

Incidental Harassment Authorization

Pillar Point Harbor Johnson Pier Expansion and Dock Replacement Project

Produced for San Mateo County Harbor District

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1. INTRODUCTION

San Mateo County Harbor District (SMCHD) is proposing the Pillar Point Harbor (PPH) Johnson Pier Expansion and Dock Replacement Project (the Project). The Project involves replacing existing deteriorated commercial floating docks (Dock D, E, F, G, H, and fuel dock), expanding Johnson Pier to improve the safety of commercial fish handling operations, and completing minor concrete and utility repairs. The Project is located at Pillar Point Harbor in the Community of Princeton, north of Half Moon Bay, San Mateo County, California. The Project occurs within the Pillar Point inner harbor protected by three solid rubble-mound breakwaters. The Pillar Point outer harbor is protected by two additional solid rubble-mound breakwaters (Figure 1).

The Project may result in the incidental injurious take (Level A) and incidental harassment (Level B take) of marine mammals protected under the Marine Mammal Protection Act (MMPA). The take is related to construction noise introduced through in-water and/or in-air work from pile driving. San Mateo County Harbor District (SMCHD) is requesting Incidental Harassment Authorization (IHA) for Level A and Level B harassment for two (2) species, the harbor seal (*Phoca vitulina*) and the California sea lion (*Zalophus californianus*) pursuant to 50 CFR 216.104 guidance.



Figure 1 - Project Location Map



1.1. DESCRIPTION OF SPECIFIED ACTIVITY

The Project consists of the following:

- Johnson Pier partial demolition
 - North Timber Pier: Demolish and remove approximately 2,500 square feet (sf) of existing fixed timber pier and up to 55, 14-inch diameter treated timber piles.
 - North floats: Demolish and remove approximately 1,900 sf of existing floating docks and up to 7, 14-inch diameter square concrete piles.
 - East timber pier: Demolish and remove approximately 600 sf of existing fixed treated timber pier and up to 20, 14-inch treated timber piles.
- Johnson Pier expansion
 - North expansion: Expand the northern portion of the pier by approximately 7,200 sf and install up to 65, 24-inch diameter precast concrete piles to replace the North Timber Pier.
 - South expansion: Expand the southern portion of the pier by approximately 8,500 sf and install up to 65, 24-inch precast concrete piles.
- Minor concrete repairs at Johnson Pier, including concrete crack repairs
- Commercial floating dock and fuel dock replacement
 - Demolish and remove the existing commercial treated-timber floating docks and fuel dock, replacing the existing docks and expanding the docks for an additional 20,000 sf, inclusive of removal of up to 190, 14-inch diameter square concrete piles, and installation of up to 215, 16-inch diameter concrete or fiberglass piles and 15, 24-inch concrete piles.
- Minor utility improvements including replacement of all power, potable water, and fire water utilities on the commercial docks, and relocation of the existing fuel lines, sewage pumpout and force main within the footprint of the commercial docks and Johnson Pier.

1.1.1. Johnson Pier Partial Demolition

For the demolition phase of the Project, the existing 2,500 sf north timber pier, 600 sf east timber pier, 1,900 sf north floats will be removed (Figure 2). This includes approximately 55, 14-inch creosote-treated north timber pier piles, 20, 14-inch diameter creosote-treated east timber pier piles, and 7, 14-inch concrete square north float piles. Pile installation and removal methods are discussed in Section 1.1.6.

It is anticipated that the superstructure will be removed entirely from top of deck using power tools including a chainsaw. Sections of the timber deck will be cut at the beams and lifted as a unit to minimize cutting over the water. Any scraps that might fall off will float and will be retrieved immediately by small boat ready to retrieve them. Demolished decking sections will be placed on the barge and transported to an upland disposal site for further cutting and loading for removal to a licensed disposal site.

1.1.2. Johnson Pier Expansion

The expansion on the north of the existing Johnson pier head will result by filling in the narrow (44-foot-wide) eastern portion to achieve a uniform 72-foot width (Figure 3). This will add approximately 7,200 square feet of deck area needed for fish handling, forklift maneuvering and truck turnaround. The proposed pier

expansion to the south will add approximately 8,500 square feet of area to the pier (Figure 3). This area will allow trucks to pull in forward, turn around, and pull out forward.

Materials and framing for the south and north expansions will be similar to the existing pier structure including precast prestressed concrete piles, precast concrete planks, and cast-in-place concrete. A total of up to 130, 24-inch octagonal piles could be installed as part of the expansion. Pile installation methods are discussed in Section 1.1.6.

1.1.3. Minor Concrete Repairs at Johnson Pier

Approximately 200 sf of existing concrete pile caps, beams, and decking that are experiencing cracking will be repaired. One pile experiencing cracking will be repaired. A jackhammer will be used to remove the damaged concrete. After the damaged concrete is removed the rebar will be cleaned and new concrete will be placed over the damaged areas and allowed to set. Concrete will likely be mixed at the site on a barge or on the existing concrete deck. Concrete deck work will occur from the top of the existing deck and pile cap. Beam work may be performed from scaffolding. Scaffolding will include a solid scaffolding platform and will extend the full length of concrete work to catch any falling concrete debris.

1.1.4. Commercial Floating Dock and Fuel Dock Replacement

The existing treated timber floating docks and fuel dock will be removed and replaced, while simultaneously expanding the docks for an additional 20,000 sf. The replacement of Dock E will include the addition of a 2,500 sf concrete floating work dock (Dock EW). This will be achieved by a combination of hand tool disassembly and removal by crane positioned on a crane barge or on the pier. Up to approximately 190, 14-inch square concrete guide piles could be removed and would likely be replaced with up to approximately 215, 16-inch square concrete or fiberglass guide piles. Pile installation methods are discussed in Section 1.1.6.

1.1.5. Minor Utility Replacements

Pier electrical power upgrades are required at the fish buyers building at the south end of Johnson Pier which is currently not providing sufficient power for present operations. The sewage lift station on Johnson Pier is near the end of its service life and in need of replacement.

Existing utilities for the floating docks include power, potable water, and fire water. As part of the floating dock replacements, all of these utilities will need to be removed and replaced. For the fuel dock, fuel lines from the pier to the existing fuel dock will be relocated to the new fuel dock, and the sewage pump out equipment and force main will be relocated to the Dock EW on the west side of Johnson Pier (Figure 3).

1.1.6. Pile Installation and Removal Methods

As discussed in Section 1.1.2 and 1.1.4, up to 145, 24-inch diameter concrete piles and up to 215, 16-inch diameter concrete or fiberglass piles would be installed. Concrete pile installation is proposed to be completed by impact pile driving using an impact hammer attached to a crane positioned on a crane barge or on the pier. If fiberglass guide piles are installed, installation methods would involve a vibratory hammer and impact proofing. In addition, a hydraulic jet may be used to assist in pile installation. Pile driving could occur for up to approximately 80 days, with approximately 5 piles driven per day.

Up to approximately 190 existing 14-inch concrete guide piles at docks D, E, F, G, and H and 7, 14-inch concrete square piles at the north floats would be removed using vibratory extraction. The existing 55, 14-inch creosote-treated piles at the north timber pier, and 20, 14-inch creosote-treated timber pile at the east

pier would be removed using vibratory extraction or direct pull. It is anticipated that most of the piles will be removed fully, however if the pile breaks during removal they will be cut below the mudline.

The inclusion of hydraulic jetting as another pile driving method allows the selected contractor to modify their pile driving methods if deemed necessary during construction. Hydraulic jetting works by directing pressurized water flow down the pile to the soils directly beneath it. Hydraulic jetting liquefies the soils at the pile tip reducing friction and causing the pile to descend downwards under its own weight. Hydraulic jetting can be used to decrease pile driving time and the number of impact blows required to drive piles. A combination of vibratory, hydraulic jetting, and impact pile driving may, therefore, be used.

