, A. Unietis, and B. Bennet. 2012. Seismic survey mitigation measures and marine mammal observer reports. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2012-015. See also Attachment D to April 29, 2015 letter of IAGC, API, and NOIA (included in Appendix).

Associations recommend either no buffer zone or, alternatively, a 17.5 km buffer zone consistent with standard industry practice.

3. Mandatory “all clear” periods

All of the IHA applicants propose mandatory “all clear” periods, but two of the applicants propose a 30-minute window as opposed to the 60-minute “all clear” period proposed by BOEM in the PEIS. As a practical matter, expanding the standard 30-minute “all clear” period to 60 minutes would substantially increase the duration and cost of seismic surveys, which, in turn, increases safety and environmental risks. Increased survey time will also increase the amount of time that protected species are exposed to the potential effects associated with the presence of vessels.

Moreover, a mandatory 60-minute “all clear” period would be both novel and not supported by the best available science. To our knowledge, a 60-minute “all clear” period has never been required as a condition of any offshore seismic authorization in the United States. In fact, the routine and proven practice is to require a 30-minute or less “all clear” period for marine mammals.¹¹ There is no available information suggesting that the standard practice has not been effective and, to the contrary, all available information demonstrates that the standard practice has been very successful in protecting marine mammals. *See* footnotes 2 and 11. Mitigation measures required in an IHA must be supported by the best available science and limited to those that effect the “least practicable adverse” impact. A 60-minute “all clear” period is not supported

¹¹ Since the ROD was issued, additional MMPA incidental take authorizations that include 15- and 30-minute “all clear” periods have been proposed by NMFS. *See Issuance of IHA to Apache Alaska Corp. for Seismic Survey in Cook Inlet*, 79 Fed. Reg. 13,626, 13,636-37 (Mar. 11, 2014) (requiring 30-minute observation period before startup and after sightings of killer and ESA-listed beluga whales and large odontocetes, but only 15-minute period after sightings of pinnipeds and small odontocetes); *Issuance of IHA to Apache Alaska Corp. for Seismic Survey in Cook Inlet*, 78 Fed. Reg. 12,720, 12,732-33 (Feb. 25, 2013) (providing same requirements, and specifying that the shorter 15-minute clearance period applies to harbor porpoises); *Issuance of IHA to TGS-NOPEC for Seismic Survey in Chukchi Sea*, 78 Fed. Reg. 51,147, 51,154, 51,160 (Aug. 20, 2013) (same); *Issuance of IHA to Shell and WesternGeco for Seismic Surveys in the Beaufort and Chukchi Seas*, 73 Fed. Reg. 66,106, 66,135-36 (Nov. 6, 2008) (requiring 30-minute observation period before ramp-up and 15- or 30-minute delay of ramp-up for sightings of small odontocetes and pinnipeds, or baleen whales and large odontocetes, including ESA-listed species, respectively); *Issuance of ITR for Oil and Gas Activity in Chukchi Sea*, 78 Fed. Reg. 35,364, 35,424, 35,425 (June 12, 2013) (requiring monitoring period of 30 minutes for walrus and ESA-listed polar bears before startup and after sighting); *Issuance of ITR for Oil and Gas Activity in Beaufort Sea*, 76 Fed. Reg. 47,010, 47,052 (Aug. 3, 2011) (same).

by the best available science and is not necessary to achieve the least practicable adverse impact.¹²

4. Vessel Strike Avoidance

In general, the pending IHA applications propose vessel strike avoidance measures that are more than adequate to effectively avoid vessel strikes. For example, the following measures are adopted in the majority of the pending IHA applications:

- Reducing speed to 10 knots or less when transiting across designated areas closed to active seismic operations for North Atlantic Right Whales (“NARW”);
- Maintaining a 500 meter distance from any NARW and a 100 meter distance from any species listed under the Endangered Species Act (“ESA”); and
- Utilizing avoidance measures (e.g., vessel direction or speed alteration) if an ESA-listed species is seen within 100 m of the vessel.

The necessity of these proposed measures should be evaluated in the proper context. Seismic vessels are different than typical vessels due to the substantial amount of specialized equipment that they tow. Operationally, a seismic vessel must maintain forward motion to sustain the equipment spread. The consequence of immediately shifting the engine into neutral due to a marine mammal sighting could be significant equipment damage (potentially in the tens of millions of dollars), weeks of vessel downtime, and additional related safety risks to crew members. As a practical matter, a seismic vessel moving at 3 to 5 knots is very unlikely to strike an ESA-listed marine mammal. For instance, in the event of a sighting of an ESA-listed whale within 100 m of the vessel, the vessel could reasonably be expected to slow (to no less than 3 knots) and turn gently away from the animal, which would effectively avoid a collision and lessen the risk of damage to seismic equipment.¹³

¹² Although a 60-minute “all clear” period is referenced in BOEM’s Record of Decision, BOEM also indicated that “mitigation measures themselves will be reviewed as part of BOEM’s commitment to adaptive management” in “subsequent environmental reviews of site-specific action.” Record of Decision at 8. Moreover, BOEM’s Record of Decision does not dictate the content of MMPA authorizations issued by NMFS, which must be based on the most rational conclusions that NMFS can draw from the best available science.

¹³ See, e.g., *Issuance of IHA to SAExploration, Inc. for Seismic Survey in Cook Inlet*, 80 Fed. Reg. 29,162, 29,176 (May 20, 2015) (“NMFS neither anticipates nor authorizes takes of marine mammals from ship strikes.”); PEIS at xiv (“It is unlikely that survey vessels would strike marine mammals because they would travel slowly during surveys (typically between 4.5-6 knots [kn]).”).

We do not object to the IHA applicants proposing the above-listed vessel avoidance measures so long as they are practical and feasible for the operators. Indeed, some of the IHA applications reasonably provide that these measures will be implemented “when safety allows” or “to the extent practicable.” This acknowledges the inherent limitations of fully operating seismic vessels and important safety concerns balanced against the very low strike risk posed by seismic vessels.

5. Protected species observers (“PSOs”)

All four IHA applications commit to employing trained PSOs to maintain watch for marine mammals, including those protected under the ESA. The use of PSOs is a long-established, effective means of limiting the potential incidental take of cetaceans and pinnipeds.

More broadly, however, we recommend that NMFS not uniformly require implementation of the recommendations described in NOAA Technical Memorandum NMFS-OPR-49, *National Standards for a Protected Species Observer and Data Management Program: A Model Using Geological and Geophysical Surveys* (Nov. 2013) (“Observer Standards”). Although we appreciate the agencies’ attempt to clarify and standardize observer guidelines and requirements, we believe the Observer Standards are flawed in a number of respects and have not yet been subject to public review and input. See May 7, 2014 comment letter of IAGC, API, and NOIA, Attachment A (included in Appendix). Among other things, the standards should encourage adaptive technology, remote monitoring, reduction of health, safety, and environmental risks, and use of an updated reporting form that provides substantive data from observations to inform the need (if any) for additional or revised mitigation measures. Although one of the IHA applicants has voluntarily proposed to adopt the Observer Standards, NMFS should not impose those standards on other current or future applicants.

6. Passive acoustic monitoring (“PAM”)

Three of the four pending IHA applications commit to the use of PAM during all survey activities, whether or not visibility is compromised. The Associations recognize the utility of PAM during periods of low visibility. PAM is one of several monitoring techniques that complements (rather than replaces) traditional visual monitoring. Overall performance and capabilities of PAM are highly dependent on factors such as technical specification of equipment, operational setting, availability of experienced and trained personnel, and the species of marine mammals present in a given area. Use of PAM is therefore not always logistically possible. Moreover, mandatory use of PAM will increase survey cost and require the placement of more personnel on vessels (i.e., four dedicated PAM observers onboard). Accordingly, the Associations urge NMFS to either make the use of PAM optional, or require PAM only for operations at night and in periods of low visibility.

7. Special area avoidance and time-area closures

The four pending IHA applications present varied approaches to special area avoidance and time-area closures, all of which are reasonable means of minimizing and avoiding incidental take. NMFS should evaluate time-area closures on a case-by-case basis and should not require unsupported, blanket restrictions that may or may not apply to a given applicant's proposed program. Each application should be evaluated for the specific program proposed and the mitigation (time-area closures) should be narrowly tailored to only the activities proposed in a given IHA application.

D. Seismic surveys in the Atlantic OCS will not cause cumulatively significant impacts.

There has been no demonstration of population-level effects to marine life from seismic or other geophysical survey activity, individually or cumulatively. BOEM expressly recognizes this fact in its August 22, 2014 *Science Note*, in which it states that “[w]ithin 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.”¹⁴ BOEM similarly concluded in its March 9, 2015, *Science Note* that 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.” <http://www.boem.gov/BOEM-Science-Note-March-2015/>. Moreover, BOEM has spent more than \$50 million on protected species and noise-related research without finding evidence of adverse effects. The geophysical and oil and gas industries, the National Science Foundation, the U.S. Navy, and others have spent a comparable amount on researching impacts of seismic surveys on marine life and have found no evidence of cumulatively significant effects. In short, the best available data and information strongly support a conclusion that there will be no cumulatively significant impact from the surveys that have been proposed for the Mid- and South Atlantic OCS. See PEIS § 4.3.2.

¹⁴ <http://www.boem.gov/BOEM-Science-Note-August-2014/>. Moreover, it is well documented that some marine mammal populations, such as the western Arctic bowhead whale population, have continued to grow in areas where seismic survey occurs. See Allen, B. M., and R. P. Angliss, 2013 Stock Assessment Reports, NOAA-TM-AFSC-277, available at: http://www.nmfs.noaa.gov/pr/sars/2013/ak2013_bowhead.pdf (from 1978 to 2001, Arctic bowhead whale abundance “doubled from approximately 5,000 to approximately 10,000 whales” is growing at a rate of over 3% per year).

III. CONCLUSION

The Associations appreciate NMFS's review of the IHA applications and consideration of these comments. Building on decades of industry experience, the four pending IHA applications set forth aggressive mitigation programs designed to effectively avoid and limit incidental take. Many of the proposed mitigation measures are more stringent than measures that have commonly been employed and, indeed, some of the proposed mitigation measures are unnecessary, based on the best available scientific information. With the use of proper mitigation measures, seismic survey operations can and do avoid Level A harassment and, therefore, the authorization of Level A harassment is not warranted or appropriate. The Associations support the issuance of IHAs for Level B harassment that prescribe mitigation measures that are effective and consistent with the best available data and information.

Sincerely,



Nikki Martin
International Association of Geophysical Contractors
President



Andy Radford
American Petroleum Institute
Sr. Policy Advisor – Offshore



Jeff Vorberger
National Ocean Industries Association
Vice President Policy and Government Affairs

APPENDIX



April 29, 2015

VIA Federal eRulemaking Portal

Mr. Gary D. Goeke
Chief, Environmental Assessment Section
Office of Environment (GM 623E)
Bureau of Ocean Energy Management
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Re: Comments on Applications for G&G Permits in the Mid- and South Atlantic OCS

Dear Mr. Goeke:

This letter provides the comments of the International Association of Geophysical Contractors (“IAGC”), the American Petroleum Institute (“API”), and the National Ocean Industries Association (“NOIA”) (collectively, the “Associations”) in response to the Bureau of Ocean Energy Management’s (“BOEM”) request for comments on the pending Geological and Geophysical (“G&G”) permit applications for the Mid- and South Atlantic Outer Continental Shelf (“OCS”). We appreciate BOEM’s consideration of the comments set forth below.

I. THE ASSOCIATIONS

IAGC is the international trade association representing the industry that provides geophysical services (geophysical data acquisition, processing and interpretation, geophysical information ownership and licensing, and 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 some IAGC members have already filed applications for authorizations relating to such activities.

API is a national trade association representing over 625 member companies involved in all aspects of the oil and natural gas industry. API’s members include producers, refiners,

suppliers, pipeline operators, and marine transporters, as well as service and supply companies that support all segments of the industry. API and its members are dedicated to meeting environmental requirements, while economically developing and supplying energy resources for consumers.

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the U.S. OCS. The NOIA membership comprises more than 325 companies engaged in a variety of business activities, including production, drilling, engineering, marine and air transport, offshore construction, equipment manufacture and supply, telecommunications, finance and insurance, and renewable energy.

II. COMMENTS

A. Contextual Background

BOEM's plan to authorize exploratory activities on the Atlantic OCS is consistent with the Outer Continental Shelf Lands Act, which mandates the "expeditious and orderly development" of the OCS "subject to environmental safeguards." 43 U.S.C. § 1332(3). BOEM currently estimates that the Mid- and South Atlantic OCS holds at least 4.72 billion barrels of oil and 37.51 trillion cubic feet of natural gas.¹ 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 specifically and primarily seismic reflection technology, but also complimentary gravity, magnetics, and electromagnetic technology—will provide more realistic estimates of the potential resource. By utilizing these tools and by applying increasingly accurate and effective interpretation practices, industry operators can better locate and dissect prospective areas for exploration. In short, seismic and other geophysical surveys are the only feasible technologies available to accurately image the subsurface before a single well is drilled. Allowing the pending geophysical survey proposals to proceed, subject to appropriate "environmental safeguards," facilitates—indeed, makes possible—the orderly development of the Mid- and South Atlantic OCS.

For the energy industry, modern geophysical 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, which reduces the overall footprint for exploration. Because survey activities are temporary and transitory, they are the least

¹ See <http://www.boem.gov/Assessment-of-Oil-and-Gas-Resources-2014-Update/>.

intrusive and most cost-effective means to understanding where recoverable oil and gas resources likely exist in the Mid- and South Atlantic OCS.²

In addition, more than four decades of worldwide seismic surveying and scientific research indicate that the risk of direct physical injury to marine life as a result of seismic survey activities is extremely low, and currently there is no scientific evidence demonstrating biologically significant negative impacts to marine life. As BOEM stated in its August 22, 2014 *Science Note*:

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.

Moreover, IAGC, together with the oil and gas industry, funds independent research to further our understanding of the effects of seismic surveys on marine life. This is helping to reduce uncertainties about the possible effects of seismic surveys. Some of this research, in addition to other frequently cited references regarding the effects of sound on marine life, is reviewed in the annotated bibliography included as Attachment A to this letter.³

B. Seismic Survey Activities in the Mid- and South Atlantic OCS Will Have, at Most, a Negligible Impact on Marine Mammals

During the administrative process related to BOEM's issuance of its Final Programmatic Environmental Impact Statement for Proposed G&G Activities on the Mid- and South Atlantic OCS ("PEIS"),⁴ the Associations provided comments that, among other things, explained why BOEM's assessment of marine mammal impacts was flawed and why

² Although different surveys for different purposes may cover the same general area, these surveys are spread out in space and in time. If two or more surveys occur in the same place over a period of time, they are generating different information, designed to appeal to specific, unique customer needs not met by other surveys.

³ Additional technical information regarding different types of seismic surveys is provided in Attachment B.

⁴ BOEM, *Final Programmatic Environmental Impact Statement for Proposed G&G Activities on the Mid- and South Atlantic OCS* (Mar. 2014).

some of the mitigation measures proposed by BOEM were unnecessary and impractical. The Associations incorporate those comments by reference, and we have included a copy of IAGC's comment letter to the final PEIS as Attachment C. We also provide the following information, which is intended to supplement the information and positions presented in the PEIS comments.⁵

1. BOEM's site-specific environmental assessments should provide an accurate evaluation of expected marine mammal impacts

As explained in our PEIS comments, BOEM's evaluation of potential marine mammal impacts at the programmatic level is flawed because it is premised upon an unrealistic scenario in which exploration activities are projected to result in thousands of incidental takes of marine mammals, which BOEM has definitively stated will not actually occur. Indeed, in its response to comments in the Record of Decision associated with the PEIS ("ROD"), BOEM states very clearly that "the numbers estimated for incidental take are higher than BOEM expects would actually occur." ROD at 12; *see also id.* ("the take estimates are based on acoustic and impact models that are by design conservative, which results in an over-estimate of take"). The supposed effects of this "worst case" hypothetical scenario are then addressed in the PEIS with mitigation measures, many of which are similarly unrealistic because they mitigate inaccurately presumed effects.

Setting aside our continuing disagreement with BOEM's approach to the evaluation of marine mammal impacts in the PEIS, we respectfully request that BOEM perform a proper NEPA analysis in its site-specific environmental assessments and evaluate the actual environmental impacts that are expected to occur. For the reasons stated in our comments on the PEIS, such an approach would be consistent with both the law and the best available science. *See* IAGC PEIS Comment Letter § II.A (Attachment C).

2. A 40-km buffer between surveys is unnecessary and impractical

The PEIS recommends an expanded 40-km buffer zone between concurrent seismic surveys "to provide a corridor between vessels conducting simultaneous surveys where airgun noise is below Level B thresholds and approaching ambient levels." PEIS at 2-37. In the PEIS, BOEM acknowledges that there is "uncertainty about [the] effectiveness" of a 40-km buffer requirement and, in its ROD, BOEM states that it will "assess the value of this measure in site-specific environmental analyses . . . and decide whether to include it as a

⁵ Consistent with BOEM's commitment "to adaptive management and the modification of mitigations if warranted by the facts at the site-specific level" (ROD at 11), we encourage BOEM to reconsider the data and information presented in the Associations' comments on the final PEIS as well as the information presented in this comment letter.

condition of a permit or other authorization.” ROD at 10. We reiterate that a 40-km buffer is unnecessary and impractical for the reasons stated in the Associations’ comments on the PEIS. See IAGC PEIS Comment Letter § II.B.2. We also provide the following additional points, and request that BOEM consider this information, in addition to our PEIS comments, as it conducts its site-specific analyses.

Although 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, this notion is only applicable if protected species and marine animals are present in the deep sound channel to receive the higher levels of sound. Few species dive that deep in the areas of the Atlantic Ocean under consideration. In particular, baleen whale species of greatest concern are not known to be present in waters at those depths.

The seismic sound source is engineered to direct its energy downward, rather than laterally, which the National Marine Fisheries Service (“NMFS”) has admitted is itself a mitigation measure.⁷ For any energy that is transmitted laterally, the signal strength decreases rapidly, well below the thresholds NMFS has established for Level B harassment and at such low frequency that it does not cause injury to marine mammals.⁸ Consistent with this information, 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 or biologically significant impacts on marine mammal populations.

⁶ Nieukirk, S.L., Mellinger D.K., Moore S.E., Klinck K., Dziak R.P., 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 See *New Jersey v. National Science Foundation*, 3:14-cv-0429 (D. N.J.), Federal Defendants’ Brief in Opposition to Plaintiffs’ Motion for Declaratory and Injunctive Relief at 25 (July 7, 2014).

⁸ Richardson W.J., Greene Jr. C.R., Malme C.I., and Thomson D.H. 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.”).

Neither BOEM nor NMFS has yet to provide any scientifically supported rationale for the proposed 40-km buffer. Instead, the PEIS concluded the measure “would only potentially slightly reduce acoustic impacts on marine mammals, sea turtles, and other marine biota,” but even then, the effectiveness of the measure is uncertain. ROD at 6. Accordingly, we respectfully request that BOEM decline to adopt the 40-km buffer zone in site-specific environmental assessments and, instead, recommend either no buffer zone or, alternatively, a 17.5-km buffer zone, consistent with standard practice and the best available science. *See* IAGC PEIS Comment Letter § II.B.2.

3. New research demonstrates that seismic impulses have insignificant effects on dolphins

The PEIS recommends a mitigation measure calling for the shutdown of operations if a dolphin enters the acoustic exclusion zone, unless the dolphin is determined by the observer to be voluntarily approaching the vessel. PEIS at 2-11. In our comments on the PEIS, we provided substantial information demonstrating that this proposed measure is contrary to the best available science, impractical, and otherwise unsupported. In those comments, we also directed BOEM to current research being conducted with the support of the E&P Sound and Marine Life Joint Industry Program to study the effects of multiple airgun pulses in odontocetes and, specifically, to study whether bottlenose dolphin exposure to airgun impulses results in temporary threshold shift (“TTS”).⁹ *See* IAGC PEIS Comment Letter § II.B.1. As the public abstract from the study states, “subjects participated in over 180 exposure sessions with no significant TTS observed at any test frequency, for any combinations of range, volume or pressure during behavioral tests.”¹⁰ This research will be published very soon in a peer-reviewed scientific journal.¹¹ We will provide the published paper to BOEM promptly upon its publication, and we request that it be included in the administrative record and considered by BOEM during the permitting process.

⁹ James J. Finneran et al., *Final Report* (2013). TTS in odontocetes in response to multiple airgun impulses. (The Associations understand that a copy of this Final Report was provided by the author to NMFS.)

¹⁰ C.E. Schlundt et al., *Auditory Effects of Multiple Impulses from a Seismic Airgun on Bottlenose Dolphins*, presentation at the Effects of Noise on Aquatic Life Third International Conference, Budapest, Hungary (Aug. 11-16, 2013). The results of this study also are useful to support inclusion of frequency weighting in updated acoustic criteria.

¹¹ Finneran J.J., Schlundt C.E., Branstetter, B.K., Trickey, J.S., Bowman, V., and Jenkins, K. Effects of multiple impulses from a seismic air gun on bottlenose dolphin hearing and behavior. Submitted to *J. Acoust. Soc. Am.* (in review).

Additionally, PSO observation reports continue to indicate that there is no statistically significant difference between the frequency of dolphin sightings and acoustic detections during seismic operations, whether the source is active or silent. Enclosed with this letter as Attachment D is an updated version of an attachment to IAGC's PEIS comments, which includes additional data confirming this conclusion.

In sum, the proposed dolphin shutdown mitigation measure would broadly and substantially impact seismic operations without any corresponding environmental benefit and without any scientific support. For the reasons presented in this letter and in our comments on the PEIS, the Associations respectfully request that BOEM make an express finding that this recommended measure is unsupported and unnecessary.¹² In conjunction with this finding, we also request that BOEM clarify that shutdown is not required for dolphins within the exclusion zone in all circumstances, regardless of whether dolphins are exhibiting bow-riding behavior or any other behavior.

