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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XA233]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Alameda Marina Shoreline Improvement Project

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of two incidental harassment authorizations.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued two incidental harassment authorizations (IHAs) to Pacific Shops, Inc. (Pacific Shops) to incidentally harass, by Level B harassment only, marine mammals during construction activities associated with the Alameda Marina Shoreline Improvement Project in Alameda, CA.

DATES: These authorizations are effective from August 1, 2020 to July 31, 2021 for Year 1 activities, and August 1, 2021 to July 31, 2022 for Year 2 activities.

FOR FURTHER INFORMATION CONTACT: Leah Davis, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth.

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On November 25, 2019, NMFS received a request from Pacific Shops, Inc. (Pacific Shops) for two IHAs to take marine mammals incidental to construction activities at the Alameda Marina in Alameda, CA over two years. The applicant expects to conduct vibratory pile removal and vibratory and impact installation during Year 1, and vibratory and impact pile installation during Year 2. The application was deemed adequate and complete on April 9, 2020. Pacific Shops' request is for take of a small number of six species of marine mammals, by Level B harassment. Neither Pacific Shops nor NMFS expects serious injury or mortality to result from this activity and, therefore, IHAs are appropriate.

Description of the Specified Activity

Overview

Pacific Shops is planning to conduct improvements to the Alameda Marina and its shoreline in Alameda, CA over a two-year construction period. The project will address climate resiliency and rehabilitate existing shoreline and marina facilities so that the shoreline meets current seismic resistance criteria and addresses sea level rise risk. The project will update the existing marina facilities, reconfigure some of the existing marina piers, and provide the public with more aquatic recreational opportunities. The construction activities include vibratory and impact pile driving and removal which will ensound the Oakland Estuary over approximately 68 days in Year 1, and 98 days in Year 2.

A detailed description of the planned project is provided in the *Federal Register* notice for the proposed IHA (85 FR 23790; April 29, 2020). Since that time, no changes have been made to the planned construction activities. Therefore, a detailed

description is not provided here. Please refer to that *Federal Register* notice for the description of the specific activity.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to Pacific Shops was published in the *Federal Register* on April 29, 2020 (85 FR 23790). That notice described, in detail, Pacific Shops' activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals, their habitat, planned amount and manner of take, and planned mitigation, monitoring and reporting measures. During the 30-day public comment period, NMFS received a comment letter from the Marine Mammal Commission (Commission). NMFS also received a letter from the general public. All substantive recommendations are responded to here. Please see the Commission's letter for full detail regarding justification for their recommendations, available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-construction-activities>.

Comment 1: Regarding bubble curtains, the Commission recommends that NMFS (1) consult with acousticians, including those at UW-APL, regarding the appropriate source level reduction factor to use to minimize near-field (<100 meters (m)) and far-field (>100 m) effects on marine mammals or (2) use the data NMFS has compiled regarding source level reductions at 10 m for near-field effects and assume no source level reduction for far-field effects for all relevant incidental take authorizations. The Commission explicitly requests a detailed response to both parts of this recommendation if NMFS does not follow or adopt it, as required under section 202(d) of the MMPA.

Response: NMFS has previously outlined our rationale for the bubble curtain source level reduction factor (84 FR 64833, November 25, 2019) in response to a similar comment from the Commission. NMFS disagrees with the Commission regarding this issue, and does not adopt the recommendation. NMFS will provide a detailed explanation of its decision within 120 days, as required by section 202(d) of the MMPA.

Comment 2: The Commission recommends that NMFS increase the shutdown zone for high-frequency cetaceans during impact installation of 36-inch (in) steel piles from 400 m to 410 m to include the entire Level A harassment zone.

Response: NMFS does not concur and does not accept the Commission's recommendation. Given the duration component associated with actual occurrence of Level A harassment take, a 400 m shutdown zone is sufficient to prevent any potential for permanent threshold shift (PTS), i.e., Level A harassment take, in an estimated 406m Level A harassment zone.

Comment 3: The Commission recommends that NMFS authorize up to five Level A harassment takes of harbor seals during Year 2 to account for protected species observers' (PSO) inability to monitor where seals are located underwater and for how long, and for visual obstructions that limit PSO observations of the zones. The Commission states that any seal that surfaces in the Level A harassment zone would be enumerated as a Level A harassment take.

Response: NMFS does not adopt the Commission's recommendation to authorize Level A harassment take of harbor seals. Given the duration component associated with potential occurrence of permanent threshold shift (PTS), NMFS disagrees with the assumption that a seal which appears in the Level A harassment zone has necessarily

incurred PTS (Level A harassment). As stated in this *Federal Register* notice, the *Federal Register* notice for the proposed IHA, and proposed and final IHAs, monitoring reports must include the estimated time that an observed marine mammal spent within the Level A and Level B harassment zones while the source was active. However, simply because a PSO observes an animal within the Level A harassment zone does not mean that animal was taken by Level A harassment.

Comment 4: The Commission suggested that NMFS underestimated California sea lion takes based on Pacific Shops' in-situ monitoring, and recommended that NMFS authorize at least 17, rather than 14, Level B harassment takes of California sea lions in Year 1 and 25, rather than 20, Level B harassment takes in Year 2.

Response: NMFS agrees that we must authorize a sufficient number of Level B harassment takes. Pacific Shops monitored for marine mammals at the project site on four days in June 2019 and observed one sea lion during that period. NMFS considered that sighting in combination with sightings reported through other avenues (see Estimated Take section, below). NMFS concurred with Pacific Shops' estimate that one California sea lion may occur in the project area every five project days, resulting in an estimated 14 Level B harassment takes in Year 1, and 20 Level B harassment takes in Year 2. NMFS disagrees with the Commission's recommended take estimate. It is not appropriate to apply Pacific Shops' sighting of one sea lion over four days of monitoring as a sighting rate, given the limited monitoring period and additional information available. The additional information suggests that the sighting rate is less than one sea lion per four days.

Comment 5: The Commission provided several recommendations related to Pacific Shops' proposed hydroacoustic monitoring plan. It recommends that NMFS (1) ensure that its internal acoustics expert reviews (a) the hydroacoustic monitoring plan before Pacific Shops implements it and (b) the hydroacoustic monitoring data and resulting Level A and B harassment zones before NMFS revises them and (2) specify in section 6(c) of the final authorizations a sufficient number of each type and size of pile and installation/removal method for which measurements would be obtained. The Commission also recommended that NMFS require all applicants proposing or required to conduct hydroacoustic monitoring to provide their proposed hydroacoustic monitoring plans prior to publication of the proposed authorization in the *Federal Register*.