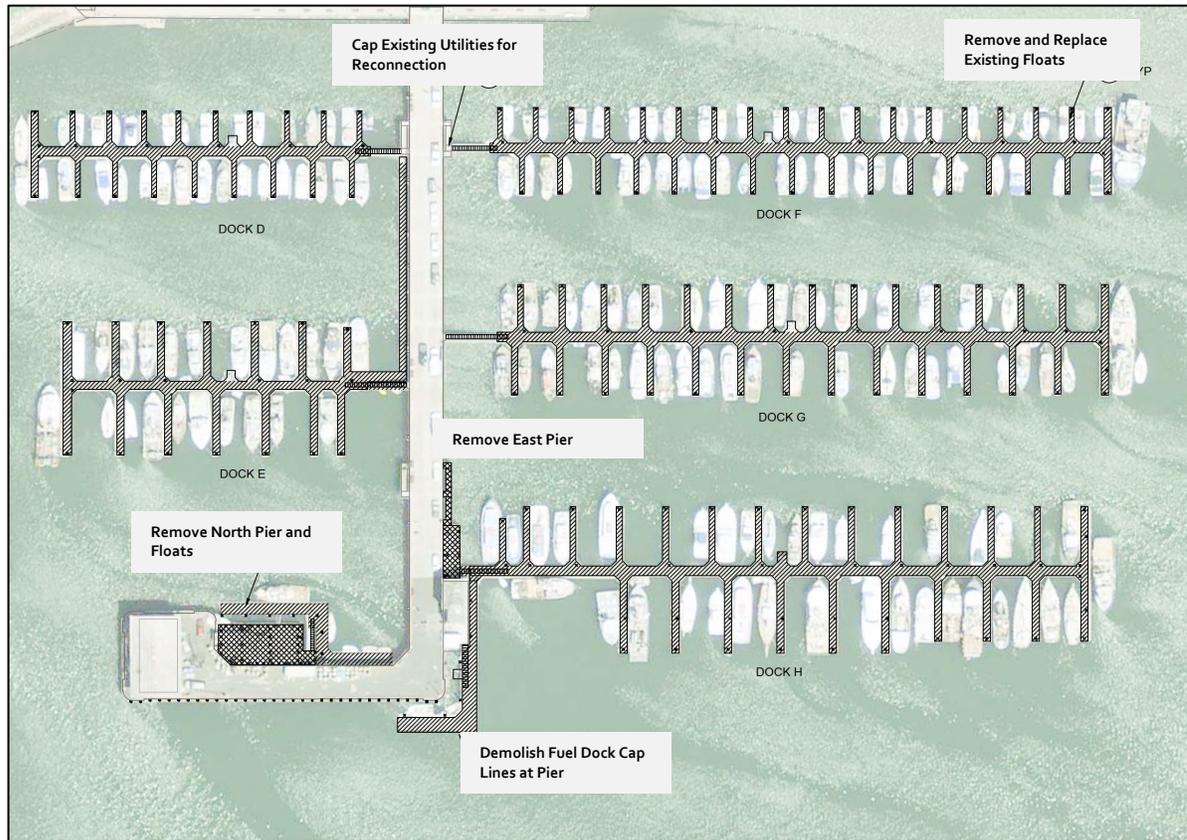


Figure 2 - Demolition Plan

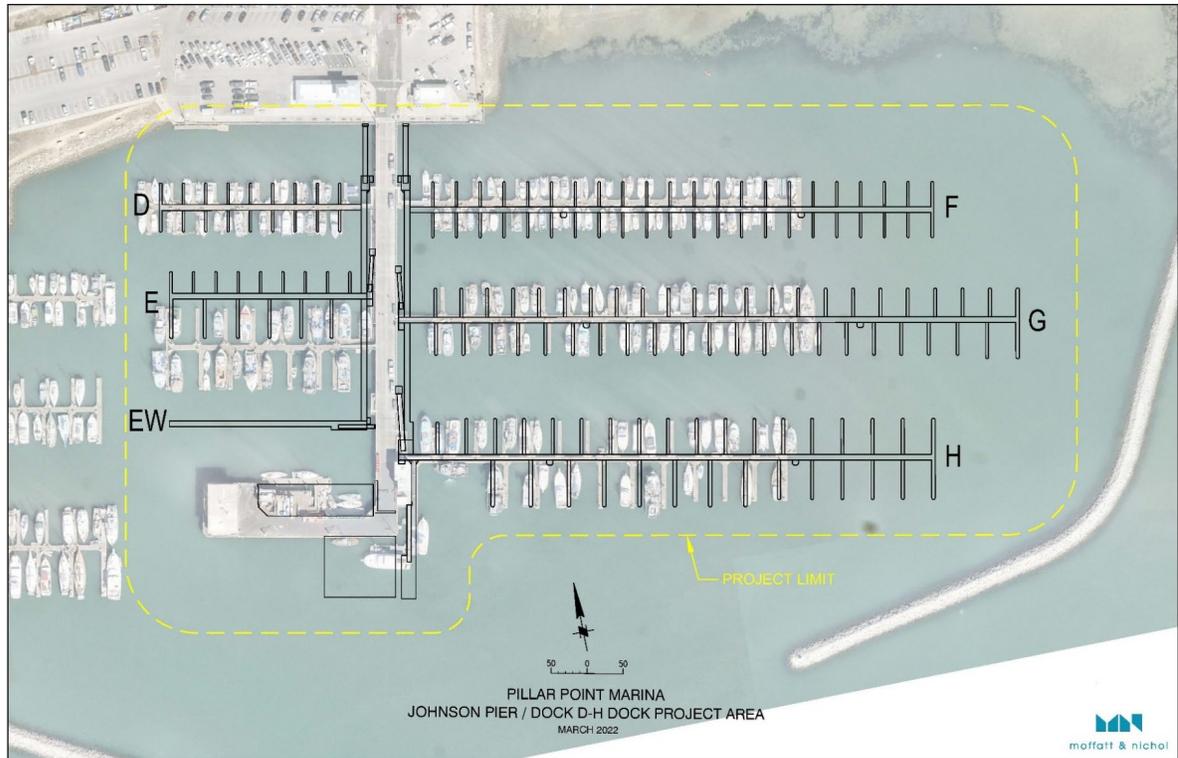


Figure 3 - Expansion Plan

1.1.7. Construction Equipment

The list of equipment anticipated to be used for the Project includes:

- Hand power tools – used for demolition of timber components of the floating timber docks and timber fixed piers including decking.
- Power (electric and gas) saws – used for demolition of timber components of the floating timber docks and timber fixed piers including decking.
- Pneumatic tools – used for demolition of concrete components including superstructure of Johnson Pier and pile caps.
- Small vessel – used for site supervision, transporting workers, and picking up any scraps from demolition that fall into the water for proper disposal.
- Crane Barge (2) – Used to support the crane used for demolition of the fixed and floating docks, storage of demolition material for proper disposal and used to support the crane used for pile driving, projected to be driving 5 piles per day for 80 construction days. Barges will be located within the Pillar Point inner harbor.
- Crane with bucket attachment – crane used for demolition activities. This crane will be located on the demolition crane barge.



- Crane with impact pile driver – crane used for pile driving activities. This crane will be located on the crane barge.
- Crane with vibratory pile driver/extractor – crane used for pile driving activities. This crane will be located on the crane barge.
- Hydraulic jet pumping system (potential) – crane attachment used to hydraulically drive piles, this is a contractor option. This system will be located on the crane barge.
- Concrete mixer – used to mix concrete on site for the Johnson Pier Expansion. Concrete mixing will occur upland and will be transported to the pier to be placed from the existing working pier platform.
- Concrete pump – used to pump the concrete for Johnson Pier Expansion. This pump will be located on the existing working pier platform.
- Diver – used as needed to perform inspections of the work.

Of the equipment listed above, the equipment associated with pile driving activities could result in take.

2. DATES, DURATION, AND SPECIFIED GEOGRAPHICAL REGION

The Project is located at the PPH in the Community of Princeton, north of Half Moon Bay, San Mateo County, California. The Project occurs within the Pillar Point inner harbor which is contained by three solid rubble-mound breakwaters. The outer harbor is contained by two additional solid rubble-mound breakwaters. Project activities will occur at floating docks Dock D, E, F, G, H, and fuel dock, north timber pier, north floats, east timber pier, and Johnson Pier. Work will begin upon obtaining all necessary local, state, and federal permits and/or approvals. The anticipated start date is spring of 2024.

Project duration including mobilization and demobilization is anticipated to take up to 36 months and may be performed in phases over a five-year period. It is anticipated that piles will be driven at a rate of 5 piles per day for 80 construction days. Barges for pile driving operations will be located within the Pillar Point inner harbor.

Laydown and staging will occur in the upper marina parking lot and Johnson Pier Road and Pillar Point Harbor Boulevard will be used for access. Materials are anticipated to be delivered by floating barge, however trucks may be used on occasion to transport materials. If chosen by the contractor, the existing Pillar Point launch ramp may also be used.

3. SPECIES AND NUMBERS OF MARINE MAMMALS

According to the Biological Resource Assessment (Rincon 2022) prepared for the Project, several Marine Mammal Protection Act (MMPA) protected species could occur within the Project vicinity (Table 1). Of these species, take is only proposed for harbor seals and sea lions. Exclusion zones will be implemented for all other marine mammals to avoid take.



