



November 21, 2016

VIA Email (Candace.Nachman@noaa.gov)

NOAA, National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway, Room 13805
Silver Spring, MD 20910
Attention: Jolie Harrison

Re: Final Environmental Impact Statement for Effects of Oil and Gas Activities in the Arctic Ocean—NOAA-NMFS-2016-25475

Dear Ms. Harrison:

This letter provides the written comments of the International Association of Geophysical Contractors (“IAGC”), the Alaska Oil and Gas Association (“AOGA”), and the American Petroleum Institute (“API”) (collectively, the “Associations”) regarding the October 2016 Final Environmental Impact Statement for Effects of Oil and Gas Activities in the Arctic Ocean (the “FEIS”) prepared by the National Marine Fisheries Service (“NMFS”). We appreciate this opportunity to comment on the FEIS and to inform the forthcoming Record of Decision (“ROD”).

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.

AOGA is a private non-profit trade association located in Anchorage, Alaska. AOGA’s 12 member companies account for the majority of oil and gas exploration, development, production, transportation, refining, and marketing activities in Alaska. AOGA’s members are the principal industry stakeholders that operate in Arctic Alaskan waters and the adjacent waters of the Outer Continental Shelf (“OCS”). AOGA and its members are longstanding supporters of

responsible oil and gas leasing, exploration and development in Alaska, and wildlife conservation, management and research in the Arctic.

API is a national trade association representing over 650 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.

II. COMMENTS

A. Introduction

The Associations submitted extensive comments on the 2011 Draft EIS and the 2013 Supplemental Draft EIS that preceded the FEIS. Those comments are part of the administrative record and are not fully repeated in this letter. NMFS's responses to comments ("Responses") address many of those comments, and we commend NMFS for the organized and relatively thorough manner in which it has presented its Responses. *See* FEIS, Appendix A, Comment Analysis Report ("Appx. A"). Some of our comments have been acceptably addressed by NMFS, while others have not. Although we maintain our previous comments of record, we respectfully submit the comments below to restate and emphasize our positions on issues that have not been acceptably addressed by NMFS and to express our support for certain revisions made by NMFS in response to our earlier comments.

B. There Is No Demonstrated Need for an EIS for Arctic Oil and Gas Exploration Activities

Marine mammal incidental take authorizations ("ITAs") in the Beaufort and Chukchi Seas have, for many years, been authorized by NMFS and the U.S. Fish and Wildlife Service ("FWS") on a project-by-project basis (*i.e.*, incidental harassment authorizations) or through the issuance of incidental take regulations ("ITRs") and related letters of authorization. These authorizations have been extensively litigated—including the issue as to whether such authorizations require the preparation of an EIS—and, in every instance and on all counts, the authorizations have been upheld by the courts.¹ Among other things, the courts have held that

¹ *See, e.g., Alaska Wilderness League v. Jewell*, 116 F. Supp. 3d 958 (D. Alaska 2015), *dismissed as moot*, 637 F. App'x 976 (9th Cir. 2015); *Ctr. for Biological Diversity v. Salazar*, 695 F.3d 893 (9th Cir. 2012); *Ctr. for Biological Diversity v. Kempthorne*, 588 F.3d 701 (9th Cir. 2009); *Ctr. for Biological Diversity v. Kempthorne*, Case No. 3:07-cv-0141-RRB, 2008 U.S. Dist. LEXIS 109152 (Apr. 22, 2008); *Native Vill. of Point Hope v. Minerals Mgmt. Serv.*, 564 F. Supp. 2d 1077 (D. Alaska 2008).

the preparation of an environmental assessment (“EA”)—as opposed to an EIS—is sufficient for the issuance of ITRs.

There is no specific proposed action evaluated in the FEIS. In the absence of a federal action or proposal for action, there is no statutory basis and “no factual predicate for the production of an environmental impact statement of the type envisioned by NEPA.” *Kleppe v. Sierra Club*, 427 U.S. 390, 403 (1976). Instead, in these circumstances “any attempt to produce an impact statement would be little more than a study ... containing estimates of potential development and attendant environmental consequences.” *Id.* Nor can there be an appropriate determination of reasonable alternatives when there is no proposed action. The lack of a proposed action is a fundamental legal and factual flaw that negates the validity of the FEIS as a whole.

By contrast, the past and existing approach to Arctic ITAs has been efficient, thorough, effective, and approved by the courts. The past and existing approach to authorizations for activities in the Arctic by the Bureau of Ocean Energy Management (“BOEM”) under the National Environmental Policy Act (“NEPA”) has been similarly effective. Moreover, as set forth below and in our previous comments, after decades of oil and gas exploration activities in the Arctic, there is no information demonstrating that any of the activities evaluated in the FEIS have had a significant impact on the environment.

Although we appreciate NMFS’s acknowledgment that the FEIS has been prepared as a precautionary matter to assist with planning and not because the contemplated activities will have a “significant impact” on the environment (Appx. A at 6), we maintain that the preparation of a programmatic EIS is unnecessary and without legal basis; inconsistent with a longstanding, effective and court-approved NEPA approach to Arctic exploration activities; and will only invite complications and otherwise avoidable challenges.² For these reasons, the Associations remain opposed to the FEIS and, accordingly, cannot support any of the alternatives.

² NMFS’s Responses incorrectly suggest that BOEM may not apply to NMFS for rulemaking under Section 101(a)(5) of the Marine Mammal Protection Act (“MMPA”). In fact, NMFS and BOEM have recently issued a draft EIS for exploration activities in the Gulf of Mexico that contemplates an MMPA incidental take petition by BOEM (“GOM DEIS”). See <https://www.boem.gov/Gulf-of-Mexico-Geological-and-Geophysical-Activities-Programmatic-EIS/>; see also 50 C.F.R. § 216.103 (defining “citizens” to include agencies of the United States). The Associations agree, however, that MMPA ITR petitions are most appropriately submitted by the industry governed by such regulations, not by federal agencies.

C. The Content and Scope of the Alternatives Are Not Reasonable

NEPA requires the lead agency to analyze the proposed action and a reasonable range of alternative actions, including the no action alternative. *See* 40 C.F.R. § 1502.14. Identification and analysis of the proposed action and reasonable alternatives is considered “the heart” of any EIS process. *Id.* Our previous comments identified a number of problems with the content and scope of the alternatives presented. We emphasize some of those comments here and note other comments that have been acceptably addressed by NMFS.

1. The FEIS incorrectly defines the activities addressed in the alternatives

Under the MMPA, NMFS has the authority to grant or deny, or to reasonably condition, marine mammal ITAs. However, NMFS lacks authority to establish closures or presumptive caps or limits on OCS oil and gas activities in the Arctic Ocean. *See* 16 U.S.C. § 1371(a)(5)(A)(i) (Secretary “shall allow” incidental taking that meets applicable statutory standards). The alternatives described in the FEIS continue to present assumed levels of annual oil and gas activities. In defining alternatives by activity level for MMPA ITAs, NMFS continues to confuse the nature of the proposed action (incidental take, not oil and gas activity) and the agency’s desire to define the proposed action (the anticipated frequency and intensity of incidental take, not the frequency of oil and gas activity), with the NEPA requirement that the impacts of the proposed action should be compared to a reasonable range of alternatives. *See Kempthorne*, 588 F.3d 701 (MMPA ITAs only authorize incidental take, not the underlying activity).

Although we appreciate NMFS’s statement that the alternatives evaluated in the FEIS do not act as a limit or cap (*see* Appx. A at 36, 44), the fact is that the need to perform new NEPA analyses on what will inevitably be very short notice for any proposed (and very time-sensitive) activities that are beyond the scope of activities identified in the FEIS may effectively act as a bar to the timely authorization of those activities. To avoid this scenario, the FEIS should have defined, but did not define, the alternatives for MMPA ITAs by the frequency and intensity of a range of incidental take levels, not by specific activity levels. We therefore respectfully disagree with NMFS’s position that “activity levels, not take, are the appropriate way to define alternatives....” Appx. A at 44.³

³ NMFS suggests that the effects of BOEM authorizations are also covered by the FEIS. However, the FEIS is expressly focused on MMPA authorizations issued by NMFS, and NMFS is the sole author of the FEIS. There is no indication in the FEIS, other than a statement that BOEM is a cooperating agency, that BOEM had any meaningful role in the development of the FEIS and the resulting analyses.

2. The FEIS's use of the term "program" still creates unnecessary potential for confusion and complication

We appreciate that NMFS has addressed its previously flawed definition of the term "program." Specifically, we note that the FEIS now states:

In a given G&G permit application or [exploration plan], a company may describe a "Program" that utilizes multiple seismic vessels or drilling units simultaneously within a season. However, for the sake of analysis in this EIS (which necessitates a good sense of the spatial and temporal extent of the projected activities), one "program" indicates the use of only one source vessel (or two/three source vessels working in tandem, e.g., OBC surveys) or one drilling unit (e.g., drillship, jackup rig, SDC) at a time, e.g., not surveying multiple sites or drilling multiple wells (with multiple rigs) concurrently. To clarify, "program" is used only to simplify the analysis of impacts; it does not change the way the BOEM issues G&G permits for seismic surveys or applications for permits to drill for exploratory drilling, and it does not limit the number of drilling rigs a single company may employ at one time per sea under an approved EP. Moreover, an individual "program" may require the use of multiple support vessels in addition to the source vessel or drilling unit conducting the actual data acquisition or drilling of the wells, respectively. Those support vessels do not count as separate "programs" as defined for evaluation purposes in this EIS.

FEIS at 2-31. Although this clarification is helpful, it still creates the potential for confusion and future complications because the FEIS persists in using the same term—"program"—that is commonly used for exploration plans and BOEM authorizations, but for a very different purpose. A simpler solution would be to use a term other than "program" to define the unit of analysis that is used for NEPA review purposes. This would significantly reduce the possibility that the FEIS could be used to effectively constrain Arctic exploration programs and unlawfully restrict operators in the exploration and development of their leases pursuant to the Outer Continental Shelf Lands Act ("OCSLA").

3. The no-action alternative is incorrectly stated in the FEIS

The FEIS states that "[u]nder the No Action Alternative, NMFS would not issue any ITAs under the MMPA for seismic surveys or exploratory drilling in the Beaufort and Chukchi seas, and BOEM would not issue G&G permits or concur on ancillary activities in the Beaufort and Chukchi seas OCS." FEIS at ES-13. By framing the no-action alternative in this manner, NMFS mistakenly treats the FEIS as a review of a pending project proposal rather than a

programmatic EIS. As NMFS admits in its Responses, the FEIS is a programmatic document, and, accordingly, the no-action alternative should be characterized as such. *See* Appx. A at 8.

The Council on Environmental Quality (“CEQ”) plainly states that, for programmatic evaluations, the no-action alternative is best characterized as “continuing with the present course of action until that action is changed” and that “[t]o construct an alternative that is based on no management at all would be a useless academic exercise.” *See* CEQ’s Forty Most-Asked NEPA Questions, No. 3. The no-action alternative should therefore be the *status quo* – *i.e.*, issuance of project-specific MMPA and OCSLA approvals. Failing to address the *status quo* as the “no action” alternative skews the analysis by, in effect, improperly presuming that the current process is inadequate and cannot continue. Moreover, as a general matter, the purposes of NEPA are not served by comparing a hypothetical range of activities (none of which are currently proposed) with a hypothetical scenario in which all ITAs are banned.

4. The description of OBC surveys must be revised

The definition provided for ocean bottom cable (“OBC”) surveys in Table 2.4 of the FEIS is not sufficient and must be revised. Although recent OBC surveys have used arrays similar to those described in Table 2.4, limiting gun and array size based on recent practices will unnecessarily constrain operator flexibility and increase potential impacts by increasing the time needed to acquire data. Similarly, the size limitations (10- by 20-mile areas) are overly restrictive.

5. The Associations appreciate NMFS’s confirmation that the FEIS addresses only oil and gas exploration activities and its clarification regarding on-ice surveys

We appreciate NMFS’s confirmation that the FEIS addresses only oil and gas exploration activities and associated ancillary activities, and that it does not, and will not, address any activities associated with development and production. Appx. A at 50. We also appreciate NMFS’s addition of text to the FEIS to specify that on-ice seismic surveys may extend onto floating ice in shallow water and in some circumstances on floating ice in deep water. Appx. A at 46; FEIS § 2.4.5.3.

D. The FEIS’s Effects Analysis Is Outdated and Incorrect Because It Is Not Based Upon the Best Available Science

The central focus of the FEIS is (or at least should be) an evaluation of the impacts associated with the authorization of incidental take by harassment of marine mammals by oil and gas exploration activities. This focus, in substantial part, requires an analysis of the effects of sound on marine mammals. In August 2016, NOAA issued its *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* (the “Guidance”). The Guidance establishes acoustic criteria for evaluating Level A harassment and temporary

threshold shift (“TTS”). Despite the availability of drafts of the Guidance and the scientific bases for the Guidance for many months (or years), the FEIS’s exposure modeling analysis does not use the Guidance.

Although NMFS has provided a rough comparison of the FEIS’s effects under the old and new criteria, it is no substitute for a full effects analysis that uses the best available science. This renders the FEIS’s effects analysis inadequate, and NMFS will be required to re-analyze effects using the best available science when it reviews subsequent proposed actions. In order to properly inform this NEPA process, stakeholders must have an opportunity to review and comment on NMFS’s application and incorporation of the new acoustic criteria in future NEPA review documents, such as EAs prepared for future proposals. This is yet another demonstration of the uselessness and impracticality of preparing a programmatic EIS for activities that have historically been effectively analyzed for NEPA purposes on a project-by-project basis. *See 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.”).⁴

E. Key Impact Findings in the FEIS Are Arbitrary and Erroneous

The MMPA allows NMFS (and FWS) to authorize incidental take of marine mammals if the anticipated effects are expected to have a “negligible impact.” 16 U.S.C. § 1371(a)(5)(A) and (D). Although the primary purpose of the FEIS for activities within NMFS’s jurisdiction is to facilitate the agency’s issuance of MMPA ITAs, the FEIS makes impact findings for marine mammal species that are supposedly greater than “negligible.” The FEIS’s impact determinations for Arctic marine mammals are flawed and contrary to the well-established record of decades of oil and gas activities in the Arctic. To make matters worse, the FEIS does not draw clear distinctions among the impact categories of no effect, negligible impacts, minor impacts, and moderate impacts. The FEIS should, but does not, provide distinct definitions for the analytical impact categories and then make impact determinations for marine mammals that are consistent with the record (*i.e.*, “negligible” or the equivalent).⁵

⁴ The Associations submitted comments on each draft of the Guidance that was released for public review. Those comment letters are attached to this letter, and we respectfully request that NMFS include them in the administrative record for the FEIS.

⁵ In its Responses, NMFS continues to justify its impact criteria on the basis that “negligible” can have different meanings under NEPA and the MMPA. However, NMFS still provides no meaningful explanation, authorities, or examples that demonstrate how a scientific determination that a given impact is supposedly not negligible for NEPA purposes can still be negligible for MMPA purposes.

The only finding that can be supported by the extensive record is that oil and gas activities in Alaska have a negligible impact on all marine mammal species and stocks.⁶ The Associations maintain their strong objection to all of the non-negligible impact findings for marine mammals in the FEIS because they have no support in the best available science or the law. Although negligible impact determinations should be made for all marine mammal species evaluated in the FEIS, we highlight below some of the particularly erroneous findings in the FEIS.

1. Bowhead whales

As described in the Associations' previous comments, the bowhead whale serves as a prime example of the arbitrary impact findings in the FEIS.⁷ The impacts of oil and gas activities on marine mammals in the Arctic has been a reasonable concern of the Native community; federal, state and local agencies; and the oil and gas industry for over 40 years. As a result of heightened attention, the Western Arctic Ocean bowhead whale stock (also known as the Bering-Chukchi-Beaufort Seas stock) is one of the most rigorously studied marine mammal stocks on Earth. Offshore oil and gas activities with the potential to affect bowhead whales in the Arctic Ocean have long been subject to a stringent set of mitigation and monitoring requirements. Over decades of continuous monitoring and study, no injuries or mortalities of bowhead whales have been detected from oil and gas activities. Moreover, even though bowhead whales are actively hunted for subsistence purposes, the Western Arctic stock has steadily rebounded from depressed abundance caused by pre-20th century commercial whaling practices to the point where the stock is acknowledged to be at or quickly approaching the carrying capacity of its habitat, while continuing to grow at a robust annual rate. *See* Allen and Angliss 2013) (Western Arctic bowhead population doubled in size from 1978 to 2001 and continues to increase).

All of the available information indicates to a high degree of scientific reliability that routine oil and gas activities have no more than a negligible impact on the Western Arctic bowhead stock, that the stock has experienced robust growth for many decades while exposed to oil and gas activities, and that the stock is healthy, resilient to the adverse impacts of all

⁶ The FEIS defines "negligible" impacts as including effects that "cannot be measured or observed." Respectfully, an effect that cannot be measured or observed describes the absence of an effect, not an effect that is "negligible."

