



MARINE MAMMAL COMMISSION

14 May 2019

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by Chevron seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take small numbers of marine mammals by harassment. The taking would be incidental to construction activities at Chevron's Richmond Refinery Long Wharf in Richmond, California. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 26 April 2019 notice (84 Fed. Reg. 17788) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

Chevron plans to repair and retrofit its wharf during a multi-year project. During this year's activities, operators would install up to 115 12- to 60-in steel, concrete, or composite piles using a vibratory and/or impact hammer. They also would remove up to 127 20- to 36-in steel, concrete, or timber piles using a vibratory hammer. Chevron expects activities to take up to 67 days, weather permitting. It would limit pile-driving and -removal activities to daylight hours only¹.

NMFS preliminarily has determined that, at most, the proposed activities could cause Level A and/or B harassment of small numbers of seven marine mammal species. NMFS anticipates that any impact on the affected species and stocks would be negligible. NMFS also does not anticipate any take of marine mammals by death or serious injury and believes that the potential for disturbance will be at the least practicable level because of the proposed mitigation measures. The proposed mitigation, monitoring, and reporting measures include—

- conducting in-situ measurements during pile driving and removal and adjusting the Level A and B harassment zones², as necessary;

¹ Operators would refrain from installing piles using an impact hammer from December 1 through May 31 to protect listed fish.

² The Commission informally noted that NMFS's *Federal Register* notice included a lesser number of piles to be monitored than Chevron's hydroacoustic monitoring plan. NMFS indicated that the hydroacoustic monitoring plan included the correct number of piles, except for concrete piles. Chevron already conducted measurements on five of the eight piles so measurements would be conducted on three remaining piles this year. NMFS also clarified that

- using only one hammer at a given time;
- using a sound attenuation device (e.g., bubble curtain) during impact driving of 60-in steel and 24-concrete piles and implementing performance standards measures for the bubble curtain;
- ceasing heavy machinery activities if any marine mammal comes within 10 m of the equipment;
- using standard soft-start, delay, and shut-down procedures;
- using two qualified land-based protected species observers to monitor the Level A and B harassment zones for 30 minutes before, during, and for 30 minutes after³ the proposed activities;
- using delay and shut-down procedures, if a species for which authorization has not been granted or if a species for which authorization has been granted but the authorized number of takes has been met, approaches or is observed within the Level B harassment zone;
- conducting marine mammal baseline observations on one day the week before initiation of activities;
- reporting injured and dead marine mammals to NMFS's Office of Protected Resources and the West Coast Regional Stranding Coordinator using NMFS's phased approach and suspending activities, if appropriate; and
- submitting draft and final marine mammal and hydroacoustic monitoring reports.

General concerns and comments

The Commission informally noted multiple typographical⁴ and other errors and shortcomings in the preamble, the proposed authorization, and the previous hydroacoustic and marine mammal monitoring report. Those included—

- specifying and using an incorrect source level based on root-mean-square sound pressure level (SPL_{rms}) for impact driving of 36-in piles⁵, which affected the Level B harassment

measurements would be taken during installation *and* removal of the specific pile sizes and types. All revisions would be included in the final authorization.

³ Chevron did not realize that it was required to monitor 30 minutes after activities ceased for the day and inadvertently monitored for only 15 minutes under its previous authorization. Chevron will monitor for the required 30 minutes after activities cease for this authorization.

⁴ The Commission informally noted that Table 8 in the *Federal Register* notice indicated that the shut-down zones were 15 rather than 10 m for removal of timber piles and 20 rather than 15 m for impact installation of concrete piles. The Commission also noted that Table 10 indicated the Level A ensonified area was 0.23 rather than 3.07 km² and the Level B ensonified area was 0.21 rather than 1.70 km² for impact installation of 60-in steel piles. In addition, the preamble noted that densities were not used to estimate takes of elephant seals but densities and associated takes were included in Table 11. Other typographical errors were noted as well. NMFS indicated the text and tables would be revised accordingly for the final authorization.