Table 1 – Marine Mammals with Potential to Occur in Project Area

Species	Scientific Name	Occurrence at Pillar Point, Inner Harbor	Take
Northern elephant seal	<i>Mirounga angustirostris</i>	Anticipated to be uncommon within the inner harbor	Take not proposed. See Section 3.1.1
Gray whale	<i>Eschrichtius robustus</i>	Not anticipated to occur within confined inner harbor	Take not proposed. See Section 3.1.2
Harbor porpoise	<i>Phocoena phocoena</i>	Anticipated to be uncommon within the confined inner harbor	Take not proposed. See Section 3.1.3
Common bottlenose dolphin	<i>Tursiops truncatus</i>	Anticipated to be uncommon within the confined inner harbor	Take not proposed. See Section 3.1.4
Harbor seal	<i>Phoca vitulina</i>	Could occur within Pillar Point, inner harbor	Take proposed (see Section 4)
California sea lion	<i>Zalophus californianus</i>	Could occur within Pillar Point, inner harbor	Take proposed (see Section 4)

3.1. MMPA SPECIES NOT PROPOSED FOR TAKE BY PROJECT

3.1.1. Northern Elephant Seal

The northern elephant seal (*Mirounga angustirostris*) is a fully protected species and is also protected by the MMPA. Individuals may occur on land to breed, rest, and/or molt, typically on sandy or rocky areas along the coastline (NOAA 2022a).

Suitable beach habitat for breeding is not present within the Project area, and the species has a low potential to transit and/or forage within Pillar Point Harbor. Exclusion zones will be implemented for Northern elephant seals species to avoid potential Level A and Level B take. Therefore, take is not proposed, and this species will not be discussed further.

3.1.2. Gray Whale

The western North Pacific distinct population segment (DPS) gray whale (*Eschrichtius robustus*) is listed as Federally Endangered and the eastern North Pacific DPS population was once listed but has successfully recovered and was delisted in 1994. Gray whales are found mainly in shallow coastal waters in the North Pacific Ocean and most spend the summers feeding in the northern Bering and Chukchi seas (NOAA 2022b). Gray whales are primarily bottom feeders that consume a wide range of benthic and epibenthic invertebrates by sucking in sediment from the sea floor and filtering it through coarse baleen plates (NOAA 2022b).

As the Project is within the Pillar Point inner harbor which is contained by three solid rubble-mound breakwaters, positioned within the outer harbor which is contained by two additional solid rubble-mound breakwaters, it is not anticipated that species will find themselves in the Project impact area – rather species will be able to avoid the site and remain outside of the breakwater structures. In the rare instance that a gray whale was to enter the impact area, exclusion zones will be implemented to avoid potential Level A and Level B take. Therefore, take is not proposed, and this species will not be discussed further.

3.1.3. Harbor Porpoise and Common Bottlenose Dolphin

The harbor porpoise is protected by the MMPA and occurs globally in temperate, subarctic, and arctic coastal and offshore waters. The species is commonly found in coastal areas, bays, estuaries, harbors, and



fjords and is most often seen in groups of under ten individuals (NOAA 2022c). Diet consists primarily of schooling fish and occasionally includes squid and octopus.

The common bottlenose dolphin is protected by the MMPA and occurs in temperate and tropical waters (NOAA 2022d). This species inhabits a variety of habitats, including harbors, bays, gulfs, and estuaries, nearshore coastal waters, deeper waters, and open ocean. Their diet consists of fish, squid, and crustaceans.

The harbor porpoise and common bottlenose dolphin are unlikely to occur within Pillar Point Harbor due to the breakwaters which separate the harbor from the ocean. Both of these species have a low potential to transit or forage within the Project area. Exclusion zones will be implemented to avoid potential Level A and Level B take. Therefore, take is not proposed, and this species will not be discussed further.

3.2. MMPA SPECIES THAT COULD RESULT IN TAKE BY PROJECT

3.2.1. Harbor Seal

The harbor seal is protected by the MMPA and inhabits temperate coastal habitats along the entire coast of California (NOAA 2022e). The species hauls out on rocks, reefs, and beaches to rest, regulate body temperature, give birth, nurse pups, and molt. Harbor seals feed in both deep and shallow coastal waters and their diet consists primarily of fish, crustaceans, and mollusks. Harbor seals were observed within the Project area during the field survey and have been frequently documented within Pillar Point Harbor (Rincon 2021)). This population shall be discussed further in Section 4.

3.2.2. California Sea Lion

The California sea lion is protected by the MMPA and occurs in the shallow waters of the eastern North Pacific Ocean (NOAA 2022f). The species prefers sandy beaches or rocky coves for breeding and hauling out, though they also occur on marina docks, jetties, and buoys along the west coast. Their primary breeding range is from the Channel Islands to central Mexico. California sea lions primarily feed offshore on a variety of prey species, including squid, anchovies, mackerel, rockfish, and sardines. California sea lions were observed within the Project area during the field survey (Rincon 2021). This population shall be discussed further in Section 4.

4. AFFECTED SPECIES STATUS AND DISTRIBUTION

Though the species listed in Section 3 may occur near the Project area, two of these species are common in the vicinity of the Project area and may be taken by the Project.

4.1. HARBOR SEAL

Harbor seals are not listed as "endangered" or "threatened" under the Endangered Species Act nor designated as "depleted" under the MMPA. Harbor seals spend about half their time in the water, where they typically dive for seven minutes in relatively shallow waters to feed on a variety of prey items, including flounder, sculpin, herring and squid (NOAA 2015). Harbor seal pups are typically born between February and April which would possibly coincide with pile driving activities for the Project.

4.1.1. Hearing Ability

Harbor seals are classified as phocid pinnipeds and have an approximate in-water hearing range of 50 hertz (Hz) to 86 kilohertz (kHz) (NMFS 2018).



4.1.2. Distribution

Harbor seals (*Phoca vitulina*) are widely distributed in the North Atlantic and North Pacific. Two subspecies exist in the Pacific: *P. v. stejnegeri* in the western North Pacific, near Japan, and *P. v. richardii* in the eastern North Pacific. The latter subspecies inhabits coastal and estuarine areas from Mexico to Alaska. These seals do not make extensive pelagic migrations, but do travel 300-500 km to find food or suitable breeding areas. In California, approximately 400-600 harbor seal haulout sites are widely distributed along the mainland and on offshore islands, including intertidal sandbars, rocky shores and beaches (NOAA 2015).

4.1.3. Status

A complete count of all harbor seals in California is impossible because not all animals are hauled out simultaneously. Population size is estimated by counting the number of seals ashore during the peak haul-out period (May to July) and by multiplying this count by a correction factor equal to the inverse of the estimated fraction of seals on land. The minimum population size is 27,348 seals (NOAA 2015). The potential biological removal (PBR) level for this stock is 1,641 animals per year.

4.1.4. Presence in the Project Area

The Project area consists of a marina and commercial fishing terminal. The Project area does not consist of harbor seal natural habitat. Breeding and/or calving is not known to occur in the Project area. Based on anecdotal statements from Pillar Point Harbor operations staff harbor seals could occur within the inner harbor area on a daily basis. Past observations indicate that harbor seals rarely haulout within the Project area.

4.2. CALIFORNIA SEA LION

California sea lions (*Zalophus californianus*) in the U.S. are not listed as "endangered" or "threatened" under the Endangered Species Act or as "depleted" under the MMPA. California sea lions would typically dive for less than three minutes in less than 80 meters of water to feed on prey items such as squid, herring, rockfish and small sharks (NOAA 2019).

4.2.1. Hearing Ability

California sea lions are classified as otariid pinnipeds and have an approximate in-water hearing range of 60 Hz to 39 kHz (NMFS 2018).

4.2.2. Distribution

California sea lions breed on islands located in southern California, western Baja California, and the Gulf of California. Sandy beaches are preferred for haul out sites. In California, they haul out on marina docks as well as jetties and buoys. Mitochondrial DNA analysis identified five genetically distinct geographic populations: (1) Pacific Temperate, (2) Pacific Subtropical, (3) Southern Gulf of California, (4) Central Gulf of California and (5) Northern Gulf of California. The Pacific Temperate population includes rookeries within U.S. waters and the Coronado Islands just south of U.S./Mexico border. Animals from the Pacific Temperate population range into Canadian and Baja California waters. Males from western Baja California rookeries may spend most of the year in the United States.



4.2.3. Status

California sea lion population size was estimated from a 1975-2014 time series of pup counts, combined with mark-recapture estimates of survival rates. Population size in 2014 was estimated at 257,606 animals, which corresponded with a pup count of 47,691 animals along the U.S. west coast (NOAA 2015).

4.2.4. Presence in Project Area

The Project area consists of a marina and commercial fishing terminal. The Project area does not consist of sea lion natural habitat. Breeding and/or calving is not known to occur in the Project area. Based on anecdotal statements from Pillar Point Harbor operations staff, sea lions could occur within the inner harbor area on a daily basis. Past observations indicate that sealions rarely haulout within the Project area.