⁷ The Associations appreciate NMFS's recognition that the Western Arctic bowhead whale stock has significantly increased in abundance and that there is no information indicating that oil and gas activities have had any effect on the stock. Appx. A at 69-70, 76, 124. Nevertheless, we are compelled to repeat our previous comments here because the FEIS persists in concluding that oil and gas exploration activities could have "moderate" or "moderate to major" impacts on the stock, which is undeniably false.

environmental, subsistence, and anthropogenic effects (including climate change), and recovered to pre-whaling abundance without a detectable slowing in the rate of growth. Numerous findings by NMFS corroborate this record, and a few examples are as follows:

- “Industrial activities have been occurring (at varying rates) in the U.S. Arctic Ocean for decades, and the available measurable indicators do not suggest that these activities are having long-term impacts. For example, bowhead whales continued to increase in abundance during periods of intense seismic activity in the Chukchi Sea in the 1980s (Raftery et al., 1995; Angliss and Outlaw, 2007), even without implementation of current mitigation requirements. Additionally, industry has been collecting data and conducting monitoring in the region for many years and will continue to do so under this IHA. Therefore, NMFS has determined that a negligible impact finding is rational.” 77 Fed. Reg. 27284, 27289 (May 9, 2012).
- “The exposure of cetaceans [including bowhead and beluga] to sounds produced by exploratory drilling operations is not expected to result in more than Level B harassment and is anticipated to have no more than a negligible impact on the affected species or stock.” 75 Fed. Reg. 25730, 25754 (May 7, 2010).
- “In regard to impacts, there is no indication that seismic survey activities are having a long-term impact on marine mammals.... As a result, NMFS has determined that seismic survey noise in the Arctic will have no more than a short-term effect on marine mammals in the Chukchi Sea.” 74 Fed. Reg. 55368, 55380 (Oct. 27, 2009).
- “In fact, bowhead whales continued to increase in abundance during periods of intense seismic activity in the Chukchi Sea in the 1980s (Raftery et al., 1995; Angliss and Outlaw, 2007). Therefore, NMFS does not believe that injury will occur as a result of Shell's activities.” *Id.* at 55382.
- “For baleen whales, while there are no data, direct or indirect, on levels or properties of sound that are required to induce TTS, there is a strong likelihood that baleen whales (bowhead and gray whales) would avoid the approaching airguns (or vessel) before being exposed to levels high enough for there to be any possibility of onset of TTS [or temporary threshold shift].” 73 Fed. Reg. 46774, 46779 (Aug. 11, 2008).
- “Moreover, marine mammal strandings do not appear to be related to seismic survey work in the Arctic Ocean.... [I]f bowhead and gray whales react to sounds at very low levels by making minor course corrections to avoid seismic noise and mitigation measures require Shell to ramp-up the seismic array to avoid a startle effect.... Therefore, NMFS does not expect any marine mammals will incur serious injury or mortality as a result of Shell's 2009/2010 survey operations, so an LOA is not needed.” 74 Fed. Reg. 55368, 55379 (Oct. 27, 2009).

Notwithstanding the consistency and reliability of the available information, and notwithstanding an unbroken record of well-supported “negligible impact” determinations by NMFS made over a period of decades, the FEIS improbably concludes that impacts to bowhead whales are either “moderate” or “moderate to major.” *See, e.g.*, FEIS at Table ES-2. These findings are arbitrary, entirely unsupported, and must be revised to accurately reflect the record. There is no available data or information to suggest that impacts from oil and gas activities (individually or cumulatively) on bowhead whales are anything other than negligible.

2. Ice seals

Similarly, the FEIS fails to conclude that the impacts of oil and gas exploration activities have “negligible” impacts on ice seals. Instead, NMFS erroneously concludes that ice seal impacts are either “minor” or “minor or moderate.” *See* FEIS at Table ES-2. Respectfully, these conclusions are also contrary to the record.

Scientific studies performed over the past three decades have not shown any measurable effects on ice seal populations due to oil and gas activities. NMFS has concluded, on numerous occasions, that the best available scientific data and information demonstrate that oil and gas operations have had no more than a negligible effect on individual ice seals, and no effect on the populations in the Alaskan Arctic. As just a few examples, NMFS has made the following findings:

- “NMFS believes that any potential impacts to ringed, bearded, and spotted seals to the proposed on-ice geophysical seismic program would be no more than negligible, and would be limited to distant and transient exposure.” 73 Fed. Reg. 9535, 9543 (Feb. 21 2008).
- “Long term research and monitoring results on ice seals in the [sic] Alaska’s North Slope have shown that effects of oil and gas development on local distribution of seals and seal lairs are no more than slight, and are small relative to the effects of natural environmental factors.” 73 Fed. Reg. 46774, 46789 (Aug. 11, 2008).
- “[T]here is no indication that seals are more than temporarily displaced from ensonified zones and no evidence that seals have experienced physical damage to their auditory mechanisms even within ensonified zones.” 73 Fed. Reg. 31816, 31819 (June 4, 2008).
- “The short-term exposures of pinnipeds to airgun sounds are not expected to result in any long-term negative consequences for the individuals or their populations, as observations have shown pinnipeds to be rather tolerant of (or habituated to) underwater seismic sounds.... Any effects would be temporary and of short duration at any one place.” 74 Fed. Reg. 55368, 55405 (Oct. 27, 2009).

- “Oil and gas exploration and development activities may include artificial island construction, drilling operations, pipeline construction, seismic surveys, and vessel and aircraft operations. The main issues for evaluating the impacts of exploration and development activities on ribbon seals are the effects of noise, disturbance, and potential oil spills produced from these activities.... Ribbon seals are also highly dispersed during the summer, open water season, so the rate of interactions with seismic surveys would likely be low, and, in any case, seals have not been shown to be significantly impacted by oil and gas seismic surveys.” 73 Fed. Reg. 79822, 79827 (Dec. 30, 2008).

These findings, among many others (including NMFS’s recognition in its Responses), demonstrate a consistent and well-supported pattern of agency conclusions that oil and gas exploration impacts to ice seals are nothing more than negligible.

Indeed, the best available data demonstrate that ice seals show no more than a temporary response to seismic operations. Monitoring studies in the Alaskan and Canadian Beaufort Sea from 1996 to 2002 provided considerable information regarding behavior of seals exposed to seismic pulses. *See* Miller et al. (2005); Harris et al. (2001); Moulton and Lawson (2002). These seismic projects usually involved arrays of six to 16 with as many as 24 airguns with total volumes of 560 to 1,500 cubic inches. The combined results suggest that some seals avoid the immediate area around active seismic vessels. In most survey years, ringed seal sightings tended to be farther away from the seismic vessel when the airguns were operating than when they were not. Moulton and Lawson (2002). However, these avoidance movements were relatively small, on the order of 100 meters (328 feet) to (at most) a few hundred meters, and many seals remained within 100 to 200 meters (328-656 feet) of the trackline as the operating airgun array passed by. Seal sighting rates at the water surface were lower during airgun array operations than during no-airgun periods in each survey year except 1997. Miller et al. (2005) also reported higher sighting rates during non-seismic than during line seismic operations, but there was no difference for mean sighting distances during the two conditions nor was there evidence ringed or bearded seals were displaced from the area by the operations. Moreover, no consistent relationship has been observed between exposure to airgun noise and proportions of seals engaged in other recognizable behaviors. *See* Miller et al. (2005); Moulton and Lawson (2002). Seals exposed to multiple seismic airguns in the Chukchi Sea during Shell and ConocoPhillips’ 2006 and 2007 operations showed no more than localized movement, and there was no indication of displacement from seismic sounds. *See* Ireland et al. (2008).

In sum, bearded and ringed seals do not show strong avoidance reactions to seismic operations. Pinnipeds frequently do not avoid the area within a few hundred meters of operating airgun arrays, even for large airgun arrays. *See* Harris et al. (2001). Reactions are localized and confined to relatively small distances and durations, with no documented long-term effects on individuals or populations. *See generally* Final Programmatic Environmental Assessment, Arctic Ocean Outer Continental Shelf Seismic Surveys – 2006 (concluding that there has been no scientific link established between exposure to sound and adverse effects on any marine mammal population). Again, the record confirms that oil and gas activities in the Arctic have had no more

than a negligible impact on ice seals.⁸ The FEIS's findings to the contrary have no basis in fact or law.

3. Polar bears and Pacific walrus

FWS has consistently concluded, in the context of issuing MMPA incidental take regulations, that Arctic oil and gas activities have no more than a “negligible” impact on polar bears and Pacific walruses. *See, e.g.*, 81 Fed. Reg. 52275 (Aug. 5, 2016); 78 Fed. Reg. 35364 (June 12, 2013); 76 Fed. Reg. 47010 (Aug. 3, 2011); 73 Fed. Reg. 33212 (June 11, 2008). These conclusions have been challenged numerous times in federal courts and, in all of these cases, FWS's conclusions have been upheld. *See, e.g., Alaska Wilderness League*, 116 F. Supp. 3d 958; *Salazar*, 695 F.3d 893; *Kemphorne*, 588 F.3d 701. Despite this unbroken and well-established record of “negligible” impact findings by FWS, the FEIS inexplicably concludes that oil and gas exploration activities may cause “minor” (defined as something greater than “negligible”) or “moderate” impacts to polar bear and walrus stocks. FEIS at Table ES-2. These conclusions are erroneous and NMFS must defer to, and incorporate, the findings of FWS (the agency with jurisdiction over polar bears and Pacific walrus) to the extent NMFS determines that it must address polar bear and walrus stocks in this FEIS.

F. Appendix F Must Be Withdrawn and Provided in Draft for Meaningful Public Review and Input

For the first time in the multi-year process leading up to the FEIS, NMFS has prepared and disclosed a “first-order assessment of chronic and cumulative effects of sound on marine

⁸ New scientific information supports these statements. *See* Reichmuth, C., Ghaul, A., Sills, J., Rouse, A. and B. Southall. 2016. Low-frequency temporary threshold shift not observed in spotted or ringed seals exposed to single air gun impulses, *J. Acoust. Soc. Am.*, 140: 2646-2658 (“There was no evidence that these single seismic exposures altered hearing – including in the highest exposure condition, which matched previous predictions of temporary threshold shift (TTS) onset... The absence of observed TTS confirms that regulatory guidelines (based on M-weighting) for single impulse noise exposures are conservative for seals.”); Sills, J.M. and C. Reichmuth. 2016. Listening for signals in seismic noise: A case study of masking in Arctic seals. *Proceedings of Meetings on Acoustics*, 27 (“This result indicates that it is not always sufficient to consider noise averages when evaluating realistic acoustic environments, and that conventional methods provide conservative estimates of auditory masking.”); Sills, J.M., Southall, B.L. and C. Reichmuth. 2015. Amphibious hearing in ringed seals (*Pusa hispida*): underwater audiograms, aerial audiograms and critical ratio measurements, *J. Exp. Bio.*, 218: 2250-2259; Sills, J.M., Southall, B.L., and C. Reichmuth. 2014. Amphibious hearing in spotted seals (*Phoca largha*): underwater audiograms, aerial audiograms and critical ratio measurements, *J. Exp. Bio.*, 217: 726-734.

mammals.” FEIS at ES-2; *see* Appx. F. This “assessment” is a 50-page detailed technical analysis purporting to evaluate complex issues involving the supposed effects of sound in the marine environment. Appx. F. At least some of the findings in the FEIS are apparently premised on this assessment.

The Associations strongly object to the last-minute inclusion of a technical analysis to which NMFS ascribes some degree of importance to the effects analysis. If this analysis is to be included in the FEIS, then it must be withdrawn and provided in draft form to the public to allow for sufficient review and input.⁹

G. The “Additional Mitigation Measures” Are Unwarranted and Arbitrary

Although NMFS and FWS have uniformly determined for decades that the anticipated impact of oil and gas activities on marine mammals in the Arctic are negligible, and although the best available science demonstrates to a high degree of reliability that these judgments were correct, NMFS persists in identifying a range of “additional mitigation measures” (also referred to as “AMMs”) in the FEIS that might be imposed as a condition of future MMPA authorizations. As a threshold matter, these additional mitigation measures are flawed because there is no statutory basis for imposing additional mitigation on activities that, as currently mitigated, do not result in more than temporary changes in behavior, without any known injury, mortality, or other adverse consequence to any marine mammal species or stocks.

We appreciate that NMFS has improved its evaluation of the additional mitigation measures to provide a more accurate assessment of the feasibility, need, and effectiveness of the measures. However, as stated in our previous comments, there is no legal or factual basis for including the additional mitigation measures in the FEIS, or the ROD, at all. We therefore reiterate the following specific concerns (which are not intended to be exclusive):

- According to the FEIS, the primary purpose of the identified time/area closures in Kaktovik and Cross Island, Hanna Shoal, Barrow Canyon and the Western Beaufort Sea, the Shelf Break of the Beaufort Sea, and Kasegaluk Lagoon/Ledyard Bay is protection of bowhead and beluga whales, and minimization of conflicts with subsistence hunting activities. However, the FEIS still does not identify any data or other scientific information establishing that past, present, or reasonably anticipated oil and gas activities in these areas has had, or is likely in the future to have, either more than a negligible impact on marine mammals or any unmitigable adverse impact on the availability of marine mammals for subsistence activities. There is no basis for including in the FEIS

⁹ Notably, an analysis of the type presented in Appendix F was not included in the recently released GOM DEIS.

time/area closures as potential “mitigation” for supposed adverse impacts that do not exist.¹⁰

- The FEIS does not provide any information about what levels of oil and gas activity are foreseeably expected to occur in identified areas in the absence of time/area closures, or what the anticipated adverse impacts from such activities would be. Without this information, the time/area closure mitigation measures are arbitrary because there is an insufficient basis to evaluate and compare the effects with and without time/area closures except through speculation.
- It appears that a primary target of the time/area closures is mitigation of an anticipated large number of seismic surveys. However, as addressed in our previous comments, the vast majority of these surveys has already been conducted—each with accompanying NMFS-issued MMPA ITAs that did not require preparation of an EIS. There is no scientific evidence that these seismic surveys, individually or collectively, resulted in more than a negligible impact.
- Restrictions intended to prevent sound levels above 120 dB or 160 dB are arbitrary and unwarranted. As the Associations have previously commented, the best scientific evidence does not support a need for imposition of restrictions at 120 dB or 160 dB levels. This point is well substantiated by the sustained period of robust growth and recovery experienced by the Western Arctic stock of bowhead whales, while exposed to decades of seismic surveys and other activities without restrictions at the 120 dB or 160 dB levels. Moreover, as addressed above, the proposal of mitigation measures is based on sound thresholds that NMFS knows are outdated.
- The additional “buffer zones” for pulsed sounds greater than 160 dB and continuous sounds greater than 120 dB around closed areas is particularly arbitrary. The best available scientific information demonstrates that consistent estimates and measurements of the distance to sound isopleths are not possible. Also, importantly, because many vessels produce sound greater than 120 dB (continuous), the contemplated buffer areas would effectively have to be closed to all vessel traffic (except for perhaps sailing yachts and small motorboats).
- NMFS has no basis whatsoever in law or in fact to impose discharge requirements on any or all of the specific discharge streams associated with proposed OCS activities under authority of the MMPA. Any such discharges are regulated by the Alaska Department of

¹⁰ This comment applies equally to the new closure proposed for the first time in the FEIS. *See* Appx. A at 120 (referring to new “closure area from Point Franklin to Barrow in the Chukchi Sea to protect bowhead and gray whales”).

Environmental Conservation and/or the Environmental Protection Agency pursuant to the Clean Water Act. Accordingly, AMM C2 and C3 are arbitrary and unlawful.