4. BOEM should modify the proposed 60-minute “all clear” requirement

The PEIS recommends that monitoring of the exclusion zone shall “begin no less than 60 min prior to start-up” and that restarting of equipment after a shutdown “may only occur following confirmation that the exclusion zone is clear of all marine mammals and sea turtles for 60 min.” PEIS at C-29. As explained in our comments on the PEIS, this proposed measure is unprecedented and without factual or scientific support. Specifically, IAGC provided numerous examples confirming that the routine, and proven-to-be-effective, practice is to require 15- and 30-minute “all clear” periods—for marine mammals and for ESA-listed species. See IAGC PEIS Comment Letter § II.B.3. In its ROD, BOEM provides no substantive response to this indisputable information. Indeed, since the ROD was issued, additional MMPA incidental take authorizations that include 15- and 30-minute “all clear” periods have been proposed by NMFS.¹³

We sincerely hope that BOEM will reconsider this proposed requirement and work with NMFS to ensure that a reasonable 15- / 30-minute “all clear” requirement is included in the federal authorizations related to seismic activities in the Atlantic Ocean, consistent with

¹² Although BOEM notes that this and other measures were addressed in the draft PEIS, it still must consider comments on these measures as part of its site-specific analyses for the proposed surveys, and it may adjust mitigation requirements based upon those analyses.

¹³ See, e.g., 80 Fed. Reg. 9510, 9524 (Feb. 23, 2015) (proposed Cook Inlet incidental take authorization calling for a 15-minute “all clear” period for small odontocetes and pinnipeds and a 30-minute “all clear” period for large odontocetes); 80 Fed. Reg. 20,084, 20,097 (Apr. 14, 2015) (same provision for proposed Beaufort Sea incidental take authorization).

the well-supported current practice. Expanding the standard 15- / 30-minute “all clear” period to 60 minutes will substantially increase the duration and cost of seismic surveys, which, in turn, increases potential risks. *See* IAGC PEIS Comment Letter § II.B.3.¹⁴

5. There will be no cumulatively significant impact from the proposed surveys

As stated in our PEIS comments, there has been no demonstration of population level effects to marine life from seismic or other geophysical survey activity, individually or cumulatively. BOEM expressly recognizes this fact in its August 22, 2014 *Science Note*, in which it states that “[w]ithin 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.” BOEM similarly concluded in its March 9, 2015 *Science Note* that 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.” Moreover, BOEM has spent more than \$50 million on protected species and noise-related research without finding evidence of adverse effects. The geophysical and oil and gas industries, the National Science Foundation, the U.S. Navy, and others have spent a comparable amount on researching impacts of seismic surveys on marine life and have found no evidence of cumulatively significant effects. In short, for the reasons stated in our comments on the PEIS, and as consistent with the well-established record and BOEM’s public findings, there will be no cumulatively significant impact from the surveys that have been proposed for the Mid- and South Atlantic OCS.

C. Seismic Survey Activities in the Mid- and South Atlantic OCS Will Have, at Most, a Negligible Impact on Fish Populations and Fish Habitat

As part of the G&G permitting process 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

¹⁴ The impact of this and other measures addressed by the Associations is magnified when coupled with the proposed expanded exclusion zones. The Associations reiterate their previous comments that exclusion zones should be based on the best available science, including when the science demonstrates that an exclusion zone of less than 500 m is appropriate. If the minimum 500 m exclusion zone requirement is not applied, IAGC would support the incorporation of power-down procedures to mitigate any potential effects, as described in IAGC’s PEIS comments. *See* Attachment C, footnote 21; *see also, e.g.*, 80 Fed. Reg. at 9524 (Cook Inlet proposed incidental take regulations); 80 Fed. Reg. at 20,097 (Beaufort Sea proposed IHA); 80 Fed. Reg. 14,913, 14,928 (Mar. 20, 2015) (Cook Inlet Proposed IHA); 79 Fed. Reg. 36,730, 36,735 (June 30, 2014) (Notice of Issuance of Beaufort Sea IHA).

to fisheries and EFH. Because the sound output from a seismic survey is immediate and local, there is no contaminate residue or destruction of habitat, and therefore no significant adverse effect to EFH. For the reasons set forth below, seismic survey activities will also not result in any significant adverse effects to fish populations or to fisheries.

Marine seismic surveys have been conducted since the 1950s and experience demonstrates 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 not expected to lead to significant impacts on a population scale.¹⁵

Seismic source vessels move along a survey tract in the water creating a line of seismic impulses. As the seismic source vessel is in motion, each signal is short in duration, local, and transient. Since seismic surveys are a moving sound source, any impacts to fish are inherently local and short term, potentially causing a localized reduction in fish abundance within close proximity to the seismic source.¹⁶ There is no conclusive evidence,

¹⁵ See Attachment A; see also 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.

¹⁶ Although some studies have shown that various life stages of fish and invertebrate species can be physically affected by exposure to sound, in all of these cases, the subjects were very close to the seismic source or subjected to exposures that are virtually impossible to occur under natural conditions. For example, frequently cited experimental studies such as Skalski et al. (1992), Lokkeborg et al. (2010), Engas (1996), and Wardle (2001) employed artificially concentrated sound within hundreds of meters of the fish under observation and the fishing vessels. As Lokkeborg et al. (2012) noted in a recent review of the literature, “Seismic air gun emissions distributed over a large area may thus produce lower sound

(continued . . .)

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 detectable effects on commercial or recreational fish catch, based on a review of NMFS's data from months surveys were conducted, which noted that "there was absolutely no evidence of harm to marine species" (including fish).¹⁷ Additionally, in the Gulf of Mexico, where G&G activities have routinely occurred for over 40 years, seafood harvested from the OCS is worth approximately \$980 million annually and the fishing industry directly supports in excess of 120,000 jobs, suggesting that G&G activities can occur without negatively impacting commercial fisheries.

Finally, seismic and other geophysical surveys also do not result in closing areas to commercial or recreational fishing. During surveys, the survey crews work diligently to maintain a vessel exclusion zone around the survey vessel and its towed streamer arrays to avoid any interruption of fishing operations, including the setting of fishing gear. As with all combined uses of offshore waters, there must be a certain level of coordination by all parties. At sea, coordination is regulated by the U.S. Coast Guard under the International Regulations for Preventing Collisions at Sea, requiring a Local Notice to Mariners specifying survey dates and locations. BOEM has concluded that "there is only a limited potential for space-use conflicts between G&G activities and commercial fishing operations within the area of interest" and any impacts "would be intermittent, temporary, and short term." PEIS at 4-160, 4-161.

III. CONCLUSION

As explained above, the performance of seismic and other geophysical surveys is critical to the federally mandated "expeditious and orderly development" of the Mid- and South Atlantic OCS. A wealth of data and information demonstrates that these surveys will have no more than a temporary, localized, and negligible impact on marine life. The Associations respectfully encourage BOEM to proceed with approving the pending permit applications and to work with NMFS to ensure that only reasonable, well-supported, and effective mitigation measures are included as conditions of the permits and the related federal authorizations.

(. . . continued)

exposure levels and thus have less impact on commercial fisheries." As another example, Aguilar de Soto (2013) exposed scallop larvae to noise at loud volume for up to 90 hours at a distance of 9 centimeters, which is virtually impossible to occur outside of experimental settings.

¹⁷ *New Jersey v. National Science Foundation*, No. 3:14-cv-0429 (D. N.J.), Federal Defendants' Brief in Opposition to Plaintiffs' Motion for Declaratory and Injunctive Relief at 25-26, citing Exhibit D, Higgins Decl. ¶ 21, Exhibit D, Mountain Decl. ¶ 8 (July 7, 2014).

Mr. Gary D. Goeke
April 29, 2015
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We appreciate your consideration of our comments. Should you have any questions, please do not hesitate to contact Nikki Martin at (713) 957-8080.

Sincerely,



Nikki Martin
International Association of Geophysical Contractors
Vice President, Government and Legal Affairs



Andy Radford
American Petroleum Institute
Sr. Policy Advisor – Offshore



Jeff Vorberger
National Ocean Industries Association
Vice President Policy and Government Affairs

ATTACHMENT A

**ANTHROPOGENIC SOUND AND IMPACTS TO MARINE LIFE:
*An Annotated Bibliography of Selected & Frequently Cited References***

IAGC, together with the oil and gas industry, funds independent research to further our understanding of the effects of seismic surveys on marine life. This is helping to remove uncertainties about the possible effects of seismic surveys. Some of this research, in addition to other frequently cited references regarding the effects of sound on marine life, is reviewed in the attached annotated bibliography.

More than four decades of worldwide seismic surveying and scientific research indicate that the risk of direct physical injury to marine life is extremely low, and currently there is no scientific evidence demonstrating biologically significant negative impacts to marine life. As BOEM stated in its August 22, 2014 *Science Note*, "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."

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 or to commercial and recreational fishing activities.

The seismic sound source is engineered to direct its energy downward, rather than laterally. For any energy that is transmitted laterally, the signal strength decreases rapidly and would not cause injury to marine mammals. Research indicates that in-water sounds received at 110-90 dB SPL are comparable to a whisper or soft speech, even if it travels hundreds or thousands of kilometers in water. In some areas, such as the busy ports of the Atlantic coast, ambient sound in the frequencies produced by seismic sources may be as high as 110-120 dB due to ship noise, thereby masking any additional contribution from distant seismic surveys. 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 biologically significant impacts on populations.

More information on our commitment to science can be found at www.soundandmarinelife.org.

**ANTHROPOGENIC SOUND AND IMPACTS TO MARINE LIFE:
An Annotated Bibliography of Selected & Frequently Cited References**

Aguilar de Soto N, Delorme N, Atkins J, Howard S, Williams J, Johnson M. 2013. Anthropogenic noise causes body malformations and delays development in marine larvae. *Scientific Reports* 3, 2831. DOI 10: 1038/srep02831. www.nature.com/scientificreports.

Purports to demonstrate that airgun sound affects development of scallop larvae at levels of 160 dB SPL or lower. But the work has many flaws; an unrealistically long sound, played at much shorter than normal intervals for as much as 90 hours continuous. The sound source used in the experiment was not able to accurately replicate the actual seismic sound and was placed only 9 cm from the test subjects, producing large particle displacement effects of 4-6mm/s velocity, comparable to an SPL of 195 dB SPL. The latter value translates to a distance of a few hundred meters from an actual source, not the hundreds of square kilometers postulated by the authors. The best laboratory culture methods typically yield some variation in survival and development, but this study reported perfect scores for all controls at all stages. The work needs to be replicated by an independent and expert experimentalist.

André M, Solé M, Lenoir M, Durfort M, Quero C, Mas A, Lombarte A, van der Schaar M, López-Bejar M, Morell M, Zaugg S, and Houégnignan L. 2011. Low-frequency sounds induce acoustic trauma in cephalopods. *Front Ecol Environ* 2011; doi: 10.1890/100124. www.frontiersinecology.org. The Ecological Society of America.

Another study where it is difficult to know what to make of the data because of the way the sound was presented and measured. The reported received level is 157 dB re 1 μ Pa, so one can presume that the measurement is of pressure, but whether this is averaged, spectrum level, total energy under the envelope is unclear. Levels up to 175 dB re 1 μ Pa are also reported but it is not clear if that is a single frequency peak or whether the received levels fluctuated around 157 dB to as high as 175 dB. Thus the actual exposure history as SEL for the two hours of exposure is unknown. The sound source is in air and its properties are not provided. Given the impedance mismatch of water the source would have had to be extremely loud to get as much as 157-175 dB SPL into the water. Squid do not have swim bladders or air spaces associated with the ears, so the appropriate value to report is actually particle velocity. This is especially true since the containers were so much smaller than the wavelengths of sound in water at those frequencies (4-30 meters). The sound field inside the containers is bound to be complex and should have been measured. What is most probable is that the squid experienced considerable vibratory motion for two hours, leading to the damage observed; damage that could have never occurred in an open water environment where pressure and particle velocity would never be experienced at those levels for that duration.

Bartol, S.M. and Bartol, I.K. 2011. Hearing Capabilities of Loggerhead Sea Turtles (*Caretta caretta*) throughout Ontogeny: An Integrative Approach involving Behavioral and Electrophysiological Techniques. Final Report, JIP Grant No.22 07-14. Available online at <http://www.soundandmarinelife.org/research-categories/physical-and-physiological-effects-and-hearing/hearing-capabilities-of-loggerhead-sea-turtles-throughout-ontogeny.aspx>

Bolle LJ, de Jong CAF, Bierman SM, van Beek PJG, van Keeken OA, Wessels PW, van Damme CJG, Winter HV, de Haan D, Dekeling RPA. 2012. Common Sole Larvae Survive High Levels of Pile-Driving Sound in Controlled Exposure Experiments. *PLoS One* 7(3): e33052. Doi 10:1371/journal.pone.0033052.

This is a well-designed and properly measured sound exposure experiment, although claims that recordings played from a speaker are able to replicate the impulse time amplitude signature should always be treated with skepticism. Exposures up to 206 dB SEL_{cum} did not produce mortality, with single strike SELs of 186 dB and zero to peak pressures of 32 kPa, erroneously reported as 210 dB re 1 μ Pa² in the abstract.

Booman, C., Dalen, J., Leivestad, H, Levsen, A., van der Meeren, T. and Toklum, K. 1996. Effects from airgun shooting on eggs, larvae, and fry. Experiments at the Institute of Marine Research and Zoological Laboratory, University of Bergen. (In Norwegian. English summary and figure legends). *Fisken og havet* No. 3. 83 pp. as reviewed in:

Dalen, J, Dragsund E, Næss A, and Sand O. 2007. Effects of seismic surveys on fish, fish catches and sea mammals. Report for the Cooperation group – Fishery Industry and Petroleum Industry, Report No. 2007-0512. Available at

<https://www.norskoljeoggass.no/PageFiles/6574/Effects%20of%20seismic%20surveys%20on%20fish,%20fish%20catches%20and%20sea%20mammals.pdf?epslanguage=no>

Observed effects on eggs and larvae only extended 1 to 5 meters from a full seismic array, suggesting that powerful particle motion effects were responsible for damaging the microscopic eggs and larvae. The net effect would be a pencil line damage zone in the wake of the array that would conceivably account for some tiny fraction of 1% of pelagic eggs and larvae distributed in the larger region of interest. Considering that more than 99% of eggs and larvae typically never make it to adulthood, this is an inconsequential effect compared to predation, disease and many other natural density-dependent or density independent causes of mortality.

Castellote, M., Clark, C.W., and Lammers, M.O. 2012. Acoustic and behavioural changes by fin whales (*Balaenoptera physalus*) in response to shipping and airgun noise. *Biological Conservation* 147: 115–122. The authors make a slim statistical case that calls were altered by the presence of shipping noise and in one case a seismic survey. Measured and modeled acoustic data in the Straits of Gibraltar, a very unusual acoustic environment, were extrapolated as a more general case to predict effects of seismic on fin and other related whales generally. This speculation should be supported with data. Inferences of whale displacement by sound were from reductions in numbers of vocalizations, not actual observed movement or changes in distribution.

Engås A, Løkkeborg S, Soldal AV, and Ona E. 1996a. Comparative fishing trials for cod and haddock using commercial trawl and longline at two different stock levels. *J Northw Atl Fish Sci* 19: 83-90.

<http://journal.nafo.int>.

Commercial bottom trawl and longline vessels fished 7 days before, 5 days during, and 5 days after a seismic survey was conducted in the area. Acoustic surveys of fish populations were also conducted, along with a sampling bottom trawl of different dimensions and mesh size than the commercial trawl. Only before and after data were analysed in this paper; “during” data were omitted but are reported in Engås et al (1996b). Because multiple fishing methods were employed on two species of fish, the matrix of data are somewhat complicated: generally, catches declined, smaller fish were caught after the seismic survey, and the ratio of haddock to cod increased after survey. It is difficult to know what to make of the results given the number of uncontrolled and possibly contributing variables that could have confounded the results, including the unusual prolonged proximity of survey vessels to fishing, and the amount of continuous fishing in one place that may have contributed to reduced catches and smaller size fish being caught over time.

Engås A, Løkkeborg S, Ona E, and Soldal AV. 1996b. Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*). *Can J Fish Aquat Sci* 53:2238-2249.

Same study as above but includes data during the survey and more spatial information showing the effects described above tended to be greatest near the seismic survey and less out to the borders of the study area. An independent re-analysis of the data (JRHGeo, unpublished) suggest a different interpretation of declining catches during the before-exposure period suggestive of depletion of stocks within the unusually heavy, concentrated fishing effort within the test area, followed by clearly decreased catches within 1 km of the survey but smooth

decline through pre- and during exposure periods, suggesting little to no effect beyond 1 km. In the 5 days following seismic survey there is a rebound of catch at both the < 1 km and 1-3 km ranges, which suggests that there may have indeed been an effect from the seismic sound on catches, but catches recovered immediately afterward, confounded by the ongoing 10-15 days of continuous intensive fishing in the area. The re-analysis suggests that the data may have been confounded by variables other than sound, and that the original clearcut conclusions in Engas et al 1996a,b are perhaps not quite as pronounced as initially stated.

Finneran J.J., Schlundt C.E., Branstetter, B.K., Trickey, J.S., Bowman, V., and Jenkins, K. (2013). Temporary threshold shift (TTS) in odontocetes in response to multiple air gun impulses. Final Report for JIP Project 2.1.1., 51 pp. Available online at <http://www.soundandmarinelifejip.org/index.php?doc=docmeta&id=3695>

Finneran J.J., Schlundt C.E., Branstetter, B.K., Trickey, J.S., Bowman, V., and Jenkins, K. (in review). Effects of multiple impulses from a seismic air gun on bottlenose dolphin hearing and behavior. Submitted to J. Acoust. Soc. Am.

Gross JA, Irvine KM, Wilmoth S, Wagner TL, Shields PA and Fox JR . 2013. The Effects of Pulse Pressure from Seismic Water Gun Technology on Northern Pike. *Trans Am Fish Soc* 142: 1335-1346. ISSN: 0002-8487 print / 1548-8659 online DOI: 10.1080/00028487.2013.802252.

The study assessed the probability of mortality of pike (freshwater) when exposed to two pulses at 3, 6 and 9 meters distance from either a 343 cu in water gun or a 120 cu in water gun, both pressurized at 2000 psi. Measures of peak and peak to peak pressure were made as well as SEL_{cum}. SEL_{cum} was used as the metric for effects in most of the results and discussion since it seemed to correlate best with levels of injury and mortality. Mortality within 72-168 hours was correlated with SELs in excess of 195 dB. Gas bladder rupture was observed at 199 dB SEL; 100% of fish at 3-6 meters and 87% of fish at 9 meters. Given the history of water guns producing greater injury and mortality than airguns, these results with two pulses from good sized single guns, indicate that fish would need to be within a few meters of a single airgun or full array to achieve comparable effects.

Harrington JJ, McAllister J, and Semmens JM. 2010. Assessing the short term impact of seismic surveys on adult commercial scallops (*Pecten fumatus*) in Bass Strait: Final Report. Tasmanian Aquaculture and Fisheries Institute, U. of Tasmania

Scallops were sampled from control and exposure sites before and after an extensive 2-D seismic survey. No statistical differences were found between control and exposed populations, neither in survival nor body condition. Exposure levels were not recorded. The paper also reviews several prior studies of seismic effects on scallops in Ireland and other sites, all also with no effect. One cited paper reported that one of three scallops experienced a split in its shell at distance of 2 meters from an airgun.

Higgins SM. 2014. Declaration; State of New Jersey, Dept of Environmental Protection vs National Science Foundation, et al. United States Federal District Court, District of New Jersey. Case 3:14-cv-04249-PGS-LHG, Document 6-7, filed 07/07/14, pageID 1520-1527

Contains a comparison of annual commercial and recreational fishery catches for years and months in which seismic surveys were conducted off the New Jersey coast, relative to the same months in other years, between 1990-2004. No discernable differences were found between periods with seismic survey and without. (Fishery statistical data from NMFS 2014, <http://www.st.nmfs.noaa.gov/>).

Lavender, A.L., Bartol, S.M., and Bartol, I.K. (2014). Ontogenetic investigation of underwater hearing capabilities in loggerhead sea turtles (*Caretta caretta*) using a dual testing approach. *J. Exp. Biol.*, 2014, 217(14):2580-2589.

Løkkeborg S, Ona E, Vold A, and Salthaug A. 2012. Effects of sounds from seismic air guns on fish behaviour and catch rates. In A.N. Popper and A. Hawkins (eds.), *The Effects of Noise on Aquatic Life*, Advances in Experimental Medicine and Biology 730, DOI 10.1007/978-1-4419-7311-5_95, pp. 415-419. Springer, NY NY.

This paper provides a good review of prior behavioral studies. They also report recent data from what is arguably the most realistic and thorough study to date; monitoring of two fisheries (gillnet and longline) for four species of fish; a halibut, two gadids (pollack and haddock) and a seabass (*Sebastes marinus*), along with acoustic (HF sonar) surveys of the fish populations. Gillnet catches of halibut and seabass increased during and after survey, possibly due to increased swimming activity, while longline catches of halibut and pollack decreased. Acoustic surveys revealed decreases in pollack abundance, but not other species, consistent with prior study by Engås et al (1996a,b).

McCauley RD, Kent CS, Archer M. 2008. Impacts of seismic survey pass-bys on fish and zooplankton, Scott Reef Lagoon, Western Australia: Full report of Curtin University findings. Center for Marine Science and Technology, Curtin University, Perth WA. 92 pp. CMST Report 2008-32.

An extensive research effort involving a real seismic survey over a thoroughly monitored reef lagoon. Caged snapper and damselfish were exposed to seismic passes as close as 45-74 meters with 1% loss of hearing hair cells, later fully recovered. Behavioral reaction was observed at 155-165 dB SPL sound exposure levels but avoidance only occurred out to 200 meters on either side of survey. There was no effect on normal fish sound choruses.

McCauley RD, Fewtrell J and Popper AN. 2003. High intensity anthropogenic sound damages fish ears. *J Acoust Soc Am* 113(1):638-642 DOI: 10.1121/1.1527962

The authors were able to produce considerable unrecovered damage to the sensory structures of a typical fish ear (Pink snapper) after seven close passes (5-15 meters) by a towed 20 cubic inch seismic air source in the span of four hours. Although no cumulative Sound Exposure Level (SEL) or peak pressure or particle velocity measures were reported, the graphical display of the passes indicates multiple exposures over short periods of time at levels in excess of 180 dB SPL $rms_{0.95}$. The fish were caged and the authors noted that their movements indicated that the fish would have moved away from the sound source if possible, thus preventing the artificially high levels of exposure experienced.