5. TYPE OF INCIDENTAL TAKING AUTHORIZATION REQUESTED

Level A and Level B harassment for exposure to underwater sound is being requested for two (2) species, the harbor seal and California sea lion. Take could result from exposure to underwater and in-air noise generated by proposed pile driving activities. A 50-foot exclusion zone will be implemented for harbor seals and California sea lions to avoid potential interaction with pile driving equipment.

6. NOISE ANALYSIS

6.1. NOISE THRESHOLDS

Exposure to substantial in-water noise can result in a noise-induced hearing threshold shift in marine mammals. If the hearing threshold returns to normal after the exposure, this is considered a temporary threshold shift (TTS). If the hearing threshold does not return to normal for some extended period of time after the exposure, this is considered a permanent threshold shift (PTS). Both PTS and TTS data has been used to determine safe noise exposure levels for marine mammals.

Using PTS and TTS data, NOAA's National Marine Fisheries Service (NMFS) has identified Level A (potential injury) and Level B (potential behavioral disturbance) in-water noise thresholds for marine mammals (NMFS 2020). Level A harassment is defined as *"any act of pursuit, torment, or annoyance that has the potential to injure a protected marine mammal or marine mammal stock in the wild"*. Level B harassment is defined as *"any act of pursuit, torment, or annoyance that has the potential to disturb a protected 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, but does not have the potential to injure a marine mammal or marine mammal stock in the wild"*.

Noise has the potential to directly impact marine mammals by causing physical injury or altering behavior when these noise thresholds are exceeded. Established noise thresholds are based on the hearing class of the marine mammal. The NMFS noise thresholds for phocid (harbor seal) and otariid (sea lion) hearing classes are shown in Table 2.



Table 2 - Phocid Pinniped and Otariid Pinniped Noise Thresholds

Hearing Group	Noise Type	Level A Harassment		Level B Harassment
		dB SELcum	dB Peak	dBrms
Phocid Pinnipeds	In-water, Impulsive	185	218	160
	In-water, Continuous	201	-	120
	In-air, all Sources- harbor seals	-	-	90
	In-air, all Sources- other phocids	-	-	100
Otariid Pinnipeds	In-water, Impulsive	203	232	160
	In-water, Continuous	219	-	120
	In-air, all Sources	-	-	100

- No applicable threshold

6.2. ESTIMATED SOUND PRODUCTION

Pile installation has the greatest potential to create in-water and in-air noise impacts. As discussed in Section 1, up to 145, 24-inch diameter concrete piles and up to 215, 16-inch diameter concrete or fiberglass piles will be installed. The installation of concrete piles will be completed by impact pile driving using an impact hammer attached to a crane positioned on a crane barge or on the pier. The impact hammer will be used to drive piles for approximately 80 days, with approximately 5 piles driven per day. Given the dense sand substrate at the Project site, up to 3,000 blows per 16-inch concrete pile and 4,000 blows per 24-inch concrete pile could be required. A hydraulic jet may be used to assist in pile installation and reduce the number of blows required to install each pile.

If fiberglass guide piles are installed, they could be installed using a combination of a vibratory hammer and impact proofing, or solely with an impact hammer. The number of blows per pile for fiberglass pile installation will be equal to or less than that required to install concrete piles. Vibratory installation could occur for up to 10 hours per day. Data for the installation of fiberglass piles is limited. Available data for the impact installation of 16-inch concrete piles was used to analyze the potential noise impacts associated with the impact installation of 16-inch diameter fiberglass piles (Table 3). Noise levels for the vibratory installation of fiberglass piles are not available. Available data for the vibratory removal of 20-inch concrete piles was used to analyze the potential noise impacts associated with the vibratory installation of 16-inch fiberglass piles (Table 3).

Existing 14-inch diameter concrete and 14-inch diameter timber piles will be extracted using direct pull or vibratory extraction. The contractor may pull piles and drive piles simultaneously in which case both pile driving and pile removal activities would be completed within 80 days. However, if the contractor pulls piles prior to installation, an additional 50 days could be required for the extraction. In this case a total of 130 days for pile driving and removal activities would be required. Vibratory extraction could occur for up to 10 hours per day. Data for the vibratory extraction of concrete or timber piles is limited. Available data for the vibratory removal of 20-inch concrete piles was used to analyze the potential noise impacts associated with the vibratory removal of 14-inch diameter concrete and 14-inch diameter timber piles (Table 3).

Anticipated noise levels for the installation of 16-inch diameter concrete or fiberglass piles, installation of 24-inch diameter concrete piles, and removal of 14-inch diameter concrete and 14-inch diameter timber piles are identified in Tables 3 and 4.



Table 3 - Anticipated In-water Equipment Noise (Unattenuated)

Equipment	Noise Level			Measurement Distance
	dB Peak	dBrms	dB SEL	
Impact pile driver (unattenuated, 16-inch concrete or fiberglass pile) ¹	193	168	160	10 meters
Impact pile driver (unattenuated, 24-inch concrete pile) ¹	188	176	166	10 meters
Vibratory driving (unattenuated, 16-inch fiberglass) ²	N/A	151.6	N/A	49 meters
Vibratory extraction (unattenuated, 14-inch concrete or timber pile) ²	N/A	151.6	N/A	49 meters

¹ Caltrans 2020

² Naval Facilities Engineering Systems Command Southwest 2022, based on unattenuated noise levels for vibratory removal of 20-inch concrete piles

Table 4 - Anticipated In-air Equipment Noise (Unattenuated)

Equipment	Noise Level		Measurement Distance
	Lmax	Unweighted dBrms	
Impact pile driver (unattenuated, 16-inch concrete pile or fiberglass) ¹	108	94	15.25 meters
Impact pile driver (unattenuated, 24-inch concrete pile) ²	115	98	15.25 meters
Vibratory pile driver/extractor (16-inch fiberglass, 14-inch concrete and timber)	94	88	15.25 meters

¹ WSDOT 2020, based on impact installation of 20-inch diameter concrete pile 16-inch diameter not available, fiberglass not available

² WSDOT 2020, based on impact installation of 36-inch diameter concrete pile, 24-inch diameter not available, fiberglass not available

³ WSDOT 2020, based on vibratory installation of 18-inch diameter steel pile, data not available for concrete, fiberglass, or timber

6.3. ESTIMATED ZONES OF INFLUENCE

The NMFS User Spreadsheet (NMFS 2020) was used to calculate in-water distances to Level A (potential injury) harassment isopleths from pile driving activities. The in-water distances to the Level B (potential disturbance) were calculated using the practical spreading loss model assuming a 4.5 dBA attenuation rate for each doubling distance (NMFS 2012). Distances to thresholds were calculated using the anticipated noise levels and measurement distances identified in Tables 3 and 4. Threshold distances for the vibratory driving of 16-inch fiberglass piles and vibratory extraction of 14-inch diameter concrete and 14-inch diameter timber piles were calculated using the measurement distance of 49 meters. Distances to established thresholds are shown in Table 5.

Typical Project related noise impacts is anticipated to be less than the maximum used for this impact analysis. The noise levels used in this analysis are based on maximum noise levels from available data for the given pile type. Additionally, it has been conservatively assumed that up to 4,000 blows per 24-inch diameter concrete pile and up to 3,000 blows per 16-inch diameter concrete or fiberglass pile could be required to install each pile. This has been assumed given the dense sand substrate at the site, however it is likely that far fewer blows are required. Vibratory pile driving or extraction could occur for up to 10 hours per day.



Table 5 - Potential Exposure of Harbor Seals and Sealions During Impact Pile Driving Activities

	Injury (PTS)		In-water Behavioral	In-air Behavioral
	185 dB SELcum	218 dB Peak	160 dBrms	90 dBrms
Phocid Pinniped Threshold				
Distance to threshold, 16-inch diameter concrete or fiberglass- impact installation	96 meters	Does not exceed	35 meters	25 meters
Distance to threshold, 24-inch diameter concrete impact installation	290 meters	Does not exceed	117 meters	39 meters
Otariid Pinniped Threshold	203 dB SELcum	232 dB Peak	160 dBrms	100 dBrms
Distance to threshold, 16-inch diameter concrete or fiberglass impact installation	7 meters	Does not exceed	35 meters	8 meters
Distance to threshold, 24-inch diameter-concrete impact installation	22 meters	Does not exceed	117 meters	13 meters

Table 6. Potential Exposure of Harbor Seals and Sealions During Vibratory Pile Driving Activities

	Injury (PTS)	In-water Behavioral	In-air Behavioral
	201 dB SELcum	120 dBrms	90 dBrms
Phocid Pinniped Threshold			
Distance to threshold, 16-inch diameter fiberglass-vibratory installation	23 meters	6,265 meters	Does not exceed
Distance to threshold, 14-inch concrete or timber piles-vibratory extraction ¹	23 meters	6,265 meters	Does not exceed
Otariid Pinniped Threshold	219 dB SELcum	120 dBrms	100 dBrms
Distance to threshold, 16-inch diameter fiberglass-vibratory installation	2 meters	6,265 meters	Does not exceed
Distance to threshold, 14-inch concrete or timber piles-vibratory extraction ¹	2 meters	6,265 meters	Does not exceed

¹ Distance to threshold was calculated using the 49-meter measurement distance (Table 3)

Due to the additive noise impacts, the Level A threshold areas for phocid pinnipeds exceed the Level B threshold areas. The calculated threshold areas will be limited by physical obstructions (three solid rubble-mound breakwaters) that restrict the extent of the calculated area to the inner harbor area (Figures 4 and 5).