Response: NMFS agrees that it is important to ensure adequate review of hydroacoustic monitoring plans before they are implemented by applicants and monitoring data before Level A and Level B harassment zones are subsequently adjusted, if appropriate. Pacific Shops provided a copy of their proposed plan to NMFS prior to NMFS' publication of the proposed authorization in the *Federal Register*. NMFS reviewed Pacific Shops' proposed hydroacoustic monitoring plan, and NMFS advised Pacific Shops on required adjustments to support adequate data collection according to accepted methodological standards. NMFS will also review the resulting data prior to adjusting the Level A and Level B harassment zone sizes. The issued IHA notes that Pacific Shops must conduct acoustic monitoring for the number of each pile type and size indicated in the hydroacoustic monitoring plan. NMFS feels it is important to state the objectives of the proposed acoustic monitoring in the notice of the proposed IHA.

However, the basic methodological details follow widely accepted practices and, therefore, it is unnecessary to provide these plans for public review.

Comment 6: The Commission recommends that NMFS require Pacific Shops to position its far-field protected species observer (PSO) sufficiently in the far field and not within a few hundred meters of the pile-driving or –removal site, considering locations on the perimeter of Grand Harbor, Fortmann Marina, or Union Point Marina, along the Coast Guard (CG) Island, and at the farthest points of land surrounding Encinal Basin depending on the activity conducted. Location of the PSOs should be stipulated in the final authorizations.

Response: Most of the suggested locations were included in the applicant’s initial evaluation of potential monitoring locations. After re-evaluating the proposed locations, and all of the locations suggested by the Commission, NMFS and the applicant still find that the best location for the far field PSO is on top of the barge at the end of Pier 5 (12.6 ft. (3.8 m) high) within the Alameda Marina. This elevated location has an excellent view in all directions, is safe for the observer, and continued access for PSOs is not a concern.

The applicant raised concerns regarding access, visibility, and safety at the other locations. The applicant did not expect that they would be granted long-term access to the neighboring marinas, as they are privately owned. CG Island is an active Coast Guard base, and access to this federal site is very limited and generally not accessible to non-military personnel. It is also unlikely that these sites would allow the applicant to build a tower structure for elevated viewing at these locations. Given the topography, elevated viewing significantly enhances visibility of the monitoring area.

Additionally, except for CG Island, each of the locations is inset somewhat into the shoreline, thereby restricting visibility in one direction or another. The dock on the southwest side of CG Island could potentially provide good visibility except when ships are at the dock, when visibility would be almost completely blocked.

The applicant previously considered a public park just north of Union Point Marina where access would be less of an issue, but it is not a safe location for observers.

The near-field PSO's view will be limited to the marina. The far-field PSO (on the barge) will be in an excellent position to alert the near-field PSO of approaching animals. Therefore, as noted above, NMFS requires Pacific Shops to station their far-field PSO on the barge at the end of Pier 5, and has included the final PSO locations in the authorizations.

Comment 7: 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.

Response: NMFS does not adopt this recommendation as stated. The examples are simply intended to serve as examples. We will consider revising these examples on a case-specific basis.

Comment 8: The Commission recommends that NMFS ensure that Pacific Shops keeps a running tally of the total takes, based on observed and extrapolated takes, for Level B harassment consistent with condition 4(i) of the final authorizations.

Response: We agree that Pacific Shops must ensure they do not exceed authorized takes but do not concur with the recommendation. NMFS is not responsible for ensuring that Pacific Shops does not operate in violation of an issued IHA.

Comment 9: The Commission recommends that NMFS refrain from issuing renewals for any authorization and instead use its abbreviated *Federal Register* notice process. If NMFS continues to propose to issue renewals, the Commission recommends that it (1) stipulate that a renewal is a one-time opportunity (a) in all *Federal Register* notices requesting comments on the possibility of a renewal, (b) on its webpage detailing the renewal process, and (c) in all draft and final authorizations that include a term and condition for a renewal and, (2) if NMFS declines to adopt this recommendation, explain fully its rationale for not doing so.

Response: NMFS has stated in the issued IHAs that a renewal is a one-time opportunity. NMFS will provide a further detailed explanation of its decision within 120 days, as required by section 202(d) of the MMPA.

Comment 10: The Commission expressed concern that, if a renewal is issued for Year 1 construction activities, the timing of these activities could overlap with the scheduled Year 2 construction activities. The Commission recommends that NMFS either make its determinations regarding small numbers and negligible impact based on the total number and type of taking for each species or stock for both authorizations combined or delay the Year 2 activities until 2022 if a renewal authorization is issued for the Year 1 activities.

Response: Pacific Shops' proposed construction activities would occur in linear fashion according to the schedule that informs their request for two consecutive IHAs,

and which was described in detail in our notice of proposed IHAs. Therefore, activities described in association with the Year 1 IHA would not occur concurrently with activities described in association with the Year 2 IHA, whether occurring under the issued Year 1 IHA or under a renewal of the Year 1 IHA, if necessary. Therefore, the Commission's recommendation is moot.

Changes from the Proposed IHA to Final IHA

The applicant is now planning to begin construction in August 2020 rather than June 2020, as included in the proposed authorization. As such, the effective dates of the IHAs are now August 1, 2020- July 31, 2021 (Year 1) and August 1, 2021 to July 31, 2022 (Year 2). Additionally, NMFS modified the Level A and Level B harassment zones for impact and vibratory pile driving of 36-in piles to reflect that the applicant will drive a max of two piles per day in Year 1, and one pile per day in Year 2. We also made some small clarifications to the hydroacoustic monitoring reporting requirements, and corrected typographical errors in the Level A harassment isopleths.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (<https://www.fisheries.noaa.gov/find-species>).

Table 1 lists all species with expected potential for occurrence in Alameda, CA and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2019). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS' stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprise that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific SARs (e.g., Carretta *et al.*, 2019). All values presented in Table 1 are the most recent available at the time of publication and are available in the 2018 SARs (Carretta *et al.*, 2019) and draft 2019 SARs (available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>).

