E 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XC916]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Chevron Long Wharf Maintenance and Efficiency Project in San Francisco Bay, California

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

ACTION: Notice; issuance of incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given the NMFS has issued an incidental harassment authorization (IHA) to Chevron Products Company (Chevron) to incidentally harass, by Level B harassment only, marine mammals during construction activities associated with the Long Wharf Maintenance and Efficiency Project (LWMEP) in San Francisco Bay, California.

DATES: This authorization is effective from June 1, 2023 through May 31, 2024.

FOR FURTHER INFORMATION CONTACT: Jessica Taylor, 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/national/marine-mammal-protection/incidental-take-authorizations-construction-activities*. 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 proposed or, if the taking is limited to harassment, a notice of a proposed IHA is 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 December 16, 2022, NMFS received a request from Chevron Products Company (Chevron) for an IHA to take marine mammals incidental to pile driving activities associated with the LWMEP in San Francisco Bay (the Bay), California. Following NMFS' review of the application, Chevron submitted a final revised version on February 27, 2023. The application was deemed adequate and complete on March 20, 2023. Chevron's request is for take of 7 species of marine mammals by Level B

harassment only. Neither Chevron nor NMFS expect serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued IHAs to Chevron for similar work (83 FR 27548, June 13, 2018; 84 FR 28474, June 19, 2019; 85 FR 37064, June 19, 2020; 86 FR 28578, May 27, 2021; 87 FR 35180, June 9, 2022). Chevron complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHAs, and information regarding their monitoring results may be found in the **Estimated Take** section.

The IHA will cover 1 year of a larger project for which Chevron obtained prior IHAs and intends to request take authorization for subsequent facets of the project. The larger 5-year project involves upgrading Long Wharf to satisfy current Marine Oil Terminal Engineering and Maintenance Standards.

There are no changes from the proposed IHA to the final IHA.

Description of Activity

Overview

Chevron plans to upgrade Berth 1 of the Refinery Long Wharf in the Bay, California in order to meet current safety and efficiency standards. As part of the project, Chevron will use vibratory extraction to remove concrete piles associated with the existing gangway and catwalk. Impact hammers will be used to install concrete piles to construct a mooring dolphin and hook, breasting dolphin and breasting points with standoff fenders, and to replace the catwalk in a different location. A temporary construction template composed of steel piles will be installed through the use of a vibratory hammer and removed by vibratory extraction when in-water construction activities are complete. The Long Wharf has six berths for receiving raw materials and shipping products. The project area encompasses the entirety of Berth 1, an area of approximately 470 square meters (m^2). All in-water work will take place within the

seasonal work window of June 1, 2023 through November 30, 2023. Unless otherwise specified, the term "pile driving" may refer to either pile installation or removal.

Chevron's activity includes impact and vibratory pile driving and vibratory pile removal, which may result in the incidental take of marine mammals, by harassment only. Due to mitigation measures, no Level A harassment is anticipated to occur, and none is authorized.

A detailed description of the planned construction project is provided in the **Federal Register** notice for the proposed IHA (88 FR 19247, March 31, 2023). 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 a description of the specific activity. Mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Mitigation** and **Monitoring and Reporting**).

Comments and Responses

A notice of NMFS' proposal to issue an IHA to Chevron was published in the **Federal Register** on March 31, 2023 (88 FR 19237). That notice described, in detail, Chevron's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. In that notice, we requested public input on the request for authorization described therein, our analyses, the proposed authorization, and any other aspect of the notice of proposed IHA, and requested that interested persons submit relevant information, suggestions, and comments. During the 30-day public comment period, NMFS did not receive any public comments.

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. NMFS fully considered all of this information, and we refer

the reader to these descriptions, instead of reprinting the information. Additional information regarding population trends and threats may be found in NMFS' Stock Assessment Reports (SARs; *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' website (*https://www.fisheries.noaa.gov/find-species*).

Table 1 lists all species or stocks for which take is expected and authorized for this activity, 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. 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' SARs). While no serious injury or 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 or stocks 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 comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS' U.S. Pacific SARs. All values presented in Table 1 are the most recent available at the time of publication (including from the draft 2022 SARs) and are available online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*.

Table 1 -- Marine Mammal Species[4] Likely to be Impacted by the Specified Activities

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance (CV, Nmin, most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Artiodactyla – Infraorder Cetacea – Mysticeti (baleen whales)						
Family Eschrichtiidae						
Gray whale	*Eschrichtius robustus*	Eastern North Pacific	-, -, N	26,960 (0.05, 25,849, 2016)	801	131
Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Bottlenose dolphin	*Tursiops truncatus*	California Coastal	-, -, N	453 (0.06, 346, 2011)	2.7	≥2.0
Family Phocoenidae (porpoises)						
Harbor porpoise	*Phocoena phocoena*	San Francisco/Russian River	-, -, N	7,777 (0.62, 4,811, 2017)	73	≥0.4
Order Carnivora – Pinnipedia						
Family Otariidae (eared seals and sea lions)						
California sea lion	*Zalophus californianus*	U.S.	-, -, N	257,606 (N/A, 233,515, 2014)	14,011	>321
Northern fur seal [5]	*Callorhinus ursinus*	California	-, D, N	14,050 (N/A, 7,524, 2013)	451	1.8
Family Phocidae (earless seals)						
Harbor seals	*Phoca vitulina*	California	-, -, N	30,968 (N/A, 27,348, 2012)	1,641	43
Northern elephant seal	*Mirounga angustirostris*	California Breeding	-, -, N	187,386 (N/A, 85,369, 2013)	5,122	13.7

[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-assessments/*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable as in the case of the pinnipeds, as population estimates are dependent upon the numbers of individuals hauled out or the number of pups.