For phocid pinnipeds, the Level A noise threshold could be exceeded within approximately 290 meters (0.18 miles) of the installation of 24-inch piles and 96 meters (0.06 miles) of the installation of 16-inch piles (Table 5, Figure 4). For otariid pinnipeds, the Level A noise threshold could be exceeded within approximately 22 meters (0.02 miles) of the installation of 24-inch piles and 7 meters (0.01 miles) of the installation of 16-inch piles (Table 5, Figure 4).

For phocid pinnipeds and otariid pinnipeds, the in-water behavioral threshold could be exceeded within approximately 117 meters (0.08 miles) of the installation of 24-inch piles (Table 5, Figure 5) and 35 meters (0.06 meters) of the impact installation of 16-inch piles (Table 5, Figure 5). If vibratory pile driving is used to install 16-inch diameter fiberglass piles, the in-water behavioral threshold for phocid pinnipeds and otariid pinnipeds could be exceeded within approximately 6,265 meters (Table 6, Figure 5). Similarly, during vibratory extraction, the in-water behavioral threshold could be exceeded within 6,265 meters for phocid and otariid pinnipeds (Table 6, Figure 5).

For phocid pinnipeds the in-air behavioral threshold could be exceeded within 39 meters (0.025 miles) of the installation of 24-inch piles and 25 meters (0.016 miles) of the installation of 16-inch piles (Table 5, Figure 6). For otariid pinnipeds, the in-air behavioral threshold could be exceeded within 13 meters (0.008 miles) of the

installation of 24-inch piles and 8 meters (0.005 miles) of the installation of 16-inch piles (Table 5, Figure 6). Vibratory installation or extraction would not result in in-air behavioral threshold exceedances (Table 6).

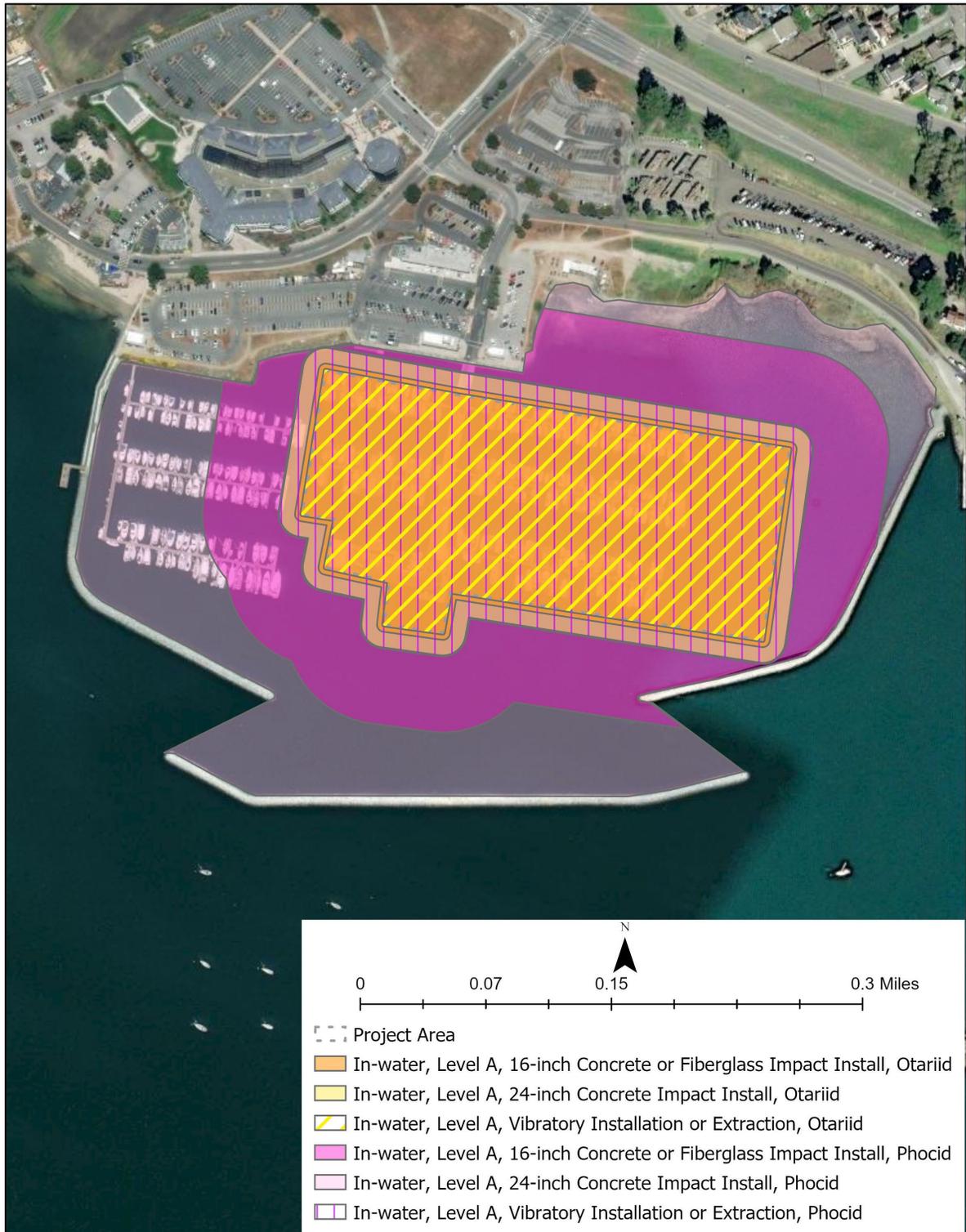


Figure 4 - In-water Level A Threshold Areas, Based on Pile Installation Project Area

