



# MARINE MAMMAL COMMISSION

29 June 2020

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 the City and County of San Francisco (City of SF) seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA) to take small numbers of marine mammals by harassment. The taking would be incidental to various construction activities on Treasure Island in San Francisco Bay, California. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 9 June 2020 notice (85 Fed. Reg. 35271) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

City of SF plans to install and remove piles during construction of a ferry terminal, breakwater, and fireboat access pier and removal of an old pier on Treasure Island. Operators would (1) install and remove up to 2 36-in steel pipe piles and 196 14-in x 89-ft Hpiles using a vibratory hammer, (2) install up to 8 36-in and 5 48-in steel pipe piles, 52 24-in concrete piles, and 120 14-in x 48-in concrete sheet<sup>1</sup> piles using a vibratory and/or impact hammer, and (3) remove up to 198 12-in timber piles using a vibratory hammer, direct pull, or cutting them at the mudline. Up to two hammers could be used at the same site or at two different sites during the proposed activities. City of SF's activities could occur on up to 189 days, weather permitting, during daylight hours only.

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—

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<sup>1</sup> The Commission informally noted that the preamble incorrectly specified that (1) 186 rather than 196 14-in x 89-ft Hpiles piles would be installed and removed, (2) 9 rather than 8 36-in steel pipe piles would be installed, (3) 120 14-in x 89-ft Hpiles rather than 120 14-in x 48-in concrete sheet piles would be installed, and (4) a total of 784 rather than 779 piles would be installed or removed. NMFS indicated these details would be revised in the notice for final authorization issuance.

- ceasing in-water heavy machinery activities if any marine mammal comes within 10 m of the equipment and reducing vessel speed to the minimum level required to maintain steerage and safe working conditions;
- using standard soft-start, delay, and shut-down procedures;
- using up to two land-based qualified protected species observers to monitor the Level A<sup>2</sup> and B harassment zones for 30 minutes before, during, and for 30 minutes after 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 takes are met, approaches or is observed within the Level A and/or B harassment zone;
- reporting injured and dead marine mammals to the Office of Protected Resources and the West Coast Regional Stranding Coordinator and ceasing activities, if appropriate; and
- submitting a draft and final report<sup>3</sup>.

### Source levels, harassment zones, and numbers of takes

The Commission informally noted multiple issues regarding the source levels used and the Level A and B harassment zones estimated by NMFS. Those issues included—

- The source levels for impact installation of 48-in steel pipe piles based on Caltrans (2015) were inappropriate and underestimated as compared to source levels from Austin et al. (2016). The Caltrans (2015) source levels were from a single pile driven within a dewatered casing in 1.5 m of water in the Russian River—source levels that are only applicable to driving on land or in a dewatered casing. The source levels of 186.7 dB re 1  $\mu\text{Pa}^2\text{-sec}$  at 11 m, 198.6 dB re 1  $\mu\text{Pa}_{\text{root-mean-square (rms)}}$  at 10 m, and 212.5 dB re 1  $\mu\text{Pa}_{\text{peak}}$  at 11 m from Austin et al. (2016) should have been used by NMFS in Tables 5 and 9 of the *Federal Register* notice consistent with other recent authorizations. The revised source levels would result in (1) Level A harassment zones of 1,138 m rather than 798 m for low-frequency (LF) cetaceans, 41 m rather than 28 m for mid-frequency (MF) cetaceans, 1,356 m rather than 950 m for high-frequency (HF) cetaceans, 609 m rather than 427 m for phocids, and 44 rather than 31 m for otariids in Table 10 of the notice<sup>4</sup>; (2) a Level B harassment zone of 3,744 m rather

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<sup>2</sup> And shut-down zones.

<sup>3</sup> The Commission informally noted that, in addition to extrapolating Level B harassment takes for the various species, the City of SF should be required to extrapolate the Level A harassment takes of harbor porpoises due to the extents of the revised zones discussed herein. NMFS indicated that it would add that requirement to the notice for final authorization issuance and condition 5(b)(xii) of the final authorization.