[3] - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury 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.

[4]- Information on the classification of marine mammal species can be found on the web page for The Society for Marine Mammalogy's Committee on Taxonomy *(https://marinemammalscience.org/science-and-publications/list-marine-mammal-species-subspecies/*; Committee on Taxonomy (2022)).

[5]- Survey years = Sea Lion Rock-2014; St. Paul and St. George Is - 2014, 2016, 2018; Bogoslof Is. - 2015, 2019.

As indicated above, all seven species (with seven managed stocks) in Table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. All species that could potentially occur in the project area are included in Table 4-1 of the IHA application. While humpback whales have been sighted in the coastal waters outside of the Bay, the spatial occurrence of this species is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Although there are no published studies available regarding the distribution of humpback whales in the Bay, sightings from whale watching vessels and other mariners report that when humpback whales enter the Bay, they rarely move east into the Bay towards the vicinity of the project area and are unlikely to occur during the activities.

A detailed description of the species likely to be affected by the pile driving activities, 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 (88 FR 19247, March 31, 2023); 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.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007, 2019) recommended that

marine mammals be divided into hearing groups based on directly measured (behavioral or auditory evoked potential techniques) or estimated hearing ranges (behavioral response data, anatomical modeling, *etc.*). Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 2.

Table 2 -- Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, Cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al*., 2007) and PW pinniped (approximation).	

The pinniped functional hearing group was modified from Southall *et al*. (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al*., 2006; Kastelein *et al*., 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from Chevron's pile driving activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the project area. The notice of the proposed IHA (88 FR 19247, March 31, 2023) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from Chevron's pile driving activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of the proposed IHA (88 FR 19247, March 31, 2023).

Estimated Take of Marine Mammals

This section provides an estimate of the number of incidental takes authorized through this IHA, which informed both NMFS' consideration of "small numbers," and the negligible impact determinations.

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 for individual marine mammals resulting from exposure to the acoustic sources. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.,* shutdown zones, protected species observers (PSOs) monitoring) discussed in detail below in the **Mitigation** section, Level A harassment is neither anticipated nor authorized.

As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below, we describe how the take numbers are estimated.

For acoustic impacts, 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 factors can contribute to a basic calculation to provide an initial prediction of potential 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 estimates.

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 permanent threshold shift (PTS) of some degree (equated to Level A harassment).

Level B Harassment – 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 or exposure context (*e.g.*, frequency, predictability, duty cycle, duration of the exposure, signal-to-noise ratio, distance to the source), the environment (*e.g.*, bathymetry, other noises in the area, predators in the area), and the receiving animals (hearing, motivation, experience, demography, life stage, depth) and can be difficult to predict (*e.g.*, Southall *et al.,* 2007, 2021; Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a metric that is both predictable and measurable for most activities,

NMFS typically uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS generally predicts that marine mammals are likely to be behaviorally harassed in a manner considered to be Level B harassment when exposed to underwater anthropogenic noise above RMS pressure received levels (SPL) of 120 dB (referenced to 1 micropascal (re 1 μPa)) for continuous (*e.g.,* vibratory pile-driving, drilling) and above RMS SPL 160 dB re 1 μPa for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Generally speaking, Level B harassment take estimates based on these behavioral harassment thresholds are expected to include any likely takes by temporary threshold shift (TTS) as, in most cases, the likelihood of TTS occurs at distances from the source less than those at which behavioral harassment is likely. TTS of a sufficient degree can manifest as behavioral harassment, as reduced hearing sensitivity and the potential reduced opportunities to detect important signals (conspecific communication, predators, prey) may result in changes in behavior patterns that would not otherwise occur.

Chevron's pile driving activities include the use of continuous (vibratory pile-driving) and impulsive (impact pile-driving) sources, and therefore the RMS SPL thresholds of 120 and 160 dB re 1 μPa are applicable.

Level A harassment – 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). Chevron's pile driving activities include the use of impulsive (impact hammer) and non-impulsive (vibratory hammer) 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: *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 3 -- Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{p,0\text{-pk,flat}}$: 219 dB $L_{E,p,\ LF,24h}$: 183 dB	*Cell 2* $L_{E,p,\ LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{p,0\text{-pk,flat}}$: 230 dB $L_{E,p,\ MF,24h}$: 185 dB	*Cell 4* $L_{E,p,\ MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{p,0\text{-pk,flat}}$: 202 dB $L_{E,p,HF,24h}$: 155 dB	*Cell 6* $L_{E,p,\ HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{p,0\text{-pk.flat}}$: 218 dB $L_{E,p,PW,24h}$: 185 dB	*Cell 8* $L_{E,p,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{p,0\text{-pk,flat}}$: 232 dB $L_{E,p,OW,24h}$: 203 dB	*Cell 10* $L_{E,p,OW,24h}$: 219 dB

* Dual metric 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 are recommended for consideration.