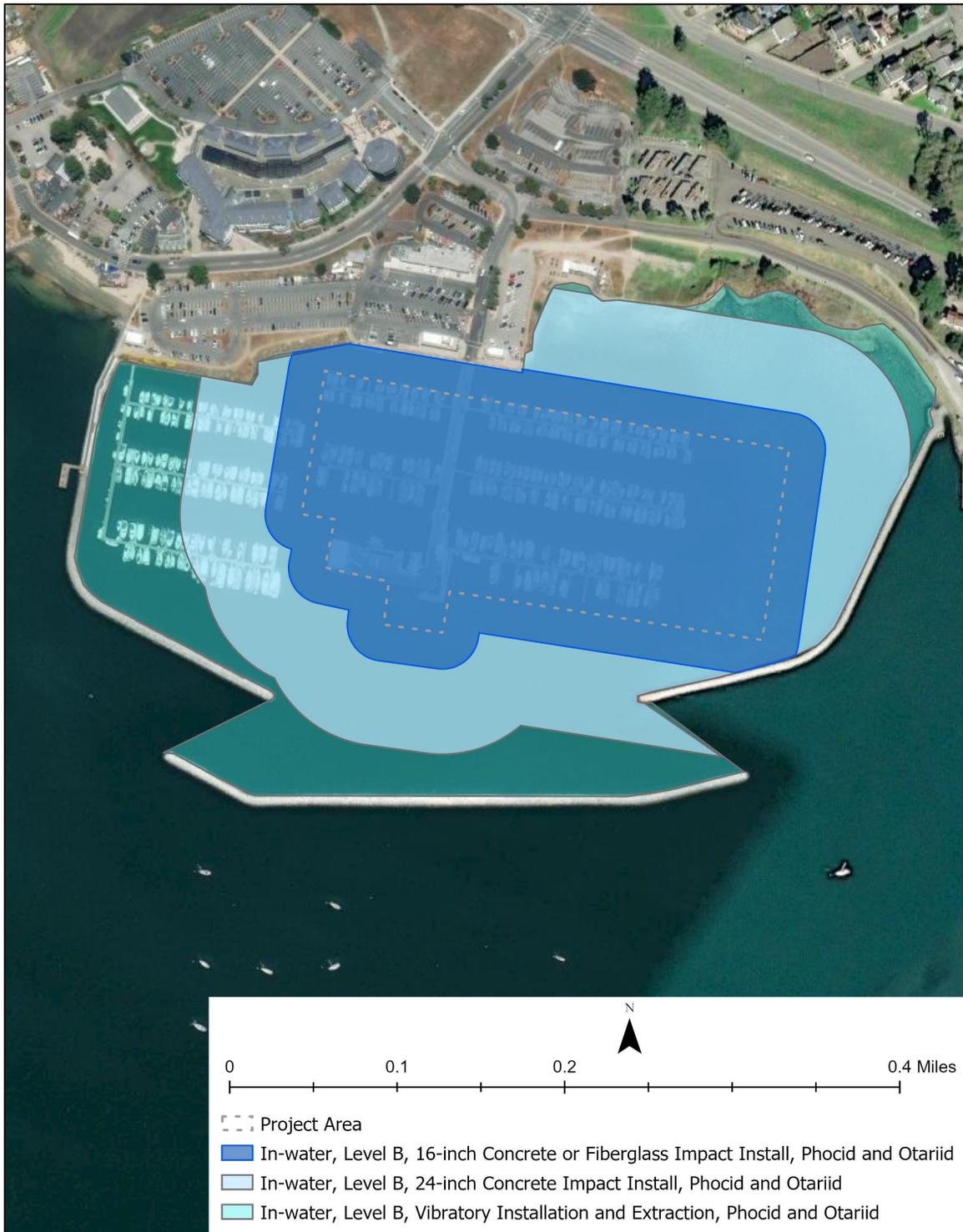


Figure 5 - In-water Level B Threshold Areas, Based on Pile Installation Project Area

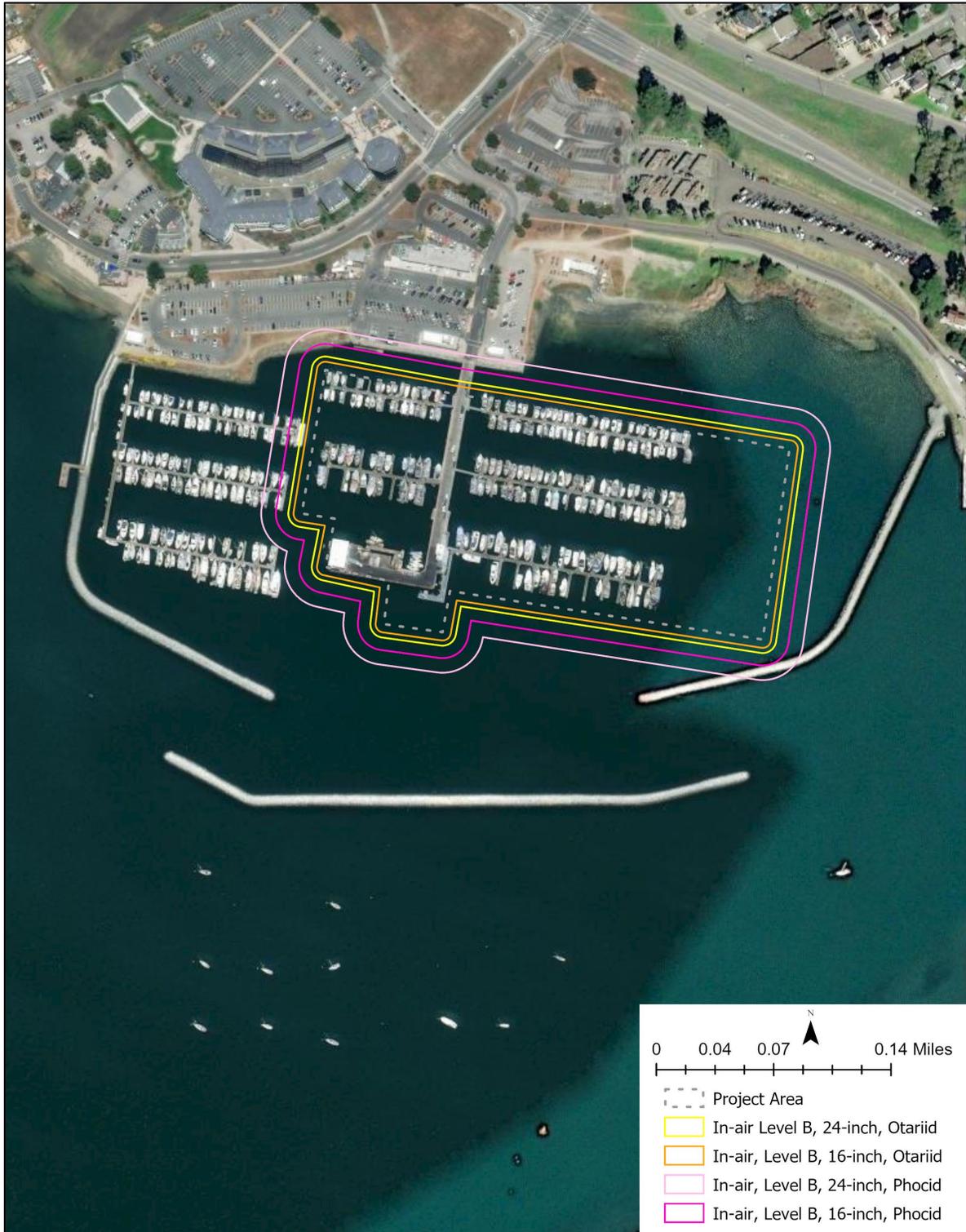


Figure 6 - In-air Level B Threshold Areas, Based on Pile Installation Project Area



7. TAKE ESTIMATES FOR HARBOR SEALS AND SEA LIONS

Take estimates are based on the calculated zones of influence (Section 6.3, Figure 4, Figure 5, and Figure 6) and the anticipated likelihood of species occurrence within these zones during pile driving activities. Based on anecdotal statements from Pillar Point Harbor operations staff, one sea lion and one harbor seal could occur within the inner harbor area each day. Detailed pinniped presence data for Pillar Point Harbor is not available. Therefore, it has been conservatively assumed that the pinnipeds occurring in the inner harbor area are separate individuals. Each sighting will be recorded as a separate take. Past observations indicate that harbor seals and sea lions rarely haulout within the zones of influence.

For harbor seals, the Level A take area supersedes the Level B threshold area during installation activities. Therefore, all take of harbor seals will be Level A take during installation. For the purpose of this IHA it has been conservatively assumed that harbor seal Level A take will occur anytime a harbor seal enters the inner harbor area during pile installation (Figure 7). Harbor seal Level A take during removal activities has been conservatively assumed to occur when a harbor seal is identified within 25 meters of the proposed pile removal activities (Figure 8). Harbor seal Level B take during removal activities has been conservatively assumed to occur when a harbor seal enters the inner harbor area during pile removal activities (Figure 8).

Sea lion Level A take during installation activities has been conservatively assumed to occur when a sea lion is identified within 25 meters of the proposed pile driving activities (Figure 7). Sea lion Level B take has been conservatively assumed to occur when a sea lion enters the inner harbor area during pile installation or extraction activities (Figure 7 and Figure 8). A 15.25 meter exclusion zone will be implemented for harbor seals and California sea lions to avoid potential interaction with pile driving equipment. The proposed monitoring zones are shown on Figure 7.

Given past observations, the proposed duration of pile driving activities, and the calculated zones of influence, estimated Level A and Level B Take are summarized in Table 7. Although, based on anecdotal statements from Pillar Point Harbor operations staff, one sea lion and one harbor seal could occur within the inner harbor area each day, to account for irregular conditions and to avoid the need to shutdown project activities it has been conservatively assumed that up to two harbor seals and two seal lions could occur within the inner harbor area during project activities.

Table 7 – Estimated Take for 80 Days of Pile Driving Activities and 50 days of Removal Activities