Table 1-- Species That Spatially Co-Occur With the Activity to the Degree That Take May Occur

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose Dolphin	<i>Tursiops truncatus</i>	California Coastal	-, -, N	453 (0.06, 346, 2011)	2.7	>2.0
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	San Francisco/Russian River	-, -, N	9,886 (0.51, 2019)	66	0
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California Sea Lion	<i>Zalophus californianus</i>	United States	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>321
Northern fur seal	<i>Callorhinus ursinus</i>	California	-, D, N	14,050 (N/A, 7,524, 2013)	451	1.8
		Eastern North Pacific	-, D, N	620,660 (0.2, 525,333, 2016)	11,295	399
Family Phocidae (earless seals)						
Northern elephant seal	<i>Mirounga angustirostris</i>	California Breeding	-, -, N	179,000 (N/A, 81,368, 2010)	4,882	8.8
Harbor seal	<i>Phoca vitulina</i>	California	-, -, N	30,968 (N/A, 27,348, 2012)	1,641	43

¹ - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

² - NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region>. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance.

³ - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury (M/SI) from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

Harbor seal and California sea lion spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have authorized take of these species. For bottlenose dolphin, harbor porpoise, northern fur seal, and northern elephant seal, occurrence is such that take is possible, and we have authorized take of these species also. All species that could potentially occur in the project area are included in Pacific Shops' IHA application (see application, Table 4). While gray whale and humpback whale could potentially occur in the area, the spatial occurrence of these species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. In recent years there have been an increased number of gray whales in the San Francisco Bay, but they primarily occur in the western and central Bay (W. Keener, pers. comm. 2019), and none have been reported in the Estuary (NMFS 2019a, 2019b). Humpbacks have regularly been seen inside the Bay, primarily in the western Bay, from April through November since 2016 (W. Keener, pers. comm. 2019), and sometimes venture up the Delta waterway (*e.g.*, Gulland *et al.* 2008), but have not been recorded in the Estuary (NMFS 2019a, 2019b). Additionally, both gray whales and humpback whales are not expected to enter the project area due to the narrow channel width and shallow water depths.

A detailed description of the species likely to be affected by the Alameda Marina Shoreline Improvement Project, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the *Federal Register* notice for the proposed IHA (85 FR 23790; April 29, 2020); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are

not provided here. Please refer to that *Federal Register* notice for these descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

Underwater noise from impact and vibratory pile driving activities associated with the Alameda Marina Shoreline Improvement Project have the potential to result in harassment of marine mammals in the vicinity of the action area. The *Federal Register* notice for the proposed IHA (85 FR 23790; April 29, 2020) included a discussion of the potential effects of such disturbances on marine mammals and their habitat, therefore that information is not repeated in detail here; please refer to that *Federal Register* notice (85 FR 23790; April 29, 2020) for that information.

Estimated Take

This section provides an estimate of the number of incidental takes authorized through these IHAs, which inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would be by Level B harassment only, in the form of disruption of behavioral patterns and/or temporary threshold shift (TTS) for individual marine mammals resulting from exposure to pile driving and removal noise. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.*, shutdown zones) discussed in detail below in the Mitigation Measures section, Level A harassment is neither anticipated nor authorized. As described previously, no mortality is anticipated or authorized for this activity.

Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for Non-Explosive Sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μ Pa (rms) (microPascal, root mean square) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μ Pa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources.

Pacific Shops' activity includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1 μ Pa (rms) are applicable.

Level A Harassment for Non-Explosive Sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-

impulsive). Pacific Shops’ activity includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Table 2-- Thresholds Identifying the Onset of Permanent Threshold Shift

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 3</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	<i>Cell 9</i> $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa , and cumulative sound exposure level (L_E) has a reference value of 1 $\mu\text{Pa}^2\text{s}$. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving and vibratory pile driving and removal). The largest calculated Level B harassment zone is 21.5 kilometers (km) (13.4 miles (mi)) from the source, however, the zone of influence (ZOI) is functionally only 1.43 km^2 (0.6 mi^2) due to the geography of the Estuary.

The project includes vibratory and impact pile installation and vibratory pile removal. Source levels of pile installation and removal activities are based on reviews of measurements of the same or similar types and dimensions of piles available in the literature. Source levels for vibratory installation and removal of piles of the same

diameter are assumed the same. Source levels for each pile size and activity are presented in Table 3.

The source level for vibratory removal of timber piles is from in-water measurements generated by the Greenbusch Group (2018) from the Seattle Pier 62 project (83 FR 39709; August 10, 2018). Hydroacoustic monitoring results from Pier 62 determined unweighted rms ranging from 140 dB to 169 dB. NMFS analyzed source measurements at different distances for all 63 individual timber piles that were removed at Pier 62 and normalized the values to 10 m. The results showed that the median is 152 dB SPLrms.

Pacific Shops will implement bubble curtains (*e.g.* pneumatic barrier typically comprised of hosing or PVC piping that disrupts underwater noise propagation; see Mitigation Measures section below) during impact pile driving of the wide flange beams, 30-in steel pipe piles, and 36-in steel pipe piles. They have reduced the source level for these activities by 7dB (a conservative estimate based on several studies including Austin *et al.*, 2016 and Caltrans, 2015).

Table 3-- Project Sound Source Levels

Pile Type	Source Level @ 10m			Source
	dB RMS	dB peak	dB SEL	
VIBRATORY				
16-in Timber (removal)	152			The Greenbusch Group, Inc 2018
12-in Square Concrete (removal)	155			CalTrans 2015 (Based on 12-in steel pipe pile)
Steel sheet pile	160			CalTrans 2015 (Based on 24-in AZ steel sheet)
30-in Steel Pipe	170			CalTrans 2015 (Based on 36-in steel pipe pile)
36-in Steel Pipe	170			CalTrans 2015

Wide Flange Beam	155			Based on 38-in x 18-in king piles at the Naval Station Mayport in Jacksonville, Florida
IMPACT				
14-in Square Concrete	166	185	155	CalTrans 2015 (Based on 18-inch concrete piles)
16-in Square Concrete	166	185	155	CalTrans 2015 (Based on 18-inch concrete piles)
24-in Concrete piles	176	188	166	CalTrans 2015
Wide Flange Beam (attenuated in parentheses)	194 (187)	207 (200)	178 (171)	CalTrans 2015 (Source levels based on 24-in steel pipe pile)
30-in Steel Pipe (attenuated in parentheses)	190 (183)	210 (203)	177 (170)	CalTrans 2015
36-in Steel Pipe (attenuated in parentheses)	193 (186)	210 (203)	183 (176)	CalTrans 2015

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \text{Log}_{10} (R_1/R_2),$$

where

TL = transmission loss in dB

B = transmission loss coefficient

R₁ = the distance of the modeled SPL from the driven pile, and

R₂ = the distance from the driven pile of the initial measurement

Absent site-specific acoustical monitoring with differing measured transmission loss, a practical spreading value of 15 is used as the transmission loss coefficient in the above formula. Site-specific transmission loss data for Alameda Marina are not available,

therefore the default coefficient of 15 is used to determine the distances to the Level A and Level B harassment thresholds.