Note: Peak sound pressure level ($L_{p,0\text{-pk}}$) has a reference value of 1 µPa, and weighted cumulative sound exposure level ($L_{E,p}$) has a reference value of 1µPa^{2}s. In this Table, thresholds are abbreviated to be more reflective of International Organization for Standardization standards (ISO, 2017). The subscript "flat" is being included to indicate peak sound pressure are flat weighted or unweighted within the generalized hearing range of marine mammals (*i.e.*, 7 Hz to 160 kHz). 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 weighted 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 thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that are used in estimating the area ensonified above the acoustic thresholds, including source levels and transmission loss coefficient.

Pile driving activities, using an impact hammer as well as a vibratory hammer, will generate underwater noise that could result in disturbance to marine mammals near the project area. A review of underwater sound measurements for similar projects was conducted to estimate the near-source sound levels for impact and vibratory pile driving and vibratory extraction. Source levels for removal and installation activities derived from this review are shown in Table 4.

Table 4 -- Source Levels for Pile Removal and Installation Activities

Method	Pile type	Source Levels (dB)/Source Distance (m)			Reference
		Peak Sound Pressure (dB re 1 µPa)	Mean Maximum RMS SPL (dB re 1 µPa)	SEL [1] (dB re 1 µPa2 sec)	
Impact install [2]	24-inch square concrete pile	191/10	173/10	161/10	AECOM (2018, 2019)
Vibratory install/extract	36-inch steel shell pile	196/10	167/15	167	AECOM (2019)
Vibratory extract [3]	18-inch concrete pile	N/A	163/10	150	NAVFAC SW (2022)

[1] Sound exposure level (SEL).
[2] Chevron will use a bubble curtain attenuation system for all impact pile driving. NMFS conservatively assumes that the bubble curtain will result in a 5 dB reduction in sound. These source levels incorporate the 5 dB reduction.
[3] 20-inch concrete piles used as a proxy as vibratory data for 18-inch concrete piles was not available.

Level B Harassment Zones-- 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 topography. The general formula for underwater TL is:

$TL = B * Log10 (R_1/R_2)$, where

TL = transmission loss in dB;

B = transmission loss coefficient;

R_1 = the distance of the modeled SPL from the driven pile; and

R_2 = the distance from the driven pile of the initial measurement.

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, known as practical spreading. As is common practice in coastal waters, here we assume practical spreading (4.5 dB reduction in sound level for each doubling of distance) for vibratory extraction of concrete piles, as hydro-acoustic data for the same pile type was not available for this project site. Chevron conducted hydro-acoustic monitoring for prior projects at Long Wharf for the impact driving of 24-inch concrete piles and vibratory driving of 36-inch steel piles. Based upon hydro-acoustic monitoring conducted at Long Wharf in 2018 and 2019 (AECOM, 2018, 2019), Chevron calculated a transmission loss coefficient ranging from 14 to 20 (~4.4 dB to 8 dB per doubling of distance). As this estimate represents a wide range of measured transmission loss, NMFS applied the standard value of 15 for impact driving of concrete piles. For vibratory driving of 36-inch steel piles, Chevron calculated a transmission loss coefficient of 20.8 to 25.0 (~8 dB to 9 dB per doubling of distance) from hydro-acoustic monitoring conducted at Long Wharf in 2019 (AECOM, 2019). Given that all available data suggested a higher transmission loss, NMFS found it appropriate to apply this to its analysis. NMFS applied the lower of these two values, 20.8 TL, to this analysis to be conservative. The Level B harassment zones and ensonified areas for Chevron's activities are shown in Table 5.

Table 5 -- Distance to Level B Harassment Thresholds and Ensonified Areas

Pile Type	Source Levels (dB)/Source distance (m)		Distance to Level B harassment thresholds (m)	Ensonified area (km^2)
	Peak	RMS		
Impact Installation				
24-inch square concrete pile	191/10	173/10	74	0.02
Vibratory Installation				
36-inch steel shell pile	196/10	167/15	2,727	23.36

Vibratory Extraction				
18-inch concrete pile	N/A	163/10	7,356	170
36-inch steel shell pile	196/10	167/15	2,727	17.24