⁵ 193 rather than 190 dB re 1 µPa was used. An incorrect peak SPL (SPL_{peak}) source level also was noted but was not ultimately used for determining the extent of the harassment zones; 210 rather than 208 dB re 1 µPa was used. In addition, an incorrect SPL_{rms} source level of 150 dB re 1 µPa for vibratory installation of 20-in piles was noted in Table 5 of the *Federal Register* notice but the correct source level of 163 dB re 1 µPa was used to estimate the extent of the Level A and B harassment zones and the numbers of takes. NMFS indicated revisions would be included in the relevant sections of the preamble and associated tables in the preamble and final authorization.

- zones, associated ensonified areas, and ultimately the numbers of takes for California sea lions and harbor porpoises;
- specifying and using incorrect propagation loss for impact driving of 36- and 20-in piles⁶, which affected the Level A and B harassment zones, associated ensonified areas, and ultimately the numbers of takes for California sea lions and harbor porpoises⁷;
 - failing to position PSOs to monitor the Level A and B harassment zones adequately during previous activities⁸;
 - omitting the required information in the previous marine mammal monitoring report⁹ and not sufficiently justifying the proposed number of harbor seal takes¹⁰; and
 - omitting the required information in the previous hydroacoustic monitoring report¹¹.

Although NMFS plans to rectify these issues in the preamble and final incidental harassment authorization and Chevron plans to rectify the issues in the marine mammal and hydroacoustic monitoring report, they should have been discovered and corrected prior to publishing the *Federal Register* notice. Other proposed authorizations published in recent years have had similar issues, including Chevron's previous authorization¹². Thus, the Commission again recommends that NMFS review more thoroughly both the applications prior to deeming them complete and its notices prior to submitting them for publication in the *Federal Register*.

Appropriateness of the Level A harassment zones

As the Commission has indicated in previous letters, it supports NMFS's use of the updated permanent threshold shift (PTS) thresholds and associated weighting functions to estimate the Level A harassment zones. However, there are some shortcomings that need to be addressed regarding the methodology for determining the extent of the Level A harassment zones based on the associated PTS cumulative SEL (SEL_{cum}) thresholds for the various types of sound sources, including stationary sound sources. For determining the range to the SEL_{cum} thresholds, NMFS uses a baseline accumulation period of 24 hours unless an activity would occur for less time (e.g., 8 hours). The Commission supports that approach *if* an action proponent is able to conduct more sophisticated

⁶ 20logR rather than 15logR was used. NMFS indicated revisions would be included in the relevant sections of the preamble and associated tables in both the preamble and final authorization.

⁷ Based on source level and propagation loss issues, takes of California sea lions increased from 322 to 479 and from 342 to 509 for harbor porpoises. NMFS indicated it would revise the takes accordingly in the final authorization.

⁸ Which is discussed in a separate section herein.

⁹ The Commission informally noted that Chevron did not extrapolate the numbers of marine mammals taken based on the extent of the Level B harassment zones. Chevron plans to amend its monitoring report accordingly. NMFS must ensure that marine mammal takes are enumerated, including extrapolated, appropriately for the next monitoring report.

¹⁰ See the Addendum for more details.

¹¹ The Commission informally noted that the previous hydroacoustic monitoring memos, that informed the monitoring report, did not include the correct Level A and B harassment thresholds, consistent and relevant metrics and statistics, pulse durations, cumulative density functions/spectra, etc., as specified and required in sections 6.5 and 8 of the previous hydroacoustic monitoring plan. Chevron plans to revise the monitoring report and include the required information in the future monitoring report. The Commission also noted that source levels for vibratory driving were not integrated over the same timeframe. SPL_{rms} source levels were integrated over 10 sec and sound exposure level (SEL) source levels were integrated over 1 sec, resulting in higher source levels reported for SPL_{rms} . For vibratory pile driving, the SPL_{rms} and SEL source levels should be the same. NMFS indicated Chevron would use the correct 1-sec integration time for source levels based on both SELs and SPL_{rms} during vibratory pile-driving and -removal for the final authorization.