Miller I. and Cripps E. 2013. Three dimensional marine seismic survey has no measurable effect on species richness or abundance of a coral reef associated fish community. *Mar Pol Bull*. Elsevier Press. <http://dx.doi.org/10.1016/j.marpolbul.2013.10.031>

No change in abundance or species composition was found in a natural reef community of resident reef fishes (emphasis on damselfishes) and mobile demersal fishes (emphasis on snappers of the Family Lutjanidae). Multiple passes by a full working seismic array were separated by about 6 hours between pass. Minimum stand-off distances from the reef were 400 meters on the outside and 800 meters inside the reef lagoon. Estimated exposures were generally around 187 dB SEL with some exposures as high as 200 dB SEL. Instantaneous peak or average SPL or particle velocity/acceleration were not measured.

Moein, S. E., Musick, J. A., Keinath, J. A., Barnard, D. E., Lenhardt, M. L. & George, R. 1995. Evaluation of seismic sources for repelling sea turtles from hopper dredges. In *Sea Turtle Research Program: Summary Report*. (Ed. Hales, L. Z.) pp 90-93. Technical

Report CERC-95.

National Research Council (NRC). 2005. Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects. National Academy Press, Washington DC.

www.nap.edu.

This NRC report lays out a framework for estimating long term, cumulative population consequences from behavioral disturbance by sound, and by extension, any source of behavioral perturbation, individually or cumulatively. While developed for marine mammals, the principles of the Population Consequences of Acoustic Disturbance (PCAD) model are appropriate to any biological population.

Parry GD and Gason A. 2006. The effect of seismic surveys on catch rates of rock lobsters in western Victoria, Australia. *Fisheries Research* 79 (2006): 272-284.

A statistical comparison of changes in commercial catch rates (Catch Per Unit Effort, CPUE) coincident with seismic survey effort. No correlation was found in a two way analysis of variance, although the authors do note that most survey effort was in deep water away from the shallow water fishery, and that one survey in shallow water was in an area of low lobster abundance.

Peña H, Handegard NO, and Ona E. 2013. Feeding herring schools do not react to seismic air gun surveys. *ICES J Marine Science*, doi:10.1093/icesjms/fst079. 7 pp. <http://icesjms.oxfordjournals.org/>

A full 3-D seismic survey array was used to assess responses of herring monitored by an omnidirectional fisheries sonar. The source vessel approached the fish school from a distance of 26 km to a close approach at 2 km without any effect on the swimming and schooling behavior of the fish.

Popper AN, Smith ME, Cott PA, Hanna BW, MacGillivray AO, Austin ME and Mann DA. 2005. Effects of exposure to seismic airgun use on hearing of three fish species. *J Acoust Soc Am* 117:3958-3971.

Whitefish and juvenile pike did not show any TTS after exposure to five seismic playbacks of about 209 dB SPL_{peak} or 180 dB SEL, and particle displacements of 139 db SVL re 1nm/s (it is not possible to determine which physical property was responsible for any TTS observed in any of the tests). Adult pike under similar exposure conditions showed a TTS of about 20 dB at 400 Hz, which was recovered within 18 hours. Chub, also under similar exposure levels, showed slightly higher levels of TTS, about 25 dB at 200 Hz and 35 dB at 400 Hz, similar for 5 playbacks or 20 playbacks, and fully recovered within 18 hours. Chub are members of a hearing specialist family of freshwater fishes with no marine species.

Santulli A, Modica A, Messina C, Ceffa L, Curatolo A, Rivas G, Fabi G, D'Amelio V. 1999. Biochemical Responses of European Sea Bass (*Dicentrarchus labrax* L.) to the Stress Induced by Off Shore Experimental Seismic Prospecting. *Marine Pollution Bulletin*, Volume 38, Issue 12, December 1999, Pages 1105-1114.

This study involved exposure of caged fish to very close and very prolonged seismic air source in order to obtain physiological responses typical of stress. The fish returned to baseline levels within 72 hours, with no injury and no apparent lasting effect, despite the unusually high and prolonged sound exposures.

Song, J., D.A. Mann, P.A. Cott, B.W. Hanna, and A.N. Popper. 2008. The inner ears of Northern Canadian freshwater fishes following exposure to seismic air gun sounds. *J. Acoust. Soc. Am.* 124(2):1360-1366.

No damage was found to any of the ears of the test fish from Popper et al (2005), despite findings of Temporary Threshold Shift in two cases where peak pressure exceeded 205-209 dB re 1 μ Pa SPL (peak) or 176-180 dB re 1 μ Pa²-s single impulse (shot) SEL.

United States Navy. 2013. Atlantic Fleet Training and Testing Final Environmental Impact Statement / Overseas Environmental Impact Statement. Available online at <http://afteis.com/DocumentsandReferences/AFTTDocuments/FinalEISOEIS.aspx>

Wardle CS, Carter TJ, Urquhart GG, Johnstone ADF, Ziolkowski AM, Hampson G, Mackie D (2001) Effects of seismic air guns on marine fish. Cont Shelf Res 21:1005–1027.

A study of free swimming cod, pollack and hake on a reef, using a fixed seismic source. C-start but no movement away from the source was observed at exposure levels up to 195 dB SPL at a distance of 109 meters. The authors speculate on possible reasons for the lack of response, including site fidelity to the unique reef environment at which the study was performed.

ATTACHMENT B

ATTACHMENT B

Currently, three types of surveys are proposed in the Atlantic OCS: 2D seismic surveys, a 3D seismic survey, and an airborne gravity and magnetic survey. These surveys are described in more detail below.

A. Seismic Surveys – Towed Streamers

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 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. 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. 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.

2D Seismic Surveys

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. 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 hours 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 requirements or mechanical maintenance, standby for weather or other interferences, and performance of mitigation measures (e.g., ramp-up, pre-survey visual observation periods, and shutdowns).

3D Seismic Surveys

3D towed-streamer seismic surveys enable industry to image the subsurface geology with much greater clarity than 2D data because of the much denser data coverage. The quality is such that 3D data can often indicate hydrocarbon-bearing zones from water-bearing zones. Because 3D seismic data has been continuously and rapidly improving since its introduction in the 1970s, areas covered by 3D data shot only a few years ago may be reshot with current, improved technology, offering greater clarity than previous surveys. In addition, areas already covered using 2D techniques may be resurveyed with 3D. Further, 3D surveys may be repeated over producing fields at successive calendar times (at 6-month to several-year intervals) to better characterize and record changes over producing reservoirs. These 4D, or time-lapse 3D, surveys are used predominantly as a reservoir monitoring tool to detect and evaluate reservoir changes over time. Conventional, single-vessel 3D surveys are referred to as narrow azimuth 3D surveys.

The current state-of-the-art ships conducting 3D surveys are purpose-built vessels with much greater towing capability than the vessels conducting 2D surveys. While these vessels are generally 60 - 120 m long, with the largest vessels over 120 m (ft) in length and greater than 65 m (230 ft) wide at the back deck. These seismic ships typically tow two parallel source arrays 200-300 m (656-984 ft) behind them. The two source arrays are identical to each other and are the same as those used in the 2D surveys described previously. Following 100-200 m (328-656 ft) behind the dual source arrays are the streamers.

Most 3D ships can tow eight or more streamers at a time, with the total length of streamers (number of streamers multiplied by the length of each one) exceeding 80 km (50 mi). The theoretical towing maximum today is 24 streamers, each of which can be up to 12 km (7.5 mi) long, for a total of 288 km (179 mi). Towing 8-14 streamers that are each 3-8 km (1.9-5 mi) long is normal practice. Towing 10 streamers that are separated by 75-150 m (246-492 ft) means that a swath 675-1,350 m (2,215-4,429 ft) wide is covered on the sea surface in one pass of the ship along its track line. Other streamer configurations (number of streamers and their separation distance) can produce narrower or wider swaths.

The survey ship tows the apparatus at a speed of 3 to 5.5 kn during production. Approximately every 11 - 15 s (i.e., a distance of 25 m [82 ft] for a vessel traveling at 4.5 kn [8.3 km/hr]), one of the dual air source arrays is fired. The other array is fired 11 - 15 s later. To achieve the desired spacing, the time between firings depends on the ship speed. While surveying, a ship travels along a track for 12-20 hours (i.e., a distance of 100-167 km [62 - 104 mi] at 4.5 kn [8.3 km/hr]), depending on the size of the survey area. Upon reaching the end of the track, the ship takes 3 to 5 hours to turn around and start along another track. This procedure 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).

B. Non-Seismic Gravity and Magnetic Surveys

Both conventional gravity surveys and gravity gradiometry surveys are conducted today, most often by fixed-wing aircraft, or where necessary, by marine vessel deployment. There is no sound source associated with gravity or magnetic surveys. The dimensions of the gravity instruments and stand are approximately 1 m by 1 m by 1.5 m high (3 ft by 3 ft by 5 ft) and the total weight is approximately 150 kg (330 lb). The survey acquisition grid is similar to ship-based seismic surveys, generally with flight-line spacing of 0.5-3 km (0.3-2 mi). Surveys of 500 sq. km (180 sq. mi) can be completed in a few hours, with the aircraft flying at an altitude of 70-300 m (230-1,000 ft). The objectives of the survey will determine the flight-line spacing (distance between flight lines) and the altitude at which the survey will be conducted.

Measurements of the earth's magnetic field are useful in helping to determine geologic structures and stratigraphy in the subsurface in frontier exploration areas, such as the Atlantic OCS, and as a complement to existing seismic data. There are at least five types of

magnetometers, three of which are commonly used in airborne magnetic surveying. In addition to the different types of magnetometers, there are also several different configurations that can be used on the aircraft. These configurations include: (1) a single sensor, typically a tail installation; (2) two horizontally separated magnetometers, usually wingtip pod sensors; (3) two vertically separated sensors, usually tail-mounted; and (4) a total magnetic intensity configuration, typically involving three, but potentially four, magnetic sensors. The sensor pods are cylindrical in shape, and typically 1-2 m (3.3-6.6 ft) long and several centimeters (several inches) in diameter.

The objectives of the survey (such as the amount of area to be covered, the desired detail to be obtained, etc.) and the cost determine three of the most important factors to be specified for any given survey: (1) the altitude at which the survey will be conducted; (2) the flight-line separation; and (3) the flight-line orientation, or direction. Recent surveys done in the Gulf of Mexico have been flown at altitudes of 60-300 m (200-1,000 ft), at speeds of 110 knots (250 km/hr), and with line spacings of 0.5-2 km (0.3-1.3 mi). Similar surveys were recently completed offshore Greenland and offshore Honduras.

ATTACHMENT C



May 7, 2014

Via Federal eRulemaking Portal

Mr. Gary D. Goeke
Chief, Environmental Assessment Section
Office of Environment (GM 623E)
Bureau of Ocean Energy Management
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, LA 70123-2394

Re: Comments on Final Programmatic Environmental Impact Statement for Proposed G&G Activities on the Mid- and South Atlantic OCS

Dear Mr. Goeke:

This letter provides the comments of the International Association of Geophysical Contractors (“IAGC”) in response to the Bureau of Ocean Energy Management’s (“BOEM”) Notice and Request for Comments on its Final Programmatic Environmental Impact Statement for Proposed G&G Activities on the Mid- and South Atlantic OCS (“PEIS”). *See* 79 Fed. Reg. 13,074 (Mar. 7, 2014). We appreciate BOEM’s consideration of the comments set forth below.

IAGC is the international trade association representing the industry that provides geophysical services (geophysical data acquisition, processing and interpretation, geophysical information ownership and licensing, and 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 some IAGC members have already filed applications for authorizations relating to such activities.¹

¹ In a joint letter with the American Petroleum Institute (“API”) and the National Ocean Industries Association (“NOIA”), IAGC earlier commented on the draft PEIS (“DPEIS”). *See* Letter from Andy Radford, Sarah Tsoflias, and Luke Johnson to Gary D. Goeke (July 2, 2012) (“DPEIS Comment Letter”). API, NOIA, and IAGC have also submitted a comment letter dated (continued . . .)

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 3.3 billion barrels of oil and 31.3 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. Because survey activities are temporary and 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.

I. OVERVIEW

IAGC supports BOEM's plan to authorize exploratory activities on the Atlantic OCS consistent with the Outer Continental Shelf Lands Act ("OCSLA"), which calls for the "expeditious and orderly development" of the OCS "subject to environmental safeguards." 43 U.S.C. § 1332(3). However, the PEIS undermines OCSLA's mandate, as well as the requirements of other applicable laws, such as the Marine Mammal Protection Act ("MMPA"), in a number of ways. In general, a fundamental flaw with the PEIS is its establishment of an unrealistic scenario in which exploration activities are projected to result in thousands of incidental takes of marine mammals, which BOEM admits will not actually occur. The supposed effects of this "worst case" hypothetical scenario are then addressed in the PEIS with mitigation measures, many of which are similarly unrealistic because they mitigate inaccurately presumed effects. This approach is contrary to both the best available scientific information and applicable law.

Many of the mitigation measures recommended in the PEIS are infeasible, will impose serious burdens on industry, may discourage exploration of the Atlantic, and will result in no benefits to protected species (because they address unrealistic effects). IAGC can and will support mitigation measures that are well supported by the best available science, consistent with existing practices that are proven to be effective and operationally feasible. However, we cannot

(. . . continued)

May 7, 2014 (the "Joint Trades Letter"), in response to the PEIS, which IAGC incorporates by reference.

support mitigation measures with no basis in fact or science, which are intended to address effects that will not occur, and which will result in less exploration of the OCS, contrary to OCSLA.

Accordingly, we strongly urge BOEM to include in its Record of Decision (“ROD”) the modifications suggested in the comments set forth below. With respect to the alternatives presented in the PEIS, Alternative A presents the option that is most supported by the best available science and applicable law. However, IAGC would support BOEM’s adoption of Alternative B only so long as all of the modifications suggested below are incorporated into the ROD. All of these suggested modifications are within the scope of the analyses contained in the PEIS. *See Great Old Broads for Wilderness v. Kimbell*, 709 F.3d 836, 854-55 (9th Cir. 2013) (modified alternative in ROD upheld because all relevant impacts analyzed in NEPA document); *see also W. Watersheds Project v. BLM*, 721 F.3d 1264, 1277-78 (10th Cir. 2013) (same).

II. DETAILED COMMENTS

A. The PEIS’s Marine Mammal Impact Analyses Are Factually and Legally Flawed

The PEIS’s analysis of marine mammal impacts is, by BOEM’s admission, an unrealistic assessment of the potential impacts of geophysical surveys on marine mammals that is purposefully constructed to overestimate levels of incidental take. The PEIS explains:

The acoustic and impact modeling conducted to develop these [incidental take] estimates is by its very nature complex and demands numerous specific details be identified and used during calculations[.] However, it must be emphasized that each of these assumptions are purposely developed to be conservative and accumulate throughout the analysis (e.g., representative sound source is modeled at highest sound levels and always at maximum power and operation, sound levels received by an animal are calculated at highest levels, marine mammal density values used likely exceed actual densities, and models do not include the effect of all mitigations in reducing take estimates). Therefore, the results of the modeling predictions will overestimate take.

PEIS at 1-5 (emphases added); *see also* PEIS at 4-62 (“BOEM emphasizes that these estimates should be seen as highly conservative of potential take without the consideration of most mitigation with the exception of the time-area closure described in Alternative A.”). The results of this hypothetical “worst case” scenario analysis are strikingly divergent from the record of actual observed marine mammal impacts related to offshore exploration activities. *See* DPEIS Comment Letter §§ I, II & Appx. 1. For example, the PEIS implausibly concludes that thousands of marine mammals will experience Level A incidental take, and that hundreds of thousands of marine mammals will experience Level B incidental take, as a result of seismic

activities. PEIS at Tables 4-9, 4-10, 4-11, 4-12. These take estimates would result in tens of thousands of shutdown events per year, in contrast to the average 55 shutdowns that are required per year in the Gulf of Mexico under existing operations, monitoring, and mitigation.² See DPEIS Comment Letter, Appx. 1.

We are aware of no federal agency assessment of the effects of seismic activities on marine mammals that results in incidental take estimates that are remotely similar to those stated in the PEIS. Moreover, the history of incidental take authorizations for offshore seismic activities demonstrates that levels of actual incidental take are far smaller than even the most balanced pre-operation estimates of incidental take. See DEIS at E-69.³ The PEIS's flawed

² Aggregating the estimated takes presented in Table 43 of the PEIS yields a total of 26,000 estimated takes.

³ 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.”); *id.* at 2-23 (with respect to sea turtles, “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 (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.”); *id.* 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.”); 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 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

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approach to assessing the impacts of seismic activities on marine mammals results in a number of significant legal and factual errors, as set forth below.

1. The PEIS unlawfully analyzes a worst case scenario

Prior to 1986, NEPA regulations required a lead agency to prepare a “worst case analysis” of impacts for which there is incomplete or unavailable information. *See* 51 Fed. Reg. 15,618 (Apr. 25, 1986).⁴ However, this requirement was expressly rescinded decades ago because it was found to be “an unproductive and ineffective method of achieving [NEPA’s] goals; one which can breed endless hypothesis and speculation.” *Id.*; *see Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 354-56 (1989) (U.S. Supreme Court confirming that worst case analysis is no longer applicable). In place of the worst case analysis requirement, the federal Council on Environmental Quality (“CEQ”) promulgated “a wiser and more manageable approach to the evaluation of reasonably foreseeable significant adverse impacts in the face of incomplete or unavailable information in an EIS.” 51 Fed. Reg. at 15,620. The new (and current) approach, codified in 40 C.F.R. § 1502.22, requires federal lead agencies to disclose such impacts and perform a “carefully conducted” evaluation based upon “credible scientific evidence.” *Id.*; 40 C.F.R. § 1502.22(b)(1). In developing this requirement, CEQ explained that “credible” means “capable of being believed” and stated that “[i]nformation which is unworthy of belief should not be included in an EIS.” 51 Fed. Reg. at 15,622-23 (responses to comments) (emphasis added).

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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”).

⁴ In the PEIS, BOEM determines that there is incomplete or unavailable information for a full assessment of the impacts of the proposed activities on marine mammals. *See* PEIS at 4-6, 4-47.

By performing an analysis of marine mammal impacts that is “purposely developed to be conservative,” based on the “highest” sound levels and erroneously high marine mammal densities, and intended to “overestimate take,” BOEM has performed precisely the same type of “worst case analysis” that was rejected by both CEQ and the U.S. Supreme Court many years ago. By its terms, and as expressly stated in the PEIS, the analysis of marine mammal impacts is purposely designed to be inaccurate and to evaluate the worst possible consequences that could hypothetically result from unmitigated seismic surveying. Indeed, it is hard to imagine an analysis that presents a scenario worse than the hundreds of thousands of incidental takings that are erroneously predicted by the PEIS. The PEIS’s analysis of marine mammal effects is plainly not credible, it evaluates effects that, by BOEM’s admission, will not occur, and, therefore, it is “unworthy of belief.” The PEIS’s assessment of marine mammal impacts unlawfully applies a “worst case” analysis and does not comply with NEPA or currently applicable CEQ regulations (40 C.F.R. § 1502.22).

2. The PEIS does not present an accurate scientific analysis

An EIS must rely upon “high quality” information and “accurate scientific analysis.” 40 C.F.R. § 1500.1(b); *Conservation Nw. v. Rey*, 674 F. Supp. 2d 1232, 1249 (W.D. Wash. 2009); *Envtl. Def. v. U.S. Army Corps of Eng’rs*, 515 F. Supp. 2d 69, 78 (D.D.C. 2007) (“Accurate scientific analysis [is] essential to implementing NEPA.”). It also must have “professional integrity, including scientific integrity” and may not rely on “incorrect assumptions or data” or “highly speculative harms” that “distort[] the decisionmaking process.” See *Theodore Roosevelt Conservation P’ship v. Salazar*, 616 F.3d 497, 511 (D.C. Cir. 2010); 40 C.F.R. § 1502.24; 73 Fed. Reg. 61,292, 61,299 (Oct. 15, 2008) (CEQ regulations require “high quality” information and “scientific integrity”); *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964 (9th Cir. 2005); *City of Shoreacres v. Waterworth*, 420 F.3d 440, 453 (5th Cir. 2005) (internal citations omitted).⁵ To be sure, courts have invalidated EISs that did not meet these standards, that were based on “stale scientific evidence . . . and false assumptions,” or that failed to disclose the “potential weakness” of relied-upon modeling. See, e.g., *Seattle Audubon Soc’y v. Espy*, 998 F.2d 699, 704 (9th Cir. 1998); *Or. Natural Res. Council Fund v. Goodman*, 505 F.3d 884, 897 (9th Cir. 2007) (citations omitted).

Respectfully, the PEIS fails to satisfy any of these important NEPA principles. An analysis that, by the agency’s admission, overestimates take and relies upon incorrect assumptions, is, by definition, “inaccurate.” Moreover, the PEIS’s analysis of marine mammal impacts is, at best, “highly speculative” because it is based on scenarios and assumptions that will not occur.

⁵ See also *CBD v. BLM*, 937 F. Supp. 2d 1140, 1155 (N.D. Cal. 2013) (principle that reasonably foreseeable environmental effects may not include “highly speculative harms” is equally applicable to direct and indirect effects).

3. The conclusions of the PEIS fail to consider, and are contrary to, the MMPA

The PEIS's assessment of marine mammal impacts is directly contrary to the MMPA. BOEM has defined the proposed action to include only those activities that have first received incidental take authorizations under the MMPA. *See* PEIS at 1-14, 1-25. As a prerequisite to incidental take authorization, the MMPA requires the permitting agency to find that the authorized take will have a "negligible impact" on marine mammals. 16 U.S.C. § 1371(a)(5)(A), (D). Accordingly, by definition, the proposed action analyzed in the PEIS should include only those seismic activities causing incidental take at levels that NMFS has expressly determined result in a "negligible impact" to marine mammal stocks. However, in sharp contrast, the PEIS concludes that the impacts of airguns on marine mammals under the proposed action are "moderate." PEIS at Table 2-4. By concluding that "moderate" impacts will result from seismic operations, BOEM has incorrectly analyzed the proposed action that is defined in the PEIS. Moreover, this discrepancy highlights the significant flaws that result from the PEIS's erroneous analysis of marine mammal impacts.⁶ BOEM must analyze the effects of the action it has proposed, which includes offshore seismic operations that will receive incidental take authorizations under the MMPA and, by definition, will have no more than a negligible impact on marine mammal stocks. Based on 40 years of experience and recent scientific research and observational data, BOEM should find in the ROD that the impacts of seismic exploration are indeed negligible.