Level A Harassment Thresholds-- The ensonified area associated with Level A harassment is more technically challenging to predict due to the need to account for a duration component. Therefore, NMFS developed an optional User Spreadsheet tool to accompany the Technical Guidance that can be used to relatively simply predict an isopleth distance for use in conjunction with marine mammal density or occurrence to help predict potential takes. We note that because of some of the assumptions included in the methods underlying the optional tool, we anticipate that the resulting isopleth estimates are typically going to be overestimates of some degree, which may result in an overestimate of potential take by Level A harassment. However, this optional tool offers the best way to estimate isopleth distances when more sophisticated modeling methods are not available or practical. For stationary sources, such as pile driving activities, the optional User Spreadsheet tool predicts the closest distance at which a stationary animal would not be expected to incur PTS if the sound source traveled by the stationary animal in a straight line at a constant speed. The isopleths generated by the User Spreadsheet used the same TL coefficients as the Level B harassment zone calculations, as indicated above for each activity type. Inputs used in the User Spreadsheet (*e.g.,* number of piles per day, duration and/or strikes per pile) are presented in Table 1 of the **Federal Register** notice for the proposed IHA (88 FR 19247, March 31, 2023). The maximum RMS SPL/SEL SPL as well as peak SPL and resulting isopleths are reported below in Table 6. The RMS SPL value was used to calculate Level A harassment isopleths for vibratory pile driving and extraction activities, while the single strike SEL SPL value was used to calculate Level A isopleths for impact pile driving activity.

Table 6 -- Distance to Level A Harassment Thresholds for each Marine Mammal Hearing Group

Pile Type	Source Levels (dB)/ Source Distance (m)		Distances to Level A harassment threshold (m)				
	Peak	RMS/SEL	Lf cetaceans	Mf cetaceans	Hf cetaceans	Phocid pinnipeds	Otariid pinnipeds
Impact Installation							
24-inch square concrete pile	191/10	161/10 SEL	31.3	1.1	37.3	16.8	1.2
Vibratory Installation							
36-inch steel shell pile	196/10	167/15 RMS	15.9	2.8	21	11.1	1.6
Vibratory Extraction							
18-inch concrete pile	N/A	163/10 RMS	3.4	0.3	5	2.1	0.1
36-inch steel shell pile	196/10	167/15 RMS	15.9	2.8	21	11.1	1.6

Lf = low frequency, Mf = mid-frequency, Hf = high frequency.

Marine Mammal Occurrence

In this section, we provide information about the occurrence of marine mammals, including density or other relevant information that will inform the take calculations.

Harbor Seal-- Limited at-sea densities are available for Pacific harbor seals in the Bay. To estimate the number of harbor seals potentially taken by Level B harassment, take estimates were developed based upon annual surveys of haulouts in the Bay conducted by the National Park Service (NPS) (Codde and Allen 2013, 2015, 2017, 2020; Codde, 2020). Harbor seals spend more time hauled out and enter the water later in the evening during molting season (NPS, 2014). The molting season occurs from June-July and overlaps with the construction period of June-November, therefore, haulout counts may provide the most accurate estimates of harbor seals in the area during that time. Due to the close proximity of Castro Rocks to the project area, Chevron used the highest mean value of harbor seals observed hauled out at Castro Rocks during the molting season in any recent NPS annual survey. The highest mean number of harbor seals was recorded in 2019 as 237 seals. There are no systematic counts available to estimate the number of

seals that may be in the water near Long Wharf at any given time and the number of seals hauled out on Castro Rocks may vary based upon time of day, tide, and seal activity. Therefore, the analysis assumes that all 237 seals could swim into the Level B harassment zone each day that pile driving is occurring.

California sea lion— Although there are no haulout sites for California sea lions in close proximity to the project area, sea lions have consistently been sighted in the Bay while monitoring during past construction projects (AECOM, 2019, 2020, 2021, 2022; Caltrans, 2017). As limited data is available on the occurrences of California sea lions in the Bay, NMFS used PSO monitoring data from previous stages of the LWMEP (AECOM, 2019, 2020, 2021) and Year 1 of the Point Orient Wharf Removal (POWR) project (AECOM, 2022) to generate a daily occurrence rate. NMFS calculated daily occurrence rate using the following equation:

Daily occurrence rate = Total number of animals sighted / Total monitoring days.

From 2018-2022, a total of 73 days of monitoring occurred across all projects during the seasonal window of June through November. During this time, 13 sea lions were sighted. Based upon sightings and monitoring days, we calculated a daily occurrence rate of 0.18 sea lions per day.

San Francisco has received a record amount of rainfall since July 1, 2022 (Bay City News, 2023), indicating that increased freshwater inflow into the Bay could be expected this year. The Bay did not experience similar freshwater inflow during the LWMEP and POWR years of 2018-2022. As the impacts of increased freshwater flow into the project area on California sea lion occurrences are unclear, and this increased freshwater input did not occur during prior monitoring years, we conservatively used a daily occurrence rate of California sea lions, one sea lion per day, to estimate take.