¹² See the Commission's [15 May 2018 letter](#).

sound propagation and animat modeling. However, that approach is less than ideal for action proponents that either are unable, or choose not, to conduct more sophisticated modeling.

As an example, the Level A harassment zone for high-frequency cetaceans was estimated to be greater than the Level B harassment zone during impact driving of 60-in steel piles (990 vs. 736 m, respectively)¹³. Based on the extent of those zones, it is assumed that an animal would experience PTS before responding behaviorally and leaving or avoiding the area. That notion runs counter to the logic that permanent and temporary physiological effects are expected to occur closest to the sound source, with behavioral responses triggered at lower received levels, and thus at farther distances. Specifically, the Level A and B harassment zones do not make sense biologically or acoustically due to NMFS's unrealistic assumption that the animals remain stationary throughout the entire day of the activity.¹⁴ By assuming a stationary receiver, all of the energy emitted during a 24-hour period is accumulated for the SEL_{cum} thresholds.

The Commission continues to believe that it would be prudent for NMFS to consult with scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of the Level A harassment zones based on the associated SEL_{cum} thresholds in such situations. Those zones should incorporate more than a few hammer strikes (or acoustic pulses) but less than an entire workday's worth of strikes (or pulses). This recommendation is the same as those made in the Commission's [11 July 2017 letter](#) on NMFS's final Technical Guidance and numerous previous letters. Other federal partners, including the Navy, have made similar recommendations. Since the Commission and other federal partners have determined that this issue needs resolution, the Commission recommends that NMFS make this issue a *priority* to resolve in the near future. The Commission understands that NMFS formed an internal committee to address this issue but believes that external expertise also is needed to resolve it. Therefore, the Commission recommends that NMFS consult with external scientists and acousticians to determine the appropriate accumulation time that action proponents should use to determine the extent of the Level A harassment zones based on the associated SEL_{cum} thresholds for the various types of sound sources, including stationary sound sources. Estimated swimming speeds of various species and behavior patterns (including residency patterns)¹⁵ should be considered. More specifically, animat modeling that considers various scenarios should be used to address this issue. This is especially important for ensuring that NMFS's assumptions regarding the appropriate accumulation time conform to real-world scenarios.

Bubble curtain efficacy

The Commission previously commented on the assumptions used by NMFS regarding the efficacy of bubble curtains¹⁶. Although NMFS had been applying presumed source level reductions inconsistently when bubble curtains were to be used during impact pile driving, it has adopted a standard 7-dB reduction in the last year. Variability in attenuation levels results from differences in

¹³ The Level A harassment zone also is greater than the Level B harassment zone for low-frequency cetaceans.

¹⁴ Which generally has been more of an issue for stationary sound sources. However, this also could be an issue for moving sound sources that have short distances between transect lines, in which the user spreadsheet may not be appropriate for use unless the source level could be adjusted accordingly.

¹⁵ Results from monitoring reports, including animal responses, submitted in support of incidental harassment authorizations issued by NMFS also may inform this matter.

¹⁶ Please review the Commission's [21 May 2018 letter](#) in conjunction with this letter.

device design, site and environmental conditions, and difficulties in properly installing and operating sound attenuation devices—the last of which could be alleviated with NMFS’s proposed requirement for Chevron to implement various bubble curtain performance standards¹⁷. However, the main reason bubble curtains do not achieve consistently reduced sound levels is because sound resonates through the ground into the far field.

The California Department of Transportation (Caltrans) conducted performance testing of bubble curtains. Effectiveness of the bubble curtain varied with direction and distance from the pile and under different tidal conditions (Caltrans 2005). In general, the bubble curtain provided the greatest reduction in SPLs in the near field¹⁸. At distances of 400–500 m, SPLs were reduced by only 1 to 2 dB. Although a flood tide may have had some effect on the performance of the bubble curtain, the SPL reductions were still only 5 to 10 dB at distances of 45–120 m. This finding confirms that, at greater distances, more of the sound emitted during impact pile driving resonates from the ground than through the water column¹⁹. Bubble curtains are not designed to, nor can they, attenuate ground-borne sound. Furthermore, Caltrans (2015) stated that, because of the uncertainties associated with the degree of attenuation that would be provided by a bubble curtain, an assumed source level reduction should be limited to 5 dB. The Commission contends that even a 5-dB reduction could lead to an underestimation of impacts.