Table 4-- Pile Driving Source Levels and Distances to Level B Harassment Thresholds

Source	Source level at 10m (dB re 1 μ Pa rms)	Level B Harassment Threshold (dB re 1 μ Pa rms)	Distance to Level B Harassment Threshold (m)
VIBRATORY			
16-in Timber (removal)	152	120	1,359
12-in Square Concrete (removal)	155		2,154
Steel sheet pile	160		4,642
30-in Steel Pipe	170		21,544
36-in Steel Pipe	170		21,544
Wide Flange Beam	155		2,154
IMPACT			
14-in Square Concrete	166	160	25
16-in Square Concrete	166		25
24-in Concrete piles	176		117
Wide Flange Beam (attenuated ^a)	194 (187)		631 ^b
30-in Steel Pipe (attenuated ^a)	190 (183)		341 ^b
36-in Steel Pipe (attenuated ^a)	193 (186)		541 ^b

^a Includes 7dB reduction for use of bubble curtain.

^b Calculated using attenuated source level.

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that

isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as pile driving, NMFS User Spreadsheet predicts the distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs used in the User Spreadsheet, and the resulting isopleths are reported below.

Table 5 -- User Spreadsheet Input Parameters Used for Calculating Level A Harassment Isopleths

Pile Size and Installation Method	Spreadsheet Tab Used	Weighting Factor Adjustment (kHz)	Source Level	Number of piles within 24-h period	Duration to drive a single pile (minutes)	Number of strikes per pile	Propagation (xLogR)	Distance from source level measurement (m)
16-in Timber (removal)	A.1) Vibratory pile driving	2.5	152 ^a	10	5		15	10
12-in Square Concrete (removal)			155 ^a	10	5			
Steel sheet pile			160 ^a	20	10			
30-in Steel Pipe			170 ^a	1	10			
36-in Steel Pipe			170 ^a	2 or 1 ^d	10			
Wide Flange Beam			155 ^a	4	10			
IMPACT								
14-in	E.1) Impact	2	155 ^b	4		500	15	10

Square Concrete	pile driving							
16-in Square Concrete			155 ^b	4				
24-in Concrete piles			166 ^b	4				
Wide Flange Beam (attenuated)			171 ^{b,c}	4				
30-in Steel Pipe (attenuated)			170 ^{b,c}	1				
36-in Steel Pipe (attenuated)			176 ^{b,c}	2 or 1 ^d				

^a dB RMS SPL at 10m

^b dB SEL at 10m

^c Includes 7dB reduction from use of bubble curtain.

^d Two piles within a 24-hour period during Year 1 activities, one pile within a 24-hour period during Year 2 activities.

Table 6 -- Calculated Distances to Level A Harassment Isopleths

Source	Level A- Radius to Isopleth (m)			
	MF Cetaceans	HF Cetaceans	Phocids	Otariids
VIBRATORY				
16-in Timber (removal)	<1	2	<1	<1
12-in Square Concrete (removal)	<1	4	2	<1
Steel sheet pile	1	19	8	<1
30-in Steel Pipe	<1	12	5	<1
36-in Steel Pipe (Year 1)	1	19	8	<1
36-in Steel Pipe (Year 2)	<1	12	5	<1
Wide Flange Beam	<1	3	1	<1
IMPACT				
14-in Square Concrete	<1	26	12	<1
16-in Square Concrete	<1	26	12	<1
24-in Concrete piles	4	139	62	5
Wide Flange Beam (attenuated)	9	299	135	10
30-in Steel Pipe (attenuated)	3	102	46	3
36-in Steel Pipe (Year 1, attenuated)	12	406	183	13
36-in Steel Pipe (Year 2, attenuated)	8	256	115	8

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. We describe how the information provided above is brought together to produce a quantitative take estimate.

Bottlenose Dolphin

Bottlenose dolphins began entering San Francisco Bay in 2010 (Szczepaniak 2013). They primarily occur in the western Central and South Bay, from the Golden Gate Bridge to Oyster Point and Redwood City. However, one individual has been regularly seen in the Bay since 2016 near the former Alameda Air Station (Perlman 2017; W. Keener, pers. comm. 2017), and five animals were regularly seen in the summer and fall of 2018 in the same location (W. Keener, pers. comm. 2019). This area is on the far side of Alameda Island from the project area, approximately 6.8 mi (10.9 km) by water.

There have been no formal surveys of marine mammals in the Estuary before 2019 (W. Keener, pers. comm, 2019), and no known reports of bottlenose dolphins in the Estuary between 2006 and May 2019 (NMFS 2019a, 2019b). The two closest known sightings to the project area were of a single dolphin on one occasion and an adult and juvenile on another occasion in February 2019. Both sightings were on the edge of the Inner Harbor Entrance Channel to the northwest of the Estuary, approximately 5.8 mi (9.3 km) from the project area (W. Keener, pers. comm., 2019).

Pacific Shops conducted 30 hours of monitoring over four days in June 2019 at the project site, and did not observe any bottlenose dolphins. Additionally, six local frequent users of the Estuary interviewed for this project reported never having seen a

bottlenose dolphin in the Estuary. However, the applicant has requested the authorization of Level B harassment take of bottlenose dolphins due to their year-round presence in the Bay, regular proximity to the work area, and potential to enter the Level B harassment zone while pile driving or removal are underway.

Pacific Shops conservatively estimates that a group of two bottlenose dolphins may occur in the project area every 10 project days. NMFS concurs that this approach is reasonable given the available information. Pacific Shops has requested, and NMFS has authorized, 14 Level B harassment takes of bottlenose dolphins during Year 1 (2 individuals / 10 days * 68 project days = 14 Level B harassment takes), and 20 Level B harassment takes of bottlenose dolphins during Year 2 (2 individuals / 10 days * 98 project days = 20 Level B harassment takes).