Harbor porpoise— The harbor porpoise population has been growing over time in the Bay (Stern *et al.,* 2017). Although commonly sighted in the vicinity of Angel Island

and the Golden Gate Bridge, approximately 6 and 12 kilometers (3.7 and 7.5 miles, respectively) southwest of the Wharf, individuals may use other areas of central the Bay (Keener, 2011), as well as the project area. As limited data is available on the occurrences of harbor porpoises in the Bay, NMFS used PSO monitoring data from previous stages of the LWMEP (AECOM, 2019, 2020, 2021) and Year 1 of the Point Orient Wharf Removal (POWR) project (AECOM, 2022) to generate a daily occurrence rate. NMFS calculated the daily occurrence rate according to the same methods for calculating the daily occurrence rate for California sea lions, as described above. From 2018-2022, a total of 16 harbor porpoises were sighted on 73 monitoring days, resulting in a daily occurrence rate of 0.22 harbor porpoises per day. Due to the impacts of increased freshwater inflow into the Bay (Bay City News, 2023) resulting from elevated rainfall being unclear, we conservatively used a higher daily occurrence rate of harbor porpoises, one porpoise per day, to estimate take.

Gray whale— Gray whales are often sighted in the Bay during February and March, however, pile driving activities are not planned to occur during this time. Prior monitoring reports for similar projects occurring during the same work windows did not document gray whales in the area (AECOM, 2019, 2020, 2021). Limited sightings of gray whales in the Bay include strandings (Bartlett, 2022; TMMC, 2019) and whale watch reports (Bartlett, 2022). At-sea densities and regular observational data for gray whales in the Bay during the planned project time are not available. Although unlikely during the time planned for in-water construction activities, Chevron conservatively estimated that up to two gray whales may occur in the project area.

Bottlenose dolphin— The numbers of dolphins in the Bay have been increasing over the years (Perlman, 2017; Szczepaniak *et al.,* 2013), and a recent study determined that bottlenose dolphins have expanded their range to include coastal waters north and south of the Bay (Keener *et al.,* 2023). In the Bay, dolphins have been sighted in the

vicinity of the Golden Gate Bridge, around Yerba Buena and Angel Islands, and in the central Bay as far east as Alameda and Point Richard (Keener *et al.,* 2023). Although dolphins may occur in the Bay year-round, occurrence estimates are limited. Chevron estimated that one group of dolphins may enter the Bay once per month. Weller *et al.* (2016) estimated an average group size for coastal bottlenose dolphins to be approximately 8.2 dolphins.

Northern elephant seal— Small numbers of elephant seals may haul out or strand within the central Bay (Hernández, 2020). Previous monitoring, however, has shown northern elephant seal densities to be very low in the area and, based upon seasonality of occurrences, northern elephant seals would be unlikely to occur in the project area during the project activities. Additionally, northern elephant seals were not observed during pile driving monitoring for the LWMEP from 2018-2021 (AECOM, 2018, 2019, 2020, 2021) nor for the Point Orient Wharf Removal in 2022 (AECOM, 2022), which was located just north of the project area. While it is unlikely that northern elephant seals would occur in the project area during the months in which work is planned, Chevron conservatively estimated that 1 northern elephant seal could enter the project area once every 3 days during in-water construction activities resulting in a total of 10 northern elephant seals.

Northern fur seal— The presence of northern fur seals in depends upon oceanic conditions, as more fur seals are more likely to range in the Bay in search of food and strand during El Niño events (TMMC, 2016). Equatorial sea surface temperatures of the Pacific Ocean have been below average across most of the Pacific. La Niña conditions are likely to remain into the spring of 2023, after which conditions are expected to become more neutral. However, it is unlikely El Niño conditions will develop later in 2023 (NOAA, 2022). Northern fur seals were not observed during prior LWMEP monitoring (AECOM, 2019, 2020, 2021) nor during the POWRP monitoring (AECOM, 2022). While it is unlikely that northern fur seals would occur in the project areas during

in-water activities, Chevron conservatively estimated that a maximum of 10 northern fur seals could occur enter the project area.

Take Estimation

Here, we describe how the information provided above is synthesized to produce a quantitative estimate of the take that is reasonably likely to occur.

Take estimate calculations vary by species. To calculate take by Level B harassment for harbor seals, California sea lions, and harbor porpoises, NMFS multiplied the daily occurrence estimates described in the *Marine Mammal Occurrence* section by the number of project days (Table 7).

For bottlenose dolphins, Chevron estimated, and NMFS concurs, that one group of eight bottlenose dolphins may be taken by Level B harassment every month of the project. Therefore, Chevron requested, and NMFS has authorized, 32 takes of bottlenose dolphins by Level B harassment.

Chevron based requested take by Level B harassment for gray whales upon total daily occurrence estimates during the project period. Chevron conservatively estimated, and NMFS concurs, that two gray whales may enter the project area per year. Therefore, Chevron requested, and NMFS has authorized, two takes of gray whales by Level B harassment (Table 7).

For northern elephant seals, Chevron conservatively estimated, and NMFS concurs, that one northern elephant seal could enter the project area once every 3 days during in-water construction activities. Therefore, Chevron requested, and NMFS has authorized, 10 takes of northern elephant seals by Level B harassment (Table 7).

Based upon prior occurrences in the Bay, Chevron conservatively estimated, and NMFS concurs, that a maximum of 10 northern fur seals could occur in the project area during the in-water construction activity period. Therefore, Chevron requested, and NMFS has authorized 10 takes of northern fur seals by Level B harassment (Table 7).

