

July 17, 2017

**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: Secretary of Commerce’s Review of Technical 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 Marine Fisheries Service’s (“NMFS”) notice and request for comments to assist the Secretary of Commerce’s review of the Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (“Technical Guidance”), pursuant to Section 10 of Presidential Executive Order (“EO”) 13795. *See* 82 Fed. Reg. 24,950 (May 31, 2017). These comments follow our previously submitted comments on the first and second draft versions of the Technical Guidance, as well as our comments on NMFS’s 2016 proposed revisions to the draft Technical Guidance. The comments provided below are specifically intended to inform the Secretary of Commerce’s review of the Technical Guidance.<sup>1</sup>

**I. INTRODUCTION**

The President recently signed EO 13795, expressly stating that it “shall be the policy of the United States to encourage energy exploration and production, including on the Outer

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<sup>1</sup> We incorporate our previous three comment letters (including attachments) by reference and expect that those comments will be considered as part of the review ordered by EO 13795. 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 three comment letters.

Continental Shelf [“OCS”], in order to maintain the Nation’s position as a global energy leader and foster energy security and resilience for the benefit of the American people, while ensuring that any such activity is safe and environmentally responsible.”<sup>2</sup> This directive is consistent with statutorily enacted policy calling for the “expeditious and orderly development” of the U.S. OCS “subject to environmental safeguards.” 43 U.S.C. § 1332(3). Indeed, Congress enacted the OCS Lands Act (“OCSLA”) to “achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade.” 43 U.S.C. § 1802(1).

Seismic surveying is essential to achieving the goals stated by the EO and OCSLA because it is the only feasible technology available to accurately image the subsurface of the OCS before a single well is drilled. Technological innovations and improvements afford industry significant precision in subsurface imaging and will continue to provide more realistic estimates of potential resources. Furthermore, modern geophysical imaging reduces risk by increasing the likelihood that exploratory wells will successfully tap hydrocarbons and by decreasing the number of wells that need to be drilled in a given area, thereby reducing associated safety and environmental risks and the overall environmental footprint for exploration. Because geophysical activities are temporary and transitory, seismic surveying is the least intrusive and most cost-effective means to determine the likely locations of recoverable oil and gas resources on the OCS.

The Technical Guidance is directly relevant to essential offshore geophysical activities because federal agencies and permit applicants may use the guidance to determine the potential effects of those activities on marine mammals. Although NMFS must ensure that all statutory requirements are satisfied when issuing incidental take authorizations (“ITAs”) under the Marine Mammal Protection Act (“MMPA”), it also must ensure that the MMPA permitting process does not undermine the goals stated in OCSLA and the EO. Moreover, the Bureau of Ocean Energy Management (“BOEM”), which may use the Technical Guidance in its National Environmental Policy Act analyses, is required to implement OCSLA’s (and the EO’s) mandates.

As requested by NMFS, our comments focus on (1) the availability of published new science relevant to marine mammal hearing or impacts of noise on hearing since the publication of the Technical Guidance, and (2) recommendations for how NMFS can aid the application and implementation of the Technical Guidance. Our comments are intended to inform the Secretary of Commerce’s review being carried out in response to the EO’s instruction that the “Secretary of Commerce shall review [the Technical Guidance] for consistency with the policy set forth [above] and . . . take all steps permitted by law to rescind or revise that guidance, if appropriate.”

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<sup>2</sup> Presidential Executive Order Implementing an America-First Offshore Energy Strategy (Apr. 28, 2017), <https://www.whitehouse.gov/the-press-office/2017/04/28/presidential-executive-order-implementing-america-first-offshore-energy>.

## II. COMMENTS

### A. Relevant New Science.

We have identified below new scientific publications relevant to marine mammal hearing or impacts of noise on marine mammal hearing, along with links to each publication. These publications should be considered in the Secretary's review of the Technical Guidance.

Branstetter et al. 2017. Killer Whale (*Orcinus orca*) behavioral audiograms. J. Acoust. Soc. Am. 141(4): 2387-2398. <http://asa.scitation.org/doi/10.1121/1.4979116>.

Houser et al. 2017. A review of the history, development and application of auditory weighting functions in humans and marine mammals. J. Acoust. Soc. Am. 141: 1371-1413. <http://dx.doi.org/10.1121/1.4976086>.

