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F8a

1-20-0171 (CITY OF POINT ARENA)

March 12, 2021

EXHIBITS

Exhibit 1 – Regional Location

Exhibit 2 – Vicinity Map

Exhibit 3 – Project Plans

Exhibit 4 – Hydroacoustic Analysis (excerpts)

Exhibit 5 – Marine Mammal Monitoring Plan (MMMP) (excerpts)

Exhibit 6 – ESA Review Form (excerpts)

Exhibit 7 – Agency Correspondence





EXHIBIT NO. 2

CDP Application No.
1-20-0171 (Point Arena)
VICINITY MAP

CITY OF POINT ARENA ARENA COVE PIER REPAIR POINT ARENA, CALIFORNIA

PREPARED BY:

SN
MAY 2019



LOCATION MAP
N/S

APPROVALS

RICHARD SHOENMAKER
CITY MANAGER, CITY OF POINT ARENA

DATE

JASON B. ISLAND, P.E. CHAIRMAN
SN CONSULTING ENGINEERS & GEOLOGISTS, INC.

DATE



VICINITY MAP
N/S

INDEX OF SHEETS

SHT	DWG	TITLE
1	G-1	COVER
2	G-2	STANDARD ABBREVIATIONS AND LEGENDS
3	C-1	PIER REPAIR PLAN
4	C-2	FENDER PILE DETAILS
5	C-3	GUIDE PILE DETAILS

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CONSULTING ENGINEERS
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CITY OF POINT ARENA
POINT ARENA, CALIFORNIA

COVER

SHEET
G-1
1
DATE 08/20/2019
PROJECT NO. 418003



EXHIBIT NO. 3

CDP Application No.
1-20-0171 (Point Arena)
PROJECT PLANS (1 of 5)

EXHIBIT NO. 3

CDP Application No.
1-20-0171 (Point Arena)
PROJECT PLANS (2 of 5)

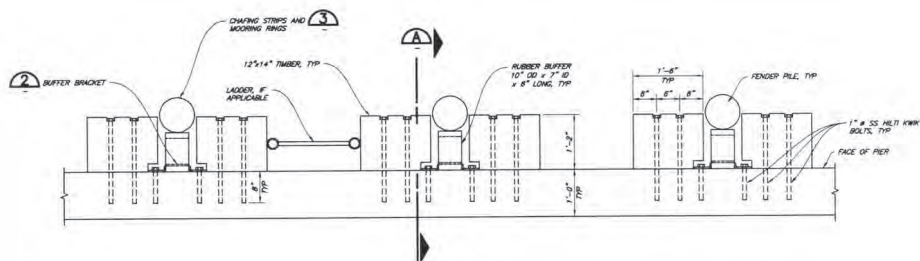
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GUIDE PILE	STEEL	10 3/4"	1



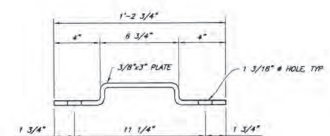
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ARMA COVE PIER REPAIR					
POINT ANA, CALIFORNIA					
NO. 41803					
DATE 10/20/19					
DRAWN BY JMB					
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APPROVED BY JMB					
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PROJECT NO. 41803					
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PROJECT OUTCOME					
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CDP Application No.
1-20-0171 (Point Arena)
PROJECT PLANS (3 of 5)

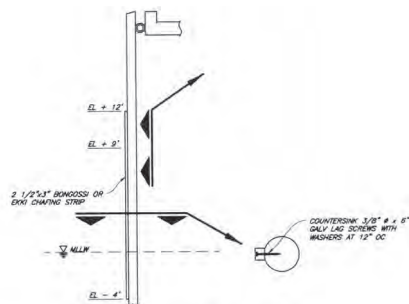
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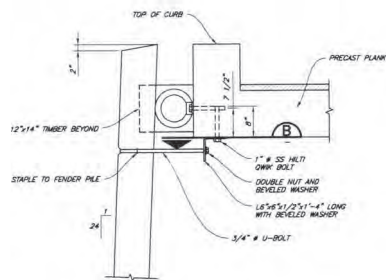
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 (FENDER PILE PLAN)



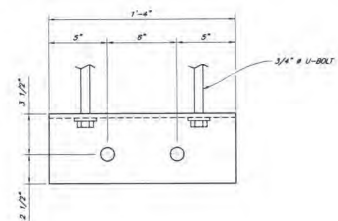
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 (BUFFER BRACKET)



DETAIL 3
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 (FENDER PILE CHAFING STRIPS & MOORING RINGS)



SECTION A
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 (FENDER PILE CONNECTION)



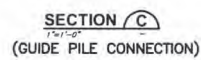
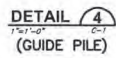
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SHEET NO.		1
PROJECT NO.		10171
DATE		05/20/2019
DRAWN BY		SHAWN
CHECKED BY		SHAWN
APPROVED BY		SHAWN
SCALE		AS SHOWN
PROJECT NAME		CITY OF POINT ARENA ARENA COVE PIER REPAIR POINT ARENA, CALIFORNIA
PROJECT TITLE		FENDER PILE DETAILS
SHEET NO.		C-2
PROJECT NO.		10171

EXHIBIT NO. 3

CDP Application No.
 1-20-0171 (Point Arena)
PROJECT PLANS (4 of 5)

[illegible]

CDP Application No.
1-20-0171 (Point Arena)
PROJECT PLANS (5 of 5)

Pile Driving Noise Analysis in support of Endangered Species Act and Marine Mammal Protection Act Compliance

Point Arena Cove Pier Repair Project

FEMA-4305-DR-CA, PW 00467(1); Arena Cove Pier (MNPAG01)

May 2020



FEMA

Federal Emergency Management
Department of Homeland Security
1111 Broadway, Suite 1000
Oakland, CA 94607

EXHIBIT NO. 4

CDP Application No.
1-20-0171 (Point Arena)
Hydroacoustic Analysis
(1 of 19)

1 Introduction

The Arena Cove Pier Repair Project (proposed project) entails replacing the damaged and missing components of the Arena Cove Pier (specifically nine wooden fender piles and one steel guide pile). The proposed repairs are a priority to ensure that additional damage to the pier is not incurred prior to completion of the proposed project. The purpose of this report is to provide an analysis of the underwater and airborne noise that may be generated by the proposed pile driving activities. The materials presented here may be incorporated into further analysis of the potential effects that the pile driving noise may have on sensitive receptors, such as fish and marine mammals. See Appendix A for figures of Project Vicinity and Project Area.

The existing fender piles are pressure-treated wood poles approximately 9 inches in diameter and approximately 50 feet long. They were anchored into the ocean floor using land-based pile driving equipment and secured using steel, wood, and rubber hardware to the concrete pier deck. Most of the hardware remains and the proposed project specifies replacing the nine missing wood fender piles in-kind using land-based pile-driving equipment. New timber piles would be wrapped to prevent leaching of the wood preservative into the water. The damaged guide pile is a steel tube 10.75 inches in diameter and approximately 50 feet in length that is driven into the ocean floor and anchored to the concrete pier deck with a T-shaped assembly of welded square tube steel. The proposed project would replace the existing broken pile with a new pile anchored into the ocean floor using land-based vibratory pile-driving equipment. The existing steel beam assembly that anchors the top of the piling to the pier deck would be re-used. Damaged piles to be removed would be fully removed by pulling or cutting two feet below the mud line if full removal is not possible.

Sound is a physical phenomenon consisting of pulses of minute vibrations that travel through a medium, such as air or water. When a pile-driving hammer strikes a pile, a pulse is created that propagates through the pile and radiates sound into the water and the ground substrate, as well as the air. Vibratory pile drivers also produce high-intensity noise, but work on a different principle and have a very different sound profile than impact pile driving. A vibratory pile driver works by inducing particle motion to the substrate immediately below and around the pile, causing liquefaction, which allows the pile to sink downward. The noise produced during vibratory driving is lower in intensity, and can be considered continuous in comparison to the pulse-type noise produced during impact pile driving.

Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the pitch of a sound and is measured in Hertz; intensity describes the loudness of a sound and is measured in decibels (dB). Decibels are measured using a logarithmic scale. The underwater noise from impact and vibratory pile driving can have the potential to affect hearing and cause changes in behavior in fish and marine mammals. In some cases, pile driving noise of sufficient intensity may even result in permanent injury or death of fish due to barotrauma – injury resulting from a rapid change in pressure. For this reason, underwater noise analysis, such as presented here, are often completed for pile driving projects when sensitive receptors, such as special-status fish and marine mammals, may be present.

Pile driving also generates airborne noise, which may cause behavioral changes to wildlife in the vicinity including hauled-out pinnipeds (such as harbor seals).

EXHIBIT NO. 4

CDP Application No.
1-20-0171 (Point Arena)
**Hydroacoustic Analysis
(2 of 19)**

1.1 Regulatory Background

There are three Federal statutes that are of bearing to the potential effects of underwater noise that may result from the proposed project:

The federal **Endangered Species Act (ESA) of 1973** and subsequent amendments provide guidance for the conservation of federally listed/proposed species and the ecosystems (critical habitat) on which they depend. Section 9 of the ESA prohibits the take of any fish or wildlife species listed as threatened, endangered, or proposed for listing unless otherwise authorized or exempted by Federal regulations. The ESA also establishes certain prohibitions on “take” of listed species. Under the ESA, the term “take” means to harass¹, harm², pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The unauthorized take of federally listed/proposed species is illegal and can result in fines or criminal penalties. Underwater noise of sufficient intensity has the potential to result in take of listed fish or marine mammal species. There are two processes whereby take is authorized when it is incidental to an otherwise legal activity; these are described in Section 7 and Section 10 of the ESA. Since the proposed project may be funded by the Federal Emergency Management Agency (FEMA), a federal agency, the proposed project would be subject to Section 7 of the ESA.

Section 7 of the ESA provides a process for authorizing the take of federally listed species by Federal agencies or their designees; this process applies to actions that are conducted, permitted, or funded by a Federal agency. Under Section 7, Federal agencies must consult with the United States Fish and Wildlife Service (USFWS) and/or the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NMFS) when any action the Federal agency carries out, funds, or authorizes (such as issuing a discretionary permit) may affect a species federally listed or proposed to be listed as endangered or threatened.

The **Magnuson-Stevens Fishery Conservation and Management Act (MSA)**, which was enacted in 1976 and reauthorized in 2006, is the primary law governing marine fisheries management in United States Federal waters. The MSA created eight regional fishery management councils to manage fisheries and promote conservation. The MSA focuses on rebuilding overfished fisheries and protecting Essential Fish Habitat (EFH). Provisions for EFH were added to the MSA in 1996.

The MSA requires a Federal agency to consult with NMFS on proposed projects authorized, funded, or undertaken by the agency that may adversely affect EFH for fish species covered under a Fisheries Management Plan (FMP). As part of the EFH consultation process, Federal agencies must prepare a written EFH Assessment describing the effects of that action on EFH. NMFS must provide the Federal agency with EFH consultation recommendations for any action that may adversely affect EFH. Guidelines under Section 305(b) of the MSA direct NMFS to use a coordinated process to evaluate projects that may adversely affect EFH, in conjunction with the required Section 7 consultation process under the ESA.