Chevron conducted hydroacoustic measurements of 24-in concrete piles when a bubble curtain was employed in 2018. The *attenuated* source levels were 191 dB re 1 $\mu\text{Pa}_{\text{peak}}$, 173 dB re 1 $\mu\text{Pa}_{\text{rms}}$, and 161 dB re 1 $\mu\text{Pa}^2\text{-sec}$ at 10 m (84 Fed. Reg. 17794). Caltrans (2015) reported unattenuated source levels for 24-in concrete piles in San Francisco Bay, also in water depths of less than 5 m, similar to Chevron’s project area. Those *unattenuated* source levels were 185 dB re 1 $\mu\text{Pa}_{\text{peak}}$ and 172 dB re 1 $\mu\text{Pa}_{\text{rms}}$ at 10 m (Table I2-3 in Caltrans (2015))²⁰. It is unclear how *unattenuated* source levels can be that much less than *attenuated* source levels, particularly for SPL_{peak} . Bubble curtains originally were used to minimize both lethal and sub-lethal effects on fish in the near field caused by SPL_{peak} . In this instance, they clearly had no impact on reducing SPL_{peak} sound levels or far-field sound levels that are more problematic for marine mammals.

Given that Level A harassment is primarily based on thresholds²¹ associated with SEL_{cum} , it is the far-field sound that matters—particularly when the estimated ranges to Level A harassment are on the order of 500 to 1,000 m²². Level B harassment also would be estimated to occur at comparable or greater far-field distances. At those distances, reductions in sound levels have not consistently been shown to be 5 dB let alone 7 dB. Therefore, the Commission recommends that, for all relevant incidental take authorizations, NMFS refrain from using a source level reduction

¹⁷ NMFS is not including these requirements consistently for all incidental take authorizations that include bubble curtains.

¹⁸ In general, the majority of the sound level measurements have been collected in the near field (well within 100 m) for studies involving unattenuated and attenuated pile driving using a bubble curtain.

¹⁹ This phenomenon also was noted in Caltrans (2015). If sound was primarily being emitted through the water column, comparable reductions (or greater reductions with increasing water depths) should be produced with increasing distance from the source, not lesser reductions.

²⁰ Similar source levels were reported for deeper water depths in nearby Oakland.

²¹ NMFS uses dual metrics for determining the range to Level A harassment, SPL_{peak} and SEL_{cum} . However, the ranges to SPL_{peak} are always less than the ranges to SEL_{cum} for impact pile-driving activities.

²² As referenced in the proposed authorization.

factor for sound attenuation device implementation during impact pile driving, including the 60-in steel piles proposed for use by Chevron.

Adequate number and locations of PSOs

Based on the previous monitoring report, the Commission informally noted that the two PSOs often were located within a few hundred feet of one another and were not observing the far-field extents as effectively as they should have been. Most of the harbor seals observed during previous activities were within 200 m of the wharf²³. Chevron did not appear to conduct far-field observations. Thus, it is unclear how many harbor seals were within the Level B harassment zone²⁴ that extended beyond the harbor seal haul-out site at Castro Rocks²⁵.

To better assess animals present in the far field, the Commission suggested that Chevron station one PSO to observe animals in the near field and one PSO on the north end of the wharf to focus on far-field observations, facing north toward Castro Rocks. This is particularly important since the Level B harassment zones for all activities, except impact installation of 24-in concrete piles, extend well beyond Castro Rocks (see Figures 6-1 and 6-2 in Chevron's application). As such, the Commission recommends that NMFS *ensure* that Chevron uses its PSOs to monitor more sufficiently both the Level A and B harassment zones, including the shut-down zones—one PSO should be located in the near-field to ensure an unobstructed view of the shut-down zones and one PSO should be located on the north end of the wharf to monitor harbor seals in the far field, focusing on the area between the wharf and Castro Rocks.