Lucke et al. 2016. Aerial low-frequency hearing in captive and free-ranging harbour seals (*Phoca vitulina*) measured using auditory brainstem responses. J. Comp. Physiol. 202:859-868. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5099358/>

Lucke et al. 2016. Auditory sensitivity in aquatic animals. J. Acoust. Soc. Am. 139(6): 3097-3101. <http://asa.scitation.org/doi/full/10.1121/1.4952711>

Lucke et al. 2016. Variability in Click-Evoked potentials in killer whales (*Orcinus orca*) and determination of a hearing impairment in a rehabilitated killer whale. Aquatic Mammals 42(2): 184-192. [http://www.aquaticmammalsjournal.org/index.php?option=com\\_content&view=article&id=1427:variability-in-click-evoked-potentials-in-killer-whales-orcinus-orca-and-determination-of-a-hearing-impairment-in-a-rehabilitated-killer-whale&catid=148&Itemid=157](http://www.aquaticmammalsjournal.org/index.php?option=com_content&view=article&id=1427:variability-in-click-evoked-potentials-in-killer-whales-orcinus-orca-and-determination-of-a-hearing-impairment-in-a-rehabilitated-killer-whale&catid=148&Itemid=157)

Reichmuth et al. 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. <http://dx.doi.org/10.1121/1.4964470>.

Ruser et al. 2016. Assessing auditory evoked potentials of wild harbor porpoises (*Phocoena phocoena*). J. Acoust. Soc. Am. 140(1): 442-452. <http://asa.scitation.org/doi/abs/10.1121/1.4955306>

### B. Recommendations for Improving Application of the Technical Guidance.

The Technical Guidance establishes new acoustic criteria for assessing potential Level A harassment under the MMPA. These new criteria are far more complex than the criteria previously used by NMFS. As a result, application of the Technical Guidance presents a significant risk that the preparation of MMPA ITA applications will become more burdensome

and time-consuming and, correspondingly, that NMFS's processing of those applications will be delayed.<sup>3</sup> Any additional administrative burden or delay to an MMPA ITA permitting process that is already difficult and time-consuming for both applicants and NMFS will not promote the policies stated in the EO.

Accordingly, it is essential that NMFS take steps to ensure that the Technical Guidance is more user-friendly and applied in a flexible, streamlined, and predictable manner. In the current form, the Technical Guidance cannot be consistently or efficiently applied. The following comments address some of the ways in which NMFS can improve the application of the Technical Guidance, consistent with the EO's policies.

The history of NMFS's implementation of acoustic guidelines provides some important context for our comments. From 1995 to the present, NMFS recommended a simple set of guidelines based on the average (root mean squared) sound pressure of a received sound (180 dB SPL<sub>rms</sub> for injury from impulse sound and 160 dB SPL<sub>rms</sub> for behavioral effects). These guidelines had the virtue of being easy to apply, but became increasingly out of alignment with a growing body of scientific evidence as time passed. The current Technical Guidance is based almost entirely on an alternative set of criteria created by the U.S. Navy.<sup>4</sup> Application of these "new" criteria is within the capabilities and resources of the Navy, but not so easily applied by the civil regulated community (which does not have the resources of the Navy). By adopting, almost verbatim, the Navy's process and criteria as NMFS technical guidance, NMFS has failed to provide useful, practicable, and effective guidance suitable for the civil regulated community.<sup>5</sup>

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<sup>3</sup> These costs and burdens can be significantly reduced if NMFS follows our recommendations below. *See generally* NMFS Policy Directive PD 04-108, Science and Technology, Policy on the Data Quality Act (June 27, 2012), <http://www.nmfs.noaa.gov/op/pds/documents/04/04-108.pdf>.

<sup>4</sup> *See* U.S. Navy, Final Atlantic Fleet Active Sonar Training Environmental Impact Statement/Overseas Environmental Impact Statement (Dec. 12, 2008), [https://www.navfac.navy.mil/content/dam/navfac/Environmental/PDFs/NEPA/AFAST\\_EIS.pdf](https://www.navfac.navy.mil/content/dam/navfac/Environmental/PDFs/NEPA/AFAST_EIS.pdf).

<sup>5</sup> This is particularly true for impulse sound sources because the Navy's existing criteria (and the Technical Guidance based upon those criteria) are almost exclusively derived from, and applied to, tonal sources such as sonars. Moreover, the one impulse sound source most used by the Navy—explosives—has been subject to a completely different (and practicable) risk analysis treatment, based on the size of the explosive. Our comments below emphasize that extrapolation from science based largely on tonal sounds lacks the critical features of simplicity and practicability. If no other aspects of the Technical Guidance are reexamined (and we strongly recommend a broader reexamination), the impulse sound guidelines at a bare minimum must be

(continued . . .)