The largest Level A harassment zone for mid-frequency cetaceans extends 12 m from the source during impact pile driving of 36-in steel pipe piles during Year 1, and 9 m from the source during impact pile driving of wide flange beams in Year 2 (Table 6). Pacific Shops is planning to implement a 25 m shutdown zone during those activities (Table 8). Given the small size of the Level A harassment zones, the shutdown zones are expected to eliminate the potential for Level A harassment take of bottlenose dolphins. Therefore, NMFS has not authorized Level A harassment take of bottlenose dolphins.

Harbor Porpoise

Historically, harbor porpoise primarily occur near the Golden Gate Bridge, Marin County, and the city of San Francisco on the northwest side of the Bay (Keener *et al.* 2012, Stern *et al.* 2017). However, in the summer of 2017 and 2018, mom-calf pairs and small groups (one to four individuals) were seen to the north and west of Treasure Island,

and just south of YBI (Caltrans 2018a, 2019), indicating that their range may be expanding within the Bay.

No formal surveys of marine mammals were conducted in the Estuary before 2019 (W. Keener, pers. comm. 2019). The applicant conducted 30 hours of monitoring over four days in June 2019 at the project site, and did not observe any harbor porpoises. Six local frequent users of the Estuary interviewed for this project reported never seeing a harbor porpoise in the Estuary. Between 2006 and June 2019, one harbor porpoise stranded in the Estuary. The animal was in an advanced state of decomposition (NMFS 2019a), indicating that it probably died outside of the Estuary and floated in. However, given their year-round residency in the Bay, their proximity to the work area, and their seemingly expanding range within the Bay, the applicant has requested the authorization of Level B harassment take of harbor porpoise.

Pacific Shops conservatively estimates that a group of two harbor porpoises may occur in the project area every 10 project days. NMFS concurs that this approach is reasonable given the available information. Pacific Shops has requested, and NMFS has authorized, 14 Level B harassment takes of harbor porpoise during Year 1 (2 individuals / 10 days * 68 project days = 14 Level B harassment takes), and 20 Level B harassment takes of harbor porpoise during Year 2 (2 individuals / 10 days * 98 project days = 20 Level B harassment takes).

The largest Level A harassment zone for high-frequency cetaceans extends 406 m from the source during impact pile driving of 36-in steel pipe piles in Year 1, and 299 m during impact installation of wide flange beams in Year 2 (Table 6). We do not expect a harbor porpoise to remain within the Level A harassment zone during either activity for a

long enough period to incur PTS. Pacific Shops is planning to implement 400 m and 300m shutdown zones, respectively, during those activities (Table 8). These shutdown zones include the respective 11.7 m and 7.4 m peak PTS isopleths. Pacific Shops will station a far field PSO on a 3.8m (12.5 ft) high barge, and the nearfield PSO on a metal storage container approximately 2.6m (8.5 ft) high. NMFS expects that these elevated locations, in combination with the anticipated ideal weather conditions, will allow PSOs to effectively observe harbor porpoises at 400 m. Therefore, the shutdown zones are expected to eliminate the potential for Level A harassment take of harbor porpoise, and NMFS has not authorized Level A harassment take of harbor porpoise.

California Sea Lion

There have been no formal surveys of marine mammals in the Oakland Estuary before 2019 (W. Keener, pers. comm. 2019). The few sightings that have been recorded have been opportunistic, including a sea lion observed in May 2017 in the small canal that connects Lake Merritt with the Estuary (Martichoux, 2017). Between 2006 and May 2019, 18 confirmed sea lion sightings in the Estuary were reported to TMMC and California Academy of Sciences (CAS) (NMFS 2019a, 2019b), and between 2006 and June 2019, three sea lions stranded in the Estuary (NMFS 2019a, 2019b). The applicant conducted 30 hours of monitoring over four days in June 2019 at the project site, and observed one sea lion near the project site, across the Estuary under the Coast Guard dock approximately 1130 ft (345 m) from the Alameda Marina shoreline. Interviews with local frequent users of the Estuary confirm that sightings of sea lions are rare. Two people interviewed reported seeing one to two sea lions per year in the Estuary. California sea

lions forage for Pacific herring in eelgrass beds in the winter (Schaeffer *et al.* 2007), however, there are no eelgrass beds in the Estuary to attract foraging sea lions.

Pacific Shops conservatively estimates that one California sea lion may occur in the project area every five project days. NMFS concurs that this approach is reasonable given the available information. Therefore Pacific Shops has requested, and NMFS has authorized, 14 Level B harassment takes of California sea lion during Year 1 (1 individual / 5 days * 68 project days = 14 Level B harassment takes), and 20 Level B harassment takes of California sea lion during Year 2 (1 individual / 5 days * 98 project days = 20 Level B harassment takes).

The largest Level A harassment zone for otariids extends 13 m from the source during impact pile driving of 36-in steel pipe piles in Year 1, and 10m from the source during impact pile driving of wide flange beams in Year 2 (Table 6). Pacific Shops is planning to implement a 25 m shutdown zone during those activities (Table 8). Given the small size of the Level A harassment zones, we expect the shutdown zones to eliminate the potential for Level A harassment take of California sea lion. Therefore, NMFS has not authorized Level A harassment take of California sea lion.

Northern Fur Seal

There are no available density estimates of northern fur seals in the project area, and northern fur seals have not been reported in the Estuary (NMFS 2019b). The applicant conducted 30 hours of monitoring over four days in June 2019 at the project site and did not observe any fur seals. Between 2006 and May 2019 there were no reports of stranded fur seals in the Estuary (NMFS 2019a, 2019b). Interviews with frequent users of the Estuary also reported they had never seen a fur seal in the Estuary. However, to

account for the possible rare presence of the species in the action area, NMFS has authorized six Level B harassment takes of northern fur seal during Year 1, and nine Level B harassment takes of northern fur seal during Year 2.

The largest Level A harassment zone for otariids extends 13 m from the source during impact pile driving of 36-in steel pipe piles in Year 1, and 10m from the source during impact pile driving of wide flange beams in Year 2 (Table 6). Pacific Shops is planning to implement a 25 m shutdown zone during those activities (Table 8). Given the small size of the Level A harassment zones, we expect the shutdown zones to eliminate the potential for Level A harassment take of northern fur seal. Therefore, NMFS has not authorized Level A harassment take of northern fur seal.