B. Certain Mitigation Measures Recommended in the PEIS Are Unsupported and Unreasonable

The record demonstrates that the scope of mitigation measures applied to offshore operations in the Gulf of Mexico is already more than adequate to protect marine mammals and sea turtles in a manner consistent with federal laws.⁷ Despite this record, the PEIS recommends

⁶ The PEIS's "moderate" impact finding is also factually inconsistent. "Moderate" impacts are defined in the PEIS as "detectable, short-term, extensive, and severe; or ... detectable, short-term or long-lasting, localized, and severe; or ... detectable, long-lasting, extensive or localized, but less than severe." PEIS at x. Accordingly, a "moderate" seismic impact must be either "long-lasting" or "severe." However, insofar as we are aware, no seismic activities that have received MMPA incidental take authorizations have caused impacts amounting to anything more than temporary changes in behavior, without any known injury, mortality, or other adverse consequence to any marine mammal species or stocks. *See supra* note 3.

⁷ *See supra* note 3; *see also* Mary Jo Barkaszi et al., *Seismic Survey Mitigation Measures and Marine Mammal Observer Reports* (2012); A. Jochens et al., *Sperm Whale Seismic Study in the Gulf of Mexico: Synthesis Report*, at 12 (2008) ("There appeared to be no horizontal avoidance to controlled exposure of seismic airgun sounds by sperm whales in the main SWSS study area."); 78 Fed. Reg. 11,821, 11,827, 11,830 (Feb. 20, 2013) ("[I]t is unlikely that the

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certain mitigation measures that have never been required for offshore exploratory operations, and that are more stringent (and less supported) than the measures that have already been successfully implemented. The unprecedented measures recommended in the PEIS are a direct result of BOEM's flawed impact assessments. For example, as described above, the PEIS creates a hypothetical worst case scenario for marine mammal impacts, determines that the projected adverse effects in that scenario will be substantial, and then recommends mitigation measures to address those supposed effects. However, because the adverse effects identified in the PEIS are inaccurate and unrealistic, the mitigation measures intended to address those effects are similarly flawed and without any factual or scientific support.

The mitigation measures that particularly concern IAGC are addressed in detail below. Without question, these measures, if implemented, will have substantial adverse effects on offshore geophysical operations. These measures will result in increased survey duration, which, in turn, can increase the potential exposure of marine mammals to seismic-related effects.⁸ We strongly urge BOEM to reconsider these mitigation measures as it prepares the ROD.⁹

1. Dolphin shutdowns

The PEIS recommends a mitigation measure calling for the shutdown of operations if a dolphin enters the acoustic exclusion zone unless the dolphin is determined by the observer to be

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proposed project [a USGS seismic project] would result in any cases of temporary or permanent hearing impairment, or any significant non-auditory physical or physiological effects"; "The history of coexistence between seismic surveys and baleen whales suggests that brief exposures to sound pulses from any single seismic survey are unlikely to result in prolonged effects."); 79 Fed. Reg. 14,779, 14789 (Mar. 17, 2014) ("There 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."); 79 Fed. Reg. 12,160, 12,166 (Mar. 4, 2014) ("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.").

⁸ The mitigation measures also increase the amount of time the vessel spends surveying because shutdowns and delays necessarily result in overall increased surveying time to preserve data quality and integrity.

⁹ The effects analysis contained in NMFS's associated biological opinion suffers from the same flaws as the PEIS's effects analysis. In addition, the terms and conditions stated in the biological opinion (which mitigate the inaccurate effects conclusions) lack a rational basis for the reasons stated in this letter with respect to the PEIS's corresponding mitigation measures. IAGC requests that BOEM work with NMFS to similarly reconsider and modify the biological opinion's terms and conditions.

voluntarily approaching the vessel. PEIS at 2-11.¹⁰ This proposed measure is contrary to the best available science, impractical, arbitrary, and unsupported for at least the following reasons.

First, dolphins are mid- to high-frequency specialists and, therefore, insensitive to the low frequency impulse sounds emitted by seismic operations. The E&P Sound and Marine Life Joint Industry Program has supported research to study the effects of multiple airgun pulses in odontocetes and, specifically, to study whether bottlenose dolphin exposure to airgun impulses results in temporary threshold shift (“TTS”).¹¹ As the public abstract from the study explains, “subjects participated in over 180 exposure sessions with no significant TTS observed at any test frequency, for any combinations of range, volume or pressure during behavioral tests.”¹² Even at ranges as close as 3.9 m and with the air gun operating at 150 in³ and 2000 psi, resulting in cumulative Sound Exposure Levels of 189-195 dB re 1μPa²s, the impulses did not result in detectable TTS in any dolphin tested. As a result of the relative low-frequency content of airgun impulses compared to the relative high-frequency hearing ability of dolphins, no injuries or significant behavioral responses were observed in this study.¹³ Industry observations corroborate this scientific evidence. For example, dolphins are frequently observed by personnel on seismic vessels to approach the vessels during operations to bow-ride and chase towed equipment – a direct indication of insensitivity to seismic sound generation. PSO observation reports indicate that there is no statistically significant difference between the frequency of dolphin sightings and

¹⁰ “Voluntary approach” is defined as “a clear and purposeful approach toward the vessel by delphinid(s) with a speed and vector that indicates that the delphinid(s) is approaching the vessel and remains near the vessel or towed equipment.” PEIS at 2-11.

¹¹ James J. Finneran et al., *Final Report* (2013). TTS in odontocetes in response to multiple airgun impulses. (IAGC understands that a copy of this Final Report has been furnished by the author to NMFS).

¹² C.E. Schlundt et al., *Auditory Effects of Multiple Impulses from a Seismic Airgun on Bottlenose Dolphins*, presentation at the Effects of Noise on Aquatic Life Third International Conference, Budapest, Hungary (Aug. 11-16, 2013) (emphasis added). The results of this study also are useful to support inclusion of frequency weighting in updated acoustic criteria.

¹³ In a 2011 Programmatic EIS, the National Science Foundation recognized that “[t]here has been no specific documentation that TTS occurs for marine mammals exposed to sequences of air-gun pulses during operational seismic surveys.” Programmatic EIS/OEIS for NSF-Funded & USGS Marine Seismic Research, at 3-133 (June 2011), http://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis_3june2011.pdf (recognizing 180 dB re 1 uPa (rms) criterion for cetaceans “is actually probably quite precautionary, i.e., lower than necessary to avoid TTS at least for delphinids, belugas and similar species”).

acoustic detections during seismic operations when the source is active or silent. *See* Attachment A.¹⁴

Second, even if there were scientific justification for the proposed dolphin shutdown mitigation measure (which there is not), implementation of the measure is impractical. We are aware of no mitigation measures applicable to offshore exploration activities in which an observer is required to subjectively determine the intent of a marine mammal. Determining marine mammal intent from great distances is very difficult for experienced marine mammal biologists in staged scientific experiments, let alone for observers who will be attempting to determine dolphin intent over vast distances in the ocean environment. Based on observation reports, PSOs will be unable to confidently assess animal behavior or “intentions” because they cannot accurately determine species within the expanded exclusion zone.¹⁵ The result is that observers will likely, out of caution, call for shutdowns in almost all instances where dolphins are observed within the exclusion zone.

Third, in areas of high-density dolphin populations, such as the Atlantic Ocean and the Gulf of Mexico, shutdown requirements for a species that enjoys bow-riding and approaching vessels could effectively bring all seismic activity to a halt. Implementation of this proposed measure will substantially increase the number of shutdowns and delays in ramp-ups, which will result in much longer surveys and significantly increased costs with no environmental benefit. *See Barkaszi, supra*, note 7, at 1 (75% of delays in ramp-ups due to presence of protected species in exclusion zone during 30 minutes prior to ramp-up were due to dolphins).

Fourth, the proposed measure is without precedent. Under Joint NTL No. 2012-G02 (and previously NTL No. 2007-G02), BOEM required seismic operators in the Gulf of Mexico to shut down for any whale observed in the exclusion zone. BOEM defined “whales” as all marine mammals except dolphins and manatees. In the June 2013 settlement of litigation challenging BOEM’s permitting of seismic activity in the Gulf of Mexico, the U.S. District Court for the Eastern District of Louisiana extended the shutdown requirements to manatees. In short, no

¹⁴ *See also* A. MacGillivray et al., *Marine Mammal Audibility of Selected Shallow-Water Survey Sources*, J. Acoustical Soc’y of Am. 135(1) (Jan. 2014).

¹⁵ *See* Attachment A. It is well known that different species will exhibit different behaviors. For example, Risso’s dolphins generally avoid vessels and rarely bow-ride, rough-toothed dolphins generally avoid vessels but do bow-ride, and common dolphins are avid bow-riders. *See* K. Wynn & M. Schwartz, *Guide to Marine Mammals and Turtles of the U.S. Atlantic and Gulf of Mexico* (2009).

dolphin shutdown provision, as recommended in the PEIS, has ever been required by any federal agency.¹⁶

Finally, there is no legal basis for the proposed dolphin shutdown measure. Under the MMPA, mitigation measures attached to incidental take authorizations must address the reduction of incidental take. *See* 16 U.S.C. §§ 1371(a)(5)(A), (a)(5)(D); 50 C.F.R. § 216.104(a)(13). However, as set forth above, there is no scientific evidence demonstrating that active acoustic seismic surveys result in any incidental takes of dolphins. Accordingly, there is no statutory basis for recommending the dolphin shutdown mitigation measure.

In sum, the proposed dolphin shutdown mitigation measure would broadly and substantially impact seismic operations without any corresponding environmental benefit and without any scientific support. IAGC respectfully requests that BOEM, in its ROD, expressly find that this recommended measure is unsupported and unnecessary, and exclude the measure from the ROD's recommended mitigation measures. The ROD should also affirmatively clarify that shutdown is not required for dolphins within the exclusion zone in all circumstances, regardless of whether dolphins are exhibiting bow-riding behavior or any other behavior.

2. 40 km buffer zone between concurrent surveys¹⁷

In Alternative B, BOEM recommends an expanded 40 km buffer zone between concurrent seismic surveys. The rationale for this expanded buffer is “to provide a corridor between vessels conducting simultaneous surveys where airgun noise is below Level B thresholds and approaching ambient levels.” PEIS at 2-37. The agency's stated scientific basis for this proposed measure is, at best, ambiguous: “New information suggests that, in some circumstances, airgun noise can be detected at great distances from the sound source, such as across ocean basins (Nieu Kirk et al., 2012), yet it is unknown if detection of sound at these distances has any effect on marine mammals or other marine species.” PEIS at 2-38. No other scientific evidence, no published studies, and no other rationale are provided for this proposed measure, which is given a half-page explanation in Appendix C. In addition, this proposed

¹⁶ For example, in the Gulf of Mexico, the average shutdown lasts for 58 minutes, *see, e.g.,* Barkaszi, *supra*, note 7, which the PEIS would extend by at least 30 minutes by increasing the visual monitoring period following a shutdown from 30 to 60 minutes. Multiplying a rough 1.5-hour average shutdown by 26,000 shutdowns would yield roughly 39,000 hours of shutdowns or approximately 1625 days. Because the typical seismic survey operation costs roughly \$1.5 million per day, the total potential costs arising from the PEIS's assumptions equal a staggering \$2.5 billion.

¹⁷ This measure, as well as the 60-minute “all clear” period addressed below, were not addressed anywhere in the DPEIS. This is the first opportunity the regulatory community has had to comment on these measures.

measure is not mentioned at all in the biological opinion.

In contrast, the best available scientific information supports a buffer zone, if any, of 17.5 km, which is the standard separation distance maintained by seismic operators. The modeling performed by JASCO (*see* PEIS at Appx. D) demonstrates that the typical exposure radius for the 160 dB threshold is 10 km. The largest observed exposure radius was 15 km, but this occurred in less than 10% of the modeled cases. The lowest observed exposure radius was 5 km. Current technology has enabled many operators to decrease typical exposure radii to 7 to 9 km.

A buffer zone that more than doubles the highest possible exposure radii is clearly not reasonable or scientifically supportable – i.e., it is arbitrary. Moreover, the PEIS’s reference to airgun noise detections at “great distances” does not support the proposed buffer zone because those detections occur (if at all) at very low levels that are well below the thresholds NMFS has established for Level B harassment.

The recommendations and analyses in an EIS must be “accurate,” not speculative, and grounded in “high quality” scientific information. *See supra* Section II.A.2. The recommended 40 km buffer zone fails all of these standards. There is literally no scientific information that supports this measure, and, as explained above, the best available information contradicts it. To our knowledge, no buffer zones even approaching this magnitude have ever been required as a condition of offshore seismic authorizations.¹⁸ To make matters worse, BOEM admits in the PEIS that implementation of the 40 km buffer would result in no additional benefits to protected species. PEIS at xxiv (40 km buffer “would not be expected to change any impact ratings”). Consequently, BOEM must decline to adopt the 40 km buffer zone mitigation measure in the ROD and, instead, recommend either no buffer zone, as recommended in Alternative A, or, alternatively, a 17.5 km buffer zone, consistent with standard practice.

3. 60-minute “all clear” period

The PEIS recommends that monitoring of the exclusion zone shall “begin no less than 60 min prior to start-up” and that restarting of equipment after a shutdown “may only occur following confirmation that the exclusion zone is clear of all marine mammals and sea turtles for 60 min.” PEIS at C-29. However, again, BOEM has provided no factual or scientific support for this measure, nor is any meaningful supporting information provided in the biological opinion. To our knowledge, a 60-minute “all clear” period has never been required as a condition of any offshore seismic authorization in the United States. In fact, the routine and proven-to-be-effective practice is to require a 30-minute “all clear” period – for marine mammals

¹⁸ *See, e.g.*, 78 Fed. Reg. 35,364, 35,423 (June 12, 2014) (vessel spacing of 24 km required to avoid any effects of multiple surveys on migrating or foraging walrus).

generally and for ESA-listed species.¹⁹ There is no available information suggesting that the standard practice has not been effective and, to the contrary, all available information demonstrates that the standard practice has been very successful in protecting marine mammals.

Expanding the standard 30-minute “all clear” period to 60 minutes will substantially increase the duration and cost of seismic surveys, which, in turn, increases safety and environmental risks. Extrapolated over all surveys that will be performed over a five-year period, the increased time and expenses resulting from this mitigation measure alone will be dramatic. Increased survey time will also increase the amount of time that protected species are exposed to the potential effects associated with the presence of vessels. The PEIS contains no analysis of the increased operational or environmental effects associated with the 60-minute “all clear” period, compared to the standard 30-minute period (and sometimes 15-minute period) that has successfully been implemented in all offshore seismic operations to date.²⁰ Accordingly, in the ROD, BOEM should decline to adopt the 60-minute period as unsupported and unprecedented and, instead, adopt the standard 30-minute period.

¹⁹ See *Issuance of IHA to Apache Alaska Corp. for Seismic Survey in Cook Inlet*, 79 Fed. Reg. 13,626, 13,636-37 (Mar. 11, 2014) (requiring 30-minute observation period before startup and after sightings of killer and ESA-listed beluga whales and large odontocetes, but only 15-minute period after sightings of pinnipeds and small odontocetes); *Issuance of IHA to Apache Alaska Corp. for Seismic Survey in Cook Inlet*, 78 Fed. Reg. 12,720, 12,732-33 (Feb. 25, 2013) (providing same requirements, and specifying that the shorter 15-minute clearance period applies to harbor porpoises); *Issuance of IHA to TGS-Nopec for Seismic Survey in Chukchi Sea*, 78 Fed. Reg. 51,147, 51,154, 51,160 (Aug. 20, 2013) (same); *Issuance of IHA to Shell and WesternGeco for Seismic Surveys in the Beaufort and Chukchi Seas*, 73 Fed. Reg. 66,106, 66,135-36 (Nov. 6, 2008) (requiring 30-minute observation period before ramp-up and 15- or 30-minute delay of ramp-up for sightings of small odontocetes and pinnipeds, or baleen whales and large odontocetes, including ESA-listed species, respectively); *Issuance of ITR for Oil and Gas Activity in Chukchi Sea*, 78 Fed. Reg. 35,364, 35,424, 35,425 (June 12, 2013) (requiring monitoring period of 30 minutes for walruses and ESA-listed polar bears before startup and after sighting); *Issuance of ITR for Oil and Gas Activity in Beaufort Sea*, 76 Fed. Reg. 47,010, 47,052 (Aug. 3, 2011) (same).

²⁰ Pre-ramp-up and post-shutdown, the vessel is still moving and likely would move 8-9 km at 3-5 knots in a 60-minute period, bypassing any established exclusion zone several times. See 79 Fed. Reg. at 14,797 (NMFS stating that ramp-up is unnecessary “[b]ecause the vessel has transited away from the vicinity of the original sighting during the 8-minute period, implementing ramp-up procedures for the full array after an extended power-down (i.e. transiting for an additional 35 minutes from the location of initial sighting) would not meaningfully increase the effectiveness of observing marine mammals approaching or entering the exclusion zone for the full source level and would not further minimize the potential for take”).

4. Exclusion zones greater than 500 meters

The PEIS explains that exclusion zones “shall be calculated independently and shall be based on the configuration of the array and the ambient acoustic environment, but shall not have a radius of less than 500 m....” PEIS at 2-10. BOEM’s suggested approach for exclusion zones will require substantial modeling effort and will result in exclusion zones that are many times greater than those that have typically been implemented (with success) in the Gulf of Mexico. *See supra* note 3. The expanded exclusion zones are especially concerning because they will ultimately be dictated by the hearing group with the largest modeled radii once new group-specific acoustic criteria are implemented. High-frequency cetaceans, particularly delphinids, will therefore determine the size of the exclusion zone in most instances. Since BOEM is applying shutdown requirements to delphinids, and, as described above, because the exception to those requirements will rarely be applied in practice, this will result in numerous shutdowns due to the observation of delphinids within the large exclusion zone.

Moreover, these shutdowns will serve no environmental benefit because, as explained above, the best available science and information demonstrates that delphinids are unaffected by the lower frequency sounds produced by seismic operations. Exclusion zones should be based on the best available science and modeling and, if that modeling demonstrates that exclusions zones of less than 500 meters are warranted, then there is no basis for arbitrarily requiring a minimum exclusion zone of 500 m. If the minimum 500 m exclusion zone requirement is not applied, IAGC would support the incorporation of power-down procedures to mitigate any potential effects. Power-down procedures acceptable to IAGC are a modified version of the procedures described at 79 Fed. Reg. 14,780, 14,797 (Mar. 17, 2014) (“Langseth IHA”).²¹

5. Turtle shutdowns

The PEIS applies exclusion zone shutdown criteria equally to marine mammals and sea turtles. However, the PEIS does not meaningfully address the fact that sea turtles are much more difficult to observe than marine mammals. Sea turtles can be reasonably observed at distances of 100 m to 300 m from a vessel, but it is very unlikely that sea turtles can be reliably observed at greater distances. *See* Attachment A (most turtle observations within 100 m). In addition, if a sea turtle is observed within the exclusion zone (triggering a shutdown of airguns), assuming the vessel is moving at 3 to 5 knots, the observed turtle will be outside of the exclusion zone within approximately 15 minutes because sea turtles swim very slowly compared to marine mammals.

²¹ Specifically, IAGC would support power-down procedures similar to those in the Langseth IHA provided that: (1) power-down would be implemented only if a marine mammal is observed in or entering (not “likely” to enter) the exclusion zone; (2) power-down procedures may involve a reduction in the volume and/or pressure of the array; and (3) if a marine mammal is observed within the 500 m exclusion zone, then the reduced array would be shut down and shutdown procedures would apply.

In such circumstances, a 60-minute “all clear” requirement would plainly be unnecessary (setting aside the fact that it is unnecessary in all circumstances).

Because turtles are difficult to observe at distances greater than 300 m, application of the exclusion zone shutdown to sea turtles is infeasible and will very likely result in unwarranted shutdowns because observers, acting out of precaution, will call for shutdowns when anything resembling a sea turtle is observed. There is also no existing scientific basis for the proposed turtle shutdown requirement, and none is provided in the PEIS. *See supra* note 3. The ROD should therefore recommend a reduced exclusion zone for sea turtles that is feasible and practical. Such a reduction is also consistent with the best available science, which indicates that sea turtles are not as sensitive to sound as marine mammal species. *See* PEIS, Appx. I. IAGC recommends a 300 m exclusion zone for all sea turtle species.

6. Expanded NARW time-area closure and DMAs²²

As part of Alternative B, BOEM recommends an expansion of the time-area closure applicable to North Atlantic Right Whales (“NARW”) to a continuous 37 km-wide zone extending from Delaware Bay to the southern limit of the programmatic area. PEIS at C-32. It appears that BOEM intends this closure to be applied to any sound produced by seismic vessels such that no portion of a vessel’s ensonification zone may enter the closed area. The result is that the proposed NARW time-area closure will be much larger than what is described in the PEIS. Because NARWs are primarily threatened by ship strikes and fishing entanglement – not seismic sound – BOEM should clarify in its ROD that the NARW time-area closure applies to the presence of vessels, not a vessel’s ensonified zone. BOEM should also clarify in its ROD that vessels may transit through the closure area when seismic equipment is not active.

In addition, the PEIS includes time-area closure measures in areas designated as Dynamic Management Areas (“DMAs”) under NMFS’s ship-strike reduction regulations. *See* PEIS at C-16. These measures are very problematic, and unwarranted, for at least the following reasons:

- DMAs were created to address ship strike situations, which involve vessels traveling at high rates of speed (12-20 knots). Indeed, NMFS has indicated that vessel speeds of less than 10 knots are sufficiently protective. *See* 78 Fed. Reg. 73,726 (Dec. 9, 2013). BOEM’s proposed application of DMAs to seismic operations is therefore contrary to both the original purpose of DMAs (to address ship strikes, not potential acoustic impacts) and NMFS’s recent finding. Moreover, the proposed application to seismic vessels is particularly arbitrary because BOEM intends to broadly apply it to the vessel’s 160 dB ensonified zone.

²² The DMA-related measures were also not included for public review in the DPEIS.