Species	Level A Take	Level B Take
Harbor Seal	200	100
Sea Lion	40	260

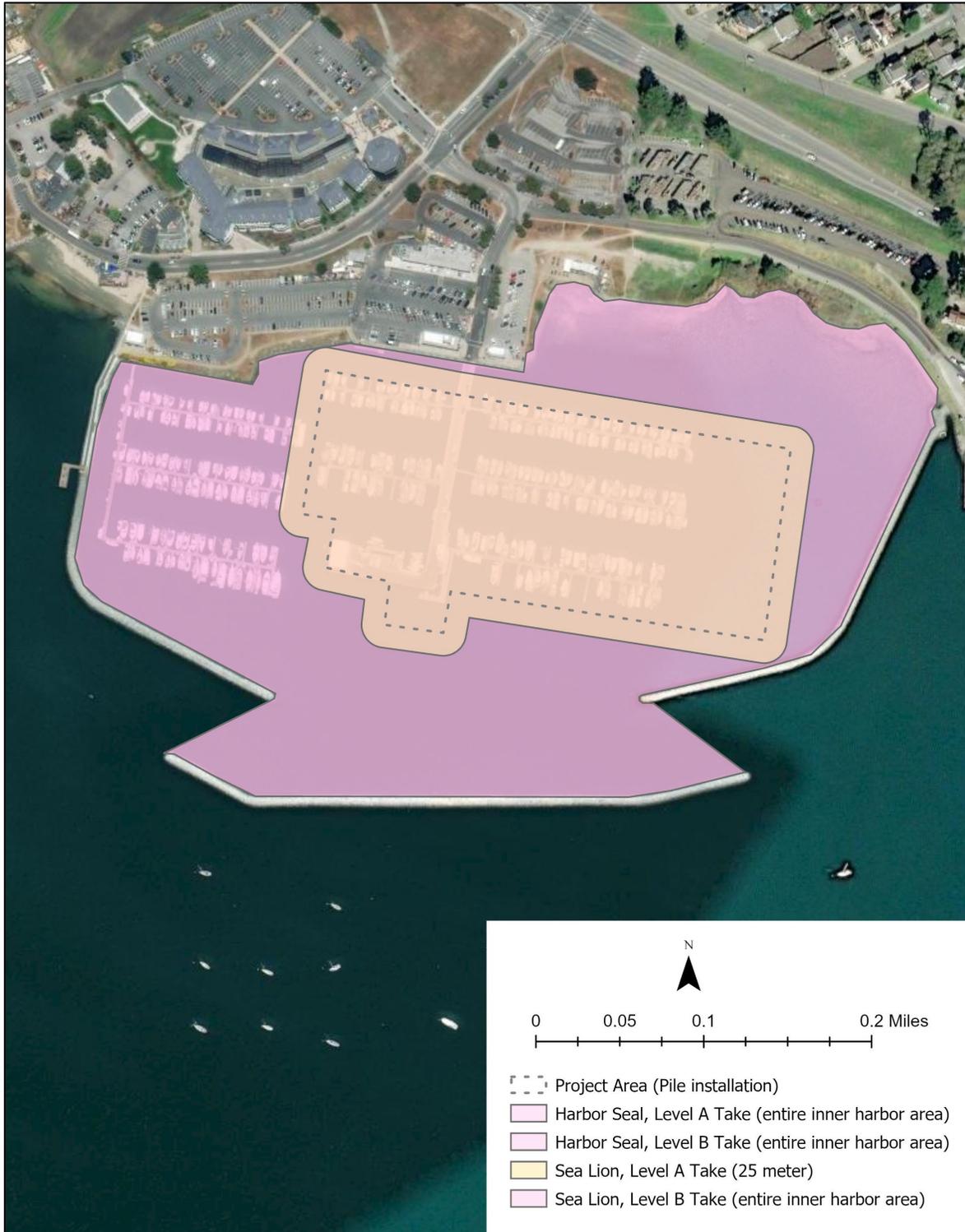


Figure 7 - Proposed Monitoring Zones During Pile Installation

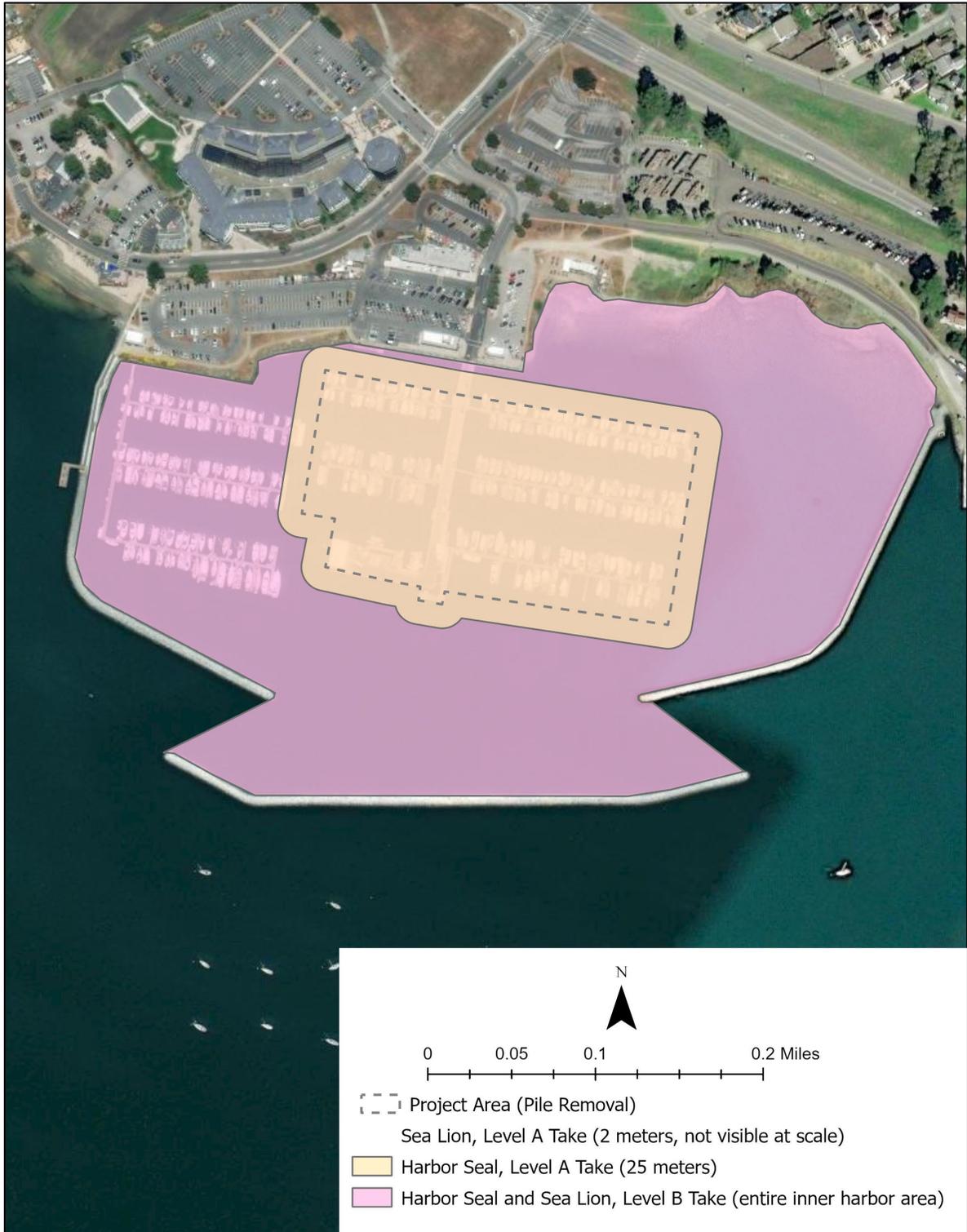


Figure 8 - Proposed Monitoring Zones During Pile Removal

8. ANTICIPATED IMPACT OF THE ACTIVITY

8.1. NOISE

8.1.1. *In-water*

The noise produced by the proposed Project has potential to harass marine mammals as described in Section 6, however the estimated level of take is low as compared to the overall marine mammal stocks. Noise can produce short-term and long-term effects to marine mammals. Effects can include disruptions to foraging success and patterns, harmful physiological conditions, and temporary and permanent hearing threshold shifts.

The in-water injury threshold area for sea lions is very small during both the installation of 24-inch piles and the installation of 16-inch piles (Table 5). Therefore, it is unlikely that sea lions will be exposed to injurious noise levels. The Level A threshold area for phocid pinnipeds is larger (up to 290 meters, but confined to inner harbor by breakwaters) and therefore phocids may be exposed to injurious noise levels during construction. A 15.25 meter exclusion zone implemented to protect harbor seals and sea lions from coming into contact with construction equipment, also is anticipated to reduce potential exposures to injurious noise levels. The inner harbor breakwaters will block noise from extending beyond the breakwaters. In-water behavioral threshold exceedances could occur within the entire inner harbor area.

Marine mammals may exhibit behavior that indicates they are startled by noise, and they may swim away from the Project area. This could result in increased swimming by marine mammals, increased time spent out of water, including haul out time and surface time, which may result in a temporary decrease in their foraging in the affected area. This avoidance behavior is expected to be short term in duration, and upon conclusion of the 80-day pile driving period, it is anticipated that marine mammal activity will return to baseline levels. It is unlikely that work will result in a permanent displacement of marine mammals from the area. No population-level impacts are anticipated to the species nor are any population-level impacts anticipated to the long-term fitness of any of the marine mammal species covered in this application.

8.1.2. *In-air*

The in-air Level B threshold area for harbor seals and sea lions is very small, reaching up to an anticipated distance of 39 meters for harbor seals during the installation of 24-inch concrete piles (Table 5). Given the small threshold area, and uncommon occurrence of hauled out harbor seals and sealions within the vicinity, it is considered unlikely that they will be behavioral disturbed by in-air noise levels.