Northern Elephant Seal

There are no available density estimates of northern elephant seals in the project area. Generally, only juvenile elephant seals enter the Bay seasonally and do not remain long if they are healthy. From mid-February to the end of June, TMMC reports the most strandings, primarily of malnourished juveniles (TMMC, 2019). However, no elephant seals, alive or stranded, have been reported in the Estuary (NMFS 2019a, 2019b). The applicant conducted 30 hours of monitoring over four days in June 2019 at the project site and did not observe any elephant seals. Interviews with frequent users of the Estuary also reported they had never seen an elephant seal in the Estuary. However, to account for the possible rare presence of the species in the action area, NMFS has authorized six Level B harassment takes of northern elephant seal during Year 1, and nine Level B harassment takes of northern elephant seal during Year 2.

The largest Level A harassment zone for phocids extends 183 m from the source during impact pile driving of 36-in steel pipe piles in Year 1, and 135 m from the source during impact pile driving of wide flange beams in Year 2 (Table 6). Pacific Shops is planning to implement a 190 m and 140 m shutdown zone, respectively, during those activities (Table 8). Given the small size of the Level A harassment zones, we expect the shutdown zones to eliminate the potential for Level A harassment take of northern elephant seal. Therefore, NMFS has not authorized Level A harassment take of northern elephant seal.

Harbor Seal

There have been no formal surveys of marine mammals in the Estuary before 2019 (W. Keener, pers. comm. 2019), and the few recorded harbor seal sightings have been opportunistic. The applicant conducted 30 hours of monitoring over four days in June 2019 at the project site and did not observe any harbor seals. A local recreational boater who lives on his boat full-time in the existing Alameda Marina reported seeing a harbor seal approximately twice a week throughout 2019 (G. Dees, pers. comm. 2019). Another recreational boater who is occasionally on her boat in Alameda Marina reported a harbor seal in the marina on five days in August through October 2019 (T. Drake, pers. comm. 2019). This respondent also reported that a single harbor seal occasionally hauled out on the marina docks for several hours. Two staff members of a local marina reported an average of two harbor seals per month in the Estuary. There were only four confirmed harbor seal sightings reported in the Estuary to TMMC and CAS between 2006 and May 2019 (NMFS 2019a, 2019b), and a dead harbor seal at Pier 2 in the existing Alameda Marina on October 27, 2019 (T. Drake, pers. comm. 2019).

The number of harbor seals hauled out on a floating platform at the Alameda Breakwater, approximately 7.8 mi (12.6 km) from the project area, has been recorded almost every day since March 2014 (M. Klein and R. Bangert, pers. comm. 2019). Between zero and 75 seals haul out each day. More animals are present in the winter during the herring run. However, based on observations at the Alameda Marina, we do not expect the counts at the Alameda Breakwater to be representative of harbor seal presence in the project area.

Between 2006 and June 2019, only two harbor seals stranded in the Estuary (NMFS 2019a, 2019b). In August 2017, a harbor seal was seen in Lake Merritt, after transiting through the Estuary (Martichoux 2017). Grigg *et al.* (2012) tagged 19 harbor seals at Castro Rocks, approximately 15.2 mi (24.5 km) north-northeast of the project area. Although some ranged as far as the South Bay, approximately 39 mi (63 km) from Castro Rocks, none were recorded in the Estuary (Grigg *et al.* 2012).

Pacific Shops conservatively estimates that one harbor seal may enter the project area per project day. NMFS concurs that this approach is reasonable given the available information. Therefore, Pacific Shops has requested, and NMFS has authorized, 68 Level B harassment takes of harbor seal in Year 1 (1 harbor seal per day x 68 project days = 68 Level B harassment takes), and 98 Level B harassment takes of harbor seal in Year 2 (1 harbor seal per day x 98 project days = 98 Level B harassment takes).

The largest Level A harassment zone for phocids extends 183 m from the source during impact pile driving of 36-in steel pipe piles in Year 1, and 135 m from the source during impact pile driving of wide flange beams in Year 2 (Table 6). We do not expect a harbor seal to remain within the Level A harassment zone for a long enough period to

incur PTS. Pacific Shops is planning to implement a 190 m and 140 m shutdown zone, respectively, during the activities referenced above (Table 8), and there is no peak PTS isopleth for phocids for either activity. Additionally, as noted previously, PSOs would be observing from elevated structures (a 2.6m (8.5 ft) high storage container in the nearfield and 3.8 m (12.6 ft) high barge in the far-field) which would further increase their ability to detect harbor seals within this zone. Therefore, the shutdown zones are expected to eliminate the potential for Level A harassment take of harbor seal, and NMFS has not authorized Level A harassment take of harbor seal.

Table 7 -- Estimated Take by Level B Harassment, by Species and Stock

Common Name	Stock	Stock Abundance	Year 1 Level B Harassment Take (Percent of Stock)		Year 2 Level B Harassment Take (Percent of Stock)	
Bottlenose Dolphin	California Coastal	453	14 (3.1)		20 (4.4)	
Harbor Porpoise	San Francisco/Russian River	9,886	14 (0.1)		20 (0.2)	
California Sea Lion	United States	257,606	14 (0.01)		20 (0.01)	
Northern Fur Seal	California	14,050	6	(0.04)	9	(0.06)
	Eastern North Pacific	620,660		(<0.01)		(<0.01)
Northern Elephant Seal	California Breeding	179,000	6 (<0.01)		9 (<0.01)	
Harbor Seal	California	30,968	68 (0.2)		98 (0.3)	

Mitigation Measures

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying

particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) the manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) the practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In addition to the measures described later in this section, Pacific Shops will employ the following mitigation measures:

- For in-water heavy machinery work other than pile driving, if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions;
- Conduct briefings between construction supervisors and crews and the marine mammal monitoring team prior to the start of all pile driving activity and when new personnel join the work, to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures;
- For those marine mammals for which Level B harassment take has not been requested, in-water pile installation/removal will shut down immediately if such species are observed within or entering the Level B harassment zone; and
- If take reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take.

The following mitigation measures apply to Pacific Shops' in-water construction activities.

- *Establishment of Shutdown Zones-* Pacific Shops will establish shutdown zones for all pile driving and removal activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will vary based on the activity type and marine mammal hearing group. The largest shutdown zones are generally for high frequency cetaceans, as shown in Table 8.

