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2023 Final Biological Monitoring and Mitigation Compliance Report

Chevron Long Wharf Maintenance and Efficiency Project

Chevron Products Company

Revised March 2024

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Acronyms and Abbreviations

BO	Biological Opinion
B1	Berth 1
CASL	California sea lion
CDFW	California Department of Fish and Wildlife
dB	decibels
°F	degrees Fahrenheit
HAPO	Harbor porpoise
HASE	Pacific harbor seal
IHA	Incidental Harassment Authorization
ITP	Incidental Take Permit
m	meters
MMO	marine mammal observer
NMFS	National Marine Fisheries Service
Project	Chevron Long Wharf Maintenance and Efficiency Project
RMS	root mean square
SEL	sound exposure level

1. Introduction

This 2023 Biological Monitoring and Mitigation Annual Compliance Report is being submitted to the California Department of Fish and Wildlife (CDFW) in accordance with Condition #6.8 in the Project Incidental Take Permit (ITP) No. 2081-2016-056-07, and to the National Marine Fisheries Service (NMFS) in accordance with the Project Biological Opinion (BO) issued April 4, 2017 (WCR-2015-1997) and Incidental Harassment Authorization (IHA) valid from June 1, 2023 through May 31, 2024.

The Chevron Long Wharf Maintenance and Efficiency Project (Project) includes multiple construction components within and above the water to bring the Long Wharf (Berths 1 through 4) into compliance with Marine Oil Terminal Engineering and Maintenance Standards and to improve the overall operational efficiency. Monitored Project construction activities (Covered Activities) for the 2023 monitoring year occurred between August 25 and November 28, 2023 at Berth 1 (Table 1).

2. Project Area

The Project is located at the Chevron Products Company Richmond Refinery Long Wharf in the City of Richmond, Contra Costa County (Table 1). The Project Area is approximately 0.75 mile south of the eastern side of the Richmond-San Rafael Bridge. Construction activities in 2023 occurred at Berth 1.

Sediments around the Long Wharf consist of a layer of recent Bay mud, approximately 5 to 12 meters in depth, overlying 9 to 18 meters of soft to medium stiff clay (Young Bay Mud), then older stiff clays to bedrock. Depth to bedrock in the area is generally 30 meters or more. The sediments are relatively uniform in the area surrounding the Wharf at locations where piles are being driven, so the description of the sediment stratigraphy would apply to all piles driven.

3. Methods

Marine mammal and fish monitoring efforts consisted of pre-Project baseline surveys, a worker education program, and visual monitoring during all work activities including impact and vibratory pile driving and extraction.

3.1 Pre-Project Baseline Biological Survey

3.1.1 Pre-Construction Nesting Bird Survey

A pre-construction