- AMM A1 is unnecessary and without basis because sound source verification does not produce reliable or repeatable results even within the area of a single seismic operation. Moreover, as recognized in the FEIS, this measure requires substantial costs and planning, and therefore is not “practicable” (as required by the MMPA).¹¹
- AMM A4 is unnecessary and impracticable because it is well established that (i) the use of passive acoustic monitoring faces substantial challenges and has been found to be ineffective in the Arctic and (ii) active acoustic monitoring is still a subject of ongoing research and has not been proven to work in Arctic conditions.
- AMM A3 is unnecessary and unsupported because cetaceans are not at significantly greater risk of harm when a soft-start is initiated in poor visibility conditions.¹² Marine mammal avoidance behavior is a critical consideration in evaluating risk of operations in low visibility conditions and is not given proper weighting in the mitigation discussion.
- NMFS proposes a new additional mitigation measure that would “restrict transit of oil and gas exploration vessels into the Chukchi Sea prior to July 1.” Appx. A at 121. This measure should be tailored to allow exceptions in certain circumstances (such as weather, demonstrated operational need, etc.) prior to the July 1 date.
- In its Responses, NMFS states that it has added an additional mitigation measure for “airgun during turns” in the FEIS. However, this additional measure is not identified or explained anywhere in the FEIS (or in any previous draft EISs). Until the public has an opportunity to review and comment on such a measure, it may not be incorporated into the ROD.
- Finally, with respect to standard mitigation measure D2, there should be no requirement for communications center operations during periods when there is no possibility for industry impact on the hunt (such as when industry is not allowed to operate). In addition, provisions for communications centers and the details of their operation historically have been developed in the Plan of Cooperation, which is an approach that

¹¹ See A.N. Popper, A. Hawkins (eds.), *The Effects of Noise on Aquatic Life II*, Advances in Experimental Medicine and Biology, 875, DOI 10.1007/978-1-4939-2981-2_2 (see Chapter 2, Aerts, L.A.M. and B. Streever, Modeled and Measured Underwater Sound Isopleths and Implications for Marine Mammal Mitigation in Alaska).

¹² See The Model Based Assessment of Underwater Noise from an Airgun Array Soft-start Operation (OGP Report 451, 2011; Hannay et al., 2010).

allows for case-by-case flexibility that a one-size-fits-all standard mitigation measure cannot accommodate.

In sum, the Associations are strong supporters of reasonable mitigation necessary to ensure that oil and gas activities have a negligible impact and that the availability of marine mammals for subsistence is not impaired. However, there is no need for any of the “additional mitigation measures” identified in the FEIS because existing mitigation measures are proven to be effective, based on an extensive record of many years of data.¹³

H. The FEIS Does Not Fairly or Comprehensively Describe the Socio-Economic Impacts from Arctic Oil and Gas Exploration Activities

In the FEIS, NMFS compares (i) a scenario in which there is no exploration for offshore oil and gas reserves in Alaska (the no-action alternative) with (ii) a variety of scenarios in which such exploration occurs at certain activity levels. In defining the alternatives in this manner, NMFS necessarily must evaluate the socio-economic consequences of eliminating oil and gas exploration in the Alaskan OCS along with the consequences of engaging in specific levels of activity. NMFS does not address this implication of its chosen no-action alternative in its Responses.

For each of the alternatives, the FEIS presents a shallow, cursory, and incomplete assessment of socio-economic impacts, and implausibly concludes that socio-economic impacts are “minor.” The socio-economic consequences to the State of Alaska, as well as the United States, from either exploring the Alaska OCS or not are undoubtedly “major.” Alaska’s OCS is estimated to hold approximately 27 billion barrels of oil and 132 trillion cubic feet of natural gas. Developing Alaska’s vast OCS resources is essential to any effort to reduce the nation’s dependence on foreign sources of oil and is vital to stemming the decline of throughput in the Trans-Alaska Pipeline, a critical national infrastructure that will continue to face operational challenges without additional supply. Development of the Arctic is also a tremendous economic opportunity for the nation as well as the state of Alaska. As the Department of Interior’s recent report to the President indicates, “the industrial sector operating in the U.S. Arctic has a major impact statewide in Alaska, generating, directly and indirectly, thousands of jobs, millions of dollars in personal income, billions of dollars in revenue (for federal, state, and local governments).” See <https://www.doi.gov/sites/doi.gov/files/migrated/news/upload/ArcticReport-03April2013PMsm.pdf>. The FEIS must, but does not, provide a rigorous socio-economics analysis, considering all of the best available information.

¹³ The geophysical and oil and gas industries fund independent research to further the understanding of the potential effects of seismic surveys on marine life. More information regarding this research program can be found at www.soundandmarinelife.org.

I. Required Monitoring Must Be Directly Related to Specific ITAs and the Incidental Take Allowed Under Such ITAs

In its Responses, NMFS suggests, under the pretense of “monitoring,” that it may require MMPA ITA applicants to conduct “studies that increase understanding of the occurrence or [sic] marine mammals, the exposure or response of marine mammals to the activity, or the further consequences to the individuals of those responses or a better understanding of mitigation effectiveness for habitat impacts.” Appx. A at 131. NMFS further states that “[s]tudies that meet the monitoring requirements can range from comparatively simple monitoring to more complex efforts that end up in peer-reviewed articles.” *Id.*

The MMPA implementing regulations require a petition for an ITA to include, among other things:

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding. Guidelines for developing a site specific monitoring plan may be obtained by writing to the Director, Office of Protected Resources....

50 C.F.R. § 216.104(a)(13). Consistent with the requirement to include a “site-specific” monitoring plan in a petition for an ITA, the MMPA simply requires ITRs to include “requirements pertaining to the monitoring and reporting of such taking.” 16 U.S.C. § 1371(a)(5)(A)(i)(II)(bb) (emphasis added); *see also id.* § 1371(a)(5)(D)(ii)(II) (same description for incidental harassment authorization). The MMPA regulations similarly refer only to monitoring that is limited to the specific incidental take authorized by the agency in a particular authorization. *See* 50 C.F.R. § 216.102(c) (NMFS must prescribe requirements or conditions “pertaining to the monitoring and reporting of such taking”); 50 C.F.R. § 216.105(b)(3) (referring to monitoring and reporting requirements “for each allowed activity”). Accordingly, any monitoring required by NMFS under MMPA ITAs must be directly related to specific activities covered by specific authorizations and pertain to the incidental take allowed under those authorizations.

J. The Process for Developing the FEIS Has Been Unreasonable

1. NMFS has unduly limited the public's ability to participate

NMFS received extensive public comments in response to the 2011 DEIS and many of those comments recommended substantial structural and content-based changes to the DEIS. However, NMFS failed to provide responses to any of those comments when it issued the 2013 SDEIS. To allow for a more informed public review and comment process for the SDEIS, NMFS should have provided specific responses to the public comments it received on the 2011 DEIS. By failing to do so, NMFS created for the public a needle-in-the-haystack exploratory exercise in which the public had to attempt to discern whether specific comments were incorporated (or not) based on review of another 1,500+ page document. The provision of responses to comments on the 2011 DEIS would have allowed for a more efficient and informed public review process for the SDEIS.

In addition, NMFS held public meetings on the SDEIS a mere two weeks after the SDEIS was released for public review (and approximately 11 weeks before the close of the comment period). Needless to say, two weeks was clearly not enough time for the public to become familiar with the SDEIS and provide informed feedback. Consequently, the public meetings on the SDEIS had essentially no value and did little to inform the process.

2. The State of Alaska should have been, but was not, consulted

As part of the scoping process, NEPA regulations require NMFS to “invite the participation of affected Federal, State, and local agencies” (among others) to participate in the EIS preparation process. 40 C.F.R. § 1501.6(a)(1). To our knowledge, the State of Alaska was not invited to participate in this NEPA process nor was it consulted on any issues of substance. This failure is particularly troubling given that the area covered by the FEIS includes state waters, which, although not subject to OCSLA, are subject to the MMPA. In its Responses, NMFS implies that because it provided copies of the draft EIS to the state, it somehow complied with 40 C.F.R. § 1501.6(a)(1). However, provision of a copy of the draft EIS does not amount to an invitation to participate in the development of the EIS, as required by § 1501.6(a)(1).

III. CONCLUSION

The Associations are longstanding supporters of the MMPA regulatory process as an effective means of balancing and rationalizing responsible Arctic oil and gas activities with conservation of marine mammals. We continue to support issuance of ITAs under the MMPA because it has been demonstrably effective in the Arctic in protecting marine mammal species without unduly and unnecessarily burdening industry. We appreciate the opportunity to comment and hope that NMFS will genuinely consider, address, and incorporate into its ROD the comments set forth above.

IAGC/AOGA/API Comments on Arctic FEIS

November 21, 2016

Page 19

Thank you for your consideration of our comments. Should you have any questions, please feel free to contact any of the undersigned.

Sincerely,



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cc: The Honorable Bill Walker, Governor, State of Alaska
The Honorable Lisa Murkowski, United States Senate
The Honorable Dan Sullivan, United States Senate
The Honorable Don Young, United States House of Representatives
U.S. Senate Committee on Energy and Natural Resources
U.S. House Committee on Natural Resources
Dr. Jill Lewandowski, BOEM, Division of Environmental Assessment Chief

Attachments

ATTACHMENTS



March 13, 2014

VIA Federal eRulemaking Portal

Chief, Marine Mammal and Sea Turtle Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226

Re: Comments on Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals - **NOAA-NMFS-2013-0177**

To Whom It May Concern:

This letter provides the comments of the American Petroleum Institute (“API”), the International Association of Geophysical Contractors (“IAGC”), the National Ocean Industries Association (“NOIA”), and the Alaska Oil and Gas Association (“AOGA”) (collectively, the “Associations”) in response to the National Marine Fisheries Service’s (“NMFS”) Notice and Request for Comments on its Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals (“Draft Guidance”). *See* 78 Fed. Reg. 78,822 (Dec. 27, 2013). We appreciate NMFS’s consideration of the comments set forth below.

I. INTRODUCTION

A. The Associations

API is a national trade association representing over 500 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’s (“MMPA”) regulatory process as an effective means of balancing and rationalizing responsible oil and gas activities with the conservation of marine mammals.

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.

AOGA is a non-profit trade association located in Anchorage, Alaska. AOGA’s 15 member companies account for the majority of oil and gas exploration, development, production, transportation, refining, and marketing activities in Alaska. AOGA’s members are the principal oil and gas industry stakeholders that operate within the range of marine mammals in Alaskan waters and in the adjacent waters of the OCS. AOGA and its members are longstanding supporters of wildlife conservation, management, and research in the Arctic, and also support the continued issuance of incidental take authorizations in the Arctic. AOGA has for many years successfully petitioned for, and defended in court, incidental take regulations applicable to offshore oil and gas activities.

B. General Comments

The Associations want to acknowledge the significant effort involved in examining the scientific literature available on the topic of marine sound and its potential impacts on marine mammals. We recognize that this topic is complex and informed by an evolving base of scientific knowledge, and we appreciate the challenges associated with translating the available information into clear criteria. In this light, we support the goal of updating and developing acoustic criteria that are informed by, and consistent with, the best available science. We also support a continued effort in furtherance of this goal that is transparent and does not result in unnecessary or unsupported new processes for the regulated community. We have carefully reviewed and analyzed the Draft Guidance and have a number of specific comments, as detailed in the following sections of this letter, in which we identify opportunities for improvement, request clarity on technical issues, and address legal concerns. Our general comments are summarized as follows.

1. In certain respects, the Draft Guidance either does not consider all of the best available science or presents other scientific, technical, implementation, or operational concerns. These concerns are addressed in detail in Sections III.A and III.B below and in the Appendix that accompanies this letter. Given the scope of our comments, and the need for more information and analyses to facilitate a sufficiently informed process, we request that NMFS issue a second version of the Draft Guidance jointly with a draft implementation guide for public review and comment.

2. The Draft Guidance does not provide a full explanation of the anticipated impact of the proposed acoustic criteria on the regulated community, and there is no clear discussion of the regulatory implications of the proposed changes. Because the Guidance will be applied in a range of regulatory actions, we recommend that NMFS undertake a study comparing the assessment approach described in the Draft Guidance with the current assessment methods to demonstrate the regulatory implications of the proposed criteria. The results of this study should be presented in the second version of the Draft Guidance that is made available for public review and comment. Although the Draft Guidance's proposed metrics are not directly comparable to current assessment methods, we believe the results of such a study would be very informative to the regulated community.

3. The Draft Guidance presents uncertainty and potential complications regarding the implementation of the proposed criteria. The complexity of the methods proposed in the Draft Guidance will result in increased time and expenses for applicants, and may lead to confusion in both the regulated community and the general public. In addition, the Draft Guidance does not address a significant category of Level B take (i.e., behavioral modification). We request that NMFS provide a more detailed description of how the proposed acoustic criteria will be implemented generally (e.g., how and when it will be formally adopted and applied in the incidental take authorization process) and specifically (e.g., how it will translate into operational mitigation and monitoring measures for project applicants).

4. We commend NMFS for its commitment to undertake review and revision of this guidance every three to five years to incorporate knowledge as it is acquired. We also welcome the opportunity for applicants to propose alternative approaches to those presented in the Draft Guidance. This flexibility will enable innovation within the bounds of regulatory compliance. There are many ways to estimate potential exposures of marine mammals to various sound levels, and future applicants should not be limited to estimating exposures using the criteria set forth in the Draft Guidance if there are other methods that are more appropriate and scientifically justified. The Draft Guidance should emphasize the agency's discretion to assess and approve approaches that differ from those described in the Draft Guidance.

5. In the Draft Guidance, NMFS has developed criteria based on extrapolations from limited data sets. We do not believe that the methods used in parts of the Draft Guidance to obtain conservative criteria are always reflective of, or consistent with, the best available science. Accordingly, we recommend that the next version of the Draft Guidance address and explain the potential shortcomings associated with extrapolation from limited data and, where appropriate (as identified in the comments below), utilize other data that, although also limited, may more accurately reflect the best available science.

6. Marine mammal incidental take authorizations for the oil and gas industry have, for many years, been authorized by NMFS and the U.S. Fish and Wildlife Service ("FWS"). The best available science demonstrates that these authorizations have resulted in no detectable adverse impacts to marine mammal populations. Although we support NMFS's development of

new criteria that are consistent with the best available science, these new criteria should not be applied in a manner that results in increased regulatory burdens. The Associations are concerned that the Draft Guidance will unnecessarily result in an increased burden to the applicant during the permitting process. In addition, if the new criteria results in an increased number of shutdowns, or longer survey duration, not only will there be increased costs, but the safety risks for the activity will also increase.

II. STATUTORY CONTEXT

The Draft Guidance is primarily relevant to federal authorizations made pursuant to the Outer Continental Shelf Lands Act (“OCSLA”), the MMPA, and the Endangered Species Act (“ESA”). To add context for our comments, this section provides a short summary of the key provisions and requirements of the OCSLA, MMPA, and ESA.

A. OCSLA

The OCS is a significant source of oil and gas for the nation’s energy supply. In 2012, offshore areas of the United States supplied over 12 percent of the country’s natural gas and oil production, and are estimated to contain roughly 23 percent of the oil and 12 percent of the natural gas resources in remaining undiscovered fields in the United States. The important role of oil and gas exploration and development in the OCS is clearly reflected in OCSLA and its implementing regulations. Under those authorities, implementing agencies are mandated to preserve, protect, and develop oil and natural gas resources in the OCS in a manner that is consistent with the need to (i) make such resources available to meet the Nation’s energy requirements as rapidly as possible, and (ii) balance orderly energy development with protection of human, marine, and coastal environments. *See* 43 U.S.C. §§ 1332(3)-(5), 1346, 1348; 30 C.F.R §§ 250.101, 250.107.

Geophysical surveys using seismic reflection are an essential, state-of-the-art component of oil and gas exploration in the OCS. Geophysical data are used by both industry and federal agencies to make informed economic and regulatory decisions regarding potential accumulations of oil and natural gas. As one of the earliest components of the lengthy process leading from leasing of lands, to exploration, to development and production of hydrocarbon resources, seismic surveys are critical to the OCS resource development mandated by Congress in OCSLA and have been demonstrated to have no detectable long-term impacts on the marine environment.

B. MMPA and ESA

Section 101(a)(5)(A) of the MMPA empowers NMFS (and FWS) to authorize the incidental take of marine mammals, subject to certain requirements. These authorizations occur in two forms: (i) incidental harassment authorizations (“IHAs”), which are issued for a period of no more than one year; and (ii) incidental take regulations (“ITRs”), which are effective for a period of up to five years and pursuant to which incidental take from a single activity is

authorized with a letter of authorization (“LOA”). 50 C.F.R. §§ 216.105, 216.106. When issuing ITRs and IHAs, NMFS must find, among other things, that the authorization will (i) have a negligible impact on marine mammal stocks; (ii) not have an unmitigable adverse impact on subsistence needs for marine animals; and (iii) minimize effects through implementation of appropriate mitigation. *See* 16 U.S.C. § 1371(a)(5)(D).

In addition, federal “agency actions” that are likely to adversely affect an ESA-listed species or its critical habitat are subject to consultation under Section 7 of the ESA, in which the consulting agency (NMFS or FWS) issues a biological opinion as to whether the action is likely to jeopardize the continued existence of the listed species or to destroy or adversely modify its critical habitat. 16 U.S.C. § 1536(a)(2). Section 7 consultation may result in the issuance of an incidental take statement (“ITS”) that includes “reasonable and prudent measures” to minimize the effects of the proposed action. *Id.* § 1536(b)(3)(A), (b)(4)(C). For MMPA incidental take authorizations that involve ESA-listed species, NMFS (or FWS) typically issues a biological opinion containing an ITS and reasonable and prudent measures applicable to the activity that may cause incidental take.

Congress has mandated that decisions made under both the MMPA and the ESA must be based on the best scientific information available. *Id.* §§ 1373(a), 1536(a)(2). The U.S. Supreme Court has explained that Congress intended this requirement to both (i) serve the goal of species preservation and (ii) prevent unnecessary economic impacts caused by the precautionary application of incomplete or speculative information. *See Bennett v. Spear*, 520 U.S. 154, 176-77 (1997).¹

III. DETAILED COMMENTS

A. NMFS Should Provide More Clarity and Explanation Regarding the Implementation of the Proposed Criteria

¹ The National Marine Sanctuaries Act (“NMSA”) requires federal agencies whose actions are likely to destroy, cause the loss of, or injure a sanctuary resource to consult with the Office of National Marine Sanctuaries (“ONMS”) before taking any action. *See* 16 U.S.C. § 1434(d)(1). The term “injure” is defined as to “change adversely, either in the short or long term, a chemical, biological or physical attribute of, or the viability of.” 15 C.F.R. § 922.3. Through the sanctuary consultation process, ONMS may recommend reasonable and prudent alternatives to protect sanctuary resources, as well as monitoring. *See* 16 U.S.C. § 1434(d)(2). The Draft Guidance does not address whether NMFS will apply the acoustic criteria any differently in the NMSA context (compared to the MMPA and ESA contexts). If NMFS plans to apply the acoustic criteria differently in the NMSA context, it should provide an explanation for the public’s consideration and comment.

The Draft Guidance should provide an explanation of the anticipated impact of the proposed acoustic criteria on the regulated community and a clear discussion of the regulatory implications of the proposed changes. In addition, to eliminate uncertainty and potential future complications, it would be helpful if the Draft Guidance contained a specific analysis of how the implementation of the proposed criteria will affect existing offshore activities, monitoring protocols, estimated incidental take assessment, and the development of mitigation measures.² These explanations and clarifications would increase transparency, allow for more informed public review and comment, and help to “ensur[e] and maximiz[e] the quality, objectivity, utility, and integrity” of the information provided in the Draft Guidance, as required by the Information Quality Act. *See* Pub. Law No. 106-554, § 515 (2000); *see also* 67 Fed. Reg. at 8,456 (“The more important benefit of transparency is that the public will be able to assess how much an agency’s analytic result hinges on the specific analytic choices made by the agency. Concreteness about analytic choices allows, for example, the implications of alternative technical choices to be readily assessed.”).³

We offer the following suggestions and examples to identify specific improvements that could be made to the Draft Guidance and topics for which additional explanation would be helpful.

1. We recommend that NMFS undertake a study comparing the assessment approach described in the Draft Guidance with the current assessment approach using case studies of various sources, both impulsive and non-impulsive, in different OCS regions, to demonstrate the regulatory and technical implications of the proposed criteria. Although the proposed criteria are not directly comparable to the criteria currently used, we believe the results of such a study

² *See* 67 Fed. Reg. 8,452, 8,459 (Feb. 22, 2012) (“In assessing the usefulness of information that the agency disseminates to the public, the agency needs to consider the uses of the information not only from the perspective of the agency but also from the perspective of the public.”). We also recommend that the Draft Guidance include a summary of the additional costs that are expected to result from implementation of the new criteria, with a comparison of the expected benefits.

³ NMFS considers the Draft Guidance to be a “highly influential scientific assessment” subject to the *National Oceanic and Atmospheric Administration Information Quality Guidelines* (“NOAA IQG”). “[I]nfluential scientific, financial, or statistical information” is specifically held to higher information quality standards. *See* 67 Fed. Reg. at 8,452, 8,455 (“OMB guidelines apply stricter quality standards to the dissemination of information that is considered ‘influential.’”). These standards further counsel in favor of more information addressing the implications and implementation of the proposed criteria. *See generally* NOAA IQG at 1-2.

would be very informative to the regulated community and would facilitate the development of additional public comments that would be helpful to NMFS as it revises and refines the Draft Guidance.

2. NMFS can improve the usefulness of the Draft Guidance and enhance the regulated community's ability to meaningfully comment by providing for public review a draft of the "user guide" that will inform and assist NMFS's implementation of new acoustic criteria. The draft of this implementation guide should be provided for review and comment along with the second version of the Draft Guidance.

3. The Associations support NMFS's determination that the proposed SEL_{cum} metric will be applied to discrete activities/sources and not used to accumulate sound exposure for multiple activities occurring over the same time period. The Draft Guidance also states that application of the proposed criteria "do[es] not represent the entirety of the impact assessment" and explains that other qualitative factors will be considered. However, the Draft Guidance provides little discussion or explanation of how these qualitative factors will be considered, the relative weight given to the factors, or how the factors will be implemented. We encourage the agency's consideration of qualitative factors in a manner that adds flexibility to the regulatory process. In addition to providing more discussion of these qualitative factors, it would be helpful for the Draft Guidance to include an explanation of the important role served by currently implemented mitigation and monitoring measures, which have been proven to substantially avoid and reduce incidental take.

4. The Draft Guidance does not address a significant category of Level B take (i.e., behavioral harassment). The vast majority of offshore oil and gas incidental take authorizations involve Level B take in the form of behavioral modification. It would greatly improve the regulated community's ability to meaningfully assess the implications of the proposed criteria if the Draft Guidance included an explanation of how the proposed acoustic criteria will be implemented in the absence of new criteria applicable to Level B behavioral harassment. Again, this will be an area for which flexibility is important.

5. It is not clear from the Draft Guidance whether NMFS intends there to be five different mitigation zones for five different functional hearing groups or whether NMFS will prescribe the most precautionary mitigation zone based on the most sensitive species but applicable to all marine mammals in the area. Both of these potential options present concerns. On the one hand, the application of multiple radii for different species will be operationally challenging to implement. If NMFS is considering the implementation of varying exclusion zones, then this approach may also require changes to the standards applicable to observer programs and additional training of protected species observers. As further addressed in the Appendix (¶ 6.1.3), it is also not clear how NMFS will address effects at multiple depths under this approach. On the other hand, prescription of a single mitigation zone based on the most sensitive species but applicable to all marine mammals in the area would not be consistent with the best available science. It would be helpful for NMFS to provide a clear description of how it

foresees the proposed criteria translating into specific operational mitigation and monitoring requirements.

6. The Draft Guidance appropriately recognizes that TTS is not an “injury,” but addresses TTS as a form of Level B harassment separate from behavioral modification. The Draft Guidance states that TTS “will be addressed for purposes of take quantification” after NMFS develops guidance for behavioral modification and that, in the meantime, “the TTS thresholds presented represent the best available science and will be used in the comprehensive effects analyses under the MMPA and the ESA and may inform the development of mitigation and monitoring.” However, it is not clear from the Draft Guidance as to how NMFS will specifically address TTS in the permitting process before behavioral modification criteria are finalized. For example, it is unclear as to whether NMFS is now going to require the use of three separate take thresholds (for PTS, TTS, and behavioral modification) and, if so, how NMFS will ensure that the permitting and implementation processes do not become too burdensome and complex. The Draft Guidance should more fully explain how these issues will be addressed.

7. It is not clear from the Draft Guidance whether or where NMFS will require sound source verification (“SSV”). In the experience of the Associations’ members, SSV poses a complicated and unnecessary burden on operations because the results of SSV are highly variable due to constantly changing conditions in the water column. If SSV is intended to be part of the standard protocol in the implementation of the proposed criteria, then it is important that the regulated community have the opportunity to provide informed input on this potential requirement. Specific recommendations regarding SSV are provided in the Appendix (§ 6.1.2).

8. The Draft Guidance addresses a complex subject, and this is reflected in an equally complex proposed approach with several options provided to applicants. The complexity of the proposed approach will result in increased time and expenses for applicants, as well as potentially strain the limited resources of specialized modeling firms. Additionally, the complexity of the Draft Guidance could create confusion among public stakeholders, possibly leading to mistaken interpretations or public statements regarding the purpose and intent of the Draft Guidance. More clarity on the purpose of the Draft Guidance, and how it will be implemented, would enhance both the regulatory and public perception aspects of the Draft Guidance.

9. In determining PTS and TTS onset levels, NMFS adopts two methodologies for determining quantitative factors that can be considered in conjunction with utilizing the numeric acoustic threshold levels: a marine mammal weighting function and an alternative acoustic threshold level. In so doing, NMFS recognizes that the applied weighting function will likely result in a lower estimate of take, but that the new methodology “might extend beyond the capabilities of some applicants” (i.e., smaller operators). This system could have inequitable results for operators who, for either cost or time reasons, may not be able to use the more complicated applied weighted factor methodology. It would be helpful for the Draft Guidance to

include more explanation to inform applicants about the potential costs, benefits, and consequences of each of these two methodologies.

10. In addition, if the incidental take estimate in a five-year ITR is based on non-weighted PTS and TTS thresholds, then the estimate will be unrealistically high. Alternatively, if an ITR is based on a weighted approach using contemporary modeling, LOA applicants who use the unweighted approach may complicate the agency's ability to reasonably manage and implement the ITR. We recommend that NMFS explain how it plans to implement future ITR/LOA processes, or multiple IHAs, in a context in which two approaches to estimating potential takes are stated in the agency's guidance.

We provide the above suggestions and examples to highlight the need for more information regarding the implementation of the proposed criteria and to identify specific opportunities for improvement. We respectfully request that NMFS revise and reissue the Draft Guidance, and a draft implementation guide, in a manner that comprehensively addresses the concerns described above and below.⁴

B. The Draft Guidance Presents a Number of Scientific and Technical Concerns That Must Be Addressed Before NMFS Issues Final Guidance

In general, the Associations support the development of new acoustic criteria based upon the best scientific information available, such as the findings and principles stated in Southall et al. (2007) and Finneran and Jenkins (2012). However, we have several scientific, technical, and operational concerns about the Draft Guidance. The following comments address these concerns.

1. TTS Thresholds

The Draft Guidance concludes that TTS is not an "injury" for MMPA purposes and should, at most, be considered Level B harassment. The Associations concur with this finding. The best available science indicates that hearing for marine mammals that have experienced TTS returns to normal within hours or days and that post-exposure behavior returns to normal. *See, e.g.,* Mooney et al. (2009a, 2009b); Popov et al. (2011); Finneran and Schlundt (2013). Moreover, behavioral studies indicate that marine mammals tend to move away from a sound

⁴ It is not clear whether NMFS reviewed the Draft Guidance pursuant to the National Environmental Policy Act ("NEPA") or, alternatively, determined that NEPA does not apply. The second version of the Draft Guidance should clarify NMFS's determination regarding the applicability of NEPA and provide NEPA review documentation, if any, for public review.

source if it is disruptive, which significantly diminishes the potential for any TTS-related effects. *See* Nowacek et al. (2007). The data collected in experiments in which animals are exposed to sounds in a controlled setting likely result in overestimates of exposure because the subjects are exposed to much longer and louder sounds than they would be in the natural environment.

In addition, the Draft Guidance does not incorporate significant recent research regarding the auditory effects on bottlenose dolphins from multiple impulses of a seismic source (Finneran et al. (2011); Finneran et al. (2012); Schlundt et al. (2013)). These studies exposed three different bottlenose dolphins to multiple (10) impulses of a seismic airgun, SEL_{cum} 195 dB re 1 μPa^2 -s, without any measurable TTS. The Draft Guidance proposes a TTS onset for impulsive sounds for mid-frequency cetaceans at SEL_{cum} 172 dB re 1 μPa^2 -s. This is an extraordinarily low and unrealistic threshold given that the Finneran research could not induce TTS at 195 dB re 1 μPa^2 -s. The draft TTS onset criteria should be revisited to consider Finneran and Schlundt's recent and more directly applicable work. As stated in Finneran et al. (2012), "[t]hese data suggest that the potential for seismic surveys using air guns to cause auditory effects on dolphins and similar delphinids may be lower than previously predicted."

Finally, the Draft Guidance describes criteria applicable to animals likely to experience TTS during marine operations that produce underwater sounds.⁵ In most cases, the authors of the available relevant studies have not used the highest levels required to induce TTS, and NMFS has excluded studies in which TTS was not induced by sound levels equivalent to those in the proposed criteria. *See* SEAMARCO (2011); Kastelein et al. (2013). As a result, animals exposed at levels associated with TTS as currently proposed will not necessarily experience TTS and, therefore, the methods described in the Draft Guidance can only be used to estimate the number of animals that could potentially experience TTS.⁶ Accordingly, the highest exposure that did not induce TTS in recent studies must be included in the data set used to develop the TTS thresholds, as referenced above. The Draft Guidance should also identify and describe each

⁵ The data for establishing TTS for representative species come from a small number of animals. The lack of available data underlying the proposed acoustic criteria is not clearly addressed or explained by NMFS. Although NMFS is required to consider the best available science, it also has an obligation to explain the limitations of the information being used as a basis to develop important agency policy and guidance.

⁶ The Draft Guidance references recent studies by Kujawa and Liberman (2009) and Lin et al. (2011) that indicate that even if a full recovery is observed after TTS in small mammals, some neurological damage was permanent. However, these results cannot be extrapolated to other species because the data are very limited and the implications for actual negative effects on the animal's ecology, behavior, or fitness have yet to be measured. Additionally, these two studies investigated extreme TTS, and, therefore, it is not known whether similar effects would occur in marine mammals at lower TTS levels.

instance in which conservative thresholds are selected (i.e., selecting the lowest TTS threshold in a small sample size), and TTS onset in these instances should be described as potential, not actual. This distinction is important because the Draft Guidance defines TTS, not “potential TTS,” as Level B harassment, and how Level B harassment is estimated has important relevance to the “small numbers” and “negligible impact” determinations that must be made in support of MMPA incidental take authorizations.

2. Functional Hearing Groups, Weighting Functions, and Threshold Criteria

In general, knowledge of basic hearing is still limited for most species of marine mammals. Finneran and Jenkins (2012) provided the most updated list of species whose hearing has been scientifically measured. Although some groupings of marine mammals that hear similarly may be appropriate, the extrapolated hearing ranges presented in the Draft Guidance are not consistent with the best available science (Southall et al. (2007) and Finneran and Jenkins (2012)) in a number of respects.

First, the extension of the hearing range of low-frequency cetaceans is not supported by empirical evidence. There is no evidence indicating that mysticetes hear above 20-22 kHz, and there are no empirical data to support the Draft Guidance’s expansion to 30 kHz. The data presented in the Draft Guidance do not provide additional scientific information to justify expanding the hearing of low-frequency cetaceans to 30 kHz.

Southall et al. (2007) indicated that vocalizations are unlikely to always predict hearing ranges. Animals tend to hear best around the frequencies they use for communication and echolocation (Ketten 2002), but can also extend below and above the range of frequencies they use. There is empirical evidence that animals can produce sounds that they cannot necessarily hear and, therefore, Au et al. (2006) should not be used in determining the hearing range of low-frequency cetaceans. For instance, Nachtigall et al. (2007) showed that white beaked dolphins do not hear past 181 kHz, even though they are often recorded producing sounds up to 305 kHz (Mitson 1990) and clicks have secondary peak at 250 kHz (Rasmussen et al. 2002). Therefore, harmonics above 20 kHz do not necessarily imply hearing in mysticetes. The Draft Guidance cites Tubelli et al. (2012) and Ketten and Mountain (2009), which are predictions based on anatomical modeling and are yet to be validated by empirical data.⁷

Moreover, the frequency weighting functions in Figure 2 of the Draft Guidance are based on no empirical data and imply that low-frequency cetaceans are much more sensitive to acoustic exposure than was formerly believed or than what the current research supports. There is also no clear explanation or support for the low-frequency cetacean auditory weighting function

⁷ Tubelli and Stein (2007) reported only potential response to 22 kHz signals.

parameters presented in Table 3. The low-frequency criteria should be based on Southall et al. (2007) and Finneran and Jenkins (2012).

Second, the hearing ranges of otariids and phocids, as proposed in the Draft Guidance, are different than the hearing ranges stated in Finneran and Jenkins (2012) (respectively, 75 Hz to 75 kHz and 100 Hz to 50 kHz). Southall et al. (2007) defined the hearing range limits as being approximately 80 dB above the lowest thresholds. However, in Kastelein et al. (2009), thresholds for phocids are more than 80 dB above the most sensitive thresholds and should not be considered to be within the functional hearing range. Likewise, Hemilä et al. (2006)'s data were based on anatomical studies, not empirical hearing data and should not substitute for actual hearing measurement data. Accordingly, for establishing reliable hearing ranges for otariids and phocids, the Draft Guidance should use the thresholds reported in Finneran and Jenkins (2012) and in Reichmuth et al. (2013). Recent work by Sills et al. (2014) provides additional support that the 70-80 kHz range encompasses the high frequency cut-off for phocids with a threshold of 101 and 102 dB at 72.4 kHz. For otariids, Finneran and Jenkins (2012) reviewed all of the best available data and recommended an underwater hearing range of 100 Hz to 50 kHz (100 Hz to 35 kHz in air). The Draft Guidance does not clearly explain why 40 kHz was selected as a high frequency cut-off for otariids instead of 50 kHz and there is no recent empirical study to support that proposed modification.

Third, the Associations are concerned with the proposed criteria for both impulsive and non-impulsive sound for high-frequency cetaceans. For impulsive sound, the proposed high-frequency cetacean thresholds are based on the underlying data from a single study involving a single animal (harbor porpoise) (Lucke et al. 2009) in which large variations in ambient noise may have caused confounding effects on the SEL_{cum} and SPL_{peak} threshold estimates.⁸ For non-impulsive sound, the extrapolation for high-frequency cetaceans is based on a single study involving only two animals (Popov et al. 2011), and the non-impulsive SPL_{peak} values are extrapolated from data on impulsive sounds rather than using the data available for non-impulsive sounds. Popov et al. (2011) recognized that their data might be biased due to multiple exposures in one day and the absence of data on the variability of baseline thresholds, which could add uncertainty and confounding factors to the TTS estimates. This highlights the need for flexibility in the implementation of the final acoustic criteria in future regulatory processes.

3. Addressing Limited Data

⁸ Finneran and Jenkins (2012) separated harbor porpoises from other high-frequency cetaceans for their behavioral thresholds because there is evidence showing that this species reacts to quieter sounds than most high-frequency cetaceans. Accordingly, using the harbor porpoise as a surrogate species for high-frequency cetaceans is unlikely to be representative.

Generally, the Draft Guidance notes that the proposed criteria are based upon research using very few marine mammals. To address limited data, the agency explains that it will choose the lowest threshold value if there are less than five relevant studies and that it will identify a median value if there are five or more studies. The Associations respectfully disagree with this approach and propose that NMFS consider the best available information, regardless of the number of available studies and, as required by the MMPA and the ESA, develop thresholds that most accurately reflect all of the available science rather than applying a conservative approach by choosing a low reported value to the exclusion of other available information.

4. Equal Energy Hypothesis

The use of SEL_{cum} is practical in the sense that it allows researchers and operators to compare sound events with various SPL and time durations. For transient sounds, SEL_{cum} is also practical as it expresses the total energy as opposed to the maximum energy. However, SEL_{cum} is used under the assumption that a low amplitude and long signal with an equal SEL_{cum} as a loud and short signal will have the same effects on the auditory system (the Equal Energy Hypothesis (“EEH”). The EEH may be correct in certain conditions, but an increasing body of evidence indicates that the EEH does not hold true in most marine mammal sound exposures. As recognized in the Draft Guidance, the EEH is not supported by several studies. *See* Kastelein et al. (unpublished); Popov et al. (2011); Popov et al. (unpublished), Supin (Aug. 2013 Abstract); *see also* Mooney et al. (2009a); Finneran et al. (2010b); Kastak et al. (2005); Kastak et al. (2007); Mooney et al. (2009b); Finneran et al. (2010a); Kastelein et al. (2012a); Kastelein et al. (2012b). Therefore, the use of SEL_{cum} has some practical aspects, particularly in the absence of a complete data set. However, as more data become available, more analyses should be performed to determine what model or equation best fits the EEH, and how the SEL_{cum} criteria should be revised to more accurately reflect the potential for TTS changes with duration and amplitude.

5. Marine Mammals’ Ability to Adjust Hearing

There is a growing body of science regarding the ability of marine mammals to adjust their hearing when exposed to loud sounds. *See* Popov (Aug. 2013 Abstract); Nachtigall and Supin (2013). This research describes the ability of cetaceans to voluntarily reduce the level of incoming sound by up to 13 dB through the use of an active noise control system. However, these studies do not appear to have been considered in the Draft Guidance. Consistent with its obligation to use all of the best available science and the recognized need for flexibility, NMFS should address and consider these studies if presented by applicants during the permitting in process, and review and update the Guidance as necessary as this area of science becomes more fully developed.

6. Recovery

In general, SEL_{cum} is an appropriate way to measure transient sounds because it allows comparisons between sound exposures of different natures or durations. However, the proposed

threshold criteria assume no recovery between sound exposure events for intermittent and repeated exposures. Given the current knowledge of TTS, this assumption may be inaccurate. Existing studies indicate that recovery may occur in both terrestrial and marine mammals, and research suggests that marine mammals have other adaptive strategies that protect them from sound (Nachtigall and Supin 2013). We recommend that NMFS include a recovery function in the Draft Guidance, and incorporate the work of Finneran et al. (2010) and Finneran and Schlundt (2013). Although these studies are limited in scope, their validity is not in question.

7. Accumulation Periods

The selection of one-hour and 24-hour accumulation periods are not biologically based, and we suggest that NMFS revise the Draft Guidance to expressly allow for the option of SEL_{cum} modeling for the duration of the activity in addition to the one-hour and 24-hour options. We also request that NMFS provide additional information to footnote 15 on page 13 of the Draft Guidance. This footnote indicates that the SEL_{cum} metric is not meant to accumulate sound exposure for multiple activities or for naturally occurring sounds, but very little supporting explanation is provided.

8. Continuous and Impulsive Sounds

The Draft Guidance's definitions of continuous and impulsive sounds are vague and do not objectively distinguish these two types of sound. Impulsive sounds become increasingly continuous with distance, due to multipath arrivals and other factors, and may have continuous components even at short distances, due to reverberation. Accordingly, clear technical definitions of continuous (non-impulsive) and impulsive sounds from geophysical sources, based on the best available scientific literature, should be included in the Draft Guidance. *See* Southall et al. (2007). NMFS should also consider waveform data at the location of the receiver (i.e., the marine mammal) as one of the parameters to determine the impulsive nature of signals covered by these criteria.

9. Relevant Recent Research

A substantial amount of information recently presented at scientific conferences should be considered in the Draft Guidance. *See* Abstracts from The Effects of Noise on Aquatic Life

(Budapest, Aug. 2013);⁹ Popov et al. (unpublished). Among other things, this new information addresses (i) the effects of low-frequency sound as well as EQL for pinnipeds, and (ii) the validity of EEH. Moreover, Southall et al. (2007) will be updated to address the results of recent research, and the proceedings of the August 2013 International Conference on the Effects of Noise on Aquatic Life will soon be published. If this work is available when NMFS prepares a second version of the Draft Guidance or before final guidance is issued, it should be considered and incorporated.¹⁰

C. New Acoustic Criteria Should Not Result in More Regulatory Burdens for Offshore Industries

For many years, marine mammal incidental take authorizations for the oil and gas industry have been authorized by NMFS and FWS on a project-by-project basis (i.e., IHAs) or through the issuance of ITRs and related LOAs. The best available science and information demonstrates that these authorizations have resulted in no detectable adverse impacts to marine mammal populations. Although we support NMFS's development of new criteria that are consistent with the best available science, these new criteria should not be implemented in a manner that results in increased regulatory burdens because the best available information shows that offshore sound-producing operations, as currently regulated, have had no more than a negligible impact on marine mammal species and stocks. The Associations are concerned that the Draft Guidance will unnecessarily result in more difficulties with the permitting process, an increased number of shutdowns, longer survey duration, increased costs, and increased exposure to safety risks. We therefore ask that NMFS consider the record of offshore sound-producing activities in effectively minimizing and mitigating effects to marine mammals as it further refines the implementation processes for the proposed criteria.

IV. CONCLUSION

We appreciate the effort that NMFS has devoted to the development of new acoustic criteria. We support this effort generally but, as detailed above, we have a number of concerns about the implementation processes and the lack of substantive support for some of the proposed criteria. We respectfully ask NMFS to address these concerns and issue a revised version of the Draft Guidance, as well as a draft implementation guide, for public review and comment. The Associations will continue to support a process that is comprehensive, transparent, consistent with the best available science, and fully informed by the public.

⁹ More information and citations regarding the work presented at this conference are provided in the "References" section of this comment letter.

¹⁰ Sills et al. (2014) and Wensveen et al. (2014) are examples of emerging science that NMFS should consider in its development of acoustic criteria.

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
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Karen St. John
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Jeffrey Vorberger
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Appendix
NMFS Draft Acoustic Criteria Implementation Issues
Comments of API, IAGC, NOIA, and AOGA

1. Introduction

- 1.1. The draft acoustic criteria guidelines proposed by NMFS (the “Draft Guidance”) provide a significant change of approach and level of complexity in evaluating acoustic impacts on marine life. While much of the Draft Guidance primarily presents topics as research-related technical issues to inform the agency’s decisions regarding threshold levels, the document does highlight the importance and difficulty in operationalizing or implementing the proposed criteria in the context of applying for, issuing, and complying with incidental take authorizations pursuant to the MMPA, ESA and NMSA.
- 1.2. Overall, there is insufficient discussion in the Draft Guidance explaining how the proposed criteria would be implemented, how they will be measured by the regulated community in a meaningful way, how the permitting process may be affected, how monitoring requirements will change, or how common mitigation practices employed by the oil and gas industry for years and are proven to reduce sound impacts on marine mammals will be adequately considered.
- 1.3. The Draft Guidance provides little explanation of the anticipated impact of the new criteria on the offshore oil and gas industry. Unfortunately, the NMFS did not undertake – or did not present – information from any modeling exercises to show the practical effect of the proposed changes on either environmental protection or burden on industry. The Associations would encourage such an evaluation be conducted before the Criteria is finalized and/or an Implementation Guide is prepared.
- 1.4. Although we appreciate that comparison is made more difficult because the new criteria are based on different metrics, it is certainly possible for the agency to perform a rigorous analysis - perhaps using case studies or examples - of a “baseline” of how the agency now handles implementation versus how it will practically work in the future in the context of demonstrable risks to marine life from industry activities. Such a risk-based approach is encouraged.
- 1.5. Due to the lack of clarity around these practical issues, the Associations suggest that NMFS revisit these issues and (1) publish a revised Draft Acoustic Criteria document and (2) prepare a companion Acoustic Criteria Implementation Guide issued concurrently to bring greater certainty to both resource managers and the regulated community about the practical path forward. Both of these documents should be subject to public review and comment.
- 1.6. Industry is ready and willing to support and actively participate in discussions with agency officials and/or in workshops to facilitate greater input to development of the recommended Implementation Guide. Below, we offer preliminary input on a variety of implementation-related issues that should be addressed in this dialogue.

2. Balance Between Flexibility & Predictability

In general, the Associations believe that flexibility in assessing and mitigating effects is prudent given the diversity of marine mammal species' hearing ranges, the range of effects, and acoustic source characteristics. However, this flexibility should be balanced by the objective of greater clarity, predictability and consideration of effort, resource availability and expense borne by the agencies and industry. The Guidance, as noted, should provide a comparison of the previous approach and what is now recommended. The Associations are particularly interested in the agency's view of the impact the changes will have on permit applications and the agency's time requirements to process them.

3. Use of the Criteria in the Permitting Process

The Draft Guidance provides a brief reference to its use in the current 14-question IHA permit application. It is recommended that the Implementation Guide include a much fuller presentation of how this process will be applied. Below are a few associated issues such a guide should address.

3.1. How will the Draft Guidance be implemented in (i) the context of a five-year ITR (with specific take authorizations by LOA) and (ii) when numerous IHAs are issued for a given area in the absence of an ITR? Specifically, will the agency use different methods to estimate the amount of authorized incidental take in each of these contexts? In addition, how, if at all, will authorized take be allocated over certain periods of time in one or both of these contexts?

4. Clarification Regarding PTS/TTS

4.1. The Draft Guidance is confusing and should be further clarified regarding PTS/TTS. On page 20 NMFS says, ““NOAA equates the onset of PTS, which is an auditory injury, with “Level A Harassment” as defined in MMPA and with “harm” as defined in ESA...NOAA does not consider TTS to be an auditory injury and thus it does not qualify as Level A Harassment or harm. Nevertheless, TTS is an adverse effect that constitutes another kind of “take.”...NOAA currently is in the process of developing new thresholds for onset of behavioral effects. When that process is completed, TTS will be addressed for purposes of take quantification. In the meantime, the TTS thresholds presented here...will be used in comprehensive effects analysis...and may inform the development of mitigation and monitoring.”” This language is too vague and open-ended to inform meaningful comments.

4.2. While NMFS has limited the Draft Guidance to Level A takes, defined as auditory injury equated with PTS, the Draft Guidance makes extensive reference to TTS. Clarification is needed as to why TTS is included in the present document, which does not include behavior. The Guidance and Implementation Guide should be explicit if TTS serves another role in discussion of injury. If it does not, the potential role of TTS in behavior should be deferred to publication of draft criteria for Level B behavioral harassment.

5. Model Related Issues

- 5.1. The Draft Guidance identifies a diverse set of approaches in evaluating acoustic effects and provides a general point of view that models provide a more accurate assessment of acoustic effects. The Associations would note that without model validation/verification this assumption is untested and recommends that NMFS undertake this as part of the process of developing the final acoustic criteria.
- 5.2. The Draft Guidance suggests that a variety of model approaches and models could be employed. It is noted that the regulated community is responsible for selecting a methodology for implementing the acoustic criteria and presenting it to NMFS. While the Associations appreciate and encourage this flexibility, we also recommend that NMFS establish more specific model acceptance criteria.
- 5.3. Depending upon NMFS's decisions on the extent and depth of modeling requirements, it is likely that both the current range of modeling vendor choices and their capacity will be inadequate to fulfill the agency's requirements, which could lead to unwarranted permitting delays or costs. The Implementation Guide should address how this transition period, which will necessitate an expansion of the pool of adequate modeling expertise and vendors, will be effectively managed.

6. Data Input Requirements

- 6.1. Data input requirements should be more explicit. These requirements should be practicable and should consider the whether the demand for precision and survey-by-survey information will really yield a substantively more informed resource management decision considering the overall lack of information, natural variability, and environmental confounding factors.
- 6.2. Sound Source Verification: For the Gulf of Mexico, an area of high seismic survey activity, project specific sound source verification is impractical. The Associations recommend that NMFS model a typical source array in 9 GoM zones (3 (shallow, shelf and deep) in each of the 3 Planning Areas) by season using a number of sound velocity profiles available from publically available NOAA CTD data. NMFS should then conduct sensitivity analyses on these profiles to determine seasonal variability and create a range of transmission loss profiles for individual model outputs to satisfy. Then, empirical data could be collected on a select number of representative projects rather than all projects, to also verify that the empirical data falls within the modeled range.
- 6.3. Water Depth Differentials: Industry recommends continuation of the existing BOEM approach to evaluate acoustic effects within standardized categories of submerged lands depth and bottom conditions rather than individual project assessments. Such an approach would provide a level of accuracy/precision sufficient for informed monitoring/mitigation decision-making. In the Gulf of Mexico, this would consider shallow water, the slope and deep water within the Western, Central and Eastern planning areas. This approach could include bottom conditions such as hard bottoms or soft sediments, which substantively affect sound propagation.

7. Implementation of Observation/Exclusion Zones

- 7.1. The Draft Guidance provides thresholds for five hearing groups, but it is not clear how these thresholds will be applied when determining safety or exclusion zones. The Implementation Guide should address how this will be practically and flexibly carried out. The Guidance should include recent approaches that give discretion for decisions involving shutdowns for dolphins that are deemed to be in the ensonified area voluntarily.
- 7.2. It is possible that the size of model-established exclusion zones will be larger than that which can be effectively monitored. Where that is the case, the Associations recommend that NMFS employ a practical limit to an area that can be effectively be monitored as it has in LOAs issued to the U.S. Navy.

8. Exposure Duration

- 8.1. Provisions are made for use of either a 1-hour or a 24-hour accumulation period depending upon whether models that calculate animal and/or source movement and exposure are used.
- 8.2. Exposure is a function of both movement of the vessel and movement of animals. In addition, animal movement is both lateral and vertical. The Draft Guidance should clarify and confirm NMFS's consideration of these factors as well as consider the reduction in incidental takes that results from avoidance.
- 8.3. We suggest that NMFS revise the Draft Guidance to expressly allow for the option of SEL_{cum} modeling for the duration of the activity in addition to the 1-hour and 24-hour options and utilize the approach with the smallest estimated number of estimated potential marine mammal exposures.
- 8.4. Implementation of the acoustic accumulation period should provide a way to consider periods of reduced or no sound propagation for power-downs and line turns (which could allow for recovery) to be more accurate.
- 8.5. Clarification regarding NMFS's approach for use of the SEL_{cum} metric would be helpful. The agency indicates SEL_{cum} is not meant to accumulate sound exposure for multiple activities or for naturally occurring sounds; however, no alternative metric is provided for this type of assessment.

9. Consideration of Mitigation Factors

The Draft Guidance notes that a variety of factors, some of which are not explicitly considered in the quantification of incidental takes, are in fact relevant. The Associations agree. In particular, avoidance behavior and the effect of ramp-up, power down, and shutdown in reducing takes are significant. The Implementation Guide should review and consider improvements in how these impact avoidance factors are given equal consideration in the agency's effects analysis. It is very likely that these avoidance factors are especially meaningful in explaining the discrepancy between the numbers of model-predicted incidental takes and actual observations in the field.



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VIA Federal eRulemaking Portal

Chief, Marine Mammal and Sea Turtle Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226
Attn: Acoustic Guidance

Re: Comments on Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing—**NOAA-NMFS-2013-0177**

To Whom It May Concern:

This letter provides the comments of the American Petroleum Institute (“API”), the International Association of Geophysical Contractors (“IAGC”), and the Alaska Oil and Gas Association (“AOGA”) (collectively, the “Associations”) in response to the National Marine Fisheries Service’s (“NMFS”) Notice and Request for Comments on the second version of its Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (“Second Draft Guidance”). *See* 80 Fed. Reg. 45,642 (July 31, 2015). We appreciate NMFS’s consideration of the comments set forth below.

I. INTRODUCTION

A. The Associations

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.

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.

AOGA is a non-profit trade association located in Anchorage, Alaska. AOGA's 14 member companies account for the majority of oil and gas exploration, development, production, transportation, refining, and marketing activities in Alaska. AOGA's members are the principal oil and gas industry stakeholders that operate within the range of marine mammals in Alaskan waters and in the adjacent waters of the Outer Continental Shelf ("OCS"). AOGA and its members are longstanding supporters of wildlife conservation, management, and research in the Arctic. AOGA has for many years successfully petitioned for, and defended in court, incidental take regulations applicable to offshore oil and gas activities.

B. Responsible Offshore Development

The OCS is a significant source of oil and gas for the nation's energy supply. In 2014, offshore areas of the United States supplied over 9 percent of the country's natural gas and oil production, and are estimated to contain roughly 17 percent of the oil and 12 percent of the natural gas resources in remaining undiscovered fields in the United States. The important role of oil and gas exploration and development in the OCS is clearly reflected in the Outer Continental Shelf Lands Act ("OCSLA") and its implementing regulations. Under those authorities, implementing agencies are mandated to preserve, protect, and develop oil and natural gas resources in the OCS in a manner that is consistent with the need to (i) make such resources available to meet the nation's energy requirements as rapidly as possible, and (ii) balance orderly energy development with protection of human, marine, and coastal environments. *See* 43 U.S.C. §§ 1332(3)-(5), 1346, 1348; 30 C.F.R. §§ 250.101, 250.107.

Geophysical surveys using seismic reflection are an essential, state-of-the-art component of oil and gas exploration in the OCS. Geophysical data are used by both industry and federal agencies to make informed economic and regulatory decisions regarding potential accumulations of oil and natural gas. As one of the earliest components of the lengthy process leading from leasing of lands to exploration, development, and production of hydrocarbon resources, seismic surveys are critical to the OCS resource development mandated by Congress in OCSLA and have been demonstrated to have no detectable long-term impacts on the marine environment.

Geophysical surveys facilitate the safe and orderly development of OCS oil and gas reserves. 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.

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 the Bureau of Ocean Energy Management 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/>.

II. COMMENTS

The Associations want to again acknowledge the significant effort involved in examining the scientific literature available on the topic of marine sound and its potential impacts on marine mammals. We recognize that this topic is complex and informed by an evolving base of scientific knowledge, and we appreciate the challenges and effort associated with translating the available information into functional criteria. We continue to support the goal of updating and developing acoustic criteria that are informed by, and consistent with, the best available science. We also support a continued effort in furtherance of this goal that is transparent and does not result in unnecessary or unsupported new processes or requirements for the regulated community.

The Associations carefully reviewed and analyzed the first version of the Draft Guidance (“First Draft Guidance”) and provided many specific comments, in which we identified opportunities for improvement, requested clarity on technical issues, and addressed legal concerns. We appreciate NMFS’s consideration of our earlier comments, some of which have been addressed in the Second Draft Guidance. Below, we address new issues specific to the Second Draft Guidance as well as restate some of our earlier comments that do not appear to have been incorporated in the Second Draft Guidance. We have divided these comments into those that are largely related to “procedural” matters and those that are largely related to “technical” matters (recognizing that there may be some overlap in these general categories). On the whole, the Associations support the agency’s issuance of the Second Draft Guidance in final, subject to the comments and recommendations provided below, which are intended to be constructive and to further improve the final guidance document.

A. Procedural Comments

1. Regulatory impacts

Marine mammal incidental take authorizations (“ITAs”) for the oil and gas industry have, for many years, been authorized by NMFS and the U.S. Fish and Wildlife Service. The best available science demonstrates that these authorizations have resulted in no detectable adverse impacts to marine mammal populations and that related monitoring and mitigation measures are effective. Although we support NMFS’s development of new criteria that are consistent with the best available science, these new criteria should not be implemented in a manner that results in increased regulatory burdens. The Associations are concerned that the Second Draft Guidance will require more time, more advanced technical expertise, and, therefore, higher costs associated with the preparation and federal review of ITA applications. The lack of guidance regarding the implementation of the new criteria (addressed below) will create regulatory uncertainty and result in unnecessarily burdensome and inconsistent permitting processes.

In this light, the Second Draft Guidance does not provide a full explanation of the anticipated impact of the proposed threshold levels and related modeling techniques on the regulated community, and there is no clear discussion of the regulatory implications of the proposed changes. In the final guidance, NMFS should provide a thorough explanation of the anticipated regulatory and economic impacts. Because the final guidance will be applied in a range of regulatory actions, we continue to recommend that, before the acoustic criteria become final, NMFS undertake a comparative assessment of the approach described in the Second Draft Guidance with the current assessment methods to demonstrate the regulatory implications of the proposed criteria. We recognize that the proposed metrics in the Second Draft Guidance are not directly comparable to current assessment methods, but we believe it is possible, and would be informative, to generally evaluate the regulatory impacts of both approaches for applicants.¹ Such scenarios or simulations could clarify implementation issues, but may also reveal limitations or unintended consequences that could be addressed before the new criteria are used in regulatory actions.

¹ In the same vein, in the *Supplemental Draft Environmental Impact Statement Effects of Oil and Gas Activities in the Arctic Ocean*, which was released March 21, 2013, NMFS stated its intent to incorporate the new acoustic criteria into the final environmental impact statement (“EIS”). We urge, due to the lack of clarity on the regulatory impact from implementation of the guidance, that the public be given an opportunity to provide written comments, in advance, regarding the incorporation of the final acoustic criteria into the Arctic EIS. This will ensure that the public can review and comment on the application of the acoustic criteria in the Arctic EIS.

2. Implementation concerns

As an initial matter, the Second Draft Guidance provides no clear explanation for how the agency uses “guidance,” the legal import of a guidance document, when the agency can and cannot deviate from guidance (as opposed to regulatory requirements), and how the agency will evaluate any deviations proposed by applicants. A clear discussion of these issues at the beginning of the document would be helpful and informative for the regulated community and the general public.

Additionally, the Second Draft Guidance presents uncertainty and potential complications regarding the implementation of the proposed criteria. As indicated above, the complexity of the methods proposed in the Second Draft Guidance will result in increased time and expenses and additional technical expertise for applicants, and will almost certainly lead to confusion in the regulated community as well as inconsistent applications and inefficient permitting processes. Although the Second Draft Guidance provides some general context for how the proposed criteria will be implemented, it does not provide a meaningful discussion outlining the key practical aspects or standards to be applied for the implementation of the criteria.

To eliminate uncertainty and potential future complications, the final guidance document should include a specific recommendation (with supporting analysis)² of how the implementation of the proposed criteria will affect existing offshore activities, monitoring protocols, estimated incidental take assessment, and the development of mitigation measures.³ For example, NMFS currently requires shut down and/or power down mitigation measures that are based on specific, non-cumulative acoustic criteria. However, the Second Draft Guidance contains no meaningful discussion about how similar avoidance-based mitigation measures will be implemented under the new criteria. The document also provides very little guidance to applicants regarding the take estimation methods (as opposed to exposure estimation) that the agency would prefer to be used in ITA applications.

² We strongly recommend that NMFS undertake a modeling exercise using available industry data and work with industry in developing a realistic scenario before publication of the final guidance. Completing a specific modeling exercise with the proposed draft criteria will provide the regulated community with proper guidance and clarity on how the proposed criteria should be implemented.

³ See 67 Fed. Reg. 8452, 8459 (Feb. 22, 2012) (“In assessing the usefulness of information that the agency disseminates to the public, the agency needs to consider the uses of the information not only from the perspective of the agency but also from the perspective of the public.”). As indicated above, we also recommend that the final guidance include a summary of the additional costs that are expected to result from implementation of the new criteria, with a comparison of the expected benefits.

We agree that it is important for NMFS to allow for sufficient flexibility in the regulatory process so that applicants can appropriately address the specific situations that arise in their ITA requests. Such flexibility enables innovation within the bounds of regulatory compliance. For example, there are many ways to estimate potential exposures of marine mammals to various sound levels, and future applicants should not be limited to estimating exposures using the specific criteria set forth in the Second Draft Guidance (or in Appendix E) if there are other methods that are more appropriate and scientifically justified.⁴ However, balanced against that flexibility, general guidance from the agency regarding take estimation methodologies and application of avoidance and mitigation measures—even if provided as nonexclusive examples—would be informative and would facilitate efficient and consistent permitting processes.⁵ Moreover, such general guidance would increase transparency, allow for more informed public review and comment, and help to “ensur[e] and maximiz[e] the quality, objectivity, utility, and integrity” of the information provided in the Second Draft Guidance, as required by the Information Quality Act. *See* Pub. L. No. 106-554, § 515 (2000); *see also* 67 Fed. Reg. at 8456 (“The more important benefit of transparency is that the public will be able to assess how much an agency’s analytic result hinges on the specific analytic choices made by the agency. Concreteness about analytic choices allows, for example, the implications of alternative technical choices to be readily assessed.”).⁶

⁴ It would be helpful for the final guidance document to provide more clarity regarding the timing and process for applicants that wish to utilize alternative approaches in their ITA applications.

⁵ As addressed in our comments on the First Draft Guidance, NMFS can improve the usefulness of new criteria by providing a “user guide” that will inform and assist NMFS’s implementation of the new acoustic criteria. If NMFS were to prepare a user guide, it should provide a draft for public review and input. In addition, IAGC is working with its members to develop processes to assist with the preparation of ITA applications and would welcome the opportunity to collaborate with NMFS, where appropriate, on efforts that facilitate efficient and consistent regulatory processes based on the best available science.

⁶ NMFS considers the Second Draft Guidance to be a “highly influential scientific assessment” subject to the *National Oceanic and Atmospheric Administration Information Quality Guidelines* (“NOAA IQG”). “[I]nfluential scientific, financial, or statistical information” is specifically held to higher information quality standards. *See* 67 Fed. Reg. at 8452, 8455 (“OMB guidelines apply stricter quality standards to the dissemination of information that is considered ‘influential.’”). These standards further counsel in favor of more information addressing the implications and implementation of the proposed criteria. *See generally* NOAA IQG at 1-2.

3. Consideration of qualitative factors

The Second Draft Guidance also recommends that certain qualitative factors be “considered within the comprehensive effects analysis.” Second Draft Guidance at 29. However, the document provides little discussion regarding how these qualitative factors will be considered, the relative weight given to these factors, or how these factors will be implemented. We encourage the agency’s consideration of qualitative factors in a manner that adds flexibility to the regulatory process and recommend that NMFS include more discussion in the final guidance regarding the application of qualitative factors. In addition, the discussion of qualitative factors in the Second Draft Guidance indicates that NMFS does not intend for qualitative information to be “used to reduce quantitatively predicted exposures produced by acoustic threshold levels.” Second Draft Guidance at 30. However, in many instances, consideration of qualitative factors (such as violation of the EEH or the failure to account for recovery in the 24-hour cumulative calculation) may demonstrate that there is less risk of PTS occurring than the quantitative analysis predicts. In these circumstances, consistent with the agency’s obligation to use the best available science and information, the qualitative information should be factored into the estimated exposure and take analyses, whether it results in an increase or decrease in the number of predicted incidental takes.

4. TTS thresholds and Level B harassment

The Second Draft Guidance appropriately concludes that TTS is not an “injury” for Marine Mammal Protection Act (“MMPA”) purposes and should, at most, be considered Level B harassment. The Associations concur with this finding, as it is based on the best available scientific information. However, the Second Draft Guidance also states that the TTS threshold levels “will be used in the comprehensive effects analyses under the MMPA and the Endangered Species Act (“ESA”) and *may* inform the development of mitigation and monitoring.” Second Draft Guidance at 40 (emphasis in original). Respectfully, this cryptic statement provides no meaningful value to the regulated community and, instead, creates uncertainty and confusion regarding NMFS’s intentions for future regulatory processes. We strongly recommend that NMFS provide more clarity and discussion in the final guidance regarding how the TTS threshold levels may or may not inform mitigation and monitoring. Without clarity from the agency on this topic, future ITA applicants will have no direction on whether and how they should address the TTS threshold levels when developing the mitigation and monitoring measures to be proposed in their applications.

In addition, the Second Draft Guidance does not address a significant category of Level B take (i.e., behavioral harassment), but also provides no explanation for how ITA applications will be processed after the new Level A thresholds are issued and before new Level B thresholds are developed. It would greatly improve the regulated community’s ability to meaningfully assess the implications of the proposed criteria if the final guidance includes an explanation for how the proposed acoustic criteria will be implemented in the absence of new criteria applicable to Level B behavioral harassment. It is also not clear from the Second Draft Guidance as to how NMFS

will specifically use the TTS threshold levels in the permitting process before behavioral modification criteria are finalized. For instance, it is unclear as to whether NMFS is going to require the use of three separate take thresholds (for PTS, TTS, and behavioral modification) and, if so, how NMFS will ensure that the permitting and implementation processes do not become too burdensome and complex. The Second Draft Guidance suggests that the TTS thresholds will not be used for “take quantification” purposes until the Level B threshold levels are developed; however, it also states that the TTS threshold levels will presently “be used in the comprehensive effects analyses under the MMPA and the ESA.” *Id.* The final guidance should clarify these statements and more fully explain how these issues will be addressed in ITA permitting processes.

5. Ongoing review of the best available science

We commend NMFS for its commitment to undertake review and revision of the final guidance on a regular basis to incorporate knowledge as it is acquired. We further suggest that NMFS maintain flexibility to promptly consider and address highly relevant new information that arises between the agency’s formal reviews. In addition, we encourage NMFS to continue supporting the science that has been, and is being, developed under the Sound and Marine Life Joint Industry Programme. See <http://www.soundandmarinelife.org/>. This program is one of the few coordinated efforts focused specifically on increasing the scientific understanding of the effects of sound on marine life.

6. NMSA concerns

The Second Draft Guidance clarifies that the new threshold criteria will be considered by NMFS and the Office of National Marine Sanctuaries for purposes of the National Marine Sanctuaries Act (“NMSA”). The Second Draft Guidance goes on to state, without any explanation, that TTS and “behavioral impacts” constitute “injury,” as that term is defined in the NMSA. See 15 C.F.R. § 922.3 (“injure” is defined as to “change adversely, either in the short or long term, a chemical, biological or physical attribute of, or the viability of”). It is not clear why the agency has made this conclusion, and, indeed, the studies cited in the Second Draft Guidance are not consistent with this conclusion. See Second Draft Guidance at 44 (citing Southall et al. (2007) (TTS is not a tissue injury) and Ward (1997) (“TTS is within the normal bounds of physiological variability and tolerance and does not represent physical injury”). If NOAA is determined to make such a sweeping legal conclusion regarding the application of the new criteria to the NMSA consultation process, then it must provide a detailed and well-supported explanation based on applicable law and the best available science. In addition, the public should have the opportunity to review and comment on this explanation, consistent with Administrative Procedure Act requirements.