**1. NMFS should provide user-friendly and scientifically supported tools to assist with the application of the Technical Guidance.**

We appreciate NMFS's development and presentation of an alternative approach to the Technical Guidance's primary criteria, as set forth in Appendix D to the Technical Guidance. Additionally, the spreadsheet that accompanies Appendix D is a helpful tool for applicants that choose to employ the Appendix D method. However, as NMFS acknowledges, even though the Appendix D method might provide flexibility for calculations, it will result in very significant overestimation of exposure numbers. Many applicants, therefore, will not use Appendix D as a substitute for the Technical Guidance's primary criteria and those that do will be penalized with an analysis that falsely assumes their activities will have a much greater impact than will actually occur and potentially results in costly and unjustified mitigation.

We therefore request—again—that NMFS create a user guide and/or other implementation tools to assist the regulated industry's application of the primary criteria and methods set forth in the Technical Guidance. A previous version of the draft Technical Guidance promised helpful user tools and contained placeholders for examples of applying and calculating the new, more complex guidance (*e.g.*, usage of frequency-dependent auditory system weighting functions for different "hearing groups" of marine mammals). The promised user tools still have not been provided. As we indicated in previous comments, the complexity of the methods proposed in the Technical Guidance will result in increased time and expenses and additional necessary technical expertise for applicants, and will almost certainly lead to confusion in the regulated community as well as inconsistent ITA applications and inefficient permitting processes. Although the Technical Guidance provides some general context for how the primary criteria should be implemented, it does not provide a meaningful discussion outlining the key practical aspects or standards to be applied for the implementation of those criteria.

Specifically, for impulse sound sources, we request that NMFS address the following important issues and questions:

- NMFS should provide a comparative analysis of the most common impulse sound sources—*i.e.* explosives, impact pile driving, compressed air sources (referred to by NMFS as "airguns"), and possibly other sources such as sparkers, boomers, or water guns. These sources differ by orders of magnitude on critical properties like signal duration, peak pressure, maximum particle acceleration (a function of duration and amplitude), and frequency composition. Most important, some sources, such as explosives and impact pile driving, produce a supersonic shock wave that is

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(. . . continued)

more thoroughly considered than they are in the Technical Guidance based upon, among other things, the explosive risk guidance currently authorized for use by the Navy.

responsible for many of the observed near-field injuries associated with these sources, whereas airguns are subsonic sources that do not produce a near-field shock wave. Accordingly, there is considerable reason to suspect that not all impulse sounds produce the same injurious or behavioral effects, yet this aspect of impulse sound sources is completely unexamined by NMFS and not addressed in the Technical Guidance.

- In the Technical Guidance, NMFS abandoned the use of an arbitrary metric for switching from impulse sound criteria to non-impulse criteria between the 2015 and 2016 drafts, as we recommended in our comments on the 2015 draft. But the difficulty still remains that the propagation of impulse sound, and the modeling of that propagation, is not as straightforward as the propagation of tonal sounds, and that at ranges within the distances to predicted Level A effects, the received sound can offer a very different time, amplitude, and frequency structure than the nominal properties at the source itself due to the physical properties of the propagating medium. NMFS should more thoroughly examine the implications of expanded signal duration with distance from the source, amplitude modulation due to multi-path propagation that offers more than one peak pressure option to measure, and the appropriate time window to use for Fast Fourier Transforms (“FFT”) transformation of the signal into discrete frequency bins that is required for weighting function application. Various effects of the propagating environment have the potential to greatly alter the frequency-specific energy to which weighting would be applied (*e.g.*, filtering of low frequencies in shallow water, filtering of high frequencies by air bubbles or fish in the water column). These considerations are not unprecedented. Indeed, multiple references exist for illustrative examples of changes to impulse sound from explosives, pile driving, and seismic surveys at different ranges from tens to thousands of meters distance from the source.<sup>6</sup>
- NMFS must provide guidance for expressing the frequency structure of an impulse sound for subsequent application of the hearing-group weighting functions. Not only will the frequency structure differ dramatically for different impulse sound sources, but the frequency structure can change dramatically within the span of tens or hundreds of meters due to propagating conditions. What is the right distance at which to estimate impulse frequency structure? Should the frequency structure be presented as spectrum level (energy/Hz), one-third octave bands, octave bands, or other increments? If octave or one-third octave bands are to be used, what is the authoritative source for the frequency span of each band: ISO 266 standards, ANSI S1.11-2004, or other? Since marine mammals hear both above (ultrasound) and

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<sup>6</sup> See generally Richardson et al. 1995. *Marine Mammals and Noise*. Academic Press, San Diego, CA ISBN 0-12-588440-0.

below (infrasound) the range of human hearing, frequency bands developed for human hearing must be extended beyond the commonly offered values.