<sup>4</sup> The Commission informally noted that the Level A harassment zones that extend beyond the shut-down zones must be specified in the final authorization. NMFS indicated that it would include them in the final authorization.

- than 1,585 m in Table 8<sup>5</sup> of the notice<sup>6</sup>; and (3) shut-down zones of 50 m rather than 30 m for MF cetaceans and otariids in Table 13 of the notice<sup>7</sup>.
- The lower rather than higher of the two sets of source levels was used for impact installation of 14-in x 48-in concrete sheet piles from Illingworth & Rodkin, Inc. (Illingworth and Rodkin; 2019b)<sup>8</sup>. Since measurements are only available for those two piles, the higher source levels of 147 dB re 1  $\mu\text{Pa}^2\text{-sec}$  at 32 m, 157 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 32 m, and 168 dB re 1  $\mu\text{Pa}_{\text{peak}}$  at 32 m should have been used in Tables 5 and 9 of the *Federal Register* notice. The revised source levels would result in (1) Level A harassment zones of 9 m rather than 8 m for LF cetaceans, 11 m rather than 10 m for HF cetaceans, 5 m rather than 4 m for phocids, and 0.4 m rather than 0.3 m for otariids in Table 10 of the notice and (2) a shut-down zone of 20 m rather than 10 m for HF cetaceans in Table 13 of the notice<sup>7</sup>.
  - The assumption that vibratory removal of 12-in timber piles at the pier would not add to the source levels during installation of piles at the breakwater was incorrect in Table 7 of the *Federal Register* notice<sup>9</sup>. Therefore, the combined source level and resulting Level B harassment zone were underestimated when a vibratory hammer would be used to install 14-in x 89-ft H piles at the breakwater and a vibratory hammer would be used to remove 12-in timber piles at the pier. The combined source level would be 155 rather than 153 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m resulting in a Level B harassment zone of 2,154 m rather than 1,585 m in Table 8<sup>5</sup> of the *Federal Register* notice.
  - The source levels based on sound pressure level rms ( $\text{SPL}_{\text{rms}}$ ) were used instead of the source levels based on single-strike sound exposure level ( $\text{SEL}_{\text{s-s}}$ ) to estimate the Level A harassment zones for impact installation of the various piles in Table 9 of the *Federal Register* notice. Neither the weighting factor adjustments nor the pulse durations that must be used in conjunction with  $\text{SPL}_{\text{rms}}$  source levels were included in Table 9. More concerning is that NMFS underestimated the Level A harassment zones for impact installation of 24-in concrete piles by incorrectly assuming that the pulse duration was 100 msec in Table 10. NMFS stipulated the source levels as 164 dB re 1  $\mu\text{Pa}^2\text{-sec}$  at 10 m and 170 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m in Table 5 of the notice based on Illingworth and Rodkin (2019a). A 6-dB difference between the  $\text{SEL}_{\text{s-s}}$  and  $\text{SPL}_{\text{rms}}$  source levels equates to a pulse duration of 250 not 100 msec<sup>10</sup>. If one uses either 164 dB re 1  $\mu\text{Pa}^2\text{-sec}$  at 10 m or the 170 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m and 250 msec pulse duration in NMFS's user spreadsheet, the resulting Level A harassment zones are the same and have been underestimated by a factor of nearly two compared to those in Table 10 of the notice. Use of the appropriate SEL-based source level would result in (1) Level A harassment zones for impact installation of 24-in concrete piles of 136 m

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<sup>5</sup> Table 2 in the final authorization would need to be amended as well.

<sup>6</sup> Table 6 in the *Federal Register* notice incorrectly stated that, when both an impact and vibratory hammer are used, the Level B harassment zone should be based on the zone associated with the vibratory hammer. The Level B harassment zone should be based on the larger of the two Level B harassment zones, which in this case is the zone associated with impact pile driving. Table 7 also incorrectly noted that the loudest sound source combination for Level B harassment would be installation of 14-in x 89-ft H piles using two vibratory hammers for the Ferry Pier rather than impact installation of 48-in steel pipe piles.