Proposed one-year authorization renewals

NMFS has indicated that it may issue a second one-year²⁶ incidental harassment authorization renewal for this and other future authorizations if various criteria are met and after an expedited public comment period of 15 days (see 84 Fed. Reg. 17804 and the proposed authorization for details). The Commission agrees that NMFS should take appropriate steps to streamline the authorization process under section 101(a)(5)(D) of the MMPA to the extent possible. However, the Commission is concerned that the renewal process proposed in the *Federal Register* notice is inconsistent with the statutory requirements—section 101(a)(5)(D)(iii) clearly states that proposed authorizations are subject to a 30-day comment period²⁷.

Another potentially significant issue with the proposed 15-day comment period is the burden that it places on reviewers, who will need to review the original authorization and supporting

²³ All were observed within 305 m of the wharf.

²⁴ PSOs documented only 24 harbor seals during the 14 days of observations. The Commission believes that number is vastly underestimated given that the Level B harassment zone extended to more than 22 km from the site.

²⁵ Castro Rocks is 1.3 km north of the wharf. The greatest mean plus the standard error equate to 176 harbor seals at Castro Rocks from 2013–2017.

²⁶ NMFS informed the Commission that the renewal would be issued as a one-time opportunity, after which time a new authorization application would be required. NMFS has yet to specify this in any *Federal Register* notice detailing the new proposed renewal process but should do so.

²⁷ See also the legislative history of section 101(a)(5)(D), which states "...in some instances, a request will be made for an authorization identical to one issued the previous year. In such circumstances, the Committee expects the Secretary to act expeditiously in complying with the notice and comment requirements." (H.R. Rep. No. 439, 103d Cong., 2d Sess. 29 (1994)). The referenced "notice and comment requirements" specify a 30-day comment period.

documentation²⁸, the draft monitoring report(s), the renewal application or request²⁹, and the proposed authorization and then formulate comments very quickly. Depending on how frequently NMFS invokes the renewal option, how much the proposed renewal or the information on which it is based deviates from the original authorization, and how complicated the activities and the taking authorization is, those who try to comment on all proposed authorizations and renewals, such as the Commission, would be hard pressed to do so within the proposed 15-day comment period. Therefore, the Commission recommends that NMFS refrain from using the proposed renewal process for Chevron's authorization. The renewal process should be used sparingly and selectively, by limiting its use only to those proposed incidental harassment authorizations that are expected to have the lowest levels of impacts to marine mammals and that require the least complex analyses. Notices for other types of activities should not even include the possibility that a renewal might be issued using the proposed foreshortened 15-day comment period. If NMFS intends to use the renewal process frequently *or* for authorizations that require a more complex review (such as Chevron's authorization) or for which much new information has been generated (e.g., multiple or extensive monitoring reports), the Commission recommends that NMFS provide the Commission and other reviewers the full 30-day comment opportunity set forth in section 101(a)(5)(D)(iii) of the MMPA.

Adequate opportunity to consider public comments

The Commission has repeatedly expressed concern over NMFS's failure to provide an adequate opportunity for public comment. The opportunity for public comment provided under section 101(a)(5)(D)(iii) of the MMPA should be a meaningful one that allows NMFS sufficient time to not only solicit public comments, but also to analyze, assess, and respond to those comments and revise, as appropriate, its proposed authorization and rationale in light of those comments. Thus, submittal of the necessary documentation by applicants and processing of applications by NMFS must be timelier, thus avoiding abbreviated timeframes in which NMFS is able to consider the comments received. In this instance, the public comment period closes on 28 May 2019, four days before Chevron's activities are scheduled to begin. Chevron did not submit its application until 17 January 2019, which reduced the time NMFS had available to review and comment on it, draft the proposed authorization, and ultimately consider public comments before issuing the final authorization. This is the second year that Chevron failed to submit its application in a timeframe that allowed adequate time for review and public comment. Given the issues associated with these applications, this should be considered unacceptable.