- How should frequency structure be derived from the impulse waveform? Unlike continuous, tonal sounds, impulses contain both many frequencies (they are broadband in how they interact with hearing structures) and no frequencies (they are too short in duration and irregular in pressure fluctuation to produce tonal sound). The time/amplitude pulse must be transformed by methods such as FFT, and there is a tradeoff between time resolution of the calculation and frequency resolution of the resulting product. Simple FFT tools are available from a variety of sources like MatLab, the ‘r’ statistics toolkit, and other sources, but require some degree of user expertise to apply. NMFS should offer the non-expert user links to these tools, as well as preferred time step values (*e.g.*, 0.01s increments) and windowing functions (*e.g.*, Hanning or Hamming functions) to ensure consistency in the frequency/amplitude products that result when different users apply the NMFS weighting functions.
- What are the cut-off criteria for not considering frequency-specific energy? For tonal signals, harmonics that are 30-60 dB lower than the dominant frequency of the signal are typically not considered during the application of weighting functions. No guidance is offered for the impulse source user looking at broadband energy across many octaves. But with broad swaths of the frequency-distributed energy output being 30-60 dB lower than the amplitude at the peak (such as peak one-third octave band, or peak within a 3dB or 10 dB band), what criteria would NMFS apply to enable the user to eliminate frequency components that may be 30-60 dB or more below the band of peak energy?
- What few data exist for the frequency at which temporary threshold shift (“TTS”) occurs from an impulse source indicate that marine mammals, like humans, do not follow the “half octave rule” for TTS from tonal signals, in which the frequency at which TTS is greatest is equal to or one-half to one octave higher in frequency than the tonal signal that induces the TTS.<sup>7</sup> Instead, there seems to be a consistent locus of

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<sup>7</sup> See Kastelein et al. 2015. Hearing frequency thresholds of harbor porpoises (*Phocoena phocoena*) temporarily affected by played back offshore pile driving sounds. *J. Acoust. Soc. Am.* 137(2):556-564, <http://dx.doi.org/10.1121/1.4906261>; Finneran et al. 2002. Temporary shift in masked hearing thresholds in odontocetes after exposure to single under-water impulses from a seismic water gun. *J. Acoust. Soc. Am.* 111:2929-2940, [https://www.researchgate.net/publication/11292497\\_Temporary\\_shift\\_in\\_masked\\_hearing\\_thresholds\\_in\\_odontocetes\\_after\\_exposure\\_to\\_single\\_underwater\\_impulses\\_from\\_a\\_seismic\\_watergun](https://www.researchgate.net/publication/11292497_Temporary_shift_in_masked_hearing_thresholds_in_odontocetes_after_exposure_to_single_underwater_impulses_from_a_seismic_watergun).

TTS at a specific frequency that seems to correspond to the geometry of the cochlea, where the cochlear spiral is tightest and broadband sound tends to “pile up” as it circulates through the cochlea. In dolphins this seems to be around 4-8 kHz, although more data are needed. *See supra* note 7. This preliminary data is, however, consistent with human and lab animal data showing a consistent frequency of TTS for broadband impulse sounds with peak energy differing from the frequency at which TTS onset is noted. These data beg the question as to whether it is even appropriate to apply a hearing weighting function, derived from tonal sources, to a broadband impulse source.

- Unlike tonal sources, which may have durations of seconds or even hours or days of continuous sound production, impulse sources are often single discrete events (*e.g.*, a single explosive detonation during naval training) or repeated events of very low duty cycle (meaning the ratio of time the sound is produced or received relative to intervals of quiet, during which the ear may experience varying levels of auditory system recovery). Seismic surveys, for example, produce a sound of 0.1 second duration or less, every 10-20 seconds or longer in some cases. This is a duty cycle of less than 1% and offers considerable time for hearing recovery between pulses. Pile driving offers similar duty cycles. Although NMFS cannot practicably provide specific recommendations for every combination of source and duty cycle, the agency should, at a minimum, offer guidance on how to express the intermittency of impulse sound sources and make a conservative correction for hearing recovery. While few data exist on marine mammal hearing recovery, this is a conservative mammalian hearing trait for which considerable data exist for humans and lab animals. Accordingly, some form of provisional, best-available-science correction factor should be provided, rather than making the assumption that no hearing recovery takes place between sound exposures for marine mammals.