<sup>7</sup> Table 3 in the final authorization would need to be amended as well.

<sup>8</sup> The Commission also notes that Illingworth and Rodkin (2019b) is not a hydroacoustic monitoring report or formal sound source verification memo, rather it is two emails with embedded tables and figures. As such, it should have been documented as a pers. comm. between Illingworth and Rodkin and WRA-CA.

<sup>9</sup> The assertion that source levels are identical for vibratory removal of 12-in timber piles and vibratory installation of 14-in x 89-ft H piles also was incorrect, as the source levels were 153 and 150 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m, respectively.

<sup>10</sup>  $\text{SEL}_{\text{s-s}} = \text{SPL}_{\text{rms}} + 10 \log(T)$ , where T is the pulse duration.

rather than 74 m for LF cetaceans, 5 m rather than 3 m for MF cetaceans, 162 m rather than 88 m for HF cetaceans, 73 m rather than 39 m for phocids, and 5 m rather than 3 m for otariids in Table 10 of the notice and (2) a shut-down zone of at least 75 m instead of 40 m for phocids<sup>7</sup>.

NMFS indicated that it would fix all of the aforementioned issues except the last point. Based on revising the Level A and B harassment zones and ensonified areas and numbers of days that activities could occur, NMFS indicated that it planned to increase the number of Level A harassment takes of harbor seals from 116 to 236 and the Level B harassment takes of harbor seals from 12,173 to 12,672, of harbor porpoises from 522 to 548, and of California sea lions from 490 to 514.

Although NMFS indicated that it would rectify these issues in the *Federal Register* notice for authorization issuance and final authorization, these types of issues have been ongoing<sup>11</sup> and the consistency and appropriateness of proxy source levels must be improved. As such, the Commission again recommends that NMFS (1) have its experts in underwater acoustics and bioacoustics review and finalize as soon as possible, its recommended proxy source levels for impact pile driving of the various pile types and sizes, (2) compile and analyze the source level data for vibratory pile driving of the various pile types and sizes in the near term, and (3) ensure action proponents use consistent and appropriate proxy source levels in all future rulemakings and proposed incidental harassment authorizations. If a subset of source level data is currently available (i.e., vibratory pile driving of 24-in steel piles), those data should be reviewed immediately and used—the data should not be ignored until the other vibratory source levels are finalized.

With regard to the Commission's last point, NMFS indicated that it could not provide a response and would look into the issue. At the most basic level, NMFS should always be using an SEL-based source level, when available, for estimating the Level A harassment zone during impact pile driving consistent with its own guidance manual for NMFS's user spreadsheet (see section 6.6.E1.3 in NMFS 2018). Specifically, NMFS (2018) asserts that, if the user has an unweighted source level expressed in the SEL metric, then determining the pulse duration is not necessary and it advises users to rely on the method using the SEL source level, as determining the pulse duration (or appropriate default) is not necessary. The Commission informally made both points, that (1) the SEL<sub>s-s</sub> source levels should be used since they are available and (2) it is unnecessary to determine the pulse duration or use the default 100-msec pulse duration. NMFS (2018) indicated that default pulse durations are needed only when the relevant activity-specific information is unavailable (see Appendix B). In this instance, it is not only unnecessary but inappropriate to use the default 100-msec pulse duration, which is less than the 250-msec pulse duration based on the actual source level data. Moreover, NMFS indicated that it would amend the Level A harassment zones by using the revised SEL<sub>s-s</sub> source levels denoted herein for impact installation of the 48-in steel piles and the 14-in x 48-in concrete sheet piles<sup>12</sup>. The hesitance to use the SEL<sub>s-s</sub> source level for impact installation of 24-in concrete piles is puzzling. The Commission recommends that NMFS (1) use 164 dB re 1  $\mu\text{Pa}^2$ -

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<sup>11</sup> For example, see the Commission's recent [5 June 2020](#), [20 April 2020](#), [23 March 2020](#), [10 February 2020](#), [3 February 2020](#), [23 January 2020](#), and [9 January 2020](#) letters, even though this issue dates back to at least the Commission's [29 August 2016](#) letter.