The **Marine Mammal Protection Act (MMPA)**, adopted in 1972, makes it unlawful to take or import any marine mammals and/or their products. Under Section 101(a)(5)(D) of this act, an incidental harassment authorization (IHA) may be issued for activities other than commercial fishing that may impact small

¹ Under the ESA, “harass” is defined by the USFWS as actions that create the likelihood of injury to a federally listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. [50 CFR §17.3]

² Under the ESA, “harm” is further defined by the USFWS to include significant habitat degradation that results in death or injury to a federally listed species by significantly impacting such as breeding, feeding, or sheltering. [50 CFR §17.3]

numbers of marine mammals. Amendments to this act in 1994 statutorily defined two levels of harassment. Level A harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild. Level B harassment is defined as harassment having potential to disturb marine mammals by causing disruption of behavioral patterns, including—but not limited to—migration, breathing, nursing, breeding, feeding, or sheltering.

Projects that occur in areas that are frequented by marine mammals may require an IHA, particularly if project activities (such as pile driving) would generate substantial underwater noise. To receive an IHA, the project proponent must submit a written request to the NMFS Office of Protected Resources. NMFS would then conduct an environmental review and place the IHA application on the Federal Register for public comment. Typically, the process of issuing an IHA takes 3 to 9 months. IHAs are typically valid for 1 year after issuance, so this authorization is generally applied for 4 to 6 months before the activity would begin.

1.2 Federally Listed Marine Mammals that May Occur in the Project Area

There are many species of cetaceans and pinnipeds that occur along the coast of Northern California. All marine mammal species receive protection under the MMPA. The potential for marine mammals to occur in the project area has been evaluated and provided in tabular form in Appendix B. In addition to receiving protections under the MMPA, some marine mammals are also listed as threatened and endangered under the ESA. There are five federally listed cetaceans and one pinniped that may occur in the coastal waters of Northern California:

- Blue Whale (*Balaenoptera musculus*);
- Fin Whale (*Balaenoptera physalus*);
- Sei Whale (*Balaenoptera borealis*);
- Humpback Whale (*Megaptera novaeangliae*)- Mexico Distinct Population Segment (DPS) and Central America DPS;
- Killer Whale (*Orcinus orca*), Southern Resident DPS (J, K, and L pods); and
- Guadalupe Fur Seal (*Arctocephalus townsendi*).

The five cetacean species listed above have potential to travel by Point Arena as seasonal foragers or migrants. None are known to calve or regularly occur near Point Arena. Point Arena Cove is a shallow embayment (less than 20 feet in depth) and the cetacean species listed above are not expected to venture into the Cove as they tend to frequent deeper waters, or would not be in the vicinity of Point Arena during the summer, when the proposed project would occur. Further details on the potential for these species to occur can be found in Appendix B.

Additionally, the Guadalupe fur seal (a federally listed pinniped) may occur in the coastal waters of California. The Guadalupe fur seal's breeding locations are much to the south, off Baja California, Mexico (NMFS, 2017c). Outside of the breeding season, this species occasionally ranges into the waters of Northern California and the Pacific Northwest. Juvenile Guadalupe fur seal occasionally strand on the California coastline, with stranding rates increasing during El Niño events. Most strandings along the California coast are animals younger than 2 years old, with evidence of malnutrition (NMFS, 2017). The potential for this species to occur in the project area is very low.

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CDP Application No.
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Hydroacoustic Analysis
(4 of 19)

1.3 Federally Listed Sea Turtles that May Occur in the Project Area

There is one species of sea turtle that may be seasonally present in the coastal waters of Northern California – the leatherback sea turtle (*Dermochelys coriacea*), a federally endangered species. Leatherback sea turtles are highly migratory and seasonally occupy waters of the west coast of the United States to forage in highly productive areas of upwelling zones of the California Current System (CCS). The CCS is a global ocean current that determines large-scale oceanographic patterns in atmospheric pressure, associated winds, biological productivity, and prey availability for marine predators (PICES 2004, Checkley and Barth 2009, Halle and Largier 2011). Coastal upwelling in the CCS varies seasonally, annually, and on a decadal scale. El Niño – Southern Oscillation and the Pacific Decadal Oscillation create annual and decadal anomalies in the Northern Pacific Ocean which cause major regional variances in biological community responses (NOAA 2019). Leatherback sea turtle habitat use varies seasonally and inter-annually due to these regional marine conditions that change where prey composition or abundance occurs.

Designated critical habitat for leatherback sea turtle foraging includes waters along the California coast from Point Arena to Point Arguello, extending east of the 3,000 meter depth contour to the extreme low tide line. Leatherback sea turtle foraging habitat is characterized by physical processes that aggregate prey, such as convergence zones between two bodies of water varying in density, or eddies that form on the boundaries of currents and around bathymetric contours of banks, underwater canyons, or other submerged features. Leatherback tracking data gathered from bycatch fisheries records, aerial surveys, geospatial data, and telemetry tagging studies show that leatherbacks target specific areas where physical marine conditions create aggregations of preferred prey, sea nettle (*Chrysaora fuscescens*) and other jellyfish of the scyphomedusae family (Benson et al. 2011, NMFS 2012). Small-scale jellyfish distribution is closely linked to the physical structure of the water column, which is controlled by bathymetry, and variable oceanic conditions associated with upwelling conditions.

The geomorphology below the nearshore waters included in leatherback Designated Critical Habitat extending south from Point Arena, California is characterized by marine terraces, geologic benches created from tectonic forces, that were created by tectonics, a series of sea-level fluctuations, and variations in sediment deposits due to wave energy (Konismark 1994, Karachewski 2013). The continental shelf break, with steeply dropping bathymetry, is located approximately 17 km offshore. Deep offshore waters support faster wind and ocean currents that create favorable upwelling regimes (Halle and Largier 2011). Oceanic fronts required to aggregate prey occur in this area near the 2000 m – 3000 m isobaths as warm offshore waters meet cooler coastal upwelled water (NMFS 2012), approximately 30 km from the shoreline. The strongest seasonal upwelling and greatest prey availability occurs in this area in summer and fall (PICES 2004, NMFS 2012).

Arena Cove, in contrast, is located on a single terrace adjacent to the coast. The Cove's seafloor is characterized by sandstone and shale and shows geomorphic conditions of a shallow sea (Konigsmark 1994). Bathymetry close to the pier is a gentle slope, with depths from 20 to 40 feet deep, and is entirely flat rocky bottom (Watkins 2000, Jones 2018). The first distinguished drop in depth of 60 feet occurs approximately 300 yards offshore (Watkins 2000, NOAA 2005). In addition, the cove faces southeast, which protects it somewhat from regional northwesterly swell and wind that supports upwelling, and instead creates gentle conditions suited for recreation (Watkins 2000). Although eddies and oceanic fronts may occur in the area during or after winter storms or particularly strong upwelling events, frontal features are not common. Due to the lack of eddies or persistent oceanic frontal conditions, prey species for leatherback sea turtle are likely limited to low densities. Since oceanographic features at Arena Cove would not typically produce prey aggregations that are important for leatherback sea turtles, the potential for this species to occur in the project area is low.

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CDP Application No.
1-20-0171 (Point Arena)
Hydroacoustic Analysis
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1.4 Other Federally Listed Species that may occur in the Project Area

There are several federally listed species of anadromous fish with potential to occur in the project vicinity, as detailed in Appendix B. There are five federally listed species of fish with potential to occur in the project vicinity:

- Coho Salmon (*Oncorhynchus kisutch*) - Central California Coast Evolutionarily Significant Unit (ESU);
- Steelhead (*Oncorhynchus mykiss*) - Northern California DPS;
- Chinook Salmon (*Oncorhynchus tshawytscha*) - California Coastal ESU;
- Eulachon (*Thaleichthys pacificus*) - Southern DPS; and
- Green Sturgeon (*Acipenser medirostris*) - Southern DPS.

The waters of Point Arena Cove are designated as critical habitat for green sturgeon – Southern DPS. Additionally, there is some potential for federally listed sea turtles to occur in the project vicinity, as detailed in Appendix B. Notably, the waters of Point Arena Cove are designated as critical habitat for the leatherback sea turtle.

1.5 Other Non-Listed Species that may occur in the Project Area

There are several species of marine mammal that have medium to high likelihood of occurring in the project area. These species are not federally listed, but are protected under the MMPA.

- Harbor Porpoise (*Phocoena phocoena*)
- Bottlenose Dolphin (*Tursiops truncatus*)
- Stellar Sea Lion (*Eumetopias jubatus*)
- California Sea Lion (*Zalophus californianus*)
- Pacific Harbor Seal (*Phoca vitulina richardii*)
- Minke Whale (*Balaenoptera acutorostrata*)

Harbor seals and potentially other pinnipeds have haulouts in the vicinity of Point Arena Cove. Additional details on potential for occurrence are included in Appendix B.

1.6 Applicable Noise Criteria for Fish

On July 8, 2008, the Fisheries Hydroacoustic Working Group (FHWG), whose members include the Southwest and Northwest Divisions of NMFS; California, Washington, and Oregon Departments of Transportation; the California Department of Fish and Wildlife; and the U.S. Federal Highway Administration issued an agreement for the establishment of interim threshold criteria to determine the effects of high-intensity sound on fish. While these criteria are not formal regulatory standards, they are generally accepted as viable criteria for underwater noise effects on fish. These criteria were established after extensive review of the most recent analysis of the effect of underwater noise on fish. The agreed-upon threshold criteria for impulse-type noise to harm fish have been set at 180 dB SEL for fish over 2 grams, and 183 dB SEL for fish under 2 grams.

EXHIBIT NO. 4

CDP Application No.
1-20-0171 (Point Arena)
Hydroacoustic Analysis
(6 of 19)

as shown in Table 1 A criteria of 150dB root mean square (RMS) is also used to establish a zone that has potential to behaviorally affect fish.

Table 1. NMFS Underwater Noise Thresholds for Fish

Impulse and Continuous Sound	Peak Noise (dB)	Accumulated Impulse Noise (SEL) (dB)	Behavioral Effects (RMS)(dB)
Fish under two grams in weight	>206	>183	>150
Fish over two grams in weight	>206	>187	>150
Source: (FHWG, 2008) Notes: > = greater than dB = decibel NMFS = National Marine Fisheries Service RMS = root mean square SEL = sound exposure level The current accumulated noise (SEL) thresholds for fish are only applicable for impulse noise (i.e. impact driving) and are not applicable to vibratory pile driving.			

The FHWG has determined that noise at or above the 206-dB peak level can cause barotrauma to auditory tissues, the swim bladder, or other sensitive organs. Noise levels above the accumulated SEL may cause temporary hearing-threshold shifts in fish. Behavioral effects may include fleeing, and the temporary cessation of feeding or spawning behaviors. As such, exceeding the behavioral threshold may or may not result in take as defined by the ESA, depending on the nature of the effects and the life history of the effected fish. Specific criteria have not yet been set by the FHWG for continuous noise, such as vibratory driving, so only the peak noise and behavioral effects thresholds are utilized in this analysis.