Chevron did not request, nor has NMFS authorized, take by Level A harassment. For all pile driving activities, Chevron will to implement shutdown zones (described further in the **Mitigation** section) that are expected to effectively prevent take by Level A harassment.

Table 7 -- Authorized Take by Level B Harassment and Estimated Take as a Percentage of the Population

Species	Expected Occurrence	Authorized Take by Level B Harassment			Estimated Take as a Percentage of Population
		Impact Install	Vibratory Install/Extract	Total	
Harbor seal	237 seals per day	4,977	2,133	7,110	23
Sea lion	1 sea lion per day [1]	21	9	30	0.012
Harbor porpoise	1 harbor porpoise per day [1]	21	9	30	0.39
Bottlenose dolphin	Up to 8 dolphins once per month	N/A	N/A	32	1.77
Gray whale	2 whales over project duration	N/A	N/A	2	0.007
Northern elephant seal	1 seal every 3 days	N/A	N/A	10	0.005
Northern fur seal	10 seals over project duration	N/A	N/A	10	0.071

[1] Rounded daily occurrence to one individual per day.

Mitigation

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, NMFS considers 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 would 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, and impact on operations.

Chevron must follow mitigation measures as specified below.

Chevron must ensure that construction supervisors and crews, the monitoring team, and relevant Chevron staff are trained prior to the start of all pile driving activities, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work.

Shutdown Zones

Chevron must establish shutdown zones for all pile driving activities. The purpose of a shutdown zone is generally to define an area within which shutdown of the activity will occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones will be based upon the Level A harassment zone for each pile size/type and driving method where applicable, as shown in Table 6. A minimum shutdown zone of 10 m will be required for all in-water construction activities to avoid physical interaction with marine mammals. For pile driving, the radii of the shutdown

zones are rounded to the next largest 10 m interval in comparison to the Level A harassment zone for each activity type. If a marine mammal is observed entering or within a shutdown zone during pile driving activity, the activity must be stopped until there is visual confirmation that the animal has left the zone or the animal is not sighted for a period of 15 minutes. Shutdown zones for each activity type are shown in Table 8.

All marine mammals will be monitored in the Level B harassment zones and throughout the area as far as visual monitoring can take place. If a marine mammal enters the Level B harassment zone, in-water activities will continue and PSOs will document the animal's presence within the estimated harassment zone.

Chevron will also establish shutdown zones for all marine mammals for which take has not been authorized or for which incidental take has been authorized but the authorized number of takes has been met. These zones will be equivalent to the Level B harassment zones for each activity. If a marine mammal species for which take is not authorized or a species for which incidental take has been authorized but the authorized number of takes has been met enters the shutdown zone, all in-water activities must cease until the animal leaves the zone or has not been observed for at least 1 hour, and NMFS will be notified about species and precautions taken. Pile removal will proceed if the animal is observed to leave the Level B harassment zone or if 1 hour has passed since the last observation.

If shutdown and/or clearance procedures will result in an imminent safety concern, as determined by Chevron or its designated officials, the in-water activity will be allowed to continue until the safety concern has been addressed, and the animal will be continuously monitored.

Table 8 -- Shutdown Zones by Activity Type

Method	Pile Type	Shutdown Zones (m) [1]				
		LF	MF	HF	PW	OW

Pile removal activities						
Vibratory extract	36-inch steel pile	20	10	30	20	10
	18-inch concrete pile	10	10	10	10	10
Pile installation activities						
Impact install	24-inch square concrete pile	40	10	40	20	10
Vibratory install	36-inch steel pile	20	10	30	20	10

[1] Observers will monitor as far as the eye can see.

Protected Species Observers

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

PSOs will monitor the full shutdown zones and the Level B harassment zones to the extent practicable. 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 areas outside the shutdown zones and thus prepare for a potential cessation of activity should the animal enter the shutdown zone.

Pre-and Post-Activity Monitoring

Monitoring must take place from 30 minutes prior to initiation of pile driving activities (*i.e.,* pre-clearance monitoring) through 30 minutes post-completion of pile driving. Prior to the start of daily in-water construction activity, or whenever a break in pile driving 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 a 30-minute

period. If a marine mammal is observed within the shutdown zones listed in Table 10, pile driving activity will be delayed or halted. If work ceases for more than 30 minutes, the pre-activity monitoring of the shutdown zones will commence. A determination that the shutdown zone is clear must be made during a period of good visibility (*i.e.,* the entire shutdown zone and surrounding waters must be visible to the naked eye).

Soft-start Procedures

Soft-start procedures 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 30-second waiting period, then two subsequent reduced-energy strike sets. 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.

Bubble Curtain

A bubble curtain must be employed during all impact pile installation of the 24-inch square concrete piles to interrupt the acoustic pressure and reduce impact on marine mammals. The bubble curtain must distribute air bubbles around 100 percent of the piling circumference for the full depth of the water column. The lowest bubble ring must be in contact with the mudline for the full circumference of the ring. The weights attached to the bottom ring must ensure 100 percent substrate contact. No parts of the ring or other objects may prevent full substrate contact. Air flow to the bubblers must be balanced around the circumference of the pile.