- The placement of PSOs during all pile driving and removal activities (described in detail in the Monitoring and Reporting section) will ensure that the entire shutdown zone is visible during pile installation. Should environmental conditions deteriorate such that marine mammals within the entire shutdown zone would not be visible (*e.g.*, fog, heavy rain), pile driving and removal must be delayed until the PSO is confident marine mammals within the shutdown zone could be detected.

Table 8 -- Shutdown Zones During Pile Installation and Removal

Source	Shutdown Zone (m)			
	MF Cetaceans	HF Cetaceans	Phocids	Otariids
VIBRATORY				
16-in Timber (removal)	10	10	10	10
12-in Square Concrete (removal)				
Steel sheet pile				
30-in Steel Pipe		25		
36-in Steel Pipe (Year 1)				
36-in Steel Pipe (Year 2)				
Wide Flange Beam		10		
IMPACT				
14-in Square Concrete	25	30	25	25
16-in Square Concrete				
24-in Concrete piles		140	70	
Wide Flange Beam		300	140	
30-in Steel Pipe		140	70	
36-in Steel Pipe (Year 1)		400 ^a	190	
36-in Steel Pipe (Year 2)	10	260	120	10

^a This shutdown zone is smaller than the 406m Level A harassment zone. NMFS expects that this shutdown zone is sufficient to prevent Level A harassment, given the duration component associated with Level A harassment take.

- *Monitoring for Level B Harassment-* Pacific Shops will monitor the Level B harassment zones (areas where SPLs are equal to or exceed the 160 dB rms threshold for impact driving and the 120 dB rms threshold during vibratory pile driving) and the Level A harassment zones. Monitoring zones provide utility for observing by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring zones enable observers to be aware of and communicate the presence of marine mammals in the project area outside the shutdown zone and thus prepare for a potential cease of activity should the animal enter the shutdown zone. Placement of PSOs on the shorelines around Alameda Marina will allow PSOs to observe marine mammals within the Level B harassment zones. However, due to the large Level B harassment zones (Table 4), PSOs will not be able to effectively observe the entire zone. Therefore, Level B harassment exposures will be recorded and extrapolated based upon the number of observed takes and the percentage of the Level B harassment zone that was not visible.
- *Pre-activity Monitoring-* Prior to the start of daily in-water construction activity, or whenever a break in pile driving/removal of 30 minutes or longer occurs, PSOs will observe the shutdown and monitoring zones for a period of 30 minutes. The shutdown zone will be considered cleared when a marine mammal has not been observed within the zone for that 30-minute period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes. When a marine mammal for which Level B harassment take is authorized is present in the Level

B harassment zone, activities may begin and Level B harassment take will be recorded. If the entire Level B harassment zone is not visible at the start of construction, pile driving activities can begin. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones will commence.

- *Soft Start-* Soft-start procedures are believed to provide additional protection to marine mammals by providing warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. For impact pile driving, contractors will be required to provide an initial set of three strikes from the hammer at reduced energy, followed by a thirty-second waiting period. This procedure will be conducted three times before impact pile driving begins. Soft start will be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer.
- *Pile driving energy attenuator-* Pacific Shops will use a marine pile-driving energy attenuator (*i.e.*, air bubble curtain system) during impact pile driving of the wide flange beams, 30-in steel pipe piles, and 36-in steel pipe piles. The use of sound attenuation will reduce SPLs and the size of the zones of influence for Level A harassment and Level B harassment. Bubble curtains will meet the following requirements:
 - The bubble curtain must distribute air bubbles around 100 percent of the piling perimeter for the full depth of the water column.
 - The lowest bubble ring shall be in contact with the mudline for the full circumference of the ring, and the weights attached to the bottom ring

shall ensure 100 percent mudline contact. No parts of the ring or other objects shall prevent full mudline contact.

- The bubble curtain shall be operated such that there is proper (equal) balancing of air flow to all bubblers.

Based on our evaluation of the applicant's planned measures, as well as other measures considered by NMFS, NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).

- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).
- Mitigation and monitoring effectiveness.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the Marine Mammal Monitoring Plan, dated June 2020. Marine mammal monitoring during pile driving and removal must be conducted by NMFS-approved PSOs in a manner consistent with the following:

- Independent PSOs (*i.e.*, not construction personnel) who have no other assigned tasks during monitoring periods must be used;

- Where a team of three or more PSOs are required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience working as a marine mammal observer during construction;
- Other PSOs may substitute education (degree in biological science or related field) or training for experience; and
- Pacific Shops must submit PSO CVs for approval by NMFS prior to the onset of pile driving.

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;
- Experience or training in the field identification of marine mammals, including the identification of behaviors;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

Two PSOs will monitor for marine mammals during all pile driving and removal activities. PSO locations will provide an unobstructed view of all water within the shutdown zone, and as much of the Level A and Level B harassment zones as possible.

PSO locations are as follows:

- On top of a metal storage container at the pile driving site or best vantage point practicable to monitor the shutdown zone; and
- On the barge at the end of Pier 5.

Monitoring will be conducted 30 minutes before, during, and 30 minutes after pile driving/removal activities. In addition, observers shall record all incidents of marine mammal occurrence, regardless of distance from activity, and shall document any behavioral reactions in concert with distance from piles being driven or removed. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving or drilling equipment is no more than 30 minutes.

Acoustic Monitoring

Pacific Shops intends to conduct a sound source verification (SSV) study to confirm the sound source levels, transmission loss coefficient, and size of the Level A and Level B harassment zones. They intend to request a modification to the zones, if appropriate based on the results of the SSV study. Their plan follows accepted methodological standards to achieve their objectives, and is available on NMFS' website at <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. If NMFS approves the results of the SSV study, we will modify

the zone sizes based on the approved data. Acoustic monitoring report requirements are listed in the *Reporting* section, below.

Reporting

A draft marine mammal monitoring report will be submitted to NMFS within 90 days after the completion of pile driving and removal activities. The report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring.
- Construction activities occurring during each daily observation period, including how many and what type of piles were driven or removed and by what method (*i.e.*, impact or vibratory).
- Weather parameters and water conditions during each monitoring period (*e.g.*, wind speed, percent cover, visibility, sea state).
- The number of marine mammals observed, by species, relative to the pile location and if pile driving or removal was occurring at time of sighting.
- Age and sex class, if possible, of all marine mammals observed.
- PSO locations during marine mammal monitoring.
- Distances and bearings of each marine mammal observed to the pile being driven or removed for each sighting (if pile driving or removal was occurring at time of sighting).
- Description of any marine mammal behavior patterns during observation, including direction of travel and estimated time spent within the Level A and Level B harassment zones while the source was active.