A user guide and other implementation tools—that address topics such as those set forth above—would enable applicants to better apply frequency-specific weighting functions without necessarily performing the mathematical calculations. Generally, a user guide should include examples for how the primary criteria should be applied in different, representative circumstances. It should also include examples that clearly illustrate the different outcomes when the primary criteria are used and when the Appendix D method is used so that applicants can make an informed decision about which method to use in their applications.

In addition to more guidance on the application of the primary criteria, it would be helpful for NMFS to provide more information about how the Technical Guidance affects existing offshore activities—particularly monitoring protocols, estimated incidental take assessments, and the development of mitigation measures. For example, NMFS currently requires shut down and/or power down mitigation measures that are based on specific, non-cumulative acoustic criteria. However, the Technical Guidance contains no meaningful discussion about how similar avoidance-based mitigation measures should be calculated or



implemented under the new cumulative sound exposure criteria, and there is a high degree of variability that occurs in their application. The Technical Guidance also provides very little direction to applicants regarding take estimation methods (as opposed to exposure estimation). Guidance from NMFS regarding take estimation methods and application of avoidance and mitigation measures—even if provided as nonexclusive examples—is critical to facilitate efficient and consistent permitting processes. *See* 72 Fed. Reg. 3,432, 3,433 (Jan. 25, 2007) (“Poorly designed or misused guidance documents can impose significant costs or limit the freedom of the public.”).

It is not sufficient for NMFS to provide only acoustic exposure guidance without also providing the above-described information that is necessary for an applicant to reasonably assess and complete the requisite risk or take analysis. For example, it is impossible to apply the Technical Guidance without the ability to correctly translate the known, commonly used properties of a sound source like charge weight for explosives, pile diameter and hammer pressurization for a marine construction project, or seismic array volume for a geophysical survey, into a value that can be applied to the Technical Guidance criteria such as source sound pressure level or Sound Exposure Level (SEL), let alone the other derived data products of time/amplitude pressure waveforms and frequency/amplitude derivatives of the time/amplitude products.<sup>8</sup> NMFS should not publish acoustic threshold criteria without also providing guidance to applicants for how those criteria should be applied. Otherwise, applicants are left to “guess” at how NMFS intends those criteria to be applied.

More broadly, NMFS’s provision of a user guide or other implementation tools to better facilitate the application of the Technical Guidance’s primary criteria will increase transparency, advance the policies stated in the EO, and help to “ensur[e] and maximiz[e] the quality, objectivity, utility, and integrity” of the Technical Guidance, as required by the Information Quality Act. *See* Pub. L. No. 106-554, § 515 (2000); *see also* 67 Fed. Reg. 8451, 8456 (Feb. 2, 2002). To help the agency further these goals, we reiterate our earlier offer to collaborate with NMFS, when appropriate, on efforts that facilitate efficient and consistent regulatory processes based on the best available science. We would welcome the opportunity to discuss in more detail the ways in which NMFS can make application of the Technical Guidance more practical and efficient.

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<sup>8</sup> NMFS knows that there are solutions to these problems based on New Explosive Weight or through the use of specialty software tools like Gundalf and NUCLEUS for seismic source arrays, but offers no help to enable applicants to adequately conform to expectations that are implicit in the Technical Guidance’s criteria.

**2. NMFS should allow ITA applicants to use other methods of estimating marine mammal impacts so long as those methods are based upon the best available science.**

NMFS states that the Technical Guidance “allows for an alternative approach if case-specific information/data indicate that such an approach is likely, in NMFS’ view following peer review, to produce an equally or more accurate estimate of auditory impacts.” 81 Fed. Reg. 51,693, 51,699 (Aug. 4, 2016). However, NMFS has otherwise provided very little information regarding the circumstances under which the agency believes it can and cannot deviate from the Technical Guidance, and how NMFS will evaluate any deviations proposed by ITA applicants.

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. Indeed, there are many ways to estimate potential exposures of marine mammals to various sound levels, and applicants should not be limited to estimating exposures using the specific methods set forth in the Technical Guidance (or in Appendix D) if there are other methods that are more appropriate and scientifically justified.