NMFS guidance states that applicants must submit their applications 6 to 9 months in advance of the intended project start date and that some incidental harassment authorizations may take longer to process³⁰. Since Chevron's activities are scheduled to begin only a few days after the comment period closes, the Commission is not convinced that NMFS has sufficient time to review the Commission's or the public's comments or to revise the proposed authorization accordingly. Therefore, the Commission recommends that, NMFS (1) request that Chevron submit any future authorizations at least 6 months prior to the planned start date for incidental harassment

²⁸ Including the original application, hydroacoustic and marine mammal monitoring plans, take estimation spreadsheets, etc.

²⁹ Including any proposed changes or any new information.

³⁰ <https://www.fisheries.noaa.gov/node/23111>

Ms. Jolie Harrison
14 May 2019
Page 8

authorizations and 9 months prior for rulemakings and (2) take all steps necessary to ensure that it publishes and finalizes proposed incidental harassment authorizations far enough in advance of the planned start date of the proposed activities to ensure full consideration is given to any and all comments received.

Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,

A handwritten signature in blue ink that reads "Peter O. Thomas". The signature is fluid and cursive, with the first name "Peter" and last name "Thomas" being more prominent than the middle initial "O".

Peter O. Thomas, Ph.D.,
Executive Director

References

- Caltrans. 2005. San Francisco–Oakland Bay Bridge east span seismic safety project: Hydroacoustic monitoring report. State of California Department of Transportation, Sacramento, California. 244 pages.
- Caltrans. 2015. Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. State of California Department of Transportation, Sacramento, California. 532 pages.

Addendum

Harbor seal takes

Given the number of harbor seals estimated to be taken during Chevron's previous activities, NMFS reduced the estimated number of Level A and B harassment takes³¹ for harbor seals by 75 percent. NMFS specifically stated that the 2018 authorization overestimated the number of harbor seal takes by a considerable margin, based on PSOs documenting less than 1 percent of the authorized number of takes³² (84 Fed. Reg. 17797). The Commission informally noted that both the number of harbor seals taken during the 2018 activities and the assumed 25-percent Level A and B harassment take estimates for 2019 activities³³ were vastly underestimated. As noted previously, the Level B harassment zones for all activities, except those involving 24-in concrete piles, extend beyond Castro Rocks. Thus, Chevron has the potential to take all the harbor seals that haul out at Castro Rocks on those 37 days of activities, resulting in 6,512 harbor seal takes³⁴. For the remaining 30 days of activities, NMFS should have estimated the number of Level B harassment takes based on the maximum number observed on a given day during previous activities, which is two³⁵. The Level B harassment takes should be 6,572 rather than 2,992 for harbor seals.

In addition, the Level A harassment zone for impact installation of 60-in steel piles extends to 445 m, which is close to Castro Rocks. Therefore, NMFS's original estimate of 64 Level A harassment takes per day is not considered an overestimate³⁶. The Level A harassment takes should be 513³⁷ rather than 128 for harbor seals. NMFS indicated that it will revise the harbor seal takes accordingly in the preamble and final authorization.

³¹ Based on 176 harbor seals potentially taken on 67 days.

³² The Commission notes that Chevron similarly monitored approximately 1 percent of the Level B harassment zone during vibratory pile driving. So the level of observed taking and extent of the observed zone are nearly the same.

³³ Equating to 2,992 harbor seals.

³⁴ Based on 176 harbor seals potentially taken on 37 days.

³⁵ The Level B harassment zone for concrete installation of 24-in concrete piles is only 45 m.

³⁶ Based on 8 days of activities, 512 Level A harassment takes could occur during impact installation of 60-in steel piles.

³⁷ Which accounts for 1 Level A harassment take during impact installation of 36-in steel piles as well.