1.7 Applicable Noise Thresholds for Marine Mammals

In 2010, NMFS established interim thresholds regarding the exposure of marine mammals to high-intensity noise that may be considered take under the MMPA. Updated NMFS guidance on assessing the effects of underwater noise on marine mammals for agency impact analysis was adopted in 2016 (NMFS, 2016a) and revised in 2018 to affirm the 2016 guidance was developed using the best available science. The 2016 guidance includes sound thresholds for slight injury to an animal's hearing, or PTS (Level A Harassment). The underwater sound pressure threshold for slight injury or Permanent Threshold Shift (Level A Harassment) is a dual metric criterion for impulse noise (e.g., impact pile-driving), including both a peak pressure and cumulative SEL (cSEL) threshold, which is specific to the species hearing group (i.e., high-frequency cetaceans [ex., harbor porpoise], mid-frequency cetaceans [ex., bottlenose dolphin], low-frequency cetacean [ex., gray whale], phocids [ex., Pacific harbor seal and northern elephant seal], and otariids [ex., California sea lion and northern fur seal]). For continuous noise (e.g., vibratory pile extraction or driving), the PTS threshold is based on cSEL for each species hearing group.

The 2010 thresholds for Level B Harassment levels are still applicable: 160 dB RMS for impulse sounds and 120 dB for non-impulsive or continuous sounds for all species. Level B Harassment is considered to have occurred when marine mammals are exposed to noise of 160 dB RMS or greater for impulse sounds and 120 dB RMS for continuous noise. In some instances, ambient noise levels may be higher than the thresholds.

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the 120 dB RMS threshold for continuous noise. For continuous noise, RMS levels are based on a time constant of 10 seconds, and those RMS levels are averaged across the entire event. For impact pile-driving, the overall RMS level are characterized by integrating sound energy for each acoustic pulse across 90 percent of the acoustic energy in each pulse, and averaging all the RMS levels for all pulses. Harassment thresholds for the various types of airborne and underwater noise are shown in Table 2.

Table 2: Injury and Behavioral Disruption Thresholds for Airborne and Underwater Noise

Hearing Group and species considered	Airborne Threshold (Impact and Vibratory Pile-Driving)	Underwater Continuous Noise Thresholds (e.g., Vibratory Pile-Driving)		Underwater Impulse Noise Thresholds (e.g., Impact Pile-Driving)		
	Level B RMS Threshold ¹	Level A cSEL Threshold	Level B RMS Threshold	Level A Peak Threshold ²	Level A cSEL Threshold ²	Level B RMS Threshold
Phocids (Pacific harbor seals, northern elephant seals)	90 dB (unweighted)	201 dB	120 dB	218 dB	185 dB	160 dB
Otariids (California sea lions, northern fur seals)	100 dB (unweighted)	219 dB	120 dB	232 dB	203 dB	160 dB
Low-Frequency Cetaceans (gray whales)	N/A	199 dB	120 dB	219 dB	183 dB	160 dB
Mid-Frequency Cetaceans (bottlenose dolphins)	N/A	198 dB	120 dB	230 dB	185 dB	160 dB
High-Frequency Cetaceans (harbor porpoises)	N/A	173 dB	120 dB	202 dB	155 dB	160 dB
<p>Notes:</p> <p>¹ The airborne disturbance guideline applies to hauled-out pinnipeds.</p> <p>² Level A threshold for impulse noise is a dual criterion based on peak pressure and cSEL. Thresholds are based on the NMFS 2016 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing.</p> <p>cSEL = cumulative sound exposure level dB = decibel</p> <p>N/A = Not applicable, no thresholds exist RMS = root mean square</p> <p>Underwater peak and RMS are re: 1 μPa; cSEL is re: 1 μPa²-sec; Airborne RMS is re: 20 μPa.</p>						

The application of the standard 120 dB RMS threshold for underwater continuous noise can sometimes be problematic, because this threshold level can be either at or below the ambient noise level of certain locations, and not all species may respond to noise at that level. Exposure thresholds for continuous noise have been developed based on the best available scientific information on the response of gray whales to underwater noise. To date, there is very little research or data supporting a response by pinnipeds or odontocetes to continuous noise from vibratory pile extraction and driving as low as the 120 dB threshold. Southall et al. (2007) summarized numerous behavioral observations made of low-frequency cetaceans to a range of non-pulse noise sources, such as vibratory pile-driving. Generally, the data suggest no or limited responses to received levels of 90 to 120 dB RMS, and an increasing probability of behavioral effects in the 120 to 160 dB RMS range. There is limited data available on the behavioral effects of continuous noise on pinnipeds while underwater; however, field and captive studies to date collectively suggest that pinnipeds do not react strongly to exposures between 90 and 140 dB re 1 microPascal (μ Pa) RMS (Southall et al. 2007). Additionally, ambient underwater noise levels in urban

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exceeds 120 dB RMS, as a result of the nearly continuous noise from recreational and commercial boat traffic.

2 Airborne Noise

Airborne noise resulting from pile driving, pipe ramming, drilling, heavy equipment operation, and generators could affect terrestrial animals (e.g., birds, mammals) by causing behavioral avoidance of the construction area and/or temporary loss of hearing capacity to sensitive species. The primary sources of noise associated with the proposed Project is the vibratory pile driving of the timber piles and the steel guide pile. The in-air noise values presented here are referenced to 20 μ Pa, which is usually considered the threshold of human hearing (roughly the sound of a mosquito flying 3 meters away) and commonly used to describe airborne noise.

Pinnipeds are the only marine mammal that regularly spend time out of the water. NMFS has established airborne noise thresholds for behavioral harassment of pinnipeds, as presented above in Table 2.

2.1 Fundamentals of Airborne Noise

Construction equipment such as a pile driver generates noise from a single location (i.e., a “point” source), from which the sound radiates uniformly outward in a spherical manner. In the absence of other attenuating factors, the sound level attenuates (or drops off) at a rate of 6 A-weighted decibels (dBA) for each doubling of distance. Usually the noise path between the source and the observer is very close to the ground, where surface conditions may greatly alter sound transmission. Environmental factors that influence attenuation include wind, terrain, vegetation, and atmospheric conditions. The frequency of the sound also is a factor in the rate at which attenuation occurs—high-frequency sounds are more readily absorbed by molecules in the air. For acoustically “hard” sites (i.e., sites with a reflective surface, such as a smooth body of water, between the source and the receiver), no excess ground attenuation is assumed. For this analysis, the drop-off rate of sound is based on spherical spreading loss (a 20 log₁₀ function) over a “hard surface.” This equates to a conservative 6 dBA reduction in sound per doubling distance.

The spectral hearing capacity of animals varies depending on the species, and therefore airborne sound pressure is often frequency weighted such that the measured level would match the perceived level of the noise by the subject. When weighted in this way, the measurement is referred to as a sound level. The International Electrotechnical Commission (IEC) has defined several weighting schemes. A-weighting attempts to match the response of the human ear to pure tones, while C-weighting is used to measure peak sound levels. Airborne noise from construction is often reported in A-weighted sound levels (dBA). While in most cases, the overall level of the noise measured as dBA does not match precisely with the noise level in the frequency region where birds communicate acoustically, it does provide a crude estimate, most likely an overestimate, of masking effects of noise on vocal communication in birds. Caltrans guidance provides that the overall level in dB(A) is a very conservative estimate of the effects of continuous-type noise on communication in birds (Dooling and Popper 2007).

The noise effects of the proposed project may include temporary threshold shifts (TTS) and behavioral disturbance. TTS is the temporary loss of hearing as a result of exposure to intense sound over time. Exposure to high levels of sound over relatively short time periods would cause the same amount of TTS as exposure to lower levels of sound over longer time periods. The duration of TTS varies depending on the nature of the stimulus, but there is generally recovery of full hearing over time.

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2.2 Estimation of Airborne Noise Effects from Pile Driving and Removal

A vibratory pile driver would be used to install and potentially to remove the steel pipe pile and wooden piles. Noise values recorded during other construction projects were reviewed in order to approximate the airborne noise of installing and removing these piles. During vibratory driving of 36-inch steel piles for the Vashon Ferry Terminal in Washington, average airborne noise levels of 91 dBA L_{max} were recorded (Laughlin, 2010). This value is representative of the expected noise values from vibratory pile driving, since similar pile driving equipment is being utilized in a similar setting. Since the airborne noise threshold for phocids (includes harbor seals) is 90 dB RMS, airborne noise that would be above harassment thresholds would only occur within 20 meters of the pile driving location, an area where pinnipeds have not been observed hauling out. The 100 dB RMS threshold for otariids (including California sea lion) would not be exceeded over any appreciable distance. In conclusion, since there are no pinniped haulouts within several hundred meters of the pile driving locations, there is no potential for hauled-out animals to be exposed to noise above the airborne thresholds presented in Table 2.

3 Underwater Noise

3.1 Fundamentals of Underwater Noise

When a pile-driving hammer strikes a pile, a pulse is created that propagates through the pile and radiates sound into the water and the ground substrate, as well as the air. The sound pressure pulse, as a function of time, is referred to as the waveform. The peak pressure is the highest absolute value of pressure over measured waveform and can be a negative or positive pressure peak. Peak pressures for underwater applications are typically expressed in dB referenced to 1 μ Pa.

Another measure of the pressure waveform that can be used to describe the pulse is the sound energy itself. The total sound energy in the pulse is referred to in many ways, including the “total energy flux” (Finneran et al., 2005). Total energy flux is equivalent to the unweighted sound exposure level (SEL) for a plane wave propagating in a free field, a common unit of sound energy used in airborne acoustics to describe short-duration events. The unit for SEL is dB referenced to 1 μ Pa²-sec. The total sound energy in an impulse accumulates over the duration of that pulse. How rapidly the energy accumulates may be significant in assessing the potential effects of impulses on fish.

Vibratory pile drivers also produce high-intensity noise, but work on a different principle and have a very different sound profile than discussed above. A vibratory pile driver works by inducing particle motion to the substrate immediately below and around the pile, causing liquefaction, which allows the pile to sink downward. For this reason, vibratory pile driving is only suitable where soft substrates are present. The noise produced during vibratory driving is lower in intensity, accumulates more slowly, and can be considered continuous in comparison to the pulse-type noise produced during impact pile driving. Peak noise levels from vibratory driving are typically 10 to 20 dB lower than impact driving for a particular pile type (Caltrans, 2015).

3.2 Estimation of Noise Effects from Pile Driving

A review of underwater sound measurements for similar projects was undertaken to estimate the near-source sound levels for vibratory pile extraction and driving. Pile driving sound from similar type and sized piles have been measured from other projects and can be used to estimate the noise levels that the proposed project would generate. This analysis utilizes the practical spreading which NMFS and USFWS have accepted to estimate transmission loss of sound th

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The only significant sources of underwater noise during construction would be vibratory pile driving and extraction, including the 11-inch steel pipe guide pile and the 9-inch wood fender piles. All installation and removal would use vibratory equipment. Water depths at the pile driving locations ranging from approximately 6 to 16 feet, depending on location and tidal phase. The substrate at the pile-driving locations is primarily sand and gravel, and the piles may be driven until they encounter bedrock. To estimate underwater noise levels for the proposed project, measurements from a number of underwater pile-driving projects conducted under similar circumstances (similar water depths in areas of similar substrate) were reviewed for use as source level data.