Additionally, NMFS should not require alternative approaches used by applicants in their ITA applications to be peer reviewed so long as those approaches are based upon the best available science. There is no statutory or regulatory requirement that a particular applicant’s ITA application must be peer reviewed, and doing so would be administratively impracticable and prevent NMFS from meeting statutory deadlines for processing ITA applications. Rather, NMFS must ensure that the principles, information, and criteria relied upon by the take estimation analysis presented in ITA applications reflect the best available science, without having to resort to costly and time-consuming external review processes. Allowing for flexibility in the application of the Technical Guidance promotes the EO’s policies and is consistent with the Technical Guidance’s status as non-binding agency guidance. If applicants present more accurate approaches to estimate potential take in their ITA applications, NMFS must consider those approaches so long as they are based upon the best available science.

**3. NMFS should revisit substantive elements of the Technical Guidance that will result in inaccurate or inflated take estimates.**

Application of the Technical Guidance must result in objective, accurate estimates of marine mammal take based on the best scientific information available. However, certain elements of the Technical Guidance will undermine this essential prerequisite by producing inaccurate or inflated incidental take estimates. If not corrected, these errors undermine the MMPA permitting process for offshore oil and gas activities, which, in turn, undermines the policies of the EO and OCSLA.

*First*, we request that NMFS reconsider certain comments provided by the Associations in response to NMFS’s call for comments on the 2016 proposed changes to the draft Technical

Guidance. *See* 81 Fed. Reg. 14,095 (Mar. 16, 2016). NMFS’s 2016 changes were substantial and resulted in very different criteria than were proposed in the 2015 version of the draft Technical Guidance. Despite these substantial changes, NMFS allowed only 14 days for the public to comment and then largely adopted the changes into the final document without any apparent meaningful consideration of some of the comments.

We therefore specifically request that NMFS reconsider the comments provided in Sections III.A, III.B, and III.C of the Associations’ comment letter dated March 30, 2016. These comments address aspects of the Technical Guidance—particularly the criteria applicable to low-frequency cetaceans (addressed in Section III.A of our March 30, 2016 comment letter)—that result in inaccurate, overly conservative, and artificially inflated take estimates. A copy of our March 30, 2016 comment letter is included with this letter as Attachment A.

*Second*, NMFS has appropriately concluded that TTS is not an “injury” for MMPA purposes. The Associations concur with this finding, as it is based on the best available scientific information. However, NMFS continues to state, without explanation, that the TTS threshold levels “will be considered as part of the larger comprehensive effects analyses under the MMPA and the ESA” and “may be used to inform the development of mitigation and monitoring measures pursuant to the MMPA, ESA, or NMSA.” 81 Fed. Reg. at 51,697. These vague statements provide no meaningful value to the regulated community and, instead, create uncertainty and confusion regarding NMFS’s intentions for future regulatory processes. This, in turn, undermines the policies of the EO and OCSLA.

We therefore recommend that NMFS provide more clarity and discussion regarding how the TTS threshold levels may or may not inform mitigation and monitoring or a “comprehensive effects” analysis. Without clarity 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 ITA applications, and agencies will not clearly or consistently address the issue in their “comprehensive effects” analyses.<sup>9</sup>

#### **4. NMFS should retract its NMSA injury-related statements.**

NMFS states that the acoustic criteria in the Technical Guidance will be considered by NMFS and the Office of National Marine Sanctuaries for purposes of the National Marine Sanctuaries Act (“NMSA”). NMFS further states, without explanation, that the NMSA’s “broad definition” of “injury” includes permanent threshold shift, TTS, and “other adverse changes in physical or behavioral characteristics that are not addressed in the Technical Guidance.” 81 Fed. Reg. at 51,695 (emphasis added); *see* 15 C.F.R. § 922.3 (“injure” is defined as to “change

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<sup>9</sup> This issue was addressed in Section II.A.4 of our comment letter dated September 14, 2015, and was not sufficiently addressed by NMFS when it issued the Technical Guidance. Our September 14, 2015 letter is included with this letter as Attachment B.

adversely, either in the short or long term, a chemical, biological or physical attribute of, or the viability of”). It is not clear why NMFS has decided to make this sweeping legal conclusion in the context of its issuance of non-binding technical guidance. Moreover, studies cited in the Technical Guidance are not consistent with this conclusion. *See* 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”).