Based on our evaluation of the applicant’s planned measures, NMFS has determined that the mitigation measures provide the means of 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 would 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 while conducting the activities. 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 activity; 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); and,
- Mitigation and monitoring effectiveness.

Visual Monitoring

Marine mammal monitoring must be conducted in accordance with the conditions in this section, the Monitoring Plan, and this IHA. Marine mammal monitoring during pile driving activities will be conducted by PSO's meeting NMFS' standards and in a manner consistent with the following:

- PSOs must be independent of the activity contractor (for example, employed by a subcontractor) and have no other assigned tasks during monitoring periods;
- At least one PSO will have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization;
- Where a team of three or more PSOs is required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization; and
- PSOs must be approved by NMFS prior to beginning any activity subject to the IHA.

PSOs should 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.

Chevron will have at least two PSOs stationed at the best possible vantage points in the project area to monitor during all pile driving activities. Monitoring will occur from elevated locations along the shoreline or on barges where the entire shutdown zones and monitoring zones are visible. PSOs will be equipped with high quality binoculars for monitoring and radios or cells phones for maintaining contact with work crews. Monitoring will be conducted 30 minutes before, during, and 30 minutes after all in water construction activities. In addition, PSOs will record all incidents of marine mammal occurrence, regardless of distance from activity, and will 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 equipment is no more than 30 minutes.

In addition to monitoring on days that construction will occur, as planned by the applicant, Chevron will conduct biological monitoring within 1 week ahead of the

project's start date to establish baseline observation. These observation periods will encompass different tide levels at different hours of the day.

Data Collection

Chevron will record detailed information about implementation of shutdowns, counts and behaviors (if possible) of all marine mammal species observed, times of observations, construction activities that occurred, any acoustic and visual disturbances, and weather conditions. PSOs will use approved data forms to record the following information:

- Date and time that permitted construction activity begins and ends;
- Type of pile removal activities that take place;
- Weather parameters (*e.g.,* percent cloud cover, percent glare, visibility, air temperature, tide level, Beaufort sea state);
- Species counts, and, if possible, sex and age classes of any observed marine mammal species;
- Marine mammal behavior patterns, including bearing and direction of travel;
- Any observed behavioral reactions just prior to, during, or after construction activities;
- Location of marine mammal, distance from observer to the marine mammal, and distance from pile driving activities to marine mammals;
- Whether an observation required the implementation of mitigation measures, including shutdown procedures and the duration of each shutdown; and
- Any acoustic or visual disturbances that take place.

Reporting

Chevron must submit a draft marine mammal monitoring report to NMFS within 90 days after the completion of pile driving activities, or 60 days prior to the requested issuance of any future IHAs for the project, or other projects at the same location,

whichever comes first. A final report must be prepared and submitted within 30 calendar days following receipt of any NMFS comments on the draft report. If no comments are received from NMFS within 30 calendar days of receipt of the draft report, the report shall be considered final. The marine mammal report will include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets and/or raw sighting data. Specifically, the report will include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including: (a) How many and what type of piles were driven or removed and the method (*i.e.,* impact or vibratory); and (b) the total duration of time for each pile (vibratory driving) number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring; and
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance.

For each observation of a marine mammal, the following will be recorded:

- Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting;
- Time of sighting;
- Identification of the animal(s) (*e.g.,* genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species;
- Distance and location of each observed marine mammal relative to pile being driven or removed for each sighting;
- Estimated number of animals (min/max/best estimate);

- Estimated number of animals by cohort (adults, juveniles, neonates, group composition, *etc.*);
- Description of any marine mammal behavioral observations (*e.g.,* observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.,* no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching); and
- Animal's closest point of approach and estimated time spent within the harassment zone.

Additionally, Chevron must include the following information in the report:

- Number of marine mammals detected within the harassment zones, by species; and
- Detailed information about any implementation of any mitigation triggered (*e.g.,* shutdowns and delays), a description of specific actions that ensured, and resulting changes in behavior of the animal(s), if any.

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, Chevron will report the incident to the Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS and to the West Coast regional stranding network (866-767-6114) as soon as feasible. If the death or injury was clearly caused by the specified activity, Chevron will 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 IHAs. Chevron must not resume their activities until notified by NMFS.

The report will include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);

- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- 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 impacts or responses (*e.g.*, intensity, duration), the context of any impacts or responses (*e.g.*, critical reproductive time or location, foraging impacts affecting energetics), 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' 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 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, the discussion of our analysis applies to all the species listed in Table 2, given that the anticipated effects of this activity on these different marine

mammal stocks are expected to be similar. There is little information about the nature or severity of the impacts, or the size, status, or structure of any of these species or stocks that would lead to a different analysis for this activity.

Level A harassment is extremely unlikely given the small size of the Level A harassment isopleths and the required mitigation measures designed to minimize the possibility of injury to marine mammals. No serious injury or mortality is anticipated given the nature of the activity.

Pile driving activities have the potential to disturb or displace marine mammals. Specifically, the project activities may result in take, in the form of Level B harassment from underwater sounds generated from impact and vibratory pile driving activities. Potential takes could occur if individuals move into the ensonified zones when these activities are underway.