The analysis of pile driving impacts assumes that a receptor (such as a fish or marine mammal) within the area of noise effects is stationary during the pile driving and does not relocate away from the activity during driving, and that noise levels would mimic the average 1-second RMS of the chosen source levels. This therefore represents a calculation of a reasonable worst-case scenario for accumulated sound effects over a 24-hour period. The following analysis also assumes an attenuation factor of 15 (~4.5 dB per doubling of distance) -this is the standard conservative value for attenuation in shallow-water pile driving (depths of less than 45 feet). The attenuation factor in the project area would likely be greater than 15 due to the presence of thick kelp beds and a down sloping sea floor, which would serve to attenuate noise levels. Tables 3 and 4 provide a summary of the noise impact analyses for impacts to fish and marine mammals that is presented in the following paragraphs. See Figures 2 and 3 of Appendix A for isopleths of distances to fish and marine mammal thresholds, respectively. Figure 4 provides the distances to the marine mammal thresholds with bathymetric mapping as the background.

Table 3. Expected Pile-Driving Noise Levels and Distances over which Noise Thresholds for Fish May be Exceeded

Pile Type	Source Levels(dB)***		Distance to Threshold* (meters)	
	Peak Noise Level	RMS, 1- second	Injury - 206 dB Peak	Behavioral -150 dB RMS
Vibratory Driving/Extraction				
11-inch steel pipe pile (1 pile total)	171	155	NE	22
9-inch wood pile (4 per day)	164	152	NE	22
Notes: dB decibels NE threshold not exceeded SEL sound exposure level ** For vibratory driving, the Single Strike SEL represents the SEL of 1 second of pile driving. *** Source levels as measured at 10 meters for the 11-inch steel pipe pile and 16 meters for 9-inch wood pile				

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Table 4: Expected Pile-Driving Noise Levels and Distances over which Noise Thresholds for Marine Mammals May be Exceeded

Project Element Requiring Pile Installation	Source Levels(dB)***		Distance to Level B Threshold in meters (120 dB RMS)	Distance to Level A Threshold ¹ in meters				
	Peak ²	RMS/SEL		Low-Frequency Cetaceans	Mid-Frequency Cetaceans	High-Frequency Cetaceans	Phocid Pinnipeds	Otariid Pinnipeds
11-inch steel pipe pile (1 pile total)	171	155RMS	2,154	0.8	0.1	1.2	0.5	0
9-inch wood pile (4 per day)	164	152 RMS	2,175	2.1	0.2	3.1	1.3	0.1

Notes:
 For calculation worksheets used to develop these numbers is provided in Appendix C.
¹ Level A thresholds are based on the NMFS 2016 Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing; cSEL threshold distances are shown. See footnote 3 below.
² All distances to the peak Level A thresholds are less than 1 meter.
 Distances are rounded to the nearest foot or to "<1.0 (0)" for values less than 1 foot.
 Peak and cSEL are re: 1 µPa and 1 µPa²-sec, respectively.
 dB = decibels
 RMS=Root Mean Square
 *** Source levels as measured at 10 meters for the 11-inch steel pipe pile and 16 meters for 9-inch wood pile

3.3 Underwater Noise from 11-Inch Steel Pipe Pile

Only one 11-inch steel pipe pile would be installed to replace the damaged guide pile. The new pile would be sleeved over the damaged pile and driven into place with a vibratory driver. During installation of this pile, up to 600 seconds of vibratory driving would be done in one day using an APE 400B King Kong or similar vibratory driver. Source levels for this pile type were taken from summary values provided by Caltrans for vibratory driving of 12-inch steel piles (Caltrans, 2016). Those summary values are 171 dB peak 155 dB RMS as measured at 10 meters.

As presented in Table 3, vibratory installation of the 11-inch steel pipe pile would not produce noise levels above the 206 dB peak threshold for fish, but would exceed the 150 dB behavioral noise threshold over the short distance of 22 meters.

As presented in Table 4, the 120 dB Level B threshold may be exceeded over a distance of 2,154 meters. The Level A thresholds would only be exceeded over very short distance of a few meters or less. Marine mammals are not expected to venture that close to the Pier, so no Level A take of marine mammals is expected to occur.

3.4 Underwater Noise from 9-Inch Wood Piles

A total of 9 wooden piles would be replaced during construction. Since the damaged piles may first be extracted with a vibratory pile driver, up to 18 vibratory driving events would occur. It is assumed that up to 4 extractions/installations would occur per day over a period of 5 days. It is assumed that each extraction/installation would require 600 seconds of vibratory driving, for a total of 3600 seconds per day using an APE 400B King Kong or similar vibratory driver.

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As with the piles discussed previously, other projects conducted under similar circumstances were reviewed in order to approximate the noise effects of the 9-inch wood piles. The most applicable noise values for wooden pile removal are derived from measurements taken at the Port Townsend dolphin pile removal in Washington. During the vibratory pile extraction associated with these projects, which occurred under similar circumstances, peak noise levels were approximately 164 dB, and the average RMS (1 second) was at **most 152 dB as measured at 16 meters (WSDOT, 2011).**

As presented in Table 3, vibratory installation of the 9-inch wooden piles would not produce noise levels above the 206dB peak threshold for fish, but would exceed the 150 dB behavioral noise threshold over the short distance of 22 meters.

As presented in Table 4, the 120 dB Level B threshold may be exceeded over a distance of 2,175 meters. The Level A thresholds would only be exceeded over very short distance of a few meters or less. Marine mammals are not expected to venture that close to the Pier, so no Level A take of marine mammals is expected to occur.

4 Conclusions and Recommendations

4.1 ESA and MSA Compliance

Federally listed fish species may be present in Point Arena Cove and thus potentially be exposed to underwater pile driving noise or project-generated turbidity. For those reasons, consultation with NMFS will be conducted for listed fish species, utilizing FEMA's Programmatic Biological Opinion.

Federally listed marine mammals may occur in coastal waters near Point Arena, with the likelihood of occurrence tied to seasonality, oceanic currents, prey abundance, and other biotic and abiotic factors. The only effects of the proposed project that may extend out into coastal waters that may support federally listed marine mammals is underwater noise above the Level B harassment threshold, as discussed in Section 3. However, the periods of pile driving are expected to be very brief, limited to 40 minutes or less of pile driving per day, during a construction period of approximately one week. The potential for federally listed marine mammals to be present within ~2 kilometers (km) of the Point Arena Pier during the brief periods of pile driving is discountable in nature. The majority of listed marine mammals occur in offshore pelagic waters and are not likely to come within 2km of the Point Arena Pier (See Appendix A). Special consideration was given to Humpback whale and Southern resident Killer Whale, since these ESA listed species occur in coastal waters and may be present in northern California waters during the summer and fall months. Humpback whales are very rarely seen in coastal waters with depths of less than 60 meters (Calambokidis et al 1989). The Level B harassment threshold does not extend into water depths greater than 50 meters, so it is not expected that humpback whales would be exposed to noise above NMFS thresholds. Southern resident Killer Whales have been observed in Monterey Bay on great occasion. However, this species stays within the vicinity of Puget Sound during the spring, summer, and fall months (NMFS 2020), and would not occur near Point Arena during the work Project's work period. As a result, no federally listed marine mammals would be affected by the proposed project.

There are is one species of sea turtle that has a low to moderate potential to occur in coastal waters near Point Arena – the leatherback sea turtle. The waters of Point Arena Cove seaward from the extreme low water line are designated as critical habitat for leatherback sea turtle. However, leatherback sea turtles are largely pelagic and are unlikely to enter the shallow waters in the immediate vicinity of the Point Arena Pier, and there would be no alteration to the physical and biological characteristics of potential habitat for sea turtles within Point Arena Cove. While there is some evidence indicating that leatherback turtles are capable of hearing pile driving noise, they do not use underwater noise for communication (Dow et. al. 2012). Due to the lack of available data, no underwater noise guidelines are available for sea turtles. However, as suggested in Popper et al 2014, noise injury thresholds for fish that are not hearing specialists may be used and would be likely be conservative for sea turtles. As described in Section 3.2, noise injury thresholds for fish would not be exceeded and the behavioral threshold for fish would only be exceeded in close proximity (22 meters) of the pile driving. Due to the very low potential of leatherbacks to enter Point Arena Cove (as discussed in Section 1.3) and the low intensity of underwater noise that would be produced, no effects to leatherback sea turtle are reasonably expected to occur.

4.2 MMPA Compliance

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Several species of marine mammals may occur in coastal waters near Point Arena, with the likelihood of occurrence tied to seasonality, oceanic currents, prey abundance, and other biotic and abiotic factors. Pacific harbor seal and California sea lion have a high potential to occur in Point Arena Cove, and thus are likely to be exposed to underwater noise above the Level B harassment threshold, as discussed in Section 3. However, the periods of pile driving are expected to be very brief, limited to 40 minutes or less of pile driving per day, during a construction period of approximately one week. During vibratory driving of the piles, the Level B zone is estimated to be no more than 2,175 meters in radius, and thus does not extend into deeper waters that are more likely to support cetaceans, though pinnipeds are more likely to be present near the shoreline. Since Pacific harbor seal, California sea lion, and potentially a few other species of marine mammals may be exposed to underwater noise above NMFS thresholds, the proposed project likely will need an IHA pursuant to the requirements of the MMPA.