NOAA may only make such an important legal conclusion regarding the processes and decisions undertaken pursuant to the NMSA through an appropriate legal process that includes, *inter alia*, 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. We therefore request that NMFS retract the statements related to the NMSA’s definition of “injury” in the Technical Guidance and the associated Federal Register notice.<sup>10</sup> If a legal interpretation of this term is pursued, it is the responsibility of the Office of National Marine Sanctuaries to provide its interpretation through the proper legal process.

### III. CONCLUSION

We appreciate NMFS’s consideration of the comments set forth above. We specifically request, consistent with EO 13795’s mandate, that NMFS carefully consider and incorporate these comments, prepare a new draft version of the Technical Guidance, provide that draft for public review and comment, and then promptly issue a new, improved version of the Technical Guidance. As indicated, we remain open to further discussion with NMFS regarding the ways in which the Technical Guidance can be applied more effectively and efficiently, and revised as necessary. Should you have any questions, please contact the undersigned at 202.682.8584 or via email at [radforda@api.org](mailto:radforda@api.org). Thank you for considering and responding to these comments.

Sincerely,



Andy Radford  
American Petroleum Institute  
Sr. Policy Advisor – Offshore

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<sup>10</sup> This issue was addressed in Section II.A.6 of our comment letter dated September 14, 2015, and was not sufficiently addressed by NMFS when it issued the final Technical Guidance.



Nikki Martin  
International Association of Geophysical Contractors  
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

Attachments

# ATTACHMENT A



March 30, 2016

**VIA Federal eRulemaking Portal**

Chief, Marine Mammal and Sea Turtle Conservation Division  
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National Marine Fisheries Service  
1315 East-West Highway  
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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**

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**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

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<sup>1</sup> 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.<sup>2</sup>

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.

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<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup>

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<sup>3</sup> 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.").

<sup>4</sup> 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.

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(. . . 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,<sup>5</sup> 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,<sup>6</sup> 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).