<sup>12</sup> In those instances, the Commission informally noted that it was inappropriate to use a pulse duration of 100 msec and that the SEL-based source levels should be used to estimate the Level A harassment zones.

sec at 10 m rather than 170 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m and a 100-msec pulse duration to re-estimate the Level A harassment zones during impact installation of 24-in concrete piles, (2) revise the Level A harassment zones to be 136 m rather than 74 m for LF cetaceans, 5 m rather than 3 m for MF cetaceans, 162 m rather than 88 m for HF cetaceans, 73 m rather than 39 m for phocids, and 5 m rather than 3 m for otariids, (3) revise the shut-down zone to be 100 m rather than 80 m for LF cetaceans and at least 75 m rather than 40 m for phocids, and (4) ensure all tables in the notice for final authorization issuance and the final authorization include those revisions. If NMFS's acoustic expert determines that there are issues with the source levels reported by Illingworth and Rodkin (2019a), the Commission recommends that NMFS use a source level of 166 dB re 1  $\mu\text{Pa}^2\text{-sec}$  at 10  $\text{m}^{13}$  as reported in Caltrans (2015) for impact installation of 24-in concrete piles<sup>14</sup> to re-estimate the Level A harassment zones and revise the shut-down zones accordingly. The Commission further recommends that, for all incidental take authorizations involving impact pile driving, NMFS (1) use the  $\text{SEL}_{\text{s-s}}$  source levels, when available, to estimate the Level A harassment zones consistent with NMFS (2018), (2) if an  $\text{SEL}_{\text{s-s}}$  source level is not available, use the pulse duration that accompanies the  $\text{SPL}_{\text{rms}}$  source level, and (3) if neither an  $\text{SEL}_{\text{s-s}}$  source level nor a specified pulse duration based on the  $\text{SPL}_{\text{rms}}$  source level is available, then and only then use the 100-msec pulse duration default. NMFS should consult with its experts in underwater acoustics and bioacoustics on this matter.

## Number of PSOs

NMFS would require the City of SF to use two land-based PSOs to monitor the various zones during vibratory installation of 36- and 48-in piles<sup>15</sup> or when pile driving or removal occurs at two sites simultaneously (e.g., the pier and breakwater). The Commission agrees that at least two PSOs are necessary in those situations but contends that two PSOs should be monitoring during all of the activities. The Level B harassment zones have been revised to 3,154 m during impact installation of 35- and 48-in steel piles. A single PSO cannot adequately monitor those zones, as well as the species-specific shut-down zones. Furthermore, the activities are occurring in or adjacent to known harbor seal foraging areas (see Figure 2 in the application), harbor seals haul out regularly 1.4 km away on Yerba Buena Island, and harbor seals were prevalent during monitoring activities in 2019. The Commission recommends that NMFS (1) require the City of SF to have at least two PSOs monitoring during all activities, with at least one PSO monitoring the shut-down zones at each pile-driving or -removal site, one PSO near Pier 33 during vibratory installation of 36- and 48-in steel piles, and one PSO stationed south toward Yerba Buena Island during all other pile-driving and -removal activities and (2) specify the number and location of PSOs for each of the various activities in condition 5(iv) in the final authorization.

## In-water heavy machinery activities

NMFS indicated in the *Federal Register* notice that in-water heavy machinery activities included movement of the barge to the pile location and positioning of the pile on the substrate (85 Fed. Reg. 35288). However, condition 4(a) in the draft authorization specified that in-water heavy

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<sup>13</sup> And 176 dB re 1  $\mu\text{Pa}_{\text{rms}}$  at 10 m and 188 dB re 1  $\mu\text{Pa}_{\text{peak}}$  at 10 m.