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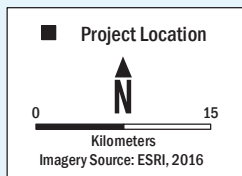


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FEMA-4305-DR-CA, PW-00467(1) (MNPAG01)

Point Arena Cove Pier
Point Arena



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FEMA-4305-DR-CA, PW-00467(1) (MNPAG01)

Point Arena Cove Pier
Point Arena

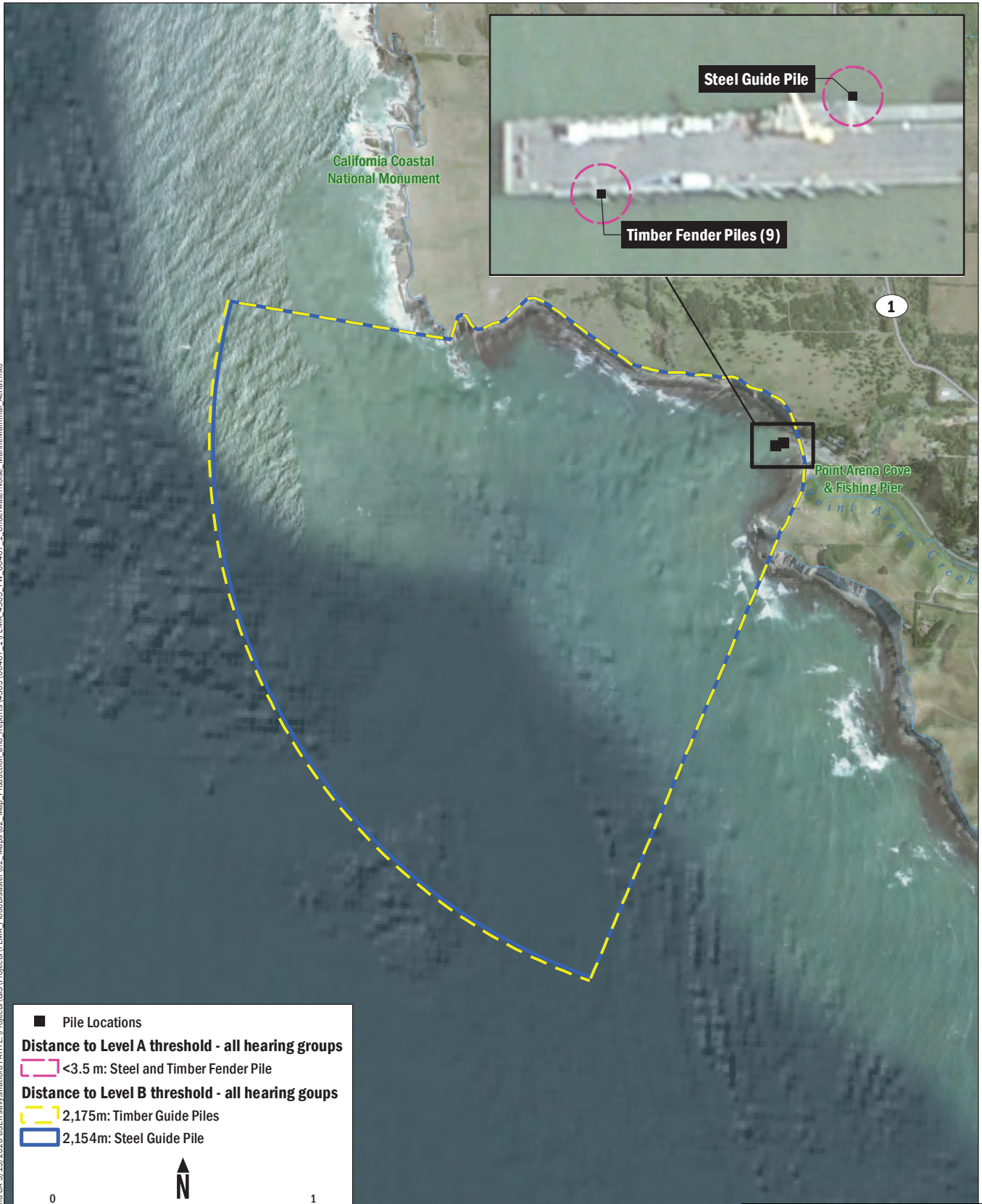


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Point Arena Cove Pier
Point Arena

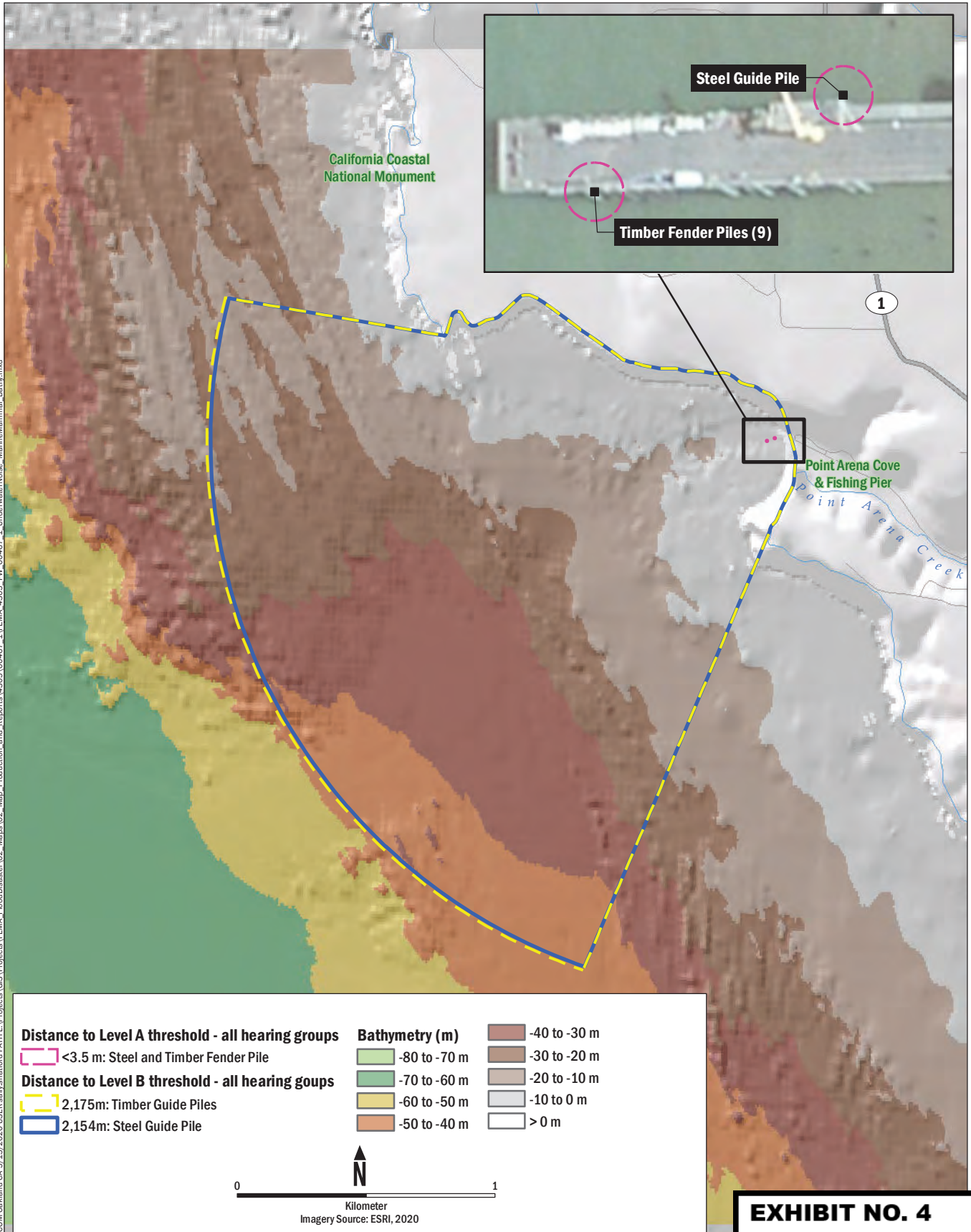


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Point Arena Cove Pier
Point Arena

Marine Mammal Monitoring Plan

Arena Cove Pier Repair Project

Prepared for:

City of Point Arena

Prepared by:



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November 2020

QA/QC: GAO__

Reference: 418003

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Proposed Project

Project Description

The proposed project is located within Arena Cove in Mendocino County, California (Figure 1) and entails replacing the damaged and missing components of the Arena Cove pier, specifically nine wooden fender piles and one steel guide pile. Construction equipment for the pier repairs will include a crane and pile driving equipment (vibratory pile driver). All work will be done by equipment operating from the deck of the pier. Construction equipment and materials will be staged on the southeast portion of the parking lot (to minimize use conflicts with other harbor activities), which is accessed by Port Road. The City of Point Arena plans to begin construction as soon as the appropriate permits have been obtained and in accordance with any required seasonal constraints. It is estimated that construction for the pier repair project will take approximately 30 days. Project description details can be found in the Arena Cove Pier Repair Project Description (SHN, 2020).

Potential Noise Effects on Marine Mammals

According to the Pile Driving Noise Evaluation prepared for the proposed project (Federal Emergency Management Agency [FEMA], 2020), the only effects of the proposed project that may extend out into coastal waters that may support federally-listed marine mammals, is underwater noise above the Level B harassment threshold¹. However, the periods of pile driving are expected to be very brief, limited to 40 minutes or less of pile driving per day, during a construction period of approximately one week. During vibratory driving of the piles, the Level B zone is estimated to be no more than 2,175 meters in radius, and thus does not extend into deeper waters that are more likely to support cetaceans, though pinnipeds are more likely to be present near the shoreline. Since Pacific harbor seal, California sea lion, and potentially a few other species of marine mammals may be exposed to underwater noise above National Marine Fisheries Service (NMFS) thresholds, this MMMP is being incorporated into the proposed project.

Regulatory Compliance

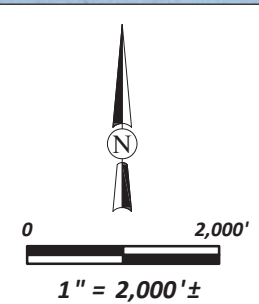
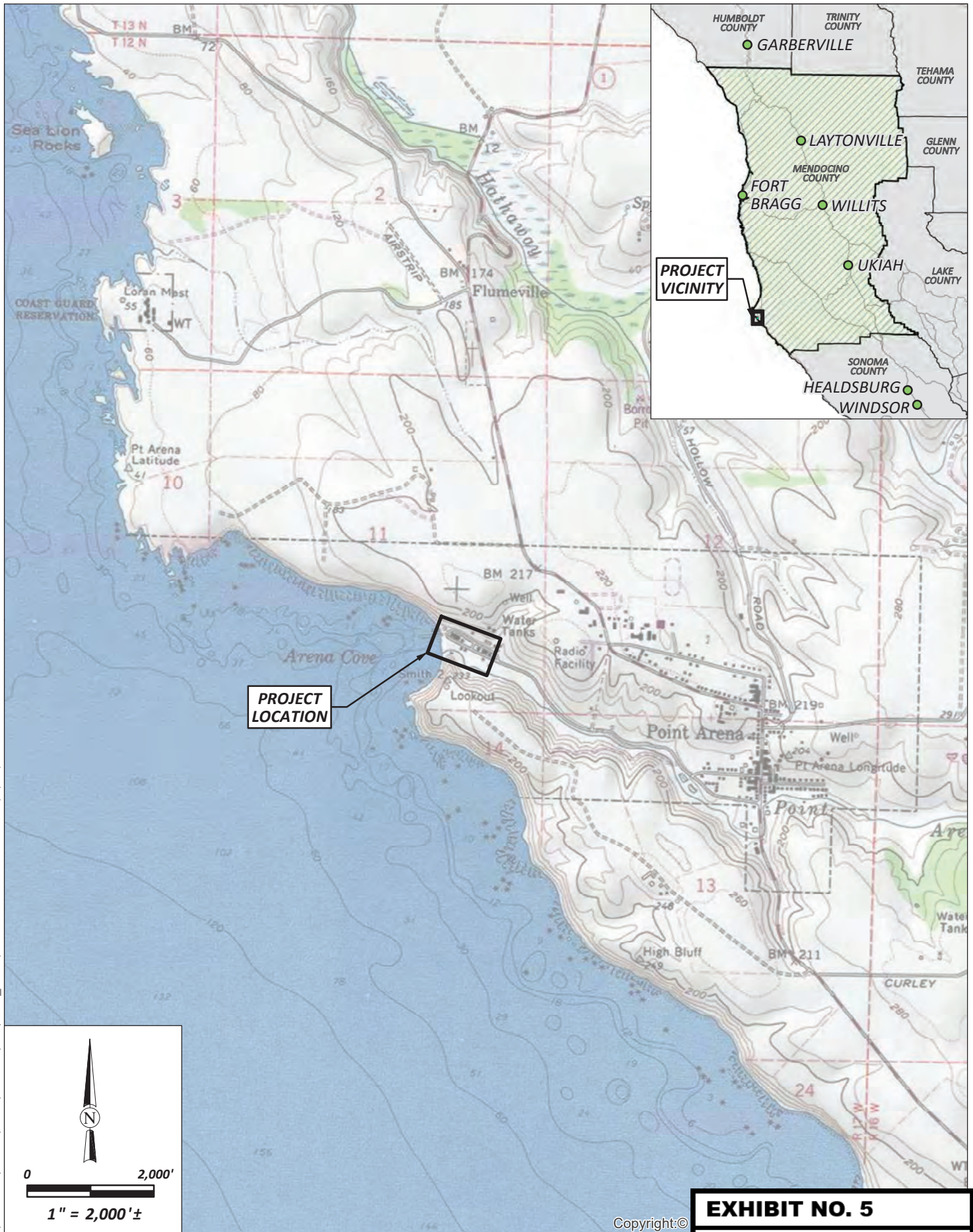
This MMMP is intended to ensure the proposed project is in compliance with the Marine Mammal Protection Act (MMPA; National Oceanic and Atmospheric Administration [NOAA], 1972). Under Section 101(a)(5)(D) of this act, an incidental harassment authorization (IHA) may be issued for activities other than commercial fishing that may impact small numbers of marine mammals. Amendments to this act in 1994 statutorily defined two levels of harassment. Level A harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild. Level B harassment is defined as harassment having potential to disturb marine mammals by causing disruption of behavioral patterns, including—but not limited to—migration, breathing, nursing, breeding, feeding, or sheltering. Projects that occur in areas that are frequented by marine mammals may require an IHA, particularly if project activities (such as pile driving) would generate substantial underwater noise. According to the Pile Driving Noise Evaluation prepared for the project (FEMA, 2020), there are several species of marine mammal that have medium to high likelihood of occurring in the project area. These species are not federally listed, but are protected under the MMPA.