- Number of individuals of each species (differentiated by month as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species (a correction factor may be applied to total take numbers, as appropriate).
- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and resulting behavior of the animal, if any.
- Description of attempts to distinguish between the number of individual animals taken and the number of incidences of take, such as ability to track groups or individuals.
- An extrapolation of the estimated takes by Level B harassment based on the number of observed exposures within the Level B harassment zone and the percentage of the Level B harassment zone that was not visible.

If no comments are received from NMFS within 30 days, the draft report will constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Pacific Shops must include the following information in their acoustic monitoring report.

- Hydrophone equipment and methods: recording device, sampling rate, distance (m) from the pile where recordings were made; depth of recording device(s).
- Type and size of pile being driven, substrate type, method of driving during recordings.
- Whether a sound attenuation device is used, and if so, duration of its use per pile.

- For impact pile driving: Pulse duration and mean, median, and maximum sound levels (dB re: 1 μ Pa): cumulative sound exposure level (SEL_{cum}), peak sound pressure level (SPL_{peak}), root-mean-square sound pressure level (SPL_{rms}), and single-strike sound exposure level (SEL_{s-s}).
- For vibratory driving/removal: Mean, median, and maximum sound levels (dB re: 1 μ Pa): SPL_{rms}, SEL_{cum}, and timeframe over which the sound is averaged.
- Number of strikes (impact) or duration (vibratory) per pile measured, one-third octave band spectrum, power spectral density plot.
- Estimated source levels referenced to 10 m, transmission loss coefficients, and estimated Level A and Level B harassment zones.

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder shall report the incident to the Office of Protected Resources (OPR) (301-427-8401), NMFS and to the West Coast Region Stranding Hotline (866-767-6114) as soon as feasible. If the death or injury was clearly caused by the specified activity, the IHA-holder must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS.

The report must include the following information:

- i. Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- ii. Species identification (if known) or description of the animal(s) involved;

- iii. Condition of the animal(s) (including carcass condition if the animal is dead);
- iv. Observed behaviors of the animal(s), if alive;
- v. If available, photographs or video footage of the animal(s); and
- vi. General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS’s implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, this introductory discussion of our analyses applies to all of the species listed in Table 7, given that many of the anticipated effects of this project on different marine mammal stocks are expected to be relatively similar in nature. Also, because the nature of the estimated takes anticipated to occur are identical in Years 1 and 2, and the number of estimated takes in each year are extremely similar, the analysis below applies to each of the IHAs.

The nature of the pile driving project precludes the likelihood of serious injury or mortality, and the mitigation is expected to ensure that no Level A harassment occurs, which would be unlikely to occur even absent the required mitigation. For all species and stocks, take will occur within a limited, confined area (Oakland Estuary) of any given stock's range. Take will be limited to Level B harassment only due to potential behavioral disturbance and TTS. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR, Inc. 2012; Lerma 2014; ABR 2016). Level B harassment will be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further, the amount of take authorized for any given stock is extremely small when compared to stock abundance.

Exposure to noise resulting in Level B harassment for all species is expected to be temporary and minor due to the general lack of use of the Oakland Estuary by marine mammals, as previously explained. In general, marine mammals are only occasionally sighted within the Oakland Estuary. Any behavioral harassment occurring during the

project is highly unlikely to impact the health or fitness of any individuals, much less effect annual rates of recruitment or survival. Any harassment will be brief, and if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the area while the activity is occurring.

As previously discussed, the closest harbor seal pupping area is 24.5 km (15.2 mi) from the project area. However, there are no habitat areas of particular importance for marine mammals within the Oakland Estuary, and it is not preferred habitat for marine mammals. Therefore, we expect that animals annoyed by project sound will simply avoid the area and use more-preferred habitats, particularly as the project will only occur on approximately 68 days in Year 1, and 98 days in Year 2, for up to approximately 9.5 hours per day.

The project is also not expected to have significant adverse effects on affected marine mammals' habitats. The project activities will not modify existing marine mammal habitat for a significant amount of time. The activities may cause some fish to leave the area of disturbance, thus temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the short duration of the activities and the relatively small area of the habitat that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality or serious injury is anticipated or authorized.
- No Level A harassment is anticipated or authorized.
- The number and intensity of anticipated takes by Level B harassment is relatively low for all stocks.

- No biologically important areas have been identified within the project area.

- For all species, the Oakland Estuary is a very small part of their range.

- For all species, Level B harassment takes authorized in each IHA will affect less than five percent of each stock.

Year 1 IHA – Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the required monitoring and mitigation measures, we find that the total marine mammal take from Pacific Shops’ construction activities will have a negligible impact on the affected marine mammal species or stocks.

Year 2 IHA – Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the required monitoring and mitigation measures, we find that the total marine mammal take from the Pacific Shops’ construction activities will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers so, in practice, where

estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Table 7 includes the number of takes for each species authorized to be taken as a result of activities in Year 1 and Year 2 of this project. Our analysis shows that less than one-third of the best available population abundance estimate of each stock could be taken by harassment during each project year. In fact, for each stock, the take authorized each year comprises less than five percent of the stock abundance. The number of animals authorized to be taken for each stock discussed above would be considered small relative to the relevant stock's abundances even if each estimated taking occurred to a new individual, which is an unlikely scenario.

Year 1 IHA- Based on the analysis contained herein of the activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks in Year 1 of the project.

Year 2 IHA- Based on the analysis contained herein of the activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks in Year 2 of the project.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks will not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed species is authorized or expected to result from this activity. Therefore, NMFS has determined that formal consultation under section 7 of the ESA is not required for this action.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must evaluate our proposed action (*i.e.*, the promulgation of regulations and subsequent issuance of incidental take authorization) and alternatives with respect to potential impacts on the human environment. This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any

extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has determined that the action qualifies to be categorically excluded from further NEPA review.

Authorization

NMFS has issued an IHA to Pacific Shops, Inc. for the potential harassment of small numbers of six marine mammal species incidental to the Alameda Marina Shoreline Improvement Project in Alameda, CA, provided the previously mentioned mitigation, monitoring and reporting requirements are followed.

Dated: June 19, 2020.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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