The takes by Level B harassment will be due to potential behavioral disturbance. The potential for harassment is minimized through construction methods and the implementation of planned mitigation strategies (see **Mitigation** section).

Take will occur within a limited, confined area of each stock's range. Further, the amount of take authorized is extremely small when compared to stock abundance.

No marine mammal stocks for which take is authorized are listed as threatened or endangered under the ESA or determined to be strategic or depleted under the MMPA. The relatively low marine mammal occurrences in the area, small shutdown zones, and planned monitoring make injury takes of marine mammals unlikely. The shutdown zones will be thoroughly monitored before the pile driving activities begin, and activities will be postponed if a marine mammal is sighted within the shutdown zone. There is a high likelihood that marine mammals will be detected by trained observers under environmental conditions described for the project. Limiting construction activities to daylight hours will also increase detectability of marine mammals in the area. Therefore,

the mitigation and monitoring measures are expected to eliminate the potential for injury and Level A harassment as well as reduce the amount and intensity of Level B behavioral harassment. Furthermore, the pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations which have occurred with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment.

Anticipated and authorized takes are expected to be limited to short-term Level B harassment (behavioral disturbance) as construction activities will occur intermittently over the course of 30 days. Effects on individuals taken by Level B harassment, based upon reports in the literature as well as monitoring from other similar activities, may include increased swimming speeds, increased surfacing time, increased haul out time by pinnipeds, or decreased foraging (*e.g.,* Thorson and Reyff, 2006; NAVFAC SW, 2018b). Individual animals, even if taken multiple times, will likely move away from the sound source and be temporarily displaced from the area due to elevated noise level during pile removal. Marine mammals could also experience TTS if they move into the Level B harassment zone. TTS is a temporary loss of hearing sensitivity when exposed to loud sound, and the hearing threshold is expected to recover completely within minutes to hours. Thus, it is not considered an injury. While TTS could occur, it is not considered a likely outcome of this activity. Repeated exposures of individuals to levels of sounds that could cause Level B harassment are unlikely to considerably significantly disrupt foraging behavior or result in significant decrease in fitness, reproduction, or survival for the affected individuals. In all, there will be no adverse impacts to the stock as a whole.

As previously described, an Unusual Mortality Event (UME) has been declared for Eastern Pacific gray whales. However, we do not expect authorized takes in this action to exacerbate the ongoing UME. As mentioned previously, no injury or mortality is authorized, and take by Level B harassment is limited (two takes over the duration of

the project). Therefore, we do not expect the take authorization to compound the ongoing UME.

The project is not expected to have significant adverse effects on marine mammal habitat. There are no known Biologically Important Areas (BIAs) or ESA-designated critical habitat within the project area, and the activities will not permanently modify existing marine mammal habitat. Although harbor seal haulout sites are located in the Bay, hauled out seals are not likely to be impacted. PSOs during the seismic retrofit of the Richmond Bridge did not note any decline in use by harbor seals at Castro Rocks, a haulout site which is approximately 20 to 100 m from the bridge (Greene *et al.,* 2006) and 560 m from the project area. In addition, any pupping that may occur at Castro Rocks will take place outside of the work window for the pile driving activities. The activities may cause fish to leave the area temporarily. This could impact marine mammals' foraging opportunities in a limited portion of the foraging range, however, due to the short duration of activities and the relatively small area of affected habitat, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

In combination, these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities will have only minor, short-term effects on individuals. The specified activities are not expected to impact reproduction or survival of any individual marine mammals, much less have impacts on annual rates of recruitment or survival.

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

- No serious injury, mortality, or Level A harassment is anticipated or authorized;

- The specified activities and associated ensonified areas are very small relative to the overall habitat ranges of all species;
- The project area does not overlap known BIAs or ESA-designated critical habitat;
- The lack of anticipated significant or long-term effects to marine mammal habitat;
- The presumed efficacy of the mitigation measures in reducing the effects of the specified activity; and
- Monitoring reports from similar work in the Bay have documented little to no effect on individuals of the same species impacted by the specified activities.

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 monitoring and mitigation measures, NMFS finds that the total marine mammal take from the activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted previously, only take of small numbers of marine mammals 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 and 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. When the predicted number of individuals to be taken is fewer than one-third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of take NMFS has authorized is below one-third of the estimated stock abundances for all seven stocks (refer back to Table 8). For most stocks, the authorized take of individuals is less than 2 percent of the abundance of the affected stock (with exception of harbor seals at 23 percent). This is likely a conservative estimate because it assumes all takes are of different individual animals, which is likely not the case for harbor seals, given the nearby haulout. Some individuals may return multiple times in a day, but PSOs will count them as separate takes if they cannot be individually identified.

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.

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 would 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 review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 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 issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Authorization

NMFS has issued an IHA to Chevron for the potential harassment of small numbers of seven marine mammal species incidental to the LWMEP in San Francisco Bay, California, provided the previously mentioned mitigation, monitoring, and reporting requirements are followed.

Dated: May 15, 2023.

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