According to the Pile Driving Noise Evaluation prepared for the project (FEMA, 2020), the five species of Endangered Species Act (ESA)-listed whales that occur along the coast of Northern California are not expected to venture into the shallower waters of Arena Cove less than 20 feet in depth) as they tend to frequent deeper waters, or would not

¹ Level B Harassment refers to acts that have the potential to disturb (but not injure) a mammal or marine mammal stock in the wild by disrupting behavioral patterns, including, but not limited to, migration, breathing, nursing, or sheltering.



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City of Point Arena
Marine Mammal Monitoring Plan
Point Arena, California

November 2020

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be in the vicinity of Point Arena during the summer, when the proposed project would occur. The one species of ESA-listed fur seal that may occur in the coastal waters of Northern California has a very low potential to occur in the project area.

An Incidental Harassment Authorization is not being sought for this project due to the unlikely occurrence of ESA-listed species in the project area, the short duration of potential harassment, and with concurrence from NOAA that, with implementation of this MMMP, take can likely be avoided (Daly, 9/8/20).

Monitoring Plan

Monitoring Objectives

The purpose of this MMMP is to observe marine mammals in the defined area of potential sound effects from the proposed project and to communicate with construction personnel to stop work if a marine mammal is sighted in the monitoring area. Monitoring is intended to avoid serious injury (Level A harassment) of marine mammals and minimize behavioral disturbance (Level B harassment) to the extent practicable. Lethal take of marine mammals is not expected to occur. The qualified observers will monitor any marine mammals that are present and be in communication with construction personnel to allow work to commence once the marine mammals have voluntarily left the monitoring area.

Methods

Monitoring Locations

Two marine mammal monitoring locations have been established on land with adequate visual coverage of Arena Cove out to the Level B Thresholds defined by the Point Arena Pier Pile Driving Noise Evaluation (Figure 2). One location will be next to the pier for immediate visual coverage and one location along the sea cliff to the north, for visual coverage out to 2,175 meters from the project site. These monitoring locations will be used either simultaneously with one observer at each location or one observer at one of these locations (depending on visibility conditions at the time of project implementation), at least 30 minutes prior to and during pile-driving activities.

Monitoring Protocol

The following measures are to be implemented during pier repair pile driving to help prevent acoustic effects on marine mammals:

1. The marine mammal observer(s) will be onsite at all times during pile driving. Observer(s) will be pre-approved to meet the list of qualifications before the start of pile driving (See section on Observer Qualifications).
2. The area of potential sound effects (2,175-meter radius) will be monitored for marine mammals 30 minutes prior to and during pile driving. Figure 2 identifies proposed observer positions. The positions are designed to provide full observer coverage of this area.
3. A hand-held GPS device or rangefinder will be used to verify the required monitoring distance from the project site.
4. The waters within the area of potential sound effects will be scanned using binoculars (10X42 or similar) and/or spotting scopes (20-60 zoom or equivalent), and by making visual observations.
5. If weather or sea conditions restrict the observer's ability to observe for ESA-listed species, or other marine mammals, the observer(s) will be in contact with the onsite supervisor to cease pile installation until conditions allow for monitoring to resume.



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6. Waters will be scanned for 30 minutes before and during all pile driving. If marine mammals enter or are observed within the area of potential sound effects during or 20 minutes before pile driving, the observer(s) will immediately notify the onsite supervisor and require that pile driving either not be initiated or temporarily cease until the animals have voluntarily moved outside of the area of potential sound effects.
7. Pile-driving activities will only occur during daylight hours when observers can visually monitor for marine mammals.
8. Observer(s) will use a marine mammal observation sheet (Appendix 1) to record the species, date, and time of any marine mammal sightings, as well as marine mammal behavior and any communication between the observer(s) and the onsite supervisor during pile driving.
9. If any dead or dying marine mammal species are observed in the action area, regardless of known cause, the observer(s) will record the species type (if known), date, time, and location of the observation, take a photograph of the specimen, and immediately notify NOAA Fisheries.

Observer Qualifications

Minimum Qualifications for Marine Mammal Observers

Pre-approved marine mammal observers will meet the following qualifications:

1. Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface with ability to estimate target size and distance. Use of binoculars or spotting scope may be necessary to correctly identify the target.
2. Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelor's degree or higher is preferred), or equivalent Alaska Native traditional knowledge.
3. Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
4. Experience or training in the field identification of marine mammals (cetaceans and pinnipeds).
5. Sufficient training, orientation, or experience with vessel operation and pile-driving operations to provide for personal safety during observations.
6. Writing skills sufficient to prepare a report of observations. Reports should include such information as the number, type, and location of marine mammals observed; the behavior of marine mammals in the area of potential sound effects during construction; dates and times when observations and in-water construction activities were conducted; and dates and times when in-water construction activities were suspended because of marine mammals, etc.
7. 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 needed.

Reporting

Post-project Documentation

Upon completion of the project, monitoring results will be reported to NMFS, including number, species or type, and location of marine mammals observed, the behavior of marine mammals in the area of potential sound effects during construction, dates and times when observations and in-water construction activities were conducted, dates and times when in-water construction activities were suspended because of marine mammal presence, and any other relevant marine mammal observations.



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Example Marine Mammal Observation Sheet:

Marine Mammal Observations

Project Name: _____

Date: _____ Sheet _____ of _____ for this day

Monitor: _____ Monitoring Location: _____

Sighting #	Time of Day	Weather	Species	# of Individuals	Location*	Behavior/Construction Activity

*E.g., Direction, Distance Estimate or Mark on Figure with Sighting Number

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B.3. Can the Subapplicant incorporate the general *Avoidance and Minimization Measures* and the species-specific *Conservation Measures* listed in the applicable FEMA PBA-LOC into the proposed project to avoid or minimize effects on federally listed species (including avoiding take⁸ as defined under ESA) and/or their Critical Habitat to levels that are insignificant, discountable, or wholly beneficial?

☒ **YES**

FEMA has determined that the proposed project May Affect, but is **Not Likely to Adversely Affect (NLAA)** federally listed species and/or their Critical Habitat. Direct and indirect effects would be insignificant, discountable or wholly beneficial. There are no adverse effects to species or their Critical Habitat. As such, take of individual(s) or destruction/adverse modification to Critical Habitat will not occur. Complete **Section C** of this form for NLAA determinations. FEMA will notify the USFWS by submitting the completed ESA Review Form for the proposed project and request that the proposed project be covered under the applicable FEMA PBA-LOC as an NLAA project.

☐ **NO**

FEMA has determined that the proposed project is **Likely to Adversely Affect (LAA)** at least one federally listed species and/or their Critical Habitat. Adverse effects to at least one federally listed species or at least one physical or biological feature of Critical Habitat may occur to reach an LAA determination. Therefore, this FEMA PBA-LOC is not applicable for the Subapplicant's proposed project.

SECTION C. ESA REVIEW FOR NLAA DETERMINATIONS FOR PROPOSED PROJECTS UNDER THE APPLICABLE FEMA PBA-LOC

⁸ Take: Under the ESA "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or engage in any such conduct [ESA §3(19)].

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C.1. Briefly describe the species potential to occur onsite (including closest CNDDDB occurrences, suitable habitat, available information from U.S. Forest Service data or staff, etc.) and the potential direct and indirect effects from implementation of the Subapplicant's proposed project in the Action Area. Refer to the applicable FEMA PBA-LOC for a description of potential effects, and describe additional effects as applicable.

a. Direct and Indirect Effects on Federally Listed Species

See Attachment D with a species table and their potential to occur in the Action Area, and Attachment E with an Official Species List from the Information for Planning and Consultation (IPaC) online tool. Within a 10-mile radius of the Proposed Project, 36 occurrences of Point Arena mountain beaver have been reported. The nearest occurrences were reported south of the Point Arena Pier parking lot, located on the north facing slope on the south bank of Point Arena Creek and extending from the cove upstream to Highway 1 and the city of Point Arena (represented in the CNDDDB as a 5-part polygon), from Arena Cove lookout to Highway 1 and the city of Point Arena (Attachment A, Figure 3). Together, these polygons represent the type-specimen of the species, and this area – Point Arena Creek and its riparian corridor) is characterized by coastal scrub on a steep slope with sword fern and poison oak.

Although Point Arena Creek is adjacent to the Action Area, the Action Area is physically removed from the suitable habitat within the Point Arena Creek riparian corridor, and the two are separated by the open water (Pacific Ocean), shoreline, and the Point Arena Pier parking lot, none of which provide suitable habitat for the Point Arena mountain beaver (Attachment A, Figure 2).