- Nowhere has either BOEM or NMFS evaluated the operational practicability or effectiveness of applying DMAs to seismic operations.
- Unlike NMFS's approach to DMAs, BOEM appears to propose to make seismic industry compliance with DMAs mandatory. There is no basis for such a measure, especially given that NMFS has taken no such step for the vessels that DMAs were intended to address.
- DMAs are unpredictable and the identification of DMAs on short notice will compromise the implementation of seismic survey operations that have been carefully planned over a substantial period of time, with no corresponding benefit.

7. Vessel strike avoidance

The PEIS's recommended vessel strike avoidance measures for ESA-listed whales present serious operational and safety problems, and must be modified. Specifically, the PEIS recommends that if a vessel comes within 100 m of an ESA-listed whale species, it "must reduce speed and shift the engine to neutral, and must not engage the engines until the whale(s) has moved outside of the vessel's path and the minimum separation distance has been established." PEIS at C-9. Respectfully, this measure fails to consider that seismic vessels are significantly different than typical vessels due to the substantial amount of highly specialized equipment that is towed behind a seismic vessel. Operationally, a seismic vessel must maintain forward motion to sustain the equipment spread or the whole system will collapse. The consequence of immediately shifting the engine into neutral could be significant equipment damage in the tens of millions of dollars, and weeks of vessel downtime. As a practical matter, a seismic vessel moving at 3 to 5 knots is very unlikely to strike an ESA-listed marine mammal. In the event of a sighting of an ESA-listed whale within 100 m of the vessel, the vessel could slow (to no less than 3 knots) and turn gently away from the animal, which would both avoid a collision and lessen the risk of damage to seismic equipment. In its ROD, BOEM must decline to adopt the vessel strike avoidance mitigation measure.

8. Passive acoustic monitoring

Under Alternative B, BOEM would require the use of Passive Acoustic Monitoring ("PAM") as part of the Seismic Airgun Survey Protocol. IAGC encourages consideration of PAM during periods of low visibility in its 2011 best practices guidelines. PAM is one of several monitoring techniques that compliments (rather than replaces) traditional visual monitoring. However, commercially available PAM systems can be highly variable, the equipment is unreliable, and PAM's utility as a secondary monitoring source during daylight observations has not been proven. Overall performance and capabilities of PAM are highly dependent on factors such as technical specification of equipment, operational setting, availability of experienced and trained personnel, and the species of marine mammals present in a given area. Mandatory use of PAM will increase survey cost, require the placement of more

personnel on vessels (i.e., four dedicated PAM observers onboard), and increase entanglement risk due to more gear being towed in the water.

IAGC therefore urges BOEM to either make the use of PAM optional, as recommended in Alternative A, or require PAM only for operations at night and in periods of low visibility.²³ This is reasonable given BOEM's admission that "it is difficult to quantify any difference in impact level [of Alternative B] relative to Alternative A." PEIS at 2-40; *see also* PEIS at xxiv ("The degree of improvement [due to making PAM mandatory] has not been estimated but would not be expected to change any impact ratings."). IAGC encourages BOEM to use risk-based mitigation and monitoring measures based on the best available information and promote development of technologies that can best accomplish effective detection and monitoring of marine mammals.

9. National standards for protected species observers

The PEIS and biological opinion purport to adopt the recommendations described in NOAA Technical Memorandum NMFS-OPR-49, *National Standards for a Protected Species Observer and Data Management Program: A Model Using Geological and Geophysical Surveys* (Nov. 2013) ("Observer Standards"). However, this document was never released for public review and comment and was not referenced in the PEIS. Although we appreciate the agencies' attempt to clarify and standardize observer guidelines and requirements, the Observer Standards are flawed in a number of respects. It is imperative that the agencies consider public input on the Observer Standards and make the revisions necessary to ensure that the standards are workable, accurate, and appropriate. The standards should encourage adaptive technology, remote monitoring, reduction of health, safety, and environmental risks, and use of an updated reporting form that provides substantive data from observations to inform the need (if any) for additional or revised mitigation measures. The letter by IAGC, API, and NOIA, dated May 2, 2014, addressing the Observer Standards (attached) more specifically addresses our concerns with the Observer Standards and offers constructive solutions. We appreciate BOEM's consideration of our concerns.

C. The Adaptive Management Provisions Must Be Clarified and Improved

Although the PEIS states that BOEM will consider future data regarding the efficacy of mitigation measures and will adjust requirements for individual surveys, the PEIS appears to establish minimum standards that can only become more stringent through adaptive management. *See* PEIS at 2-39 (adaptive management at the site-specific level "would analyze the best available information and apply additional mitigation, depending on the site-specific proposed action" (emphasis added)); *see also* PEIS at 1-27 to 1-28 (examples largely focus on

²³ NMFS's biological opinion (page 308) only requires PAM for ramp-up at night or in periods of low visibility.

Mr. Gary D. Goeke
May 7, 2014
Page 18

“additional” measures). As just one example, BOEM has established 500 m as a minimum exclusion zone and indicates that it will not set exclusion zones less than 500 m even if a smaller zone is supported by data and modeling.

The ROD must clarify that BOEM will implement “adaptive management” in the true sense of the term – i.e., site-specific requirements may be adjusted to be either less restrictive or more restrictive based on the project-specific information, the species present in the project area, the assessment of relevant risks, and the best available information.

III. CONCLUSION

IAGC appreciates this opportunity to comment on the PEIS. Although we support BOEM’s plan to authorize exploratory activities on the Atlantic OCS, there are several aspects of the PEIS that are not supported by science or by law, or are otherwise infeasible. Of the alternatives presented in the PEIS, Alternative A presents the option that is most supported by the best available science and applicable law. However, IAGC would support BOEM’s adoption of Alternative B only so long as all of the modifications suggested in these comments are incorporated into the ROD. We appreciate your consideration of our comments and sincerely hope that BOEM will prepare a ROD that addresses the concerns set forth above. Should you have any questions, please do not hesitate to contact me.

Sincerely,



Karen St. John
Group Vice President - Environment

International Association of Geophysical Contractors

cc: Mr. Walter Cruickshank (Walter.Cruickshank@boem.gov)
Ms. Jill Lewandowski (Jill.Lewandowski@boem.gov)

ATTACHMENT D

ATTACHMENT D

PSO Data 2013 - March 2015: Dolphin Sightings

Provided by CGG based on MMO reports submitted to BOEM during this period representing approximately 33% of total vessel activity days in the GOM since 2013.¹ Data prior to 2013 is not included in this analysis because PAM was not used consistently until this point.

Species Identification		
% of Unidentified Dolphin	85%	In many reports, PSOs contribute sea state, distance, or the sun's glare as a key factor for not being able to identify species. The significant number of acoustic detections without confirmed species identification is also a main contributor.
% of Identified Dolphin	15%	
PAM		
% of PAM Detections	78%	PAM detections accounted for a majority of the total dolphin sightings and detection reports. However, only 1% of the acoustic detections successfully identified a specific dolphin species. Visual corroboration was necessary to identify the species about 25% of the time.
Source Activity Comparison		
% of sightings and/or acoustic detections – source active	55%	The frequency of sightings and acoustic detections are almost proportional when the source is active or silent.
% of sightings and/or acoustic detections –source silent	45%	
Animal Behavior		
% of sightings when bow-riding was observed (active or silent)	6%	The data indicates an estimated 2% variance in observed bow-riding when the source was active versus when the source was silent. Fewer PSO observations when the source is silent could account for some variance. The values are close enough to conclude the frequency of animal engagement with the vessel is not specific to source status.
Average Distance of Animal at Initial Sighting	570m	Initial sightings and detections are made most often at a distance between 500m and 800m.

PSO Data 2013 - March 2015: Turtle Sightings

Provided by CGG based on MMO reports submitted to BOEM during this period representing approximately 33% of total vessel activity days in the GOM since 2013.² Data is taken from 2013 to be consistent with Dolphin sighting period.

Total Sightings	410	410 sea turtles were observed overall.
Average Distance of Animal at Initial Sighting	53m	Analysis of turtle sightings indicates observations are typically within 100m. It is often difficult to ascertain if an object in the water is a turtle or floating debris at further ranges.

¹ Estimated calculation based on level of activity from January 2013 to March 2015 from IHS SeismicBase Vessel Search Database.

² *Id.*



May 7, 2014

Mr. Gary D. Goeke
Chief, Environmental Assessment Section
Office of Environment (GM623E)
Bureau of Ocean Energy Management
Gulf of Mexico OCS Region
1201 Elmwood Park Boulevard
New Orleans, Louisiana 70123-2394

Submitted via email: ggeis@boem.gov

Re: Comments on the Final Programmatic EIS for the Mid- and South Atlantic

Dear Mr. Goeke:

This letter provides the comments of the American Petroleum Institute (“API”), the International Association of Geophysical Contractors (“IAGC”), and the National Ocean Industries Association (“NOIA”), in response to the Bureau of Ocean Energy Management’s (“BOEM”) Notice of Availability and Request for Comments on its Final Programmatic Environmental Impact Statement (EIS) for proposed Geological and Geophysical (“G&G”) Activities on the Mid- and South Atlantic Outer Continental Shelf (“OCS”). *See* 79 Fed. Reg. 13,074 (March 7, 2014). We appreciate BOEM’s consideration of the comments set forth below.

API is a national trade association representing over 600 member companies involved in all aspects of the oil and natural gas industry. API’s members include producers, refiners, suppliers, pipeline operators, and marine transporters, as well as service and supply companies that support all segments of the industry. API and its members are dedicated to meeting environmental requirements, while economically developing and supplying energy resources for consumers. API is a longstanding supporter of allowing new exploration in the Atlantic OCS and the Final Programmatic Environmental Impact Statement (“FPEIS”) is the first step toward the much needed collection of new and improved data on potential oil and natural gas resources in the Mid-and South Atlantic OCS Planning Areas.

IAGC is the international trade association representing the industry that provides geophysical services (geophysical data acquisition, processing and interpretation, geophysical information ownership and licensing, and 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.

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the U.S. Outer Continental Shelf (“OCS”). The NOIA membership comprises more than 275 companies engaged in a variety of business activities, including production, drilling, engineering, marine and air transport, offshore construction, equipment manufacture and supply, telecommunications, finance and insurance, and renewable energy.

The Associations support BOEM’s plan to authorize exploratory activities on the Atlantic OCS consistent with the Outer Continental Shelf Lands Act (“OCSLA”); however, the FPEIS undermines OCSLA’s mandate to expeditiously and orderly develop the natural resources of the OCS, and the requirements of other applicable laws such as the Marine Mammal Protection Act, in a number of ways. We feel that the FPEIS establishes an unsupported, unobserved, and unrealistic scenario where G&G activities are projected unrealistically to result in thousands of incidental takes of marine mammals – incidental takes that, in fact, BOEM admits will not actually occur. From this fundamentally flawed and inaccurate approach, the FPEIS develops and analyzes unrealistic mitigation measures to address the effects of a “worst case” hypothetical scenario. This approach is contrary to both the best available scientific information and applicable law. The Associations respectfully recommend that BOEM’s Record of Decision (ROD) reflect a revised agency judgment on these issues.

Because G&G activities have little documented impact on marine mammals, the mitigation measures endorsed by Alternative B employ speculation to impose potentially substantial operational and economic burdens on future G&G activities that undermine Congress’s clear policy mandate that the Department of Interior facilitate expeditious development of the OCS.

The results of our detailed review of the FPEIS are presented in Appendix 1 attached to this letter, but we have included an overview of the key points contained in the appendix:

1. The FPEIS and future permitting decisions must consider the statutory and environmental context of G&G activities, including the OCSLA. Geological and geophysical activities are critical to the expedited development of OCS resources and the national economic and energy policy goals mandated by OCSLA. The FPEIS omits and undermines much of the critical substantive context and plain congressional directives for the G&G activities analyzed, and it also fails to adequately consider the critical importance of G&G data to OCS development and to the reduction of risks. The ROD that will be prepared based on the FPEIS must consider all relevant factors in balancing the importance of the activities to be permitted, which are critical to the essential purpose of OCSLA.
2. The FPEIS does not incorporate all of the best available science. BOEM discounts observational data that contradict its modeled quantification of G&G impacts and instead relies on unrealistic assumptions regarding sound exposure that are not supported by the best science currently available.
3. Alternative B encourages BOEM to impose unnecessary, arbitrary, and impracticable mitigation measures lacking scientific justification, including the following:

- The FPEIS’s expansion of the exclusion zone – compounded by the extension of the shutdown requirement to delphinids – will significantly increase the number of array shutdowns required during a seismic survey, and thereby substantially impact the economics and operations of conducting a seismic survey in the Atlantic. The establishment of a 500-meter minimum is an arbitrary departure from BOEM’s rationale for amending the exclusion zone provision. Because BOEM justifies the new exclusion zone provision on the modeled footprint of the individual array’s characteristics and site-specific ambient noise conditions, the exclusion zone should always be based upon the modeled output of the array, even if the modeled output results in an exclusion zone of less than 500 meters.
 - The FPEIS extends the visual monitoring period for ramp-up of the airgun array – both prior to beginning the survey and after a shutdown – from 30 minutes to 60 minutes. The extension of the visual monitoring period compounds the other operational difficulties Alternative B imposes on seismic surveys. The FPEIS itself offers no justification for the extension of the visual monitoring period.
 - The FPEIS extends shutdown requirement to include delphinids. Both the Associations’ 2012 DPEIS comments, and BOEM’s approval of past seismic survey applications illustrate that extending the shutdown requirement to delphinids is not scientifically justified because delphinids are mid-frequency hearing specialists, with an effective hearing range largely outside of the low frequency range characteristic of airgun arrays. Implementation of this proposed measure will substantially increase the number of shutdowns with no proven environmental benefit.
 - The proposed geographic separation between simultaneous seismic airgun surveys is scientifically unsupported. Because the separation distance rests on NMFS’s exposure criteria for Level B takes, it suffers from the same flaws as NMFS’s thresholds (most notably that the thresholds do not represent the best available science). In addition, this measure is not included in the NMFS Biological Opinion and BOEM offers no evidence to support its underlying assumption that marine mammals would utilize the “corridor” that the separation requirement is designed to create.
4. The Expanded Time-Area Closure provisions for North Atlantic Right Whales lack sufficient basis in existing data, and are otherwise unsupported and unjustified. Similarly, the addition of an acoustic buffer zone around closure zones and the inclusion of Dynamic Management Areas (“DMAs”) in the FPEIS are unsupported by the science. The fact that DMAs and acoustic buffer zone mitigations were not included in the Draft EIS has precluded the opportunity for public evaluation and comment.
 5. The FPEIS proposes unprecedented observation and shutdown requirements for High Resolution Geophysical (HRG) activities that mimic closely those required of seismic surveys, despite the fact they are significantly different in many ways.

In addition, we note that the FPEIS incorporates the recently published NMFS-OPR-49, *National Standards for Protected Species Observers and Data Management: A Model Using Geological and Geophysical Surveys* (“Observer Standards”). The Associations recently sent a letter to

agency staff regarding changes that we would like to see incorporated into the Observer Standards and we have included that letter as Attachment A in our comments on the FPEIS.

The Associations feel that BOEM has failed to provide a reasoned justification for choosing Alternative B as the preferred alternative. While BOEM justifies Alternative B as providing the “highest practicable” level of mitigation measures, it is not required to make its selection based on this standard at the expense of other valid concerns necessary for achieving balance as required under OCSLA. Moreover, many of the mitigation measures recommended in the FPEIS are infeasible, will impose serious burdens on industry, may discourage exploration of the Atlantic, and will result in no benefits to protected species because they address unreal and unsupported effects. The Associations support mitigation measures that are based on the best available science, consistent with existing practices that are proven to be effective, and are operationally feasible. However, we cannot support mitigation measures with no basis in fact or science, that address effects that have not been observed, and will result in less exploration of the OCS.

The Associations appreciate the opportunity to comment on the FPEIS. Although we support BOEM’s plan to authorize exploratory activities on the Atlantic OCS, there are a number of aspects of the PEIS that are not supported by science or by law, or are otherwise infeasible. Of the Alternatives presented in the FPEIS, Alternative A presents the option that is most supported by the best available science and applicable law. However, the Associations would support BOEM’s adoption of Alternative B so long as all of the modifications suggested in separate comments to the FPEIS submitted by the IAGC (see Attachment B) are incorporated into the ROD. All of these suggested modifications are within the scope of the analyses contained in the PEIS. *See Great Old Broads for Wilderness v. Kimbell*, 709 F.3d 836, 854-55 (9th Cir. 2013) (modified alternative in ROD upheld because all relevant impacts analyzed in NEPA document); *see also W. Watersheds Project v. BLM*, 721 F.3d 1264, 1277-78 (10th Cir. 2013) (same).

We appreciate your consideration of our comments and sincerely hope that BOEM will prepare a ROD that addresses our concerns. Further, we hope that the ROD will be issued as soon as possible so that much needed seismic surveys in the Atlantic can be initiated. Should you have any questions please contact Andy Radford at (202)682-8584 or radforda@api.org.

Sincerely,



Andy Radford
American Petroleum Institute



Karen St. John

International Association of Geophysical Contractors

A handwritten signature in black ink, appearing to read "Jeff Vorberger". The signature is stylized and cursive.

Jeffrey Vorberger
National Ocean Industries Association

Appendix 1

Comments of the American Petroleum Institute, International Association of Geophysical Contractors, and National Ocean Industries Association

API, IAGC, and NOIA (collectively, “the Associations”) respectfully request that BOEM revise the FPEIS to effectuate the purposes of the Outer Continental Shelf Lands Act (OCSLA) and the agency’s obligations under the National Environmental Policy Act (NEPA). For the reasons set forth below, in the accompanying documents, and in prior comments to BOEM, the Associations believe the FPEIS’s selection of Alternative B as the preferred alternative violates BOEM’s obligations under NEPA and OCSLA. Because G&G activities have little documented impact on marine mammals, the mitigation measures endorsed by Alternative B employ speculation to impose potentially prohibitive operational and economic burdens on future G&G activities that undermine Congress’s clear policy mandate that the Department of Interior facilitate expeditious development of the OCS.

Of the Alternatives presented in the FPEIS, Alternative A presents the option that is most supported by the best available science and applicable law. However, the Associations would support BOEM’s adoption of Alternative B so long as all of the modifications suggested in separate comments to the FPEIS submitted by the IAGC (see Attachment B) are incorporated into the ROD. All of these suggested modifications are within the scope of the analyses contained in the PEIS. *See Great Old Broads for Wilderness v. Kimbell*, 709 F.3d 836, 854-55 (9th Cir. 2013) (modified alternative in ROD upheld because all relevant impacts analyzed in NEPA document); *see also W. Watersheds Project v. BLM*, 721 F.3d 1264, 1277-78 (10th Cir. 2013) (same).

I. The FPEIS Must Consider the Statutory and Environmental Context of G&G Activities.

NEPA is a purely procedural statute that “does not mandate particular results, but simply prescribes the necessary process.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989). “If the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs.” *Id.* *See also Utahns for Better Transportation v. U.S. Dep’t of Transportation*, 305 F.3d 1152, 1162–63 (10th Cir. 2002) (“[A]gencies are not required to elevate environmental concerns over other valid concerns”). Because NEPA itself provides no substantive guide for consideration of the underlying action—here, the conduct of G&G activities—the “statutory context” of the underlying action must inform the analysis of costs and benefits in an EIS. *See, e.g., League of Wilderness Defenders—Blue Mountains Biodiversity Project v. U.S. Forest Serv.*, 689 F.3d 1060, 1070 (9th Cir. 2012).

Consideration of the statutory context informs an entire EIS. For example, “the goals of an action delimit the universe of the action’s reasonable alternatives.” *City of Alexandria, Va. v. Slater*, 198 F.3d 862, 867 (D.C. Cir. 1999) (quotation omitted). *See also, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1121 (9th Cir. 2002) (Forest Service “not required under NEPA to consider alternatives . . . that were inconsistent with its basic policy objectives”).

Indeed, an agency may eliminate both alternatives and mitigation measures that do not meet the purposes and needs of a project. *See Biodiversity Conservation Alliance v. BLM*, 608 F.3d 709, 715 (10th Cir. 2010). And the goals must be “heavily influenced by the agency’s consideration of the views of Congress, expressed, to the extent the agency can determine them, in the agency’s statutory authorization act, as well as in other congressional directives.” *Natural Resources Defense Council, Inc. v. Pena*, 972 F. Supp. 9, 18 (D.D.C. 1997) (quotation omitted).

As set forth below, the FPEIS omits and undermines much of the critical substantive context and plain congressional directives for the G&G activities analyzed.

A. G&G Activities Are Critical to the Expedited Development of OCS Resources Mandated by OCSLA.

“Where an action is taken pursuant to a specific statute, the statutory objectives of the project serve as a guide by which to determine the reasonableness of objectives outlined in an EIS.” *Westlands Water District v. U.S. Dep’t of the Interior*, 376 F.3d 853, 866 (9th Cir. 2004). Here, OCSLA provides the specific statutory authorization of G&G activities. *See* 43 U.S.C. § 1340. While Chapter 1.4.2 of the FPEIS defines the purpose and need of G&G activities with reference to development of “oil and gas reserves,” BOEM’s generalized discussion of purpose neglects the strong statutory objectives Congress identified in OCSLA. *See* FPEIS at 1-9. That omission is critical.

Congress enacted OCSLA to promote and ensure the “expedited exploration and development of the [OCS] in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade.” 43 U.S.C. § 1802(1); *see also id.* § 1332(3) (the OCS “should be made available for expeditious and orderly development, subject to environmental safeguards, in a manner which is consistent with the maintenance of competition and other national needs”). Indeed, Congress specified that it wished to “make [OCS] resources available to meet the Nation’s energy needs as rapidly as possible.” *Id.* § 1802(2)(A). OCSLA accordingly “has an objective—the expeditious development of OCS resources” *California v. Watt*, 668 F.2d 1290, 1316 (D.C. Cir. 1981). Because “[t]he first stated purpose of the Act . . . is to establish procedures to expedite exploration and development of the OCS,” OCSLA’s remaining purposes primarily concern measures to eliminate or minimize the risks attendant to that exploration and development. Several of the purposes, in fact, candidly recognize that some degree of adverse impact is inevitable.” *Id.*¹ *Cf.* Executive Order 13212 (May 18, 2001) (directing that “executive departments and agencies . . . shall take appropriate actions, to the extent consistent with applicable law, to expedite projects that will increase the production, transmission, or conservation of energy”).