9. ANTICIPATED IMPACTS ON SUBSISTENCE USES

Marine mammals in the Project area are not harvested for substance use. Therefore, no impact will occur to subsistence uses.

10. ANTICIPATED IMPACTS ON HABITAT

No permanent impacts to harbor seal or sea lion habitat are anticipated. Any impacts will be temporary in nature and are associated with pile driving disturbance and will not require restoration. Site conditions are anticipated to be substantially unchanged from existing conditions for harbor seals and sea lions following Project implementation. The Project does not propose the construction of structures that will represent a significant barrier to movement for marine mammals within the Project area.

Impacts to harbor seals and sea lions could include a temporary loss of foraging habitat if harbor seals and sea lions avoid the Project area during pile driving activities. Additionally, the acoustic energy produced from pile driving has the potential to disturb fish present within the Project area, causing them to avoid the area. As a result, this could potentially reduce the amount of available foraging habitat for pinnipeds. This reduction in forage area will be temporary, and any disturbed fish are anticipated to return to the area upon



the completion of pile driving. The area of foraging habitat that could be temporarily impacted from pile driving represents an extremely small portion of available pinniped foraging habitat. The Project may also result in minor increases in turbidity during in-water construction activities such as pile driving and hydraulic jetting. Any increase in turbidity from the Project is expected to be short term, localized, and lower than thresholds typically associated with impacts to fish species that marine mammals feed upon. Turbidity produced from Project activities is expected to disperse quickly with tidal action.

The Project is not anticipated to have any significant or long-term effects on marine mammals due to impacts to their habitat. The Project area within the inner harbor breakwater is approximately 50 acres and constitutes a negligible percentage of each species' home range. Once pile driving ceases, existing functionality of habitat within the Project area is not anticipated to be altered. Harbor seals and sea lions are not known to frequently haulout at the Project site and therefore, the Project will not alter the condition of haulouts. Pupping is not known to occur at the Project site and therefore impacts to pupping habitat are not anticipated.

11. MITIGATION MEASURES TO PROTECT MARINE MAMMALS AND THEIR HABITAT

The repairs have been designed to avoid and minimize possible adverse impacts to the environment. The following construction Best Management Practices (BMPs) are also proposed to assure that potential impacts are reduced.

11.1. GENERAL BEST MANAGEMENT PRACTICES

- Construction activities will be limited to daylight hours when marine mammals can be more easily observed.
- During construction, heavy equipment will be operated in accordance with standard BMPs. All equipment shall be properly maintained such that no leaks of oil, fuel, or residues will take place. Provisions will be in place to remediate any accidental spills. Materials shall be stored at least 50 feet from water features, as feasible, or equipment will use secondary containment.
- Spill prevention and control measures shall be implemented to ensure the proper handling and storage of petroleum products and other construction materials. Including a designated fueling and vehicle maintenance area with appropriate berms and protection to prevent any spillage of gasoline or related petroleum products or contact with runoff.
- A floating boom will be installed and any material falling into the water will be contained by the debris boom and removed on a daily basis.
- All food-related trash shall be disposed of in closed containers and removed from the Project area each day during the construction period. Project personnel shall not feed or otherwise attract wildlife to the Project area.
- At Project completion, all Project-generated debris, vessels, vehicles, building materials, and rubbish shall be removed from the Project footprint.



- Areas of temporary disturbance shall be minimized to the extent practicable. Staging and laydown areas shall be limited to sites that are unvegetated and previously disturbed (e.g., existing parking lots).
- Materials shall be stored on impervious surfaces or plastic ground covers to prevent any spills or leakage. Material storage shall be at least 100 feet from the Pacific Ocean and the intermittent stream channel. Any material/spoils from Project activities shall be located and stored 100 feet from potentially jurisdictional areas. Construction materials and spoils shall be protected from stormwater runoff using temporary perimeter sediment barriers such as berms, silt fences, fiber rolls, covers, sand/gravel bags, and straw bale barriers, as appropriate.
- Contractor shall prevent the discharge of silt or pollutants from the site when working adjacent to potentially jurisdictional waters. Contractor shall implement BMPs (e.g., silt barriers, sand bags, straw bales) as appropriate.
- Site washout areas shall be at least 50-feet from a storm drain, open ditch or surface water and ensure that runoff flows from such activities do not enter receiving water bodies.
- All vehicles, vessels, and equipment shall be in good working condition and free of leaks. The contractor shall prevent oil, petroleum products, or any other pollutants from contaminating the soil or entering a watercourse (dry or otherwise). When vehicles or equipment are stationary, mats or drip pans shall be placed below vehicles to contain fluid leaks.
- All re-fueling, cleaning, and maintenance of equipment will occur at least 50 feet from potentially jurisdictional waters, as feasible.
- Any spillage of material will be stopped if it can be done safely. The contaminated area will be cleaned, and any contaminated materials properly disposed. For all spills, the Project foreman or other designated liaison will notify SMCHD immediately.
- Adequate spill prevention and response equipment shall be maintained on site and readily available to implement to ensure minimal impacts to the aquatic and marine environments.
- SMCHD shall obtain all necessary permits from applicable agencies with jurisdiction over the Project. The contractor will implement and document compliance with permit conditions and best management practices required by the permits per agency requirements and for SMCHD's records.
- Prior to initiation of Project activities (including staging and mobilization), all personnel associated with Project construction should attend WEAP training, conducted by a qualified biologist, to aid workers in recognizing special-status terrestrial and marine species, native birds, and other biological resources that may occur in the Project area. The specifics of this program should include



identification and habitats of special-status species with potential to occur at the Project area, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. A fact sheet conveying this information should also be prepared for distribution to all contractors, their employers, and other personnel involved with construction. All employees should sign a form provided by the trainer indicating they have attended the WEAP and understand the information presented to them. A WEAP training recorded by a qualified biologist specifically for the Project may be utilized if in-person trainings are restricted due to COVID-19 or if the construction schedule makes it infeasible for a biologist to train each new crew member in person.

11.2. AVOIDANCE AND MINIMIZATION MEASURES PROPOSED TO PROTECT HARBOR SEALS AND SEA LIONS

- Project-related vessels shall observe the no wake zone limit within limits of the Project.
- A wood cushion block shall be placed between the hammer and the pile.
- Establishment of 15.25 meter (50-foot) “exclusion zone” for all pinnipeds during pile driving activities to avoid interaction between pile driving equipment and pinnipeds will be implemented. Visual monitoring of the exclusion zone shall commence at least 30 minutes prior to the beginning of pile driving activities each day and after each break of more than 30 minutes. If any pinnipeds are observed within the exclusion zone, all in-water Project activities shall cease. Project activities shall not commence or continue until the pinniped has either been observed having left the exclusion zone, or at least 15 minutes have passed since the last sighting whereby it is assumed the pinniped has voluntarily left the exclusion zone.
- During pile driving activities the monitoring zone/ zone of influence will include the entire inner harbor area (Figure 7). A qualified observer will monitor the zone of influence (Figure 7), and document all harbor seals and sea lions that enter the monitoring zone and take will be tallied against allowed take authorized by the IHA. Take will be tallied when species enter the following zones:
 - Level A and B harbor seal take: Entire inner harbor area (Figure 7)
 - Level A sea lion take: Within 39 meters of the proposed pile driving activities (Figure 7)
 - Level B sea lion take: Entire inner harbor area (Figure 7)
- Pile installation activities shall not occur if any part of the monitoring or exclusion zones are obscured by weather or sea conditions.



- A “soft-start” technique will be used to allow fish and marine mammals to vacate the area before the pile driver reaches full power. For vibratory hammers, the contractor will initiate the driving for 15 seconds at reduced energy, followed by a 1-minute waiting period when there has been downtime of 30 minutes or more. This procedure shall be repeated two additional times before continuous driving is started. This procedure will also apply to vibratory pile extraction. For impact driving, an initial set of three strikes will be made by the hammer at 40 percent energy, followed by a 1-minute waiting period, then two subsequent three-strike sets before initiating continuous driving.

12. MONITORING AND REPORTING

A marine mammal monitor will observe construction activities from the inner harbor breakwater and will keep a daily log that outlines marine mammal observations, location of the animal, behavior of the animal, and when the observation event was resolved. A Marine Mammal Monitoring Report will be developed to include the following criteria:

- 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).
- 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.
- Marine mammal monitor location during marine mammal monitoring.
- Distances and bearings of each marine mammal observed to the pile being driven for each 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 or as appropriate) detected within the monitoring zone, and estimates of number of marine mammals taken, by species.
- 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.



- All marine mammal monitor datasheets and/or raw sighting data (in a separate file from the Final Report)

13. SUGGESTED MEANS OF COORDINATION

All marine mammal data gathered during construction will be made available to NMFS, researchers and other interested parties. The Project will coordinate activities as needed with relevant federal agencies.



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