As primarily ground-dwelling creatures, mountain beavers have highly developed tactile senses, and are believed to be highly susceptible to disturbance from loud noises or ground vibration during the breeding season. Pier replacement activities would be limited to locations along the Point Arena Pier, and any noise or vibration would be attenuated by the open water and distance between pier piling activities and the riparian corridor [steel guide pile: 0.08 mile (397 feet); timber fender piles : 0.09 mile (460 feet)]. No in-water work would occur in Point Arena Creek, and all fender pile driving would occur during the July 1 to November 30 non-breeding season (outside of the species' December 1 to June 30 breeding season). Pile driving activities include up to 600 seconds (10 minutes) of vibratory driving to install an 11-inch steel pipe, and up to 12,000 seconds (200 minutes) of vibratory driving to install a total of 9 wooden piles. All of these activities would occur more than 250 feet from suitable habitat.

Assuming the noise path generated by pile driving activities follows very close to the ground, surface conditions such as wind, terrain, vegetation, and atmospheric conditions may greatly alter sound transmission. In this instance, sound would be traveling across a hard reflective surface (the waters of Point Arena Cove and the Pier's parking area) before transitioning to vegetated areas, where it would have to penetrate the riparian corridor surrounding Point Arena Creek 300 feet or more from the point of origin. Assuming no attenuation from vegetation and even spherical spreading, this equates to a 6 dBA reduction in sound per doubling of distance from the source. Assuming average airborne noise levels of 91 dBA at a distance of 31 feet during vibratory pile driving, this would amount to an estimated 73 dBA at 250 feet from the work activities. Although there are no published studies or guidelines on the effects of noise/vibration on mountain beavers, for comparative purposes, typical background noise levels expected at a harbor/parking lot would range from those of a quiet residential area (40 dBA), to roadway traffic (70 dBA), and occasionally that of a heavy truck or a shouted conversation (90 dBA).. For these reasons, Point Arena mountain beaver is not expected to occur within the project boundaries, and effects to the species as a result of acoustic or vibratory disturbances are not expected within the Action Area.

In the unlikely event that a Point Arena mountain beaver was present in the Action Area, the effects of the project may include the indirect effect as a result of the production of noise and vibration during pile driving activities.

Among the species-specific conservation measures that will be implemented to avoid effects to the species include prohibiting the use of motorized equipment with vibrating, or heavy-impact, operating capabilities (for example, pile-drivers) within 500 feet of occupied suitable habitat during the breeding season, and within 250 feet of occupied suitable habitat during the non-breeding season; prohibiting night lighting within 250 feet from occupied suitable habitat; restricting heavy equipment to within the road prism in areas with evidence of Point Arena mountain beaver burrowing or within unoccupied suitable habitat; and placing staging areas in unsuitable habitat areas only or on the road prism.

b. Direct and Indirect Effects on Critical Habitat (including

b. Direct and Indirect Effects on Critical Habitat (including effects on specific Physical and Biological Features⁹)

Critical habitat has not been designated for the Point Arena mountain beaver.

⁹ Per 81 FR 7414, the physical or biological features refer to the features that are present that are essential for the conservation of the species.

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C.2. Please list all the general *Avoidance and Minimization Measures* and the species-specific *Conservation Measures* from the applicable FEMA PBA-LOC that would be incorporated into the Subapplicant's proposed project to avoid and minimize direct and indirect effects, and briefly note how they would reduce those effects within the Action Area on the following:

a. Federally Listed Species

PAMB-1: Prior to implementing proposed vegetation-altering or ground-disturbing activities, habitat assessments and surveys for Point Arena mountain beaver must be conducted using Service-approved protocol (USFWS 2005b). Survey and habitat assessment results are valid for 2 years; if conducted within 500 feet of the Action Area. Therefore, if proposed activities do not begin within 2 years of surveys, additional surveys will need to be conducted prior to conducting the work. *[Please note that the Point Arena mountain beaver is already known to occur in Point Arena Creek and that it is located approximately 300 feet from the Action Area, and therefore, these surveys may not be necessary.]*

PAMB-3: No motorized equipment with vibrating, or heavy-impact, operating capabilities (for example, vibratory steel-wheeled rollers, hand-operated vibratory compactors, concrete mixer trucks with vibrating chutes, pile-drivers), will be used within 500 feet of occupied suitable habitat during the breeding season (December 1 to June 30), and within 250 feet of occupied suitable habitat during the non-breeding season (July 1 to November 30).

PAMB-4: Night lights should be at least 250 feet from occupied suitable habitat.

PAMB-5: Heavy equipment must remain on the road prism in areas with evidence of Point Arena mountain beaver burrowing or within unoccupied suitable habitat.

PAMB-6: Staging areas will be placed in unsuitable habitat areas only or on the road prism to avoid habitat disturbance. No staging areas are allowed within occupied or unoccupied suitable habitat.

The following general avoidance and minimization measures are **not** applicable to the Proposed Project:

PAMB-2: No vegetation removal or ground disturbance in occupied habitat or within unoccupied suitable habitat. However, roadside mowing along road rights-of-way, in occupied habitat or unoccupied suitable habitat using motorized equipment is allowed between July 1 and November 30 (i.e., the non-breeding season), provided a maximum 4-foot horizontal strip of vegetation will be mowed, to a minimum height of 2 feet.

RATIONALE: PAMB-2 is not applicable to this project because the proposed work will not take place within suitable habitat, and no vegetation-altering or ground-disturbance activities have been proposed.

b. Critical Habitat

Critical habitat has not been designated for the Point Arena mountain beaver.

Note: Please note that take (as defined under the ESA) of federally listed species is not allowed under the NLAA determination. If take of a federally listed species is reasonably certain to occur, this FEMA PBA-LOC is not applicable for the Subapplicant's proposed project.

the species and may require special management considerations or protection, which were former Constituent Elements.”

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CDP Application No.
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C.3. Are there any interrelated¹⁰ and/or interdependent¹¹ actions associated with the Subapplicant's proposed project? If so, please describe them.

None

C.4. Are there any other FEMA funded projects occurring within 1 mile of the Subapplicant's proposed project? If so, please list the disaster number (DR), Project Worksheet (PW), project name, and distance to this proposed project.

FEMA-4305-DR-CA, PW 00911(1) (applied for, not yet funded).

C.5. Summary of FEMA's NLAA Determination for Federally Listed Species and Critical Habitat from implementation of the Subapplicant's proposed project to demonstrate that the Subapplicant's proposed project will have insignificant, discountable, or wholly beneficial effects to federally listed species or their Critical Habitat. List all the federally listed species and/or Critical Habitat covered under this NLAA determination. An ESA determination for each federally listed species and/or Critical Habitat is required.

Species: Point Arena Mountain Beaver

Determination Rationale for Species: This project *may affect, but is not likely to adversely affect* the Point Arena mountain beaver: pier replacement would be limited to locations along the Point Arena Pier, which is more than 250 feet from suitable habitat (Point Arena Creek); no in-water work will occur in Point Arena Creek; any noise or vibration would be attenuated by the open water and distance between pier piling activities and the riparian corridor; and all fender pile driving would occur between July 1 and October 15, outside of the species' December 1 to June 30 breeding season. The application of avoidance and minimization measures [PAMB-1 (habitat assessment and surveys), PAMB-2 (seasonal work window for vibratory work), PAMB-4 (night lighting restrictions), PAMB-5 (restricting heavy equipment to road prism), and PAMB-6 (restrictions on staging areas)] would further avoid impacts to the species in the unlikely event that the species is present. For these reasons, Point Arena mountain beaver is not expected to occur within the project boundaries, and effects to the species as a result of acoustic or vibratory disturbances are not expected within the Action Area.

No Critical Habitat has been designated for the Point Arena mountain beaver.

¹⁰ Interrelated actions are actions that are part of a larger action and depend on the larger action for (36 CFR §402.02).

¹¹ Interdependent actions are actions having no independent utility apart from the proposed action (36 CFR §402.02).

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SECTION D. FOR THE ARCATA OR YREKA FWO TO COMPLETE AND SIGN

Project Name: Arena Cove Pier

FEMA Grant # or Disaster and Project Worksheet #s: DR-4305, PW 00467(1)

☒ I concur with FEMA's determination on federally listed species and critical habitat as described in this ESA Review Form, pursuant to Section 7 of the Endangered Species Act. The proposed projects are covered activities, and the affects to the Federally-listed species presented in this ESA Review Form have been analyzed in the September 7, 2018, Programmatic Letter of Concurrence for the Federal Emergency Management Agency's Disaster, Mitigation, and Preparedness Programs within the Arcata or Yreka Fish and Wildlife Office's Jurisdiction (AFWO-18B0109-1810341).

The proposed projects are appended to the September 7, 2018, programmatic letter of concurrence under the following Service File Number: ~~[FWS will insert TALEs number]~~. Therefore, no further action pursuant to the Act is necessary for the proposed projects unless new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered; or a new species is listed or critical habitat designated that may be affected by the identified action.

File # AFWO-18B0109-18I0341

☐ I do not concur with FEMA's determination for the following reason(s):

Signature is listed below:



Ecological Services Program Lead
Arcata/Yreka Fish and Wildlife Office
U.S. Fish and Wildlife Service

MAY 18, 2020
Date

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AEOM Oakland CA 5/14/2020 USER: sallyshafford PATH: L:\Projects\GIS\Projects\FEMA_FloodDisaster\02_Maps\02_Map_Production_and_Reports\4305\00467_1\FEMA_4305_PW_00467_1_ActionArea\SPNS.mxd