While the FPEIS concedes that G&G activities generate data that contribute to “informed” and “orderly” development decisions by industry and Government, *see* FPEIS at 1-8–1-9; *see also* FPEIS at 3-3 (noting importance of G&G data), BOEM’s choice of Alternative B undercuts the

¹ The FPEIS concludes that the majority of impacts from the proposed G&G activities will be “negligible” or “minor.” *See* FPEIS at x–xiv (summarizing anticipated impacts from Alternative A).

critical importance of G&G activities to expeditious OCS development and, thus, to OCSLA's animating purpose. And Alternative B endorses restrictive mitigation measures despite the generally "minor" impacts of G&G activities. As further explained *infra*, the operational and practical limitations imposed by the FPEIS threaten the viability of critical G&G activities and thereby directly undermine Congress's stated purpose to "promote the swift, orderly and efficient exploration" of OCS oil and gas resources.²

B. The FPEIS Fails To Adequately Consider the Critical Importance of G&G Activities to Development of OCS Oil and Gas Resources, and To the Reduction of Risks to Environmental Resources from OCS Development.

The FPEIS candidly acknowledges that "[t]he G&G surveys acquired during the period when Atlantic oil and gas leasing took place in the 1970's and 1980's have been eclipsed by newer instrumentation, technology, and data processing that make seismic data of that time period inferior," FPEIS at 1-9, and existing estimates of energy reserves in the Atlantic woefully out-of-date. Rather, "[n]ew surveys conducted with current technology would significantly improve the ability of both industry and Government predict where, and in what quantity, fossil fuel hydrocarbons are more likely to be found," and "allow the Government to place a fair and appropriate value on these resources for the Nation." FPEIS at 2-58.

Moreover, as the FPEIS concedes, "using . . . vintage surveys to optimally site an exploratory well or a well field, or to interpret the nature of formation fluids or gases, is generally not reasonable." FPEIS at 2-57. Having the most accurate and state-of-the-art seismic data for use in drilling and production activities reduces the environmental impact of exploration and production, by significantly reducing the number of unsuccessful wells and, thus, reducing the potential environmental impact of each well so avoided. As technology continues to advance, the seismic industry can continue to reduce drilling risk and increase potential production. Just as physicians today may use MRI technology to image an area that previously had been imaged by X-ray technology, geophysical experts are actively using and enhancing the most modern technology to make improved seismic evaluations.

Indeed, vast improvements in geophysical imaging technologies in recent years now afford the oil and gas industry significant precision in subsurface imaging, which reduces environmental risks during drilling operations. For example, subsurface imaging provides a key input to help predict hazardous over-pressurized zones in a reservoir and thus allows an operator to better design a well to minimize its associated types and levels of risk.

G&G activities thus provide environmental benefits in the conduct of the expeditious OCS oil and gas development activities mandated by OCSLA.³ The FPEIS, however, fails to consider the environmental benefits of improved G&G activities. Rather, BOEM disregards such benefits

² H.R. Rep. No. 95-590, at 8, *reprinted in* 1978 U.S.C.C.A.N. 1450, 1460.

³ *Cf.* Executive Order 12866, § 1(b)(6) (Sept. 30, 1993) ("Each agency shall assess both the costs and the benefits of the intended regulation and . . . propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.").

as “outside of the scope of the NEPA document.” FPEIS Vol. III, Table L-6 at L-116 (response to comments of API, IAGC, and NOIA).

Contrary to BOEM’s narrow view of G&G activities, “[t]he purpose of NEPA is to require agencies to consider *environmentally significant aspects* of a proposed action.” *Utahns for Better Transportation v. U.S. Dep’t of Transportation*, 305 F.3d 1152, 1162 (10th Cir. 2002) (emphasis added). *Cf. Utahns*, 305 F.3d. at 1174 (“An EIS must analyze not only the direct impacts of a proposed action, but also the indirect impacts of past, present, and reasonably foreseeable future actions . . .”). By ignoring the environmental benefits of G&G activities to anticipated oil and gas development activities, the FPEIS fails to “adequately set[] forth sufficient information to allow the decisionmaker to consider alternatives and make a reasoned decision after balancing the risks of harm to the environment against the *benefits* of the proposed action.” *Friends of the Boundary Waters Wilderness v. Dombeck*, 164 F.3d 1115, 1128 (8th Cir. 1999) (emphasis added). *See also Coal. for a Livable Westside v. U.S. Postal Serv.*, No. 99-cv-10873, 2000 WL 1264256, at *3 (S.D.N.Y. Sept. 7, 2000) (explaining that an EIS must “assess[]the environmental benefits and detriments of the proposed action”).

II. The FPEIS Does Not Incorporate the Best Available Science.

As explained in the Associations’ comments on the DPEIS (“2012 DPEIS Comments”), BOEM’s scientific analysis must be based upon the best available science. *See* 2012 DPEIS Comments, Appendix 1 at 1 (identifying requirements of NEPA and Executive Order 13563). *See also* 40 C.F.R. § 1502.24 (requiring agency to “insure the professional integrity, including scientific integrity, of the discussions and analyses in the environmental impact statements”); *id.* § 1500.1(b). For the reasons identified in the Associations’ 2012 DPEIS Comments, and as further set forth below, the FPEIS does not satisfy BOEM’s obligation to use the best available science.

A. BOEM Discounts Marine Mammal Field Observational Data that Undermines its Modeled Quantification of G&G Impacts.

Data accumulated from Marine Mammal Observers demonstrate the absence of documented effects—in particular, injury or death to an animal—of seismic surveys on marine mammals. Nevertheless, the FPEIS estimates an enormous number of Level A and Level B takes from G&G activities in the Atlantic. Relying on the sound exposure criteria developed by the National Marine Fisheries Service (NMFS), the FPEIS predicts, for example, up to nearly 12,000 Level A takes of bottlenose dolphins per year from seismic survey operations, and over 1.1 million Level B takes. *See, e.g.*, FPEIS at xi. Because such estimates bear no relation to the minimal impacts actually observed from seismic survey activities, BOEM has apparently ignored the existing data on actual, observed impacts in derogation of its obligation to utilize the best available science. *Cf. San Juan Citizens Alliance v. Stiles*, No. 08-cv-144, 2010 WL 1780816, at *16 (D. Colo. May 3, 2010) (noting that Forest Service regulation requiring use of “best available science” means agency “cannot ignore existing data” (quotation omitted)); *Turtle Island Restoration Network v. U.S. Dep’t of Commerce*, No. 12-cv-594, 2013 WL 4511314, at *22 (D. Hawai’i Aug. 23, 2013) (Under the ESA, “the ‘best available data’ requirement keeps agencies from ignoring available information.”); *The Ecology Ctr., Inc. v. U.S. Forest Serv.*, 451

F.3d 1183, 1194 n.4 (10th Cir. 2006) (looking to meaning of “best available science” under other statutory regimes to inform meaning of requirement in National Forest Management Act).

Rather than rely on observational data, BOEM estimated impacts with a predictive computer model of sound propagation and exposure. *See* FPEIS at 2-17 & Appendices D, E. The FPEIS explains that Acoustic Integration Model (AIM), which is used to estimate takes, as “a 4D, individual-based, Monte Carlo statistical model” that “is by its very nature complex and requires numerous assumptions to predict results . . .” FPEIS at 4-58. Even with that complexity, AIM does not incorporate animal behaviors, such as avoidance, which likely occur and would likely reduce the estimated number of exposures.

Notably, the D.C. Circuit has cautioned that “although computer modeling is a useful and often essential tool for performing the Herculean labors Congress imposes on administrative agencies, such models, despite their complex design and aura of scientific validity, are at best imperfect and subject to manipulation.” *Gas Appliance Mfrs. Ass’n v. Dep’t of Energy*, 998 F.2d 1041, 1045 (D.C. Cir. 1993) (quotation and alteration omitted). “Since the accuracy of any computer model hinges on whether the underlying assumptions reflect reality . . . [t]he agency’s burden [to demonstrate the reasonableness of a model] becomes heavier when a method of prediction is being relied on to overcome adverse actual test data.” *Id.* (quotations and alteration omitted).

Here, BOEM’s modeling predicts levels of take that vastly exceed, *see infra*, the observational impact data accumulated by Marine Mammal Observers on survey vessels.⁴ Far from supporting the FPEIS, the observed data conflicts with the enormous number of takes predicted by the models. *Cf. Conservation Congress v. U.S. Forest Serv.*, No. 10-17298, 489 F. App’x 151, 153 (9th Cir. June 4, 2012) (recognizing that agency’s scientific support may be insufficient where scientific studies indicate the agency’s “analysis is outdated or flawed or indicate any scientific information directly undermining” the agency’s conclusion (quotation omitted)); *Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964 (9th Cir. 2005) (“To take the required ‘hard look’ at a proposed project’s effects, an agency may not rely on incorrect assumptions or data in an EIS.”). Thus, while a model fails to satisfy NEPA requirements if it “is so oversimplified that the agency’s conclusions from it are unreasonable,” *Small Refiner Lead Phase-Down Task Force v. U.S. EPA*, 705 F.2d 506, 535 (D.C. Cir. 1983), the FPEIS employs a model with the opposite, but equally fatal, flaw: complication that is not grounded in, and deviates significantly from, existing data.

Given the FPEIS’s deviation from observed impact data, BOEM’s defense of the FPEIS as providing “a detailed description for each step in the impact assessment process,” FPEIS Vol II, Table L-6 at L-109, is non-responsive to the Association’s concerns, *compare Montana Wilderness Ass’n v. McAllister*, No. 09-36051, 460 F. App’x 667, 670 (9th Cir. Dec. 1, 2011) (finding agency met its duty to respond to comments where is “adequately responded to the **substance** of . . . comments” (emphasis added)), or the agency’s NEPA obligations.

⁴ One BOEM review of Marine Mammal Observer data, for example, logged a total of 194,273 visual survey hours, with only 125.74 hours of down time attributed to protected species shutdowns. *See* BOEM, *Seismic Survey Mitigation Measures and Marine Mammal Observer Reports*, at 1 (June 2012).

In addition to its deviation from observed impacts, the FPEIS's underlying AIM model suffers from documented weaknesses. In 2006, NMFS initiated an independent peer review of the AIM model. See Summary Report: Review of Acoustic Integration Model (AIM), University of Miami Independent System for Peer Review at 1 (Dec. 11, 2006), available at http://www.nmfs.noaa.gov/pr/pdfs/permits/lfa_aim_review.pdf. The peer review did not reach a consensus on whether AIM meets the Council for Regulatory Monitoring (CREM) guidelines "since [AIM] is not an application model (but a tool for developing such models)." *Id.* (noting "there was some diversity of opinion"). Rather, the peer review noted "[t]he need for expertise in the use of AIM" as well as "the absence of appropriate uncertainty and sensitivity tests in the current applications of AIM." *Id.* While the peer review agreed that "the use of AIM *can* lead to models which will meet CREM guidelines . . . , such models, at this stage, would need to be evaluated on a case-by-case basis (i.e., merely using AIM is not sufficient . . .)." *Id.* (emphasis added). The FPEIS provides no verification that such a case-by-case analysis was undertaken of the use of AIM here. That lack of verification is particularly significant in this case because the peer review further identified the absence of data on "real" animal behavior as a fundamental limitation of AIM, see *id.* at 7–11 (noting "knowledge of marine mammals was identified as the weakest component"), and, as explained above, observed impact data undermines the model's predictions of G&G impacts.

Finally, BOEM's explanation that the sound "propagation models" employed by the FPEIS "have been extensively tested against field measurements," FPEIS Vol. III, Table L-6 at L-111–L-112, is likewise non-responsive to the Associations' concerns. The absence of observed impacts from seismic surveys relates to the sound exposure modeling conducted by BOEM, not the propagation modeling that is limited to determining the ways that sound moves through the ocean (and is an input in the exposure model). The fact that BOEM believes the propagation models are "appropriate" and "considered" acceptable, see, e.g., FPEIS Vol. III, Table L-6 at L-109, fails to respond to the Association's showing that the sound exposure models are scientifically or practically flawed.

B. BOEM Relies on Assumptions Regarding Sound Exposure that Are Not Supported by the Best Available Science.

As explained in the Associations' 2012 DPEIS comments, BOEM's impact analysis improperly equates received sound levels to takes. See, e.g., 2012 DPEIS Comments, Appendix 2 at 10–15. The FPEIS responds simply that the impact analysis is justified because it is (1) "conservative" and (2) based upon exposure criteria developed by NMFS that is beyond BOEM's control. See, e.g., FPEIS Vol. III, Table L-6 at L-113; *id.* at L-111 (stating BOEM "cannot use the Southall criteria as the basis for take estimates because they have not been adopted by NMFS"); *id.* at L-112 (explaining that sound exposure criteria used to estimate take "are based on their acceptance by NMFS"); *id.* at L-114 ("[T]he choice of metric to use to determine takes was made by NMFS."); *id.* at L-118. The former explanation merely demonstrates BOEM's failure to adopt clear or consistent standards, and the latter abdication to NMFS violates BOEM's independent NEPA obligations.

First, the FPEIS simply states that its take estimates are "conservative" and the result of conservative—or "very conservative"—assumptions, "and this conservatism accumulates throughout the analysis." FPEIS at xii, xiii. The bare identification of an accumulated

conservatism does not itself justify BOEM's decision to employ such a conservative bias. Indeed, the FPEIS compounds its conservative bias by classifying the impacts of G&G activities on the majority of species as "negligible," but nonetheless choosing the more conservative Alternative B. See FPEIS at x–xxv. Yet the FPEIS offers no data as justification; rather, Marine Mammal Observer data indicates little seismic survey impact on marine mammals and provides no support for the FPEIS' conservatism. As the Associations' 2012 DPEIS comments make clear, BOEM's overly conservative impact analysis is exacerbated by BOEM's failure to use consistent or objective standards for assessing the severity of impacts on species, which often conflates "minor," "moderate," and "severe" impacts. See 2012 DPEIS Comments, Appendix 2 at 6.⁵

Second, the FPEIS's repeated invocations of NMFS's decisions to justify BOEM's impact analysis runs counter to the best available science on sound exposure impacts and improperly abdicates BOEM's NEPA obligations. As the Associations' demonstrated in their 2012 DPEIS Comments, NMFS's sound exposure criteria for Level A and Level B takes—180 dB re: 1µPA (rms) SPL for the former, 160 dB re: 1µPA (rms) SPL for the latter—improperly rest upon outdated data, see, e.g., *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1086–87 (9th Cir. 2011) ("Reliance on data that is too stale to carry the weight assigned to it may be arbitrary and capricious."), and fail to incorporate the more current science on this question developed by the Marine Mammal Noise Exposure Criteria Work Group ("Southall Work Group"), see, e.g., 2012 DPEIS Comments, Appendix 2 at 10.⁶

In contrast to the FPEIS, the Southall Work Group does not subjectively label animal responses to sound as "minor," "moderate," or "severe," but rather uses a nine-point continuum and thirty-four separate types of behavioral responses, and emphasizes "extreme degree of group, species, and individual variability in behavioral responses in various contexts and conditions . . .," (Southall et al. 2007) at 449. With respect to Level A takes, the Southall Work Group recommended an increase in the sound threshold to 230 dB re: 1µPA (rms) SPL, see *id.*, at 442, and supports a more contextual approach to Level B takes, that is wholly absent from the FPEIS. Indeed, the Southall Work Group's analysis of what constitutes a Level B take is substantially more nuanced than the FPEIS's practice equating certain received levels of sound with takes. See *id.* at 447 (noting one must "differentiat[e] brief, minor, biologically unimportant reactions from profound, sustained, and/or biologically meaningful responses related to growth, survival, and reproduction").

While the FPEIS purports to provide analysis based on the Southall Work Group, see FPEIS Vol. III, Table L-6 at L-112, that analysis is, at best, incomplete because it is limited to Level A takes, see, e.g., FPEIS at xi. Moreover, BOEM's principal response is that the FPEIS "cannot use the Southall criteria as the basis for take estimates because they have not been adopted by NMFS."

⁵ BOEM's lack of objective standards for categorizing effects will also foster arbitrary, and potentially conflicting, decisionmaking in assessing the vague boundaries between "minor," "moderate," and "severe" impacts. See 2012 DPEIS Comments, Appendix 2 at 6–7.

⁶ Other reports on marine sound impacts released after the Southall Work Group, such as J.J. Finneran & A.K. Jenkins, *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis* (2012), do not consider "[t]he criteria and thresholds for . . . airguns," *id.* at 2.

FPEIS Vol. III, Table L-6 at L-111; *see also, e.g., id.* at L-112 (explaining that sound exposure criteria used to estimate take “are based on their acceptance by NMFS”).⁷ Such abdication to NMFS on an issue central to assessing the impacts of G&G activities falls short of BOEM’s obligation to take a “hard look” at the environmental consequences of the proposed activities. “One agency cannot rely on another’s examination of environmental effects under NEPA.” *S. Or. Citizens Against Toxic Sprays, Inc. v. Clark*, 720 F.2d 1475, 1480 (9th Cir. 1983) (rejecting Interior Department’s reliance on EPA decision with respect to herbicide) (quotation omitted). Rather, BOEM must “assess independently,” *id.*, the environmental effects of the proposed actions it considers.

C. BOEM’s Impact Analysis Rests on Speculation.

Because the FPEIS ignores existing data demonstrating the absence of significant impacts—in particular, a lack of injuries—from G&G activities, and relies on thinly supported or outdated sound exposure assumptions, *see supra*, the FPEIS’s impact analysis ultimately provides little more than speculation about potential adverse effects of seismic surveys without regard to the probabilities of either occurrence or scope of such effects. Even with its flawed assumptions, moreover, the FPEIS concedes that the impact analysis—and the resulting choices regarding required mitigation—rests on predicted “possibility” of harm. *See, e.g.,* FPEIS at 2-20 (explaining that models predicted “possibility” of Level A takes, but did not take into account proposed mitigation measures); *id.* at 2-41 (explaining choice of Alternative B’s Brevard County time-area closure to “reduce the possibility of temporarily displacing breeding and nesting”). Yet BOEM has no obligation to assess such mere possibilities of harm. *See, e.g., S. Fork Band Council of W. Shoshone of Nevada v. Dep’t of Interior*, 588 F.3d 718, 727 (9th Cir. 2009); *Wyoming v. U.S. Dep’t of Agriculture*, 661 F.3d 1209, 1253 (10th Cir. 2011) (explaining that an agency is “not required to consider ‘speculative’ impacts”); *Sierra Club v. Hodel*, 544 F.2d 1036, 1039 (9th Cir. 1976).

III. Alternative B Encourages BOEM to Impose Unnecessary, Vague, and Impracticable Mitigation Measures.

The overarching errors in the FPEIS identified *supra* greatly overstate the impacts of G&G activities and, as a consequence, greatly overstate the alleged necessity for mitigation measures generally, and for the additional mitigation measures in BOEM’s preferred Alternative B in particular. By comparison, the FPEIS concludes that “the impacts associated with Alternative A would result in a *minor* incremental increase in underwater noise and a *minor* increase [in] impacts to marine mammals under the cumulative scenario.” FPEIS at 4-75 (emphases added). In light of the FPEIS’s overstatement of G&G impacts and the admittedly “minor” effect of G&G activities under Alternative A, BOEM’s choice of Alternative B is unjustified.

Moreover, viewed individually, the mitigation measures proposed in Alternative B are likewise unnecessary in light of the best available science, vaguely phrased in a manner that encourages arbitrary enforcement, and/or impose impractical operational burdens that threaten to

⁷ The FPEIS similarly attributes BOEM’s failure to consider the frequency weighting advocated by recent studies, *see* (Southall et al., 2007), to NMFS’s policy. *See* FPEIS Vol. III, Table L-6 at L119.

significantly limit seismic surveying that is necessary to meet OCSLA's goals, and may even threaten the overall viability of G&G activities in the Atlantic. Further, The PEIS incorporates significant new mitigation measures including dynamic management areas, acoustic buffer zones around closure areas, and a doubling of the time period required for observation of the exclusion zone before start-up is authorized. There has been insufficient justification and no opportunity for public comment; therefore, these mitigations should not be adopted.

A. The Proposed Seismic Survey Protocol.

Joint NTL 2012-G02 currently defines the current standard, "Seismic Survey Mitigation Measures and Protected Species Observer Program," in the Gulf of Mexico where the bulk of seismic surveys are conducted in U.S. waters.⁸ It has proven effective, and is therefore the best baseline for assessing proposed mitigation for G&G activities. Among other things, Joint NTL 2012-G02 (1) establishes a 500 meter exclusion zone surrounding the center of an airgun array; (2) permits the array to recommence operations only following a 30-minute visual clearance of the exclusion zone; and (3) requires the array to shut down if visual monitoring reveals a marine mammal (excluding dolphins) or sea turtle within the exclusion zone. The monitoring is conducted by a visual observer who has successfully completed a protected species observer training course.

The FPEIS proposes unjustified and unjustifiable changes to the baseline provisions of Joint NTL 2012-G02.

First, the FPEIS provides that the exclusion zone "shall be calculated independently and shall be based on the configuration of the array and the ambient acoustic environment, but shall not have a radius of less than 500 m" FPEIS at 2-10. In contrast to the current, fixed 500 meter exclusion zone, the FPEIS's proposal would result in enormously expanded exclusion zones. Indeed, the FPEIS calculates the exclusion zone—based upon NMFS's 180 dB re: 1µPA (rms) SPL criteria for Level A takes—that would be required in particular scenarios based on the size of the airgun array, resulting in exclusion zone radii ranging from 800 to over 2100 meters. *See* FPEIS Vol. II, Table D-22. The latter results in a spatial area more than 17 times larger than required by Joint NTL 2012-G02. More recent scientific research, however, undercuts this expansion; using the Southall Work Group's Level A sound threshold of 230 dB re: 1µPA (rms) SPL, (Southall et al. 2007) at 449, would in many instances result in an exclusion zone less than 500 meters.