<sup>14</sup> The source levels from Caltrans (2015) are comparable to those reported in Illingworth and Rodkin (2017) for impact installation of concrete piles at Naval Station Norfolk and are based on piles being driven in approximately the same water depths (10–15 m) as the proxy source levels for the 36-in steel pipe piles (10 m) that NMFS used.

<sup>15</sup> A PSO would be stationed near Pier 33 since the Level B harassment zone extends to more than 34 km and is clipped by land at the San Francisco waterfront.

machinery activities included use of barge-mounted excavators or dredging as examples. The Commission has informally and formally<sup>16</sup> noted that in-water heavy machinery activities generally always include movement of a barge to the pile location and positioning of the pile on the substrate, while few activities actually involve barge-mounted excavators and dredging. As such, the Commission recommends that NMFS revise its standard condition for ceasing in-water heavy machinery activities to include, as examples, movement of the barge to the pile location, positioning of the pile on the substrate, use of barge-mounted excavators, and dredging in *all* draft and final incidental take authorizations involving pile driving and removal.

### **Tally of takes**

Although it is unclear from both the preamble and the draft authorization whether City of SF will keep a running tally of the total Level B harassment takes, including observed and extrapolated takes, it is imperative that the City of SF do so to ensure that the takes are within the authorized limits, and the authorized numbers of takes are not exceeded, to implement effectively condition 4(h) in the draft authorization. The Commission recommends that NMFS ensure that City of SF keeps a running tally of the total takes, based on observed and extrapolated takes, for Level B harassment consistent with condition 4(h) of the final authorization.

### **Proposed one-year authorization renewals**

In this instance and consistent with previous Commission recommendations, NMFS stipulated that a renewal is a *one-time opportunity* (a) in the *Federal Register* notice (see 85 Fed. Reg. 35292), (b) on its webpage(s) detailing the renewal process (see the revised webpages<sup>17</sup>), and (c) in its draft authorization for the City of SF (see condition 8<sup>18</sup>). Although the Commission expects that this tack will be taken for *all* proposed and final incidental harassment authorizations that include the possibility of a renewal, it still has ongoing concerns regarding NMFS's renewal process. Those concerns can be reviewed in its [10 February 2020](#) letter. As such, the Commission again recommends that NMFS refrain from issuing renewals for any authorization and instead use its abbreviated *Federal Register* notice process, which is similarly expeditious and fulfills NMFS's intent to maximize efficiencies.

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

Sincerely,



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

cc: Amy Scholik-Schlomer, NMFS

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<sup>16</sup> e.g., see the Commission's [28 April 2020 letter](#).

<sup>17</sup> See <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act> and <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-harassment-authorization-renewals>.

<sup>18</sup> <https://www.fisheries.noaa.gov/webdam/download/107318912>.

## References

- Austin, M., S. Denes, J. MacDonnell, and G. Warner. 2016. Hydroacoustic monitoring report: Anchorage port modernization project test pile program. Version 3.0. JASCO Applied Sciences Inc., Anchorage, Alaska. 215 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.
- Illingworth and Rodkin. 2017. Pile-driving noise measurements at Atlantic Fleet Naval Installation: 28 May 2013–28 April 2016. Illingworth and Rodkin, Petaluma, California. 152 pages.
- Illingworth and Rodkin. 2019a. Pile driving noise measurements for the Alameda Seaplane Lagoon ferry terminal. Illingworth and Rodkin, Cotati, California. 39 pages.
- Illingworth and Rodkin. 2019b. Sound source measurements at Treasure Island ferry dock project.
- NMFS 2018. Manual for optional user spreadsheet tool (version 2.0) for: 2018 Technical guidance for assessing the effects of anthropogenic sound on marine mammal hearing (version 2.0): Underwater thresholds for onset of permanent and temporary threshold shifts. NMFS Office of Protected Resources, Silver Spring, Maryland. 109 pages.