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

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

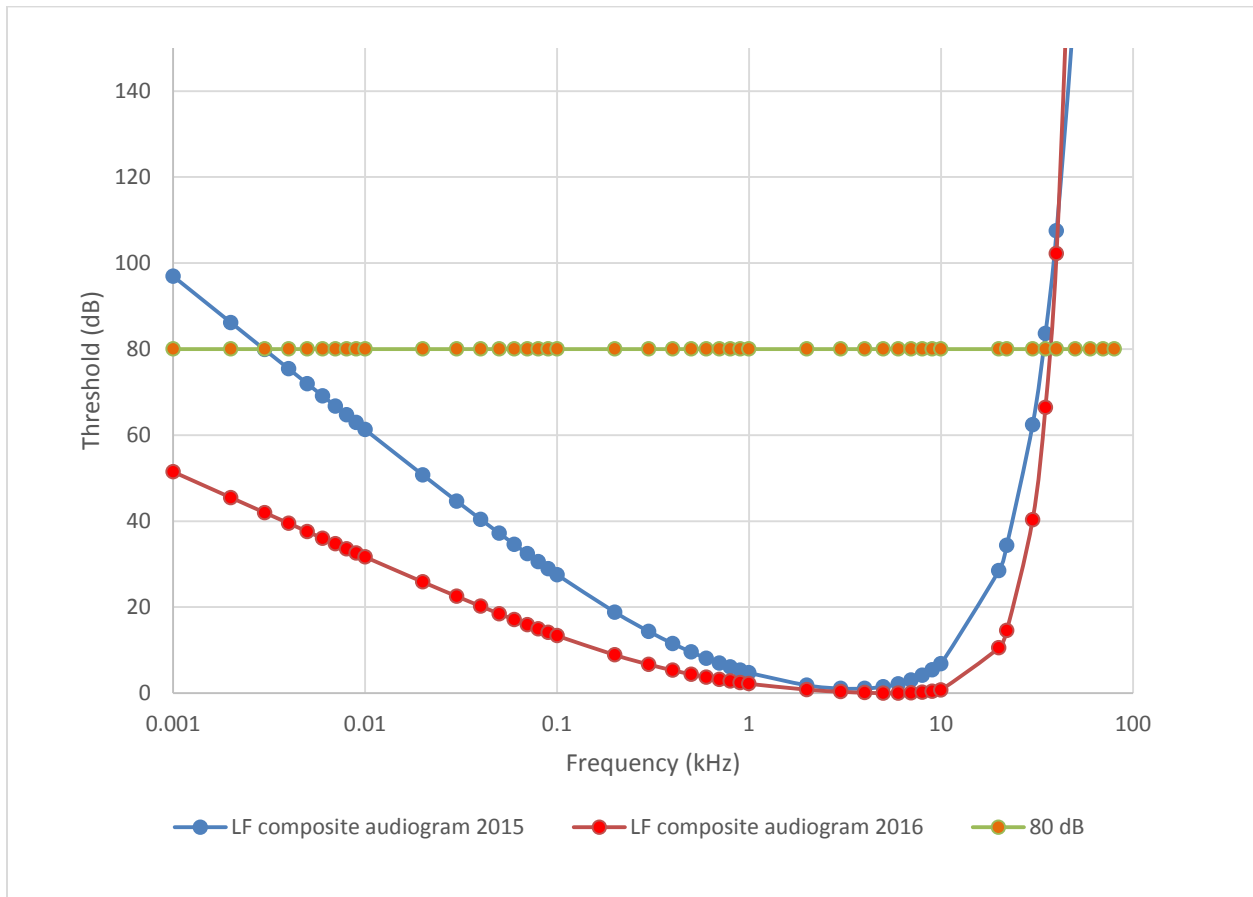


Figure 1. The consequence of the proposed changes to the LF cetacean modeled audiogram (in red) produce a hearing curve at the lowest frequencies that never approaches the 80 dB decrement from best hearing (in green) that NOAA had set as the upper and lower limiting frequencies of hearing (also a general 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 PC3<sup>7</sup> 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.

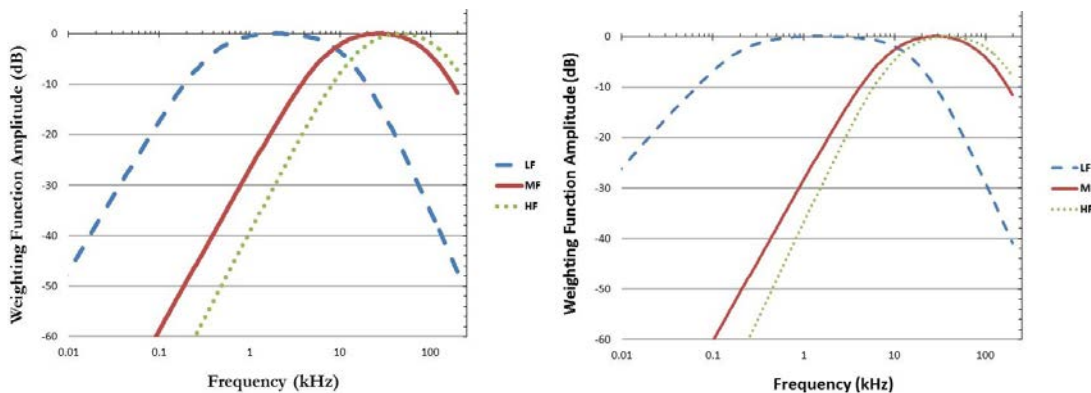


Figure 2. The left plot shows initial July 2015 cetacean weighting functions: LF in dashed blue, MF cetacean in red and HF cetacean in dotted black. While the frequency range of best hearing for LF cetaceans is conservatively generous given uncertainties in the models, the slope of the weighting functions 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.<sup>8</sup> 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

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

<sup>8</sup> A comprehensive summary of human hearing data can be viewed here: [http://www.iso.org/iso/catalogue\\_detail.htm?csnumber=34222](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.<sup>9</sup> 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.<sup>10</sup>

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.

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<sup>9</sup> 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.

<sup>10</sup> 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 1991<sup>11</sup>), and it is reasonable to expect that the

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<sup>11</sup> 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. 2005<sup>12</sup>) 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.

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<sup>12</sup> 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](mailto:radforda@api.org). Thank you for considering and responding to these comments.

Sincerely,




Andy Radford  
American Petroleum Institute  
Sr. Policy Advisor - Offshore



Nikki Martin  
International Association of Geophysical Contractors  
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

# ATTACHMENT B



September 14, 2015

**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.<sup>1</sup> 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.

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<sup>1</sup> 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)<sup>2</sup> 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.<sup>3</sup> 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.

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<sup>2</sup> 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.

<sup>3</sup> 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.<sup>4</sup> 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.<sup>5</sup> 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.”).<sup>6</sup>

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<sup>4</sup> 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.

<sup>5</sup> 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.

<sup>6</sup> 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.<sup>7</sup> 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.<sup>8</sup>

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.

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<sup>7</sup> 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.

<sup>8</sup> 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](mailto:radforda@api.org). Thank you for considering and responding to these comments.

Sincerely,



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