B. Technical Comments

1. Alternative approach for estimating exposure

We appreciate NMFS's effort to provide a simplified alternative method for calculating estimated exposures to sound at the levels set forth in the Second Draft Guidance (Appendix E). However, while this alternative method might provide flexibility for calculations, simplifying the application of weighting functions as well as the source/receptor movement scenarios for SEL_{cum} calculations will introduce variability across activities, resulting in significant overestimation of exposure numbers. NMFS indicates in the Second Draft Guidance that it is prepared to provide tools to enable applicants to apply frequency-specific weighting functions without necessarily performing the mathematical calculations. However, these tools have not been made available for public review. Moreover, this two-tiered system for estimating exposures could have inequitable results for operators who, for either cost or time reasons, may not be able to use the more complicated applied weighted factor methodology and will resort to applying for an ITA that overestimates the amount of incidental take actually caused by the underlying activity.⁷ We strongly recommend that NMFS include a detailed discussion in the final guidance that informs applicants about the potential costs, benefits, and consequences of each of the two methodologies described in the Second Draft Guidance.⁸

Specifically, the final guidance should provide examples that demonstrate the quantitative metrics of the difference in outcome for a number of given signals when individual-based models are used and when Appendix E methods are applied. These examples should include comparison calculations that indicate how use of the "safe distance" calculation differs from models in which exposure is accumulated for individual computer entities (e.g., "animats") that may or may not move relative to the source. In addition, there are other assumptions in this "safe distance" calculation, such as exposures occurring at a constant depth and exposures being constant over a consistent swath for 24 hours, that may contribute to overestimation of exposure and that should be quantitatively demonstrated (or disproven) by calculated examples rather than requiring the user to assume that the "rounding error" associated with the Appendix E methodology is not significantly different than performing a more sophisticated analysis.

⁷ This will have negative impacts that extend beyond a single applicant. For example, if the incidental take estimate in a five-year incidental take regulation ("ITR") is based on the Appendix E methodology, then the estimate will be unrealistically high. Alternatively, if an ITR is based on a weighted approach using contemporary modeling, then letter of authorization applicants that use the unweighted approach may complicate the agency's ability to reasonably manage and implement the ITR. These are significant issues that, among others, are not addressed in the Second Draft Guidance.

⁸ The Associations recognize that the simplified movement methodology may be used in non-U.S. jurisdictions where there is less regulatory focus on exposure numbers.

2. Transition from impulsive to non-impulsive acoustic threshold levels

The Second Draft Guidance acknowledges that most analyses are based on sound characteristics at the source and that NMFS analyzes impacts at the receiver, which is provided as justification for creating an impulsive to non-impulsive transition zone at 3 km. NMFS recommends this 3 km transition zone based on a “peak pressure to pulse duration of 5000” as “an appropriately precautionary approximation of where most impulsive sound sources begin to transition to having physical characteristics less likely to result in auditory injury.” Second Draft Guidance at 119. We are aware of no biological basis for this assumption, and it appears to have been chosen through an arbitrary process of attempting to identify a value that generally provides a consistent break in the pressure/duration ratio (although the available data vary considerably). However, as NMFS recognizes, a pressure duration ratio of 5,000 is more often attained at ranges of 1-2 km, rather than 3 km as stated in Table B2, which argues even more strongly for a different criterion for switching from impulse to continuous thresholds. Contributions to spreading of the acoustic energy over time include frequency-differential travel paths and times, and multi-path reflections from the surface and bottom, as well as refractive effects within the water column and geology of the sea bottom. These effects do not usually contribute substantively to signal “spread” at such short ranges, especially in deep water. Furthermore, the possibility of multiple pressure peaks from multi-path propagation and frequency-differential propagation effects suggest that weighting calculations and even integration time windows might need to be changed at different distances in order to correctly characterize the dynamic change from an impulse waveform to something increasingly resembling a “continuous” sound of highly varying duration, frequency structure, and pressure peak(s). Instead of using this arbitrary process, NMFS should have applied the time/amplitude waveforms from the examples used in the Second Draft Guidance to generate the transition threshold, and then should have generated examples showing the difference that would result from applying impulse and non-impulse criteria at these ranges (1-3 km).

We recommend that NMFS prepare further quantitative applications of various source types and scenarios, include full explanations in the final guidance, and provide, as appropriate, a revised transition range for impulsive to non-impulsive acoustic threshold levels. In addition, we recommend that NMFS clearly state that establishing such a transition from impulsive to non-impulsive only applies to Level A harassment and not Level B harassment.

3. Accumulation period

The period over which SEL_{cum} is calculated is stated as 24 hours; however, there is no discussion in the Second Draft Guidance regarding the potential for recovery between pulses or intermittent periods of exposure within this 24-hour period. This is a significant issue that is not directly addressed in the Second Draft Guidance but that, if addressed, would potentially lead to more realistic results. In addition, although the Second Draft Guidance makes allowances for a shorter accumulation period, it does not, but should, make similar allowances for a longer accumulation period.

4. Proposed threshold limits

In addition to the comments set forth above, we have the following specific comments regarding certain elements of the proposed threshold limits:

- The upper and lower threshold limits are not set consistently as they were in Southall et al. (2007) at 80 dB above threshold of best hearing. For example, the upper threshold limit for phocid seals of 100 kHz is based on Kastelein et al. (2009), in which the threshold at 100 kHz is much higher than 80 dB above best hearing.
- The very low threshold limits presented for high-frequency cetaceans are based almost exclusively on a single study (Lucke et al. 2009). These data are most likely to be obtained by using Evoked Potential (“EP”) methods, rather than behavioral methods, which necessitates a change in acceptance of EP data since the criteria set forth in the Second Draft Guidance (and in the paper from which the criteria are derived) do not incorporate the extensive and growing body of EP hearing data. Finneran (2015) and NMFS provide an explanation based on the different outcomes of EP and behavioral testing. However, studies by Finneran, Popov, and other researchers are demonstrating that this relationship is consistent and, accordingly, that NMFS should allow greater reliance on EP data in future iterations of the guidance.
- The upper end of the auditory weighting function for low-frequency cetaceans—which is reduced from 30 to 25 kHz—is a significant improvement. The 25 kHz value is still arguably too high, but it is more consistent with the best available science than was the value proposed in the First Draft Guidance.
- The method used to arrive at a SEL_{cum} PTS threshold for low-frequency cetaceans and seals is determined in the Second Draft Guidance to be “unrealistic” for arriving at a peak-pressure PTS threshold for those groups, but no explanation is given for this conclusion. This section of the Second Draft Guidance needs more explanation.
- The method for deriving PTS onset values (SEL_{cum} and peak) from TTS onset threshold for impulse sounds is not well explained in the Second Draft Guidance. It appears that a very basic method was used, which the Associations understand may have been necessitated by the paucity of available data. Nonetheless, a more complete explanation of the values selected should be provided in the final guidance.

5. Sound source verification

It is not clear from the Second Draft Guidance whether NMFS will require sound source verification (“SSV”) measurements to be made during permitted activities. In the experience of the Associations’ members, SSV poses a complicated and unnecessary burden on operations because the results of SSV are highly variable due to constantly changing conditions in the water column. If SSV is intended to be part of the standard protocol in the implementation of the new threshold levels, then it is important that the regulated community have the opportunity to provide informed input on this potential requirement and that it be based on the best available science.

III. CONCLUSION

We appreciate the effort that NMFS has devoted to the Second Draft Guidance, which represents a significant improvement over both the First Draft Guidance and the acoustic criteria guidelines that are currently used by NMFS. The Associations will continue to support a process that is comprehensive, transparent, consistent with the best available science, and fully informed by the public. We specifically support issuance of the Second Draft Guidance in final, subject to the additional comments and recommendations provided above.

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

Sincerely,



Andy Radford
American Petroleum Institute



Nikki Martin
International Association of Geophysical Contractors



Joshua Kindred
Alaska Oil and Gas Association



March 30, 2016

VIA Federal eRulemaking Portal

Chief, Marine Mammal and Sea Turtle Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3226
Attn: Acoustic Guidance

Re: Comments on Proposed Changes to Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing—**NOAA-NMFS-2013-0177**

To Whom It May Concern:

This letter provides the comments of the American Petroleum Institute, the International Association of Geophysical Contractors, the Alaska Oil and Gas Association, and the National Ocean Industries Association (collectively, the “Associations”) in response to the National Oceanic and Atmospheric Administration’s (“NOAA”) notice and request for comments on proposed changes to NOAA’s Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (“Draft Guidance”). *See* 81 Fed. Reg. 14,095 (Mar. 16, 2016). The Associations previously submitted extensive comments on both the first and second versions of the Draft Guidance.¹ Our comments on the newly proposed changes to the Draft Guidance are set forth below.

I. INTRODUCTION

As stated in our previous comments, the Associations recognize that the topic of marine sound and its potential impacts on marine mammals are complex and informed by an evolving base of scientific knowledge, and we appreciate the challenges and effort associated with translating the available information into functional guidance criteria. We also appreciate

¹ We incorporate our previous comments by reference, and expect that those comments will be included in the administrative record and fully addressed by NOAA. Collectively, the Associations represent the vast majority of all stakeholders engaged in the exploration and development of offshore oil and gas resources in the United States. The Associations are described in more detail in our previous two comment letters.

NOAA's efforts to appropriately obtain public and peer review input on the first two versions of the Draft Guidance. The Associations have been fully engaged in this process and have spent substantial amounts of time and resources evaluating both versions of the Draft Guidance and preparing comments to constructively inform this important process. Our position has been, and continues to be, that we will support a process that is comprehensive, transparent, consistent with the best available science, and fully informed by the public.

Unfortunately, NOAA has suddenly proposed to incorporate changes to the Draft Guidance in a manner that is not comprehensive, transparent, or consistent with the best available science. These proposed changes, if finalized, will also not be meaningfully informed by the public. NOAA's proposed changes are substantial, significant, and result in very different criteria than were proposed in the 2015 version of the Draft Guidance. Despite the magnitude of these proposed changes, NOAA has provided little or no supporting scientific analyses or explanations, has not yet subjected the proposed changes to peer review, and has offered the public an insufficient 14 days to evaluate the proposed changes and provide comments.²

We struggle to understand how a process that began three years ago, and that was intended to meaningfully involve the public at all stages, has so abruptly and inexplicably changed course. Considering that development of the Draft Guidance is a multi-year process, it would have been reasonable for NOAA to afford the public more than 14 days to review and provide comments on the proposed changes, particularly when those changes will drastically affect the application of the Draft Guidance. We cannot support the arbitrary process the agency has adopted as a means to quickly implement significant and substantial changes immediately prior to finalizing the Draft Guidance. Below, we have endeavored to provide objective comments as best we can in the short time allowed for public comment.

We recommend that NOAA retract the March 2016 proposed changes and instead engage in the peer review process applicable to highly influential scientific assessments, as occurred with the first and second versions of the Draft Guidance. Once that process is completed, NOAA should re-propose any necessary changes to the 2015 Draft Guidance and provide for a sufficient public review and comment period. If NOAA finds it necessary to produce final guidance before the process of incorporating any such changes can be completed, it should proceed with a final version of the 2015 Draft Guidance (revised, as appropriate, based on previously submitted public feedback), along with a user guide and implementation tools as promised in July 2015.

² Numerous requests for extensions of the public comment period were submitted to, and rejected by, NOAA.

II. PROCESS COMMENTS

Aside from the inadequate opportunity for public review and input, there are a number of other unsatisfactory aspects of NOAA's process for proposing changes to the Draft Guidance. These are detailed as follows.

First, although the proposed changes to the Draft Guidance are extensive and mathematically complex, they are incompletely documented and insufficiently explained in the March 2016 supplemental materials. This lack of substantive support is compounded by the fact that NOAA has not provided the technical tools or modeling scenarios that are necessary for the proper assessment of the new criteria and, particularly, the implications of the proposed changes. The absence of these user aids, which NOAA previously indicated would be made available, renders the analysis of the proposed changes very difficult and time-consuming. The completion of specific modeling scenarios or simulations is essential to inform the regulated community on how the proposed criteria will impact planning and operations during implementation. Additionally, such scenarios or simulations would also reveal limitations or unintended consequences that must be addressed before the new criteria (and particularly the proposed changes) are finalized and used in regulatory actions.³ NOAA's failure to provide the support necessary for the newly proposed criteria to be readily assessed further emphasizes the unreasonableness of the 14-day comment period.

Second, NOAA commissioned peer reviews of the first and second versions of the Draft Guidance before those versions were released for public review. As a result, the public was able to review and comment on draft criteria that were already informed by expert peer review, and summaries of the peer review results were provided to the public. In contrast, the currently proposed changes to the Draft Guidance were inexplicably rushed out for public review and comment without any peer review. NOAA states that it will, at some point, submit these proposed changes for peer review, which will almost certainly result in corrections and modifications to what is currently proposed. However, the public will have no opportunity to review and comment on the peer-reviewed version of the changes to the Draft Guidance.⁴

³ Rather than rushing significant changes to the Draft Guidance through an uninformed process, NOAA should be seeking to "ensur[e] and maximiz[e] the quality, objectivity, utility, and integrity" of the Draft Guidance, as required by the Information Quality Act. *See* Pub. L. No. 106-554, § 515 (2000); *see also* 67 Fed. Reg. 8452, 8456 (Feb. 22, 2012) ("The more important benefit of transparency is that the public will be able to assess how much an agency's analytic result hinges on the specific analytic choices made by the agency. Concreteness about analytic choices allows, for example, the implications of alternative technical choices to be readily assessed.").

⁴ NOAA admits that the Draft Guidance is a "highly influential scientific assessment" subject to the *National Oceanic and Atmospheric Administration Information Quality Guidelines* (continued . . .)

Third, NOAA’s statement that it may “re-evaluate [its] methodology for LF [low-frequency] cetaceans when th[e] updated Southall et al. publication becomes available” further raises the question of why NOAA is hurriedly implementing the proposed changes now. Given the significance of the proposed changes, and the fact that the proposed criteria may change again upon release of the anticipated Southall *et al.* publication (as referenced in footnote 3 of the March 2016 proposed changes to the Draft Guidance), the Associations request that NOAA expressly commit to updating the acoustic criteria no later than six months after the issuance of that publication. This request is particularly reasonable given that NOAA apparently plans to finalize the proposed acoustic criteria with full knowledge that the new Southall *et al.* paper will be published soon.

Fourth, NOAA continues to remain silent on how the agency plans to use the Draft Guidance, under what circumstances the agency believes it can and cannot deviate from guidance (as opposed to regulatory requirements), and how the agency will evaluate any deviations proposed by applicants. The errors and unjustified assumptions contained in the proposed changes further emphasize the fact that future applicants for incidental take authorization will almost certainly be compelled to propose analyses that necessarily deviate from NOAA’s acoustic criteria in order to remain faithful to the best available science.

Fifth, the proposed changes appear to be driven by (non-public) discussions internally among NOAA staff and possibly experts within the U.S. Navy. The proposed changes most significantly affect the thresholds applicable to low-frequency (“LF”) cetaceans, especially for LF sound sources. Sound produced by offshore oil and gas exploration and development activities is predominately LF, yet these proposed changes are being undertaken without any meaningful comment from the industry to which they are most relevant. Moreover, as indicated in our previous comments, our industry has continued to support relevant independent peer-reviewed science via the E&P Sound and Marine Life Joint Industry Programme (“JIP”). See <http://www.soundandmarinelife.org/>. Scientific results from JIP-funded independent research has and can continue to inform this process of developing meaningful criteria so long as the process is transparent, flexible, and consistent with the best available science.

(. . . continued)

and, therefore, to a peer review requirement. Moreover, “influential scientific, financial, or statistical information” is specifically held to higher information quality standards. See 67 Fed. Reg. at 8452, 8455 (“OMB guidelines apply stricter quality standards to the dissemination of information that is considered ‘influential.’”).

III. CONTENT COMMENTS

A. The Proposed Changes Applicable to LF Cetaceans Are Arbitrary and Contrary to the Best Available Science

The proposed changes to the LF cetacean weighting function parameter ‘*a*’ are scientifically unjustified and do not fit the models that NOAA references as support for these changes. As described below, the auditory curve and weighting functions that result from NOAA’s proposed model exhibit an anomalous LF slope that differs from all other marine mammal, human, and other mammalian hearing curves, as well as from the slopes of both the rejected and cited references for modeling hearing in LF cetaceans.

NOAA recognizes that “[m]ost mammals for which thresholds have been measured have low-frequency slopes ranging from 30-40 dB/decade.” Accordingly, the audiogram, and therefore the weighting function, should change from zero dB at 1 kHz to 30-40 dB at 100 Hz, and 60-80 dB at 10 Hz. However, instead of using the data that NOAA acknowledges are most accurate, NOAA proposes the “most conservative” metric by arbitrarily halving the data-supported metric to arrive at the proposed 20 dB/decade slope. The significance of this proposal, and its departure from the best available information, is readily depicted in Figure PC1,⁵ which clearly shows that the NOAA-proposed slope differs significantly from the two sources referenced by NOAA (Cranford and Krysl 2015; Houser et al. 2001). At 100 Hz, NOAA’s new proposal predicts hearing that is only 10 dB worse than best hearing, whereas both the Cranford and Houser models predict decrements of 25-35 dB at the same frequency. The slope of the proposed curve from 1000 to 10 Hz is less than 20 dB/decade, but the slope of the Cranford and Houser models is approximately 25 dB/decade. NOAA’s proposed departure from the best science is also highlighted in Figure PC2,⁶ in which the slope of the left side of the LF cetacean curve stands out as an anomaly compared to the other slopes presented in Figure PC2.

Another anomalous consequence of the LF cetacean slope proposed by NOAA is that there is no point at which LF cetacean hearing crosses the stated 80 dB range above best hearing. In other words, the proposed model provides no lower limit for whale hearing. Our graph demonstrates this anomaly (Fig. 1).

⁵ NOAA Proposed Changes: DRAFT Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. Mar. 2016.

⁶ NOAA Proposed Changes: DRAFT Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. Mar. 2016.

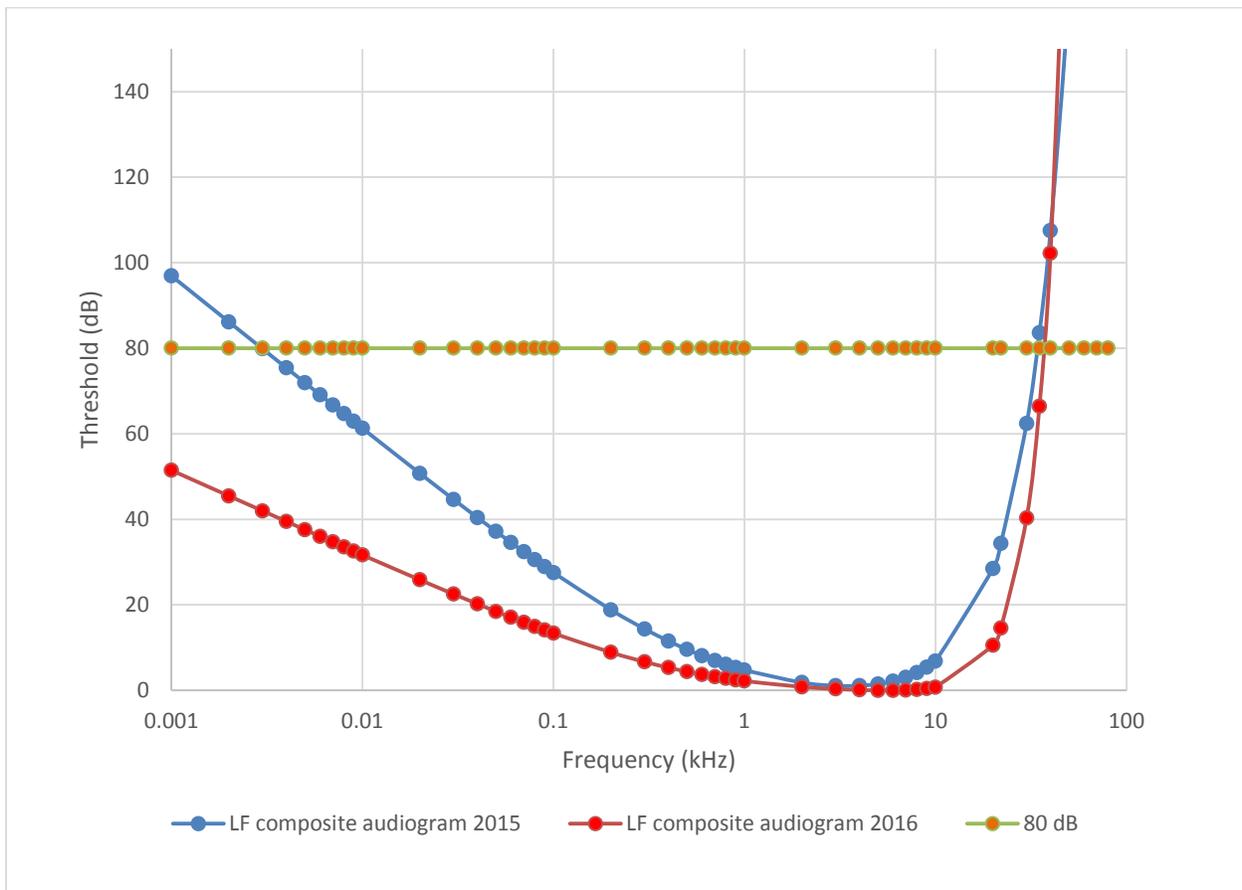


Figure 1. The consequence of the proposed changes to the LF cetacean modeled audiogram (in red) produce a hearing curve at the lowest frequencies that never approaches the 80 dB decrement from best hearing (in green) that NOAA had set as the upper and lower limiting frequencies of hearing (also a general mammalian metric of upper and lower hearing limits). The July 2015 modeled hearing curve (in blue), on the other hand, produces a crossing point with the 80 dB threshold at 3 Hz that provides a reasonable if generous lower limit of hearing.

In addition, on page 7 of the 2016 proposed changes, NOAA reviews four models for frequencies of best hearing and states that these models predict “thresholds within ~40 dB of best sensitivity as low as ~30 Hz and up to 25 kHz.” However, rather than use the predictions of these models, NOAA proposes a curve that predicts LF cetaceans can hear 30 Hz at 10 dB above best hearing, not 40 dB. Under NOAA’s model, whales could even hear sound at 10 Hz with only a 25 dB decrement from best hearing—which the best available science for baleen whale hearing modeling (*e.g.*, Houser et al. 2001; Cranford and Krysl 2015) and general mammalian hearing data strongly suggests is impossible. *See infra* footnote 8.

The impact of the new LF cetacean parameters is immediately obvious in our Figure 2 below, which compares Figure PC3⁷ of the new 2016 criteria (*see right plot below*) with the curve depicted in NOAA 2015 Draft Guidance (page 12) (*see left plot below*). In contrast to the similar shapes of all the 2015 weighting functions, the new LF cetacean curve produces a biologically unrealistic, extended, and flattened curve.

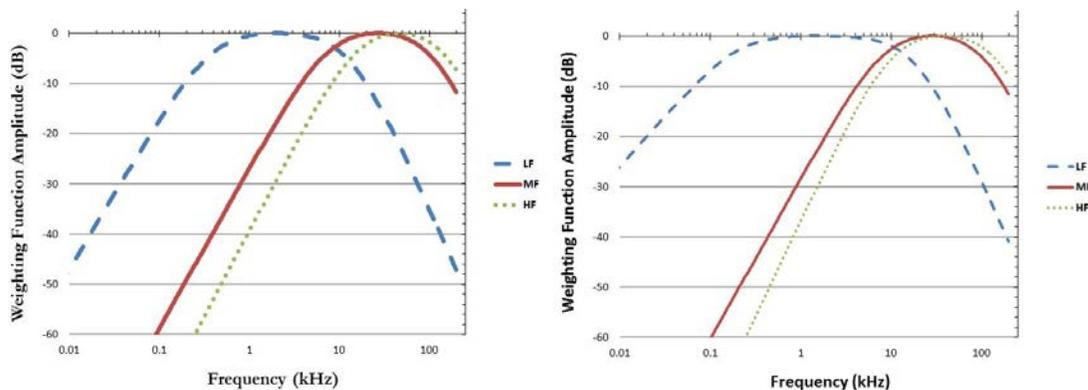


Figure 2. The left plot shows initial July 2015 cetacean weighting functions: LF in dashed blue, MF cetacean in red and HF cetacean in dotted black. While the frequency range of best hearing for LF cetaceans is conservatively generous given uncertainties in the models, the slope of the weighting functions are all parallel, consistent with what is generally observed across mammalian hearing and weighting functions. The right plot shows that the modified March 2016 weighting functions not only create a much broader and obviously unrealistic span of best hearing (the flat upper part of the curve normalized to zero), but also provide a slope of increased weighting (decreased hearing ability) at the lower frequencies that is clearly out of alignment with the measured decrement of hearing acuity in all other marine mammals, as well as for mammals in general, including other LF specialist species.

NOAA's proposed LF cetacean model also sharply deviates from data pertinent to other LF specialist mammals. For example, humans are LF hearing specialists that have a best hearing range of approximately 400 Hz to 16 kHz.⁸ But, unlike the LF cetacean model proposed by NOAA, human hearing ability is 25 dB below best hearing at 200 Hz—not the 10 Hz value generated by NOAA's proposed hearing curve. As another example, the kangaroo rat (another LF hearing specialist) has best hearing that starts to diminish at approximately 500 Hz. By 100 Hz, the kangaroo rat's hearing threshold is at least 10 dB above best hearing, and at 20-30 Hz is

⁷ NOAA Proposed Changes: DRAFT Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing. Mar. 2016.

⁸ A comprehensive summary of human hearing data can be viewed here: http://www.iso.org/iso/catalogue_detail.htm?csnumber=34222, which includes reference to the seminal Fletcher and Munson curve (JASA 5, 82-108;1933).

40-60 dB above best hearing.⁹ In contrast, under NOAA's proposed LF cetacean model, whale hearing at 30 Hz is still within 10 dB of best hearing (1 kHz)—even though every other LF specialist mammal experiences an increase in threshold of more than 40 dB across the same frequency span. It is contrary to best available science to have a model that predicts a slope for LF hearing fall-off that is far flatter than that of any other mammal, and that does not predict an LF limit for the auditory system at all.¹⁰

Overall, NOAA's proposed changes result in unsupported conclusions that LF cetaceans are able to hear a broader range of frequencies at lower sound levels, compared to the 2015 version of the Draft Guidance. These changes will result in significantly longer ranges to potential permanent threshold shift ("PTS")/temporary threshold shift ("TTS"; *see infra* Section III.C) thresholds. When coupled with other unrealistic changes such as the slope of the LF hearing and weighting curves (discussed above) and the application of high-frequency ("HF") specialist harbor porpoise dynamic range data to the LF cetacean group, the new criteria result in unrealistic thresholds of PTS risk and ranges that are approximately up to eight times greater than those produced by the peer-reviewed July 2015 Draft Guidance (based on modeling scenario results with previous guidance thresholds and some initial calculations with the 2016 changes conducted within the limited time allotted for public comments).

More generally, NOAA's approach to statistical uncertainty results in unrealistic conclusions because NOAA makes improbably conservative assumptions at each step of the analysis, and these compounded assumptions accumulate substantial errors in the end result, as is apparent with the proposed LF cetacean model. These erroneous assumptions are further compounded by the absence of empirical data and by NOAA's failure to test confidence in its curve fitting of non-linear relationships between data input and weighting functions. It is not apparent that NOAA has used any of the acceptable methods to account for limited data, such as those that have been suggested in public comments submitted on the previous versions of the Draft Guidance. In sum, the Associations object to the proposed changes to the LF cetacean criteria because they are not supported by the best available science and are the result of extrapolated conjecture based upon arbitrary and unsupported assumptions.

⁹ See Shaffer, L.A. and G.R. Long. 2004. Low-frequency distortion product otoacoustic emissions in two species of kangaroo rats: implications for auditory sensitivity. *J. Comp. Physiol. A* (2004) 190:55-60.

¹⁰ We agree with NOAA's statement that the frequency structure of an animal's vocalizations is not a good predictor of hearing sensitivity. The fact that blue whales, fin whales, and other baleen whale species may produce sound below 100 Hz should not be construed to mean that those are the frequencies of best hearing.

B. The Proposed Changes Applicable to Phocid (“PW”) Pinnipeds Are Arbitrary and Unexplained

NOAA has proposed similar changes to the PW pinniped parameter ‘*a*’. These proposed changes are apparently due to the elimination of some data points, the reasons for which are not clearly explained. NOAA begins by stating that it is removing datasets containing “individuals with hearing loss” and individuals with hearing “not representative of their functional hearing group.” However, neither of these reasons is the stated basis for the removal of four of the five peer-reviewed datasets. Instead, NOAA states that it has removed those datasets “due to high thresholds likely being masked.”

NOAA provides no explanation for why these data are believed to suffer from masking-related issues more significantly than any other audiogram data used to support the Draft Guidance. As NOAA knows, masking is a common problem when conducting studies to develop audiograms, and the degree to which it is controlled can vary considerably from one study to the next. Before removing the data, NOAA must provide a specific explanation for why these particular datasets contain unique masking problems that are unlike the other datasets upon which the Draft Guidance relies.

C. The Proposed Changes Applicable to Peak Sound Pressure Acoustic Threshold Levels Are Partially Acceptable but Contain Serious Flaws

We generally agree that removal of SPL_{peak} acoustic threshold levels for non-impulsive sounds is reasonable as it would be quite rare that continuous sounds would have a peak level that causes potential impacts at distances greater than the SEL_{cum} metric would predict. We also support NOAA’s proposal to adopt the national and international standard of dynamic range as the difference between the auditory threshold and the threshold of pain.

However, the specifically proposed changes to parameter ‘*K*’—a metric of hearing dynamic range—are arbitrary and not based on a rigorous scientific rationale. The creation of a new TTS threshold for LF cetaceans by averaging the MF cetacean TTS threshold with the clearly anomalous and unique porpoise TTS threshold is not a science-based decision, but one designed to introduce added “precaution” to a dynamic range substitute (*i.e.*, TTS) that already contains multiple conservative assumptions relative to the normative human dynamic range definition.

The onset of TTS is not the same as the onset of pain. In fact, TTS was adopted as a measurable metric of marine mammal hearing upper limits specifically because it fell below the levels associated with PTS and pain in humans. The difference between TTS onset in humans and onset of pain is about 40 dB (Melnick 1991¹¹), and it is reasonable to expect that the

¹¹ Melnick, W. 1991. Human temporary threshold shift (TTS) and damage risk. J. Acoust. Soc. Am. 90(1), July 1991.

difference would be the same or greater for marine mammals, given the shorter durations of exposure and lower levels of induced TTS used in marine mammal TTS standards relative to human TTS standards. For these reasons, the MF cetacean dynamic range metric in the 2015 version of the Draft Guidance already represented a compromise to err on the side of caution. Application of the hybrid weighting function is unwarranted for LF cetaceans. We would also point out that substitution of this same MF/HF hybrid weighting function is unnecessary for both pinniped groups (PW and OW), since they both possess sufficient data within their own taxonomic group (*e.g.*, Kastak et al. 2005¹²) to support a dynamic range metric based on their own data as set forth in the July 2015 Draft Guidance, without having to resort to the unwarranted generation of a dynamic range metric based on a scientifically unjustifiable averaging of two very different hearing groups.

D. NOAA’s Proposal to Move White-Beaked Dolphins from the MF Cetacean Group to the HF Cetacean Group Lacks Sufficient Supporting Data and Analysis

NOAA provides no substantive explanation for its conclusion that the white-beaked dolphin’s audiogram is “more similar” to other HF cetaceans (*e.g.*, harbor porpoise). At a minimum, it would have been reasonable for the agency to provide a figure comparing the two audiograms, along with a discussion of the differences between the auditory evoked potential-derived white-beaked common dolphin audiogram and the behaviorally derived harbor porpoise audiograms. NOAA also fails to provide the actual parameter estimates for the revised composite audiograms. Although NOAA does provide the parameter estimates for the weighting function derived from the revised composite audiogram, and these may be used to infer what changes were made, the lack of disclosure of a complete revised analysis, with comparisons, makes it essentially impossible to meaningfully assess the differences, and comment on them.

E. NOAA’s Proposed Update of the HF Cetacean Audiogram Lacks a Sufficient Explanation

We generally agree that it is appropriate to add another audiogram to derive a composite audiogram for the HF cetacean hearing group. However, again, NOAA fails to provide the parameter estimates for the updated HF audiogram, which makes it impossible to conduct a meaningful comparison to the 2015 Draft Guidance within the 14-day comment period. As with essentially all the changes NOAA has proposed, the agency has provided incomplete information and failed to present clear comparisons between the 2015 Draft Guidance and the currently proposed revisions.

¹² Kastak, D., B. Southall, R. Schusterman, and C. Kastak. 2005. Underwater temporary threshold shift in pinnipeds: Effects of noise level and duration. *J. Acoust. Soc. Am.* 118(5), Nov. 2005.

IV. CONCLUSION

We are genuinely disappointed that what was a constructive process involving meaningful public input has been supplanted with the abrupt issuance of arbitrary conclusions resulting from NOAA's election to prioritize speedy, unilateral, and rash decision-making above transparency, diligence, and adherence to best science. As set forth above, we cannot support the adoption of the 2016 proposed changes, particularly when the changes modify criteria that were already peer reviewed and subject to a reasonable public review and comment period. We urge NOAA to correct this failure of process, policy, and science by re-engaging in an appropriate process, as recommended in Section I *supra*, to incorporate any changes to the 2015 Draft Guidance that may be necessary.

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

Sincerely,



Andy Radford
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Nikki Martin
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President



Josh Kindred
Alaska Oil and Gas Association
Environmental Counsel



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

cc: U.S. Senate Committee on Energy and Natural Resources
U.S. House Committee on Natural Resources
Dr. Jill Lewandowski, BOEM, Division of Environmental Assessment Chief