The FPEIS's expansion of the exclusion zone—compounded by the extension of the shutdown requirement to delphinids, *see infra*—will significantly increase the number of array shutdowns required during a seismic survey, and thereby threaten the economic and operational feasibility of conducting a seismic survey in the Atlantic. Among other things, survey vessels continue to move along their tracklines even after the airgun array is shutdown. Once the exclusion zone has been visually cleared of marine mammals for, under the FPEIS, at least 60 minutes, the array can resume operations. To acquire seismic data for the region between the shutdown and start-up

⁸ U.S. Dep't of the Interior, Joint NTL No. 2012-G02, "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program, *available at* <http://www.boem.gov/Regulations/Notices-To-Lessees/2012/2012-JOINT-G02-pdf.aspx>.

positions of the array requires maneuvering the seismic survey vessels (and miles of trailing streamers) back to the shutdown position. An increase in the number of shutdowns thus increases downtime and wasteful maneuvering. Because a survey's data quality is also tied to acquiring data along specific tracklines, by breaking acquisition along a trackline, a shutdown potentially impairs data quality and prolongs the length of the survey, increasing exposure of human health, safety and environmental risks. *See, e.g., Site-Specific Environmental Assessment of G&G Survey Application No. L11-020 (Jan. 23, 2012), at 7–8.*

The FPEIS estimates that over 26,000 Level A takes would occur—thus indicating the number of shutdown events that would be necessary assuming perfect observation of species in the exclusion zone—in 2016 alone. *See FPEIS at Tables-43.*⁹ That figure dwarfs the 55 shutdowns that are typically caused by whale sightings in the Gulf of Mexico (baseline) in a year. Yet the FPEIS threatens the level or viability of seismic surveying in the Atlantic based solely on its scientifically flawed assessment of impacts, *see supra*, and expansion of the shutdown requirement to include delphinids, *see infra*. For example, in the Gulf of Mexico, the average shutdown lasts for 58 minutes, *see, e.g., BOEM, Seismic Survey Mitigation Measures and Marine Mammal Observer Reports*, at 1 (June 2012), which the FPEIS would extend by at least 30 minutes by increasing the visual monitoring period following a shutdown from 30 to 60 minutes. *See infra*. Multiplying a rough 1.5-hour average shutdown by 26,000 shutdowns would yield roughly 39,000 hours of shutdowns, or approximately 1625 days. Because the typical seismic survey operation costs roughly \$1.5 million per day, the total potential costs arising from the FPEIS's assumptions equal a staggering \$2.5 billion.

BOEM's revision of the exclusion zone is, moreover, incomplete. While the FPEIS requires a survey operator to model its array in order to calculate the proper exclusion zone, the FPEIS also mandates that the zone "shall not have a radius of less than 500 m." FPEIS at 2-10. The establishment of a 500-meter floor is an arbitrary departure from BOEM's rationale for amending the exclusion zone provision. Because BOEM justifies the new exclusion zone provision on the modeled footprint of the individual array's sound, the exclusion zone should always be based upon the modeled output of the array, even if the modeled output results in an exclusion zone of less than 500 meters. *See also supra*. In other words, the FPEIS must be consistent in its reliance on calculations of the exclusion zone and follow BOEM's own justification to its logical conclusion.

Notably, in response to the Associations' 2012 DPEIS Comments, BOEM acknowledged the need for logical consistency in calculating the size of the exclusion zone by revising the FPEIS to acknowledge that "the modeling could increase or decrease the size of the exclusion zone." FPEIS Vol. III, Table L-6 at L021. While the revision properly acknowledges the logic of decreasing an exclusion zone on the basis of the array's modeling, BOEM has not provided a justification for its failure to extend this logic below a 500-meter exclusion zone radius. *See, e.g., Business Roundtable v. SEC*, 647 F.3d 1144, 1153 (D.C. Cir. 2011) (holding agency action arbitrary where discussion of issue was "internally inconsistent").

Second, the FPEIS extends the visual monitoring period for ramp-up of the airgun array—both prior to beginning the survey and after a shutdown—from 30 minutes to 60 minutes. *See FPEIS*

⁹ The Associations aggregated the estimated takes presented in the FPEIS at Tables-43.

at 2-10-2-11. The extension of the visual monitoring period compounds the other operational difficulties Alternative B imposes on seismic surveys.

The FPEIS itself offers no justification for the extension of the visual monitoring period. *See, e.g.*, FPEIS at 2-9-2-12; FPEIS Vol. III, Appendix C. Rather, BOEM's revision appears to be based on a comment from the Georgia Department of Natural Resources that existing "visual detection mitigation techniques for right whales are inadequate due to the animal's ability to lie just under the surface and remain undetected." FPEIS Vol. III, Table L-6 at L-71-L-72. Despite the specific context of the question—related to right whales—BOEM nevertheless created a broad 60 minute monitoring period "to assist visual observers locate marine mammals during their normal dive (or subsurface rest) frequency." *Id.* BOEM did not provide any evidence demonstrating (or even indicating) that the existing 30-minute period is inadequate to identify any marine mammal.¹⁰ Indeed, in response to the Georgia Department of Natural Resources, BOEM stated generally "[t]hrough right whales may lie below the surface for periods of time, it is expected that trained PSOs would spot exhalation plumes and surface disturbances." FPEIS Vol. III, Table L-6 at L-71-L-72.

Third, the FPEIS extends NTL 2012-G02's shutdown requirement, which presently applies only to whales, to include delphinids. *See* FPEIS at 2-11. Both the Associations' 2012 DPEIS Comments, *see, e.g.*, 2012 DPEIS Comments, Appendix 2 at 20-21, and BOEM's approval of past seismic survey applications, *see, e.g., id.*, Appendix 1 at 6 n.9, illustrate that extending the shutdown requirement to delphinids is not scientifically justified because delphinids are mid-frequency specialists, with an effective hearing range largely outside of the low frequency range characteristic of airgun arrays. *E.g.* (Southall, et. al 2007) at 430-31. In response to the Associations' 2012 DPEIS Comments, BOEM again explained this provision based on NMFS's outdated sound exposure criteria. *See* FPEIS Vol. III, Table L-6 at L-122. Further, the illogical contradiction that dolphins that do not happen to bow ride require a different mitigation strategy makes no sense scientifically. Despite the lack of scientific justification, the FPEIS's extension of the shutdown requirement will vastly increase the likely number of shutdowns, with tens of thousands of shutdown events predicted for dolphins alone. *See* FPEIS, Table 4-10 at Tables 43.

Moreover, bow-riding of seismic survey vessels—a normal behavior seen with dolphins—further demonstrates the lack of injurious impact (or take) from seismic airguns. The FPEIS fails to analyze recent research into harbor porpoise (Linnenschmidt et al, 2012) and the bottlenose dolphin (Li et al, 2011, 2012) that suggest hearing control may apply to a number of different species of delphinids and cetaceans and that the animals have the ability to reduce their hearing sensitivity. The Associations appreciate BOEM's attempts, through creation of a bow-riding exception to shutdown requirements, to recognize the commonality of bow-riding and ameliorate the danger of unnecessary shutdowns brought-on by a dolphin's affirmative approach of a survey in order to bow-ride. *See, e.g.*, FPEIS Vol. III, Table L-6 at L-122. The proposed exception, however, offers little protection from unnecessary shutdowns. That exception provides:

¹⁰ Likewise, NMFS's Biological Opinion for Programmatic G&G Activities in the Mid- and South Atlantic Planning Areas from 2013 to 2020 (July 19, 2013) simply recites the mitigation included in the FPEIS, *see* FPEIS, Appendix A, without justification for lengthening the visual monitoring period.

Shutdown would not be required for delphinids approaching the vessel (or vessel's towed equipment) that indicates a "voluntary approach" on behalf of the delphinid. A "voluntary approach" is defined as a clear and *purposeful* approach toward the vessel by the delphinid(s) with a speed and vector that indicates that the delphinid(s) is approaching the vessels and remains near the vessel or towed equipment. *The intent of the delphinid(s) would be subject to the determination of the PSO.* If the PSO determines that the delphinid(s) is actively trying to avoid the vessel or the towed equipment, the acoustic sources must be immediately [shutdown] as per his/her instruction.

FPEIS Vol. III, Appendix C at C-21 (emphases added). Even if implemented to preclude shutdowns for all purposefully approaching delphinids, BOEM has estimated that only roughly one-third of dolphins within 500 meters of a survey vessel exhibit bow-riding behavior, which still leaves many thousands of potential (and scientifically unjustified) shutdowns on account of delphinids.

However, the Associations doubt that the bow-riding exception could be implemented appropriately to preclude all purposeful approaches. Because a shutdown must occur upon a delphinid's entry into the exclusion zone, the determination as to the delphinid's "intent" must be made at a great distance—a distance the FPEIS now potentially extends up to more than 2000 meters. *See supra.* The decision as to the delphinid's intent, moreover, is left wholly to the subjective discretion of PSOs who (1) are likely to err on the side of precaution and order a shutdown when it does not prove necessary, and (2) are subject to training on NMFS's 2013 National Standards for a Protected Species Observer and Data Management Program, *see* FPEIS at 2-10, which may not be consistent with the best available science and technology, clearly written, transparently implemented, or fully informed by the public, *see* Attachment A.¹¹

B. The Proposed Geographic Separation Between Simultaneous Seismic Airgun Surveys.

BOEM's choice of Alternative B "may establish a 40-km (25-mi) geographic separation between the sources of simultaneously operating seismic airgun surveys." FPEIS at 2-37. The FPEIS explains the creation of this separation requirement "to provide a corridor between vessels conducting simultaneous surveys where airgun noise is *below Level B thresholds* and approaching ambient levels such that animals *may pass through* rather than traveling larger distances to go around the survey vessels." *Id.* (emphases added). The FPEIS's justification, however, is scientifically unsupported. First, because the separation distance rests on NMFS's 160 dB re: 1 μ PA (rms) SPL exposure criteria for Level B takes,¹² it suffers from the same flaws

¹¹ Additionally, because the exception rests upon a PSO's discretionary assessment of a delphinid's subjective "intent" around and within the exclusion zone—as a proxy for the absence of harm to the animal—the PSO should have similar discretion to assess the intent of—and prevent a shutdown upon the purposeful approach of—other marine mammals.

¹² The absence of this measure from the Biological Opinion, *see* FPEIS, Appendix A, further undermines BOEM's reliance on NMFS to support a 40-km separation.

as NMFS's thresholds. *See supra*.¹³ In addition, BOEM offers no evidence to support its underlying assumption that marine mammals would utilize the "corridor" that the separation requirement is designed to create.

The proposed 40-km separation is also inconsistent with BOEM practice in the Arctic. The 2006 Final Programmatic Environmental Assessment for Arctic Ocean OCS Seismic Surveys provided for a 24 kilometer separation between the seismic source vessels of simultaneous surveys.¹⁴ Thus, the FPEIS imposes nearly twice the separation distance even though the physical environment of the Arctic—with its relatively shallow depth, rocky bottoms, and prevalent sea ice—results in greater sound propagation.

BOEM acknowledges that, even if seismic sound can theoretically propagate great distances, "it is unknown if detection of sound at these distances has any effect on marine mammals or other marine species." FPEIS at 2-38. Rather than question the propriety of its proposed 40-km separation distance, however, BOEM's sole concession to this scientific uncertainty is to claim the agency "will consider the value of this measure at the site-specific NEPA and environmental analyses level, as well as any new information available at that time. BOEM *may not* apply this specific mitigation measure programmatically." *Id.* (emphasis added). Setting aside the possibility that BOEM "may" actually employ the separation measure programmatically, the FPEIS does not explain how the uncertainty as to whether impacts occur at great distances can be resolved on site-specific information.

¹³ BOEM's secondary reliance on the assertion that "in some circumstances, airgun noise can be detected at great distances from the sound source, such as across ocean basins (Neukirk et al., 2012)," FPEIS at 2-38, is no more availing. The FPEIS does not identify any sections of the Mid- or South Atlantic planning areas that meet the specific "circumstances" of the cited study; nor does the FPEIS account for the rate of energy loss (*i.e.*, transmission loss) in specific propagating conditions in the Atlantic.

¹⁴ Mineral Management Service, Final Programmatic Environmental Assessment for Arctic Ocean OCS Seismic Surveys - 2006 (OCS EIS/EA MMS 2006-038), at p. 235.

C. The Expanded Time-Area Closure for North Atlantic Right Whales (NARW).

Alternative B prohibits seismic airgun surveys in (1) the Mid-Atlantic and South Atlantic Seasonal Management Areas (SMAs) from November 1 to April 30, *see* FPEIS, Appendix C at C-16; (2) the NARW critical habitat area from November 15 to April 15, *see id.*; and (3) in a continuous 37 km-wide zone extending from Delaware Bay to the southern limit of the programmatic area, *see id.* at C-32.¹⁵ In addition, “G&G surveys using airguns would not be allowed in [an] active” Dynamic Management Area” (DMA) created by NMFS based on “a reliable sighting of a NARW.” FPEIS, Appendix C at C-36. And surveys conducted outside of the closure areas “would be required to remain such distance that received levels at those boundaries do not exceed” 160 db re: 1μPA (rms). *Id.* The time-area closure provisions lack sufficient basis in existing data, and are otherwise unsupported and unjustified.

First, according to the FPEIS, “[t]he purpose of the expanded time-area closure,” through implementation of a 37 km-wide zone extending south from Delaware Bay, “is to prevent impacts to NARWs along their entire migration route and calving and nursery grounds.” *Id.* at C-32. While the Associations share BOEM’s concern for the health of the NARW population, as the Associations’ 2012 DPEIS Comments demonstrate, there are no documented injuries, deaths, or significant disturbances to NARWs from airguns (even though the NARW is among the most studied species of whale). *See* 2012 DPEIS Comments at 5; *id.*, Appendix 2 at 3, 17–18. Rather, the primary documented risks to the NARW population are vessel strikes and fishing gear entanglement. *See id.* at 5 & nn. 4, 5. Yet, while the NARW is particularly susceptible to lethal strikes from vessels exceeding 10 knots, seismic survey vessels—operating to carefully gather data—travel only at 4 to 5 knots (or half the mandatory speed limit under the NARW ship strike reduction rule (50 C.F.R. § 224.105)), and would have visual observers on board. *See* 2012 DPEIS Comments, Appendix 2 at 18. No closure for the NARW is therefore warranted.¹⁶

Although the Associations raised these concerns in their 2012 DPEIS Comments, BOEM’s subsequent explanation missed the point of the Associations’ comments and was therefore non-responsive. BOEM stated that “the potential for vessel strikes was not the main reason for proposing the closures” FPEIS Vol. III, Table L-6 at L-109–L-110. The Associations did not contend that BOEM based the closures on vessel strikes or the applicability of the NARW vessel strike rule. Instead, the Associations have shown that vessel strikes—not the sound from airguns¹⁷—is the primary, known danger to the NARW, and that this primary danger is largely inapplicable to seismic surveys that operate at reduced speeds, *cf. Utahns*, 305 F.3d at 1180 (finding that agency improperly “ignored the primary concern” of commenters on the project),

¹⁵ Alternative A includes only the closures in the SMAs and critical habitat areas. *See* FPEIS, Appendix C at C-16.

¹⁶ BOEM’s response that it “would not be prudent based on the endangered status of these whales,” *see* FPEIS Vol. III, Table L-6 at L-107, to issue an FPEIS without a time-area closure for the NARW is improperly conclusory in light of other species that do not similarly trigger a closure.

¹⁷ To the extent the closure is “based” on impacts from acoustic sources, FPEIS Vol. III, Table L-6 at L-109–L-110, there is no documented evidence of any such impact.

and only “represent a small percentage (i.e., 1.5–2.9%) of the projected vessel activity” in the area of interest, FPEIS at 3-52.

Moreover, Alternative B’s expansion nearly doubles the size of the closure area proposed in Alternative A. *See* FPEIS, Appendix C at C-16, C-32. Yet the FPEIS predicts, at most, only a 13 percentage point reduction in incidental takes of NARWs. *See, e.g.*, FPEIS at 2-66. Not only does BOEM fail to explain the differential between the expanded closure area and the predicted benefit, the FPEIS concedes that “incidental take was not modeled for Alternative B,” and that the alleged benefit of doubling the time-area closures was only “estimated.” FPEIS at 4-229.

Second, the FPEIS prohibits airgun surveys in DMAs without explaining the process by which a DMA is established. Rather, the FPEIS simply recites that the “locations vary as designated by NMFS,” FPEIS, Appendix C at C-17, based on “a reliable sighting of a NARW,” *id.* at C-36. The 15-day duration, *see id.* at C-23, of such vaguely established DMAs threatens severe disruption and significantly increased costs to surveys, *see supra* (describing data quality and economic burdens of survey interruption). The vague and discretionary DMA standard both lacks the requisite specificity necessary for BOEM to make a reasonable decision on implementation of the measure, and significantly hampers G&G activities despite the minimal danger G&G activities pose to the NARW. *See supra*. The unnecessary burdens also extend to HRG surveys, which must be “discontinued within 24 hr” of the establishment of a DMA in the survey area. *See* FPEIS, Appendix C at C-23.

Third, these problems with Alternative B’s expanded time-area closures is exacerbated by the creation of a further buffer at “such distance that received levels at those boundaries do not exceed” 160 db re: 1 μ PA (rms). FPEIS, Appendix C at C-36. The buffer effectively extends the extends of the (already unjustified) time-area closures. This further extension is likewise unjustified given that (a) available evidence indicates that vessel strikes—rather than such sound levels—pose the primary danger to the NARW, *see supra*, (b) BOEM offers no evidence that any adverse effects are probable from such sound levels at the boundaries of the closure areas, *see supra*, and (c) the buffer assumes that NARW distribution along the closure area boundaries without actual PSO confirmation.

D. The High Resolution Geophysical (HRG) Protocol Requirements.

In addition to the new limitations placed on seismic airgun surveys, the FPEIS proposes unprecedented observation and shutdown requirements for HRG activities. *See* FPEIS at 2-12–2-15.

Survey Protocols for HRG activities mimic closely those required of deep penetration seismic surveys, despite the fact they are significantly different in many ways. Airgun seismic sources are almost exclusively deployed from surface, where sounds are propagated through the water column to image the subsurface. Imaging targets can be at great depths, requiring complementary frequencies and volumes that propagate throughout the water column.

By contrast, HRG surveys are frequently conducted subsea from autonomous underwater vehicles (AUVs) pre-programmed at surface to survey along set transects. The frequency of the sources is typically mid- to high-frequency, with the associated high transmission loss of those

wavelengths. Multibeam systems commonly employed on AUVs operate in the 200-400 kHz range (Reson 7125 or Kongsberg EM 2040). Sidescan systems operate in the same range or at even higher frequencies. Sub-bottom CHIRP profilers typically operate in the 1 – 12 kHz range (and use a 10-50 ms swept frequency pulse). AUV surveys are conducted 20 meters above seabed (maximum 40 meters) to maintain high resolution. At these depths, sound is refracted along the seabed, with minimal loss upward into the water column.

A survey protocol based on surface deployment does not consider activities conducted close to the sea floor, with little to no sound propagation into the water column. Employing Protected Species Observers and deploying passive acoustic monitoring from surface vessels during these types of HRG surveys is impractical and unwarranted. Additional protocols of ramp-up and shut-down for these surveys cannot be adopted for surveys that are pre-set prior to subsea deployment as direct communication with these vehicles is not always possible. Regardless, surface or near-surface activity of cetaceans would not be expected to be impacted by the activity of an autonomous vehicle deployed at depth and maneuvering at long distances from the deployment vessel along pre-programmed transects.

High-resolution AUV surveys are a key tool for identifying culturally sensitive areas, such as marine archaeological sites, environmentally sensitive areas, such as cold water corals, and complex seafloor topography that could pose a hazard for future seafloor installation or drilling operations. The ability to accurately identify these types of features is not always possible with surface based seismic or multibeam bathymetry surveys, especially in deeper water environments, so AUV surveys are an efficient, low power, method of collecting regulatory and safety-critical data beneficial to a wide range of regulatory agencies and future operations. In addition, AUV platforms can carry a wide payload of sensors, which all tend to benefit from integration with the acoustic bathymetry, backscatter, and sidescan data. The benefits of these payload systems, such as still cameras, turbidity sensors, ADCP's, methane sensors, and other environmental sensors would be reduced by restrictions placed on acoustic surveys.

Industry recommends that BOEM amend the Atlantic PEIS to exclude all AUV Surveys conducted at depth from the described HRG Survey Protocol.

E. BOEM's Commitment to Adaptive Management.

The Associations appreciate and encourage BOEM's general commitment to adaptive management. In particular, the Associations agree that "its use can ensure mitigation measures effectively match existing conditions and knowledge," FPEIS Vol. III, Table L-6 at L-120, and we feel it is very important to establish that adaptive management may be used to remove mitigation measures (in addition to adding them) where the circumstances do not warrant the measures. *See, e.g.*, 2012 DPEIS Comments, Appendix 2 at 17.

The FPEIS's discussion of adaptive management raises two further concerns. First, that the FPEIS uses the term as justification for the proposed imposition of mitigation measures, such as the 40-km separation distance between simultaneous surveys, *see* FPEIS Vol. III, Table L-6 at L-121–L-122, that otherwise lack scientific or practical justification. Second, it is not clear how BOEM intends to implement its planned adaptive management. While the FPEIS includes a general discussion of adaptive management from programmatic NEPA documents to site-

specific analyses, *see* FPEIS at 1-26–1-28, it is unclear how this process fits into BOEM’s (or BSEE’s) governing regulations. For example, would the agencies be required to implement adaptive management through a new rulemaking to ensure that the applicants’ and Government’s respective rights and obligations are clearly defined?

The Associations look forward to further discussions with BOEM regarding the effective, and balanced, implementation of adaptive management.

F. Imposing the Proposed Mitigation Measures Would Violate the Administrative Procedure Act.

In addition to the scientific and practical failings with the mitigation measures endorsed by Alternative B, because the FPEIS’s measures would plainly “supplement existing law and . . . impose additional duties and requirements,” their imposition may only be accomplished pursuant to Administrative Procedure Act (APA) notice-and-comment procedures. *See, e.g., EnSCO Offshore Co. v. Salazar*, 10-cv-1941, 2010 WL 4116892, at *5 (E.D. La. Oct. 19, 2010) (vacating NTL for failure to comply with notice and comment requirements).

That BOEM intends ultimately to apply the measures through site-specific NEPA analyses cannot evade the APA requirements because the notice and comment requirement “turns on an agency’s intention to bind itself to a particular legal policy position.” *U.S. Telephone Ass’n v. FCC*, 28 F.3d 1232, 1234 (D.C. Cir. 1994).¹⁸ Consistent imposition of the measures through site-specific analyses represents the precise intent to be bound that triggers the notice-and-comment requirement. *See id.* at 1234–36 (FCC violated APA by issuing schedule for fines and consistently applying the schedule with limited departures). And the FPEIS fails to indicate any circumstances under which BOEM believes the measures may not be applied.