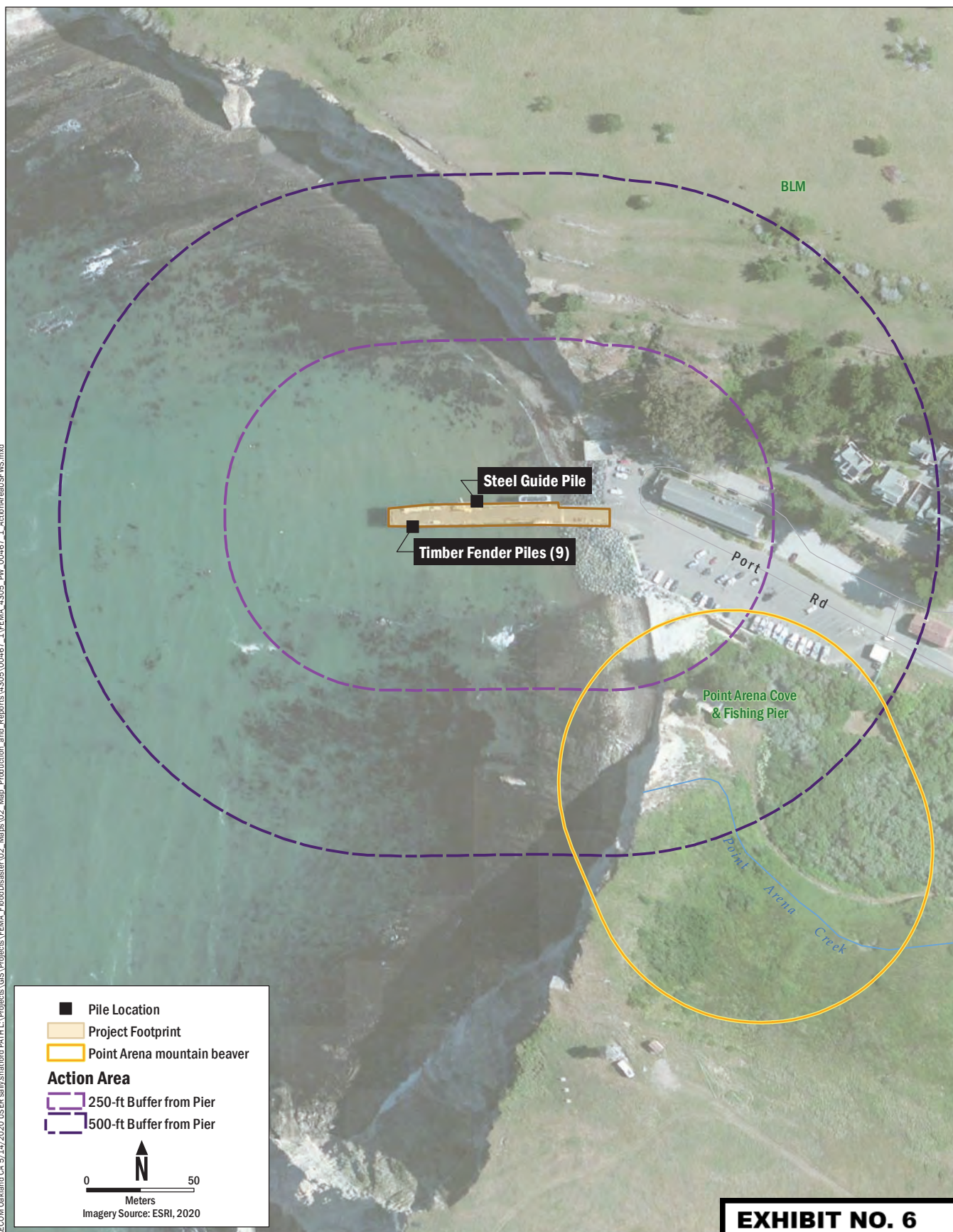
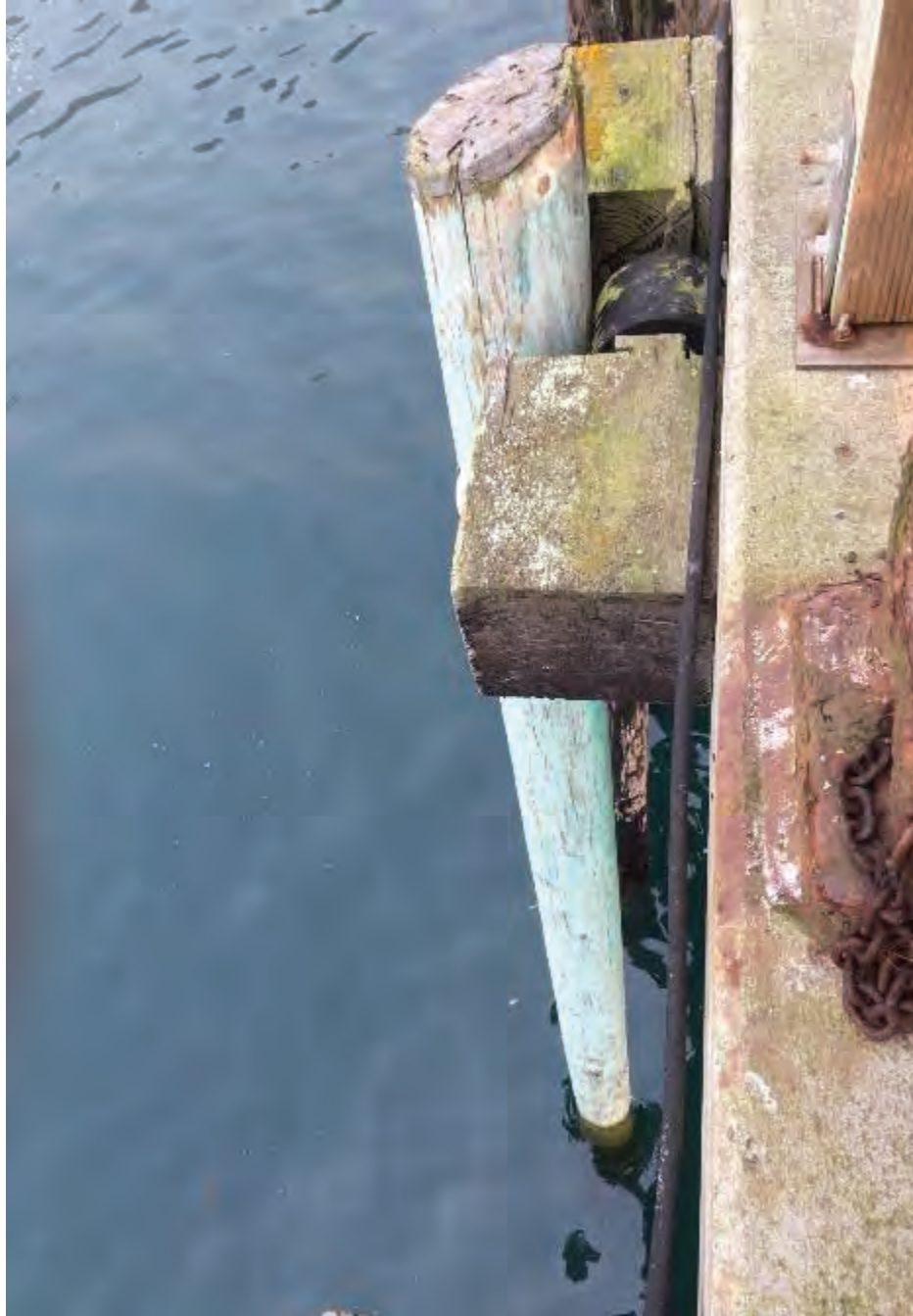


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FEMA-4305-DR-CA, PW 00467(1) (MNPAG01)

Point Arena Cove Pier
City of Point Arena



Photograph 3: Example of wooden pile that will need to be replaced on the Arena Cove Pier.

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Photograph 4: Another example of a wooden pile that needs replacement on the Arena Cove pier, with aquatic habitat below.

EXHIBIT NO. 6

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1-20-0171 (Point Arena)
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RE: Pt. Arena Pier - Marine Mammal Monitoring PlanStein Coriell <scoriell@shn-engr.com>

Wed 12/9/2020 3:58 PM

To: Jaclyn Daly - NOAA Federal <jaclyn.daly@noaa.gov>**Cc:** Holloway, Catherine@Coastal <catherine.holloway@coastal.ca.gov>; Gretchen O'Brien <gobrien@shn-engr.com>; Richard Shoemaker, PA-CM <cm@pointarena.ca.gov>; Paul Andersen <admin@pointarena.ca.gov>; Jason Island <jisland@shn-engr.com>; Scott Perkins <sperkins@shn-engr.com>

Thank you Jaclyn.

Stein

From: Jaclyn Daly - NOAA Federal <jaclyn.daly@noaa.gov>**Sent:** Wednesday, December 9, 2020 2:19 PM**To:** Stein Coriell <scoriell@shn-engr.com>**Cc:** Holloway, Catherine@Coastal <catherine.holloway@coastal.ca.gov>; Gretchen O'Brien <gobrien@shn-engr.com>; Richard Shoemaker, PA-CM <cm@pointarena.ca.gov>; Paul Andersen <admin@pointarena.ca.gov>; Jason Island <jisland@shn-engr.com>; Scott Perkins <sperkins@shn-engr.com>**Subject:** Re: Pt. Arena Pier - Marine Mammal Monitoring Plan

Hi Stein,

This looks like a comprehensive plan and with its implementation, the harassment to marine mammals is highly unlikely. I recommend that you do not apply for an IHA.

Cheers,

Jaclyn

On Thu, Dec 3, 2020 at 5:23 PM Stein Coriell <scoriell@shn-engr.com> wrote:

Jaclyn,

Attached is the requested Marine Mammal Monitoring Plan for the Arena Cove Pier Repair Project that Gretchen O'Brien was in contact with you about. We have obtained BLM concurrence for monitoring station 2 on BLM property as shown in the MMMP (attached).

Based on this, can you confirm that no Incidental Harassment Authorization is required under the Marine Mammal Protection Act?

Thank you,
Stein Coriell

From: Gretchen O'Brien <gobrien@shn-engr.com>**Sent:** Thursday, October 15, 2020 10:13 AM**To:** Jaclyn Daly - NOAA Federal <jaclyn.daly@noaa.gov>**Cc:** Stein Coriell <scoriell@shn-engr.com>**Subject:** RE: Pt. Arena Pier - FEMA BO

Jaclyn,

No take of listed marine mammals is likely for this project and you had indicated that an IHA would not be necessary, although you had asked there be a marine mammal monitoring plan as mitigation for any potential harassment of non-listed marine mammals protected under the MMPA which is why I am preparing the Marine Mammal Monitoring Plan. I just want to confirm that you still want that incorporated into the project? I have a draft close to completion.

Thank you,
Gretchen**EXHIBIT NO. 7**CDP Application No.
1-20-0171 (Point Arena)
Agency Correspondence
(1 of 2)

From: Jaclyn Daly - NOAA Federal <jaclyn.daly@noaa.gov>

Sent: Wednesday, October 14, 2020 6:31 AM

To: Gretchen O'Brien <gobrien@shn-engr.com>

Subject: Re: Pt. Arena Pier - FEMA BO

Hi Gretchen, BiOps only cover ESA-listed species so that is why you aren't seeing an analysis for non-listed species. I'm happy to review a monitoring plan for you but it's my understanding FEMA has concluded no take of marine mammals is likely from the project, correct?

Jaclyn

On Tue, Sep 29, 2020 at 5:17 PM Gretchen O'Brien <gobrien@shn-engr.com> wrote:

Jaclyn,

I don't believe you had received this bit of information regarding the Point Arena, CA Pier project. Attached BO still does not appear to cover marine mammals under MMPA so I do still intend on submitting a Marine Mammal Monitoring Plan unless you see otherwise.

From Carmen Shore at FEMA: FEMA completed consultation with the NMFS and it was determined the proposed actions were Not Likely to Adversely Affect NMFS species or critical habitat and there were no anticipated impacts to Essential Fish Habitat. The applicable Avoidance and Mitigation Measures (AMMs) are listed in the ESA/MSA Review form and the corresponding AMM descriptions are located in section 1.3.9 of the NMFS PBO.

Gretchen

Gretchen O'Brien

Senior Certified Wildlife Biologist©



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Jaclyn Daly-Fuchs

Fishery Biologist

[MMPA Incidental Take Program](#)

National Marine Fisheries Service

Office of Protected Resources

1315 East-West Highway

Silver Spring, Maryland 20910

phone: 301-427-8438

EXHIBIT NO. 7

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Agency Correspondence
(2 of 2)