Similarly, that the FPEIS has been subject to comment does not cure this procedural defect. *Cf. In re Polar Bear Endangered Species Act Listing & § 4(D) Rule Litig.*, 818 F. Supp. 2d 214, 236 (D.D.C. 2011) (rejecting argument that following APA notice-and-comment procedures satisfied NEPA comment procedures).

IV. BOEM Failed to Provide a Reasoned Justification for Choosing Alternative B as the Preferred Alternative.

Although the FPEIS justifies the choice of Alternative B as providing “the highest practicable level of mitigation measures . . .,” FPEIS at 2-68, NEPA requires only “a discussion of ‘all practicable means to avoid or minimize environmental harms,’” *The Protect Our Communities Foundation*, No. 12-cv-2211, 2013 WL 5947137, at *10 (S.D. Cal. Nov. 6, 2013) (quoting 40 C.F.R. § 1505.2(c)). By grafting “highest” onto its obligation to consider practicable mitigation, BOEM appears improperly “to elevate environmental concerns over other valid concerns.” *Utahns for Better Transportation*, 305 F.3d at 1162–63.

¹⁸ Nor are certain measures—such as the separation requirement and NARW time-area closure—clearly amenable to site-specific reevaluation. These measures apply on their face from the FPEIS *ab initio*.

Indeed, with respect to several additional mitigation measures proposed by Alternative B, BOEM failed properly to support the selection of mitigation beyond Alternative A. Rather, the FPEIS simply assumes that additional or expanded mitigations would necessarily achieve significant environmental benefits. For example, while Alternative B added a 40-km separation zone between surveys, “[t]he degree of improvement has not been estimated” See PEIS at xxiv. Because BOEM did not calculate any improvement, it did not conduct any balancing against the additional burdens placed upon applicants’ operations, *see supra*, applicants’ interests, *see infra*, or OCSLA’s purpose to expedite development of the OCS, *see supra*.

V. The FPEIS Fails to Take into Account the Context and Economic Consequences of Alternative B’s Proposed Mitigation Measures.

“Where the action subject to NEPA review is triggered by a proposal or application from a private party, it is appropriate to give substantial weight to the goals and objectives of that private actor.” *Citizens’ Committee to Save Our Canyons*, 297 F.3d at 1030. See also, e.g., *Sylvester v. U.S. Army Corps of Eng’rs*, 882 F.2d 407, 409 (9th Cir. 1989) (explaining that agency has a duty to take into account objectives of applicant’s project). An alternative considered in an EIS is not reasonable where it renders the applicant’s proposed project “impractical,” or not “technologically or economically feasible.” *Citizens’ Committee to Save Our Canyons*, 297 F.3d at 1031–32. See also *Sylvester*, 882 F.2d at 409 (explaining that agency must consider whether alternative is “economically advantageous” to applicant’s objective). As demonstrated above, and in the Associations’ 2012 DPEIS Comments, the mitigation measures imposed by the FPEIS’s Alternative B threaten the operational and economic viability of G&G activities in the Mid- and South Atlantic.

BOEM concedes that “technical feasibility and economic viability” are necessary for an alternative to satisfy NEPA’s reasonableness requirement. See FPEIS Vol. III, Table L-6 at L-115. Yet the FPEIS’s only response to the Associations’ showing that one of the many mitigation measures imposed by Alternative B is likely to render seismic surveys impractical is simply:

BOEM and NMFS appreciate the comment and are committed to ensuring that mitigation requirements are feasible. The Programmatic EIS has been revised to clarify the shutdown requirement for delphinids.

FPEIS Vol. III, Table L-6, at L-110. It is not, however, a lack of clarity in the mitigation measures, but rather their substantive requirements, that threaten the viability of G&G activities. To take only the delphinid shutdown example; even the allegedly clarified provision is—by BOEM’s own estimation—likely to result in tens of thousands of shutdowns. See *supra*. Under the operational conditions created by Alternative B, G&G surveys may no longer be practicable in exchange for little or no perceived environmental benefits. And the FPEIS both ignores this impracticability and fails to balance such cost against the alleged environmental benefits of Alternative B. See *Cape May Greene, Inc. v. Warren*, 698 F.2d 179, 187 (3rd Cir. 1993) (noting

NEPA “requires a balancing between environmental costs and economic and technical benefits”).¹⁹

Indeed, BOEM’s failure to fully consider the impact of mitigation measures on G&G activities compounds a second error in the FPEIS’s analysis of impacts. As the Associations’ 2012 DPEIS Comments illustrate, the FPEIS overstates the level of reasonably anticipated G&G activities because industry interest has decreased following exclusion of the Atlantic planning areas from the 2012-2017 OCS Leasing Program. *See* 2012 DPEIS Comments, Appendix 2 at 1–2 (noting “it is unrealistic to expect significant, if any, geophysical activity within this timeframe”). The significant operational limitations (and resulting economic costs) arising from Alternative B’s required mitigation measures will further depress the number of G&G activities that will actually be conducted in the Atlantic. Accordingly, the FPEIS’s estimate of anticipated industry activity—and resulting estimates of anticipated environmental impacts—is doubly overstated.

¹⁹ BOEM’s observation that “[t]here is no NEPA requirement for a cost-benefit analysis,” FPEIS Vol. III, Table L-6 at L-116, is irrelevant because (1) BOEM acknowledges its obligation to consider non-environmental factors relevant to a proposed project, *see, e.g., id.*, and (2) the observation ignores BOEM’s independent obligations under Executive Order 13563, *see* 2012 DPEIS Comments, Appendix 1 at 4. Moreover, the Associations comments provide a general discussion on economic burdens. *See* FPEIS Vol. III, Table L-6 at L-116 (stating that cost benefit analysis not conducted “because of the proprietary nature of cost information”).



Via Electronic Mail

May 2, 2014

Kyle Baker
NOAA Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701
kyle.baker@noaa.gov

Subject: Comments of the American Petroleum Institute, the International Association of Geophysical Contractors, and the National Ocean Industries Association on NOAA Technical Memorandum NMFS-OPR-49, *National Standards for a Protected Species Observer and Data Management Program: A Model Using Geological and Geophysical Surveys*

Mr. Baker,

This letter provides the comments of the American Petroleum Institute (“API”), the International Association of Geophysical Contractors (“IAGC”), and the National Ocean Industries Association (“NOIA”) (collectively, the “Associations”) on the National Oceanic and Atmospheric Administration (“NOAA”) Technical Memorandum NMFS-OPR-49, *National Standards for a Protected Species Observer and Data Management Program: A Model Using Geological and Geophysical Surveys* (“Observer Standards”). We appreciate your consideration of the comments set forth below.

API is a national trade association representing over 600 member companies involved in all aspects of the oil and natural gas industry. API’s members include producers, refiners, suppliers, pipeline operators, and marine transporters, as well as service and supply companies that support all segments of the industry. API and its members are dedicated to meeting environmental requirements, while economically developing and supplying energy resources for consumers. API is a longstanding supporter of the Marine Mammal Protection Act (“MMPA”) regulatory process as an effective means of balancing and rationalizing responsible oil and gas activities with the conservation of marine mammals. We continue to support issuance of incidental take authorizations under the MMPA because, for example, it has been demonstrably effective in the Arctic in protecting marine mammal species without unduly and unnecessarily burdening industry.

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.

NOIA is the only national trade association representing all segments of the offshore industry with an interest in the exploration and production of both traditional and renewable energy resources on the U.S. Outer Continental Shelf (“OCS”). The NOIA membership comprises more than 275 companies engaged in a variety of business activities, including production, drilling, engineering, marine and air transport, offshore construction, equipment manufacture and supply, telecommunications, finance and insurance, and renewable energy.

General Comments

The Associations commend NOAA’s National Marine Fisheries Service (“NMFS”), together with the Bureau of Ocean Energy Management (“BOEM”) and the Bureau of Safety and Environmental Enforcement (“BSEE”), (collectively “the agencies”) for providing recommendations for a Protected Species Observer and Data Management Program (“PSO program”). We understand that a technical memorandum is used for timely documentation and communication of preliminary results, interim reports, or more localized or special purpose information that may not have received formal outside peer reviews or detailed editing and that there is not a formal comment process. It is evident, however, that the agencies intend the recommendations in this technical memorandum to be immediately implemented for G&G surveys in the US OCS, and have incorporated the Observer Standards in the Atlantic OCS Proposed Geological and Geophysical Activities Mid-Atlantic and South Atlantic Planning Areas Final Programmatic Environmental Impact Statement (“Atlantic PEIS”). The Atlantic PEIS “Seismic Airgun Survey Protocol” requires that protected species observers complete a PSO training program “in accordance with the recommendations described in [the Observer Standards].”

In general, we are supportive of a process to standardize PSO eligibility requirements, training courses, data collection and reporting requirements. After carefully reviewing the Observer Standards, however, we have identified a number of concerns and opportunities for improvement, which are briefly summarized below and described in more detail in the following sections of this letter. Although we appreciate the agencies’ attempt to clarify and standardize observer guidelines and requirements, it is imperative that the agencies consider public input on the Observer Standards and make the revisions necessary to ensure that the standards are workable, accurate, and appropriate. The standards should encourage adaptive technology, such as remote visual and acoustic monitoring and infrared technology, reduction of health and safety risks, and also the use of an updated reporting form that would be able to provide substantive data from observations to substantiate the implementation of appropriate mitigation measures.

The Associations' comments are intended to be constructive and further the goal of improving the PSO Program for G&G surveys consistent with the best available science and technology, clearly written, transparently implemented, and fully informed by the public.

Role of the US Fish and Wildlife Service

With jurisdiction over several marine mammals, the US Fish and Wildlife Service (USFWS) is an important stakeholder to the PSO process; however, it does not appear that USFWS was a part of the Protected Species Working Group or that USFWS provided any input into the development of the Observer Standards. While the Observer Standards provide recommendations of report requirements for PSO sightings of polar bear and walrus (*see* p.31), the Observer Standards specifically exclude these species and all other species under USFWS jurisdiction from the purview of the standards (*see* p.v). A comprehensive national PSO program necessitates the review and input of the USFWS in addition to NMFS.

Establishment of a PSO Standardized Training Program

The Associations generally support the establishment of a standardized training program for PSOs and are interested in working with the agencies to ensure that appropriate standards are set for the "approved" vendors. We are concerned, however, that some of the recommendations for the program are based on unsupported assertions that current PSO training and reporting is inconsistent. The agencies should provide context to these assertions so that stakeholders can better understand the improvement the recommendations seek to achieve.

The Observer Standards recommend that any standardized training program should not only provide training in mitigation and monitoring requirements, but also provide health and safety considerations. The Associations agree. All PSOs should be trained to ensure complete compliance with all applicable safety procedures. A standardized training program should cover knowledge of the heightened risks working offshore on a vessel in remote locations with no or limited shore side infrastructure, and should teach personnel how to minimize risks. Training should also include information on safe travel, logistics, onboard medical infrastructure, and security including International Ship and Port Facility Security (ISPS) information.

As the Observer Standards acknowledge, many geophysical companies will also have specific requirements related to health and safety risks associated with their operations. The PSO is required to adhere to those requirements as well as any PSO provider or agency requirements. The Observer Standards should note, and any PSO training program should advise, that industry standards often exceed those of the federal agencies. Most oil and gas companies and geophysical companies require contractors to provide evidence of safety programs and requirements that meet those defined through company management systems. This should be acknowledged in any discussion of health and safety, and the agencies should also clarify whether the program intends to include medical and helicopter underwater egress training (HUET) typically required of PSOs by the industry.

The Observer Standards recommend that as part of "health and safety training," a vessel owner should "allow a PSO to briefly walk through the vessel to ensure no hazardous conditions exist

according to a safety checklist, and to visually examine any safety item, upon request.” PSOs are not, however, safety professionals qualified to conduct safety walkthroughs or inspections on every vessel to which they are assigned. The agencies should provide additional information on what information will be included on the safety checklist to clarify what the PSO would be looking for during this initial walkthrough to prevent misunderstandings and unnecessary effort.

The Associations suggest that a standardized training program for PSOs should include a course in effective communications. It is vital that PSOs establish direct communications with the instrument room on a seismic vessel to prevent problems and delays in the event of sightings that trigger shutdown requirements and to ensure the visual observation timeframes are adhered to before ramp up and after shutdown. All parties must work effectively together to ensure compliance: PSO, Seismic Technicians, Vessel Captain, and crew.

In addition, as the use of Passive Acoustic Monitoring (“PAM”) to identify marine mammals increases in geophysical operations, the PSO Program should also include a course specific to PAM operations. PAM is a highly specialized skill and it is not appropriate to expect PSOs to possess those skills. If PAM is included in the program, training should also include rigging, mobilization and demobilization of equipment.

Finally, while the Observer Standards provide opportunity for PSO candidates who do not successfully pass an approved training course to reapply, there should be a limit on the number of times a potential PSO candidate can reapply for training.

Recommendations for BOEM/BSEE

The Observer Standards provide a list of recommendations for BOEM and BSEE to satisfy the objectives of the national standards. The Associations respectfully request that as BOEM and BSEE act on these recommendations, they solicit input from industry stakeholders and consider the following comments.

The Observer Standards recommend that BOEM and BSEE “develop permits or agreements detailing expectations and data collection and reporting of third-party PSO provider companies, including performance standards, conflicts of interest, and standards of conduct.” The Associations respectfully request the agencies provide additional information and opportunity for stakeholder input regarding any proposed permitting program for PSO provider companies, including the requirements, process times, reporting requirements, and any penalties for alleged permit violations. Without well-defined boundaries, an open-ended PSO provider permitting program will provide little utility.

In addition, the Observer Standards recommend that BOEM and BSEE “develop a mechanism, procedure, or regulation to ensure that selected PSO providers are being compensated prior to deployment of approved observers.” The Observer Standards do not, however, provide sufficient explanation of the need for PSO provider compensation prior to deployment of observers. More information would need to be provided to support the development of any requirement for prior compensation.

Development of Permit Fees

The Observer Standards recommend that BOEM and BSEE “consider assessing permit fees to financially support the PSO program needed for industry activities.” It is unclear how the agencies would determine the amount of the fees or how the fees would be assessed. The Associations recommend that all monies generated from any such permit fees be developed solely for, and directly benefit, the PSO program and not be used for any other, non-related federal activities. Because other industries conduct similar activities requiring PSOs, the agencies should also ensure that any permitting fees are equitable to supporting the PSO program.

Recommended PSO Eligibility Requirements

In addition to a national PSO training course and PSO eligibility standards, the Observer Standards recommend the development of a policy for national PSO qualifications and eligibility. The difference between these two objectives is not immediately apparent. Qualifications, including education and competency, should be satisfied with completion of the training program. An additional policy on qualifications and eligibility is unnecessary and the Associations are concerned that limiting qualified PSO candidates to those who possess a science degree would result in a shortage of personnel.

In the recommended PSO training and provider services model, *NMFS-Approved Private Sector PSO Trainers and PSO Providers*, the Observer Standards explain that “PSO providers and PSO eligibility requirements would be defined by NMFS.” While the Associations agree that the recommended mechanism for PSO training would provide more flexibility and less concern of the availability of PSO staff than the other mechanisms analyzed (*see p.10*), the agencies should clarify that NMFS’ definition of PSO providers would only entail identification of those providers that meet eligibility requirements.

In the recommended waiver of education and experience requirements for PSOs, PSO candidates can provide proof of previous work experience as a PSO overseas. Some additional detail or information should be required for eligibility based on overseas work as programs and processes in other countries can vary substantially from what is expected/required for US programs. The Observer Standards also provide that the approving federal agency official has the sole discretion to waive eligibility requirements on a case-by-case basis after reviewing a waiver request and written justification. The Associations are concerned that the agency can waive “some or all of the education/experience requirements on a case-by-case basis if a lack of qualified PSOs is demonstrated.” It would not be in the best interests of the regulators or the geophysical industry to employ PSOs who lack some critical or all necessary qualifications or experience. The Associations respectfully request that the waiver request, supporting justification and agency decision be made available to the PSO provider to ensure that a complete record of a PSO’s experience is on file should issues arise.

The Associations agree that PSO candidates should also be in good health and have no physical impairments that would prevent them from performing their assigned tasks. The agencies should

clarify, however, whether documentation or medical certification would be required similar to the *National Minimum Eligibility Standards for Marine Fisheries Observers*.

PSO Demand & Cost Estimates

The Observer Standards estimate that currently 30 PSOs are needed on a daily basis for G&G surveys in the Gulf of Mexico, with an average of 15 PSOs at sea on any given day. Based on 2009 data in the GOM, the total estimated annual costs are \$2,116,547. BOEM and BSEE indicate, however, that future demand for PSOs is likely to “significantly increase over the next 5 years, and many G&G surveys are expected to occur in federal water of the Atlantic EEZ.” Accordingly, the Observer Standards severely underestimate the costs and level of PSO demand. Assuming daily rates of \$700.00 for each PSO, a reasonable estimate of 30 PSOs would cost \$21,000 per day or \$3.8M for 6 months. Travel, reporting, and health insurance would likely entail additional costs. The Associations request that the agencies update the cost and level of demand estimates with more recent data.

In addition, the Observer Standards estimate the training for each PSO in the Gulf of Mexico to cost \$3,000.00. The agencies should provide a description of the various training costs detailed in this estimate, as described in Table 3, recognizing the uncertainties/unknowns associated with each estimate. For example, the estimated costs of safety training and medical examination appear lower than the industry standard.

PSO Evaluation During Permit/Authorization Approval

The Observer Standards specify that the recommended time to evaluate PSO coverage required for all G&G projects is during BOEM’s permit application review or when applications for incidental take authorizations are submitted to NMFS. When weighing factors to determine the number of PSOs required for each survey, in addition to vessel size, the agencies should consider the number of bunks available on board the survey vessel.

Once the number of required PSOs is determined, the agencies assert that a single entity responsible for scheduling and deploying PSOs would result in “a greater level of consistency in many aspects of the PSO program...including maintaining an appropriate number of PSOs to meet scheduling and deployment needs.” The Associations are concerned, however, that the selection of a single entity, whether a third-party provider or federal agency, to meet PSO scheduling demand would be inefficient and would result in a strain on the ability to timely contract with and obtain the number of PSOs required for each geophysical survey.

In addition, the Associations are concerned that requiring a senior-level (or lead) PSO who has specific experience observing protected species in the proposed survey geographic area will drastically limit the number of available senior-level PSOs, potentially resulting in unnecessary project delays.

During monitoring, the Observer Standards recommend that in order to reduce bias, observation periods should be limited to “favorable viewing conditions.” It is unclear what is meant by unfavorable viewing conditions. During periods of “low visibility” PAM is currently required in

water depths greater than 100 meters (328 feet) in the Gulf of Mexico. The agencies should be careful not to define unfavorable conditions as anything different than low visibility or nighttime to ensure there is no gap in monitoring coverage.

Conflicts of Interest

Throughout the Observer Standards, the agencies reference “inherent conflicts of interests” between PSO providers and industry, allegedly influencing accurate reporting of data. There are several unsupported assertions of inappropriate influence and pressure by industry. These assertions are unsubstantiated, and in the absence of supporting statements or examples provided by the agencies, should be deleted. If a statement denying conflict of interest is required from the PSOs prior to deployment as recommended, the statement should also include language to the effect that the PSO will conduct all their activities and report all data in full compliance with all applicable laws and regulations.

The Observer Standards defines “a direct financial interest” as payment or compensation received directly from the owner of the seismic survey’s vessel, the G&G surveying company, or associated shore-based facility. The definition should also include any entity or leaseholder who employs or contracts with the survey company.

Standardized Data Collection

The Associations agree with and reaffirm the recommendation of the agencies to implement “standardization including data collection methods, standardized electronic forms, and software used in collaboration with NMFS and non-federal stakeholders.” Collaboration with NMFS should result in a form that produces data the agency can use and rely on to assess population numbers, stock assessments, and effects on marine species. The Associations note that Industry best practices already recommend the use of a standard reporting form, *the Marine Mammal Recording Form*, developed under a project funded by the Exploration and Production (E&P) Sound and Marine Life Joint Industry Programme.¹ The Associations would be interesting in working with the agencies to update current reporting forms to enable the reporting of substantive data from observations that could substantiate the implementation of appropriate mitigation measures.

Creation of PSO Database

The Associations support the creation and maintenance of a database to manage PSO data for geological and geophysical surveys. This information is already supplied to NMFS and BSEE, but it would be useful for interested stakeholders to have full and timely access to such a database as a means to assess PSO activities and monitor their effectiveness.

¹ See Barton, Carolyn J.S., Jaques, Robert, and Mason, Mike. 2008. Identification of Potential Utility of Collation of Existing Marine Mammal Observer Data. RSK Environmental Ltd., Cheshire, UK. The Marine Mammal Recording Form can be accessed at: <http://www.iagc.org/files/3193/>.

Conclusion

We appreciate the effort that the agencies have devoted to the development of PSO and data management programs for geological and geophysical surveys. We support this effort generally but, as detailed above, we have a number of concerns about the implementation of the recommendations. We respectfully request that the agencies engage with stakeholders prior to taking action on many of the recommendations, including the development of a PSO provider permit program, and system for permitting fees. We also encourage the agencies to pursue a program that encourages technology and remote monitoring, reducing health and safety risks. In addition, any program established should provide opportunity for feedback not only from PSOs, but also industry stakeholders. The Associations look forward to working with the agencies towards implementation of a PSO Program for geophysical surveys that is consistent with the best available science and technology, clearly written, transparently implemented, and fully informed by interested stakeholders.

Should you have any questions, please contact the undersigned at 202.682.8584, or via e-mail at radforda@api.org. Thank you for considering and responding to these comments.

Sincerely,



Andy Radford
American Petroleum Institute



Karen St. John
International Association of Geophysical Contractors



Jeffrey Vorberger
National Ocean Industries Association

cc: Deborah Epperson, BSEE Environmental Enforcement Division
Gregg Gitschlag, NMFS Southeast Fisheries Science Center
Howard Goldstein, NMFS Office of Protected Resources

Jill Lewandowski, BOEM Environmental Assessment Division
Kimberly Skrupky, BOEM Environmental Assessment Division
Brad Smith, NMFS Alaska Region Office
Teresa Turk, NMFS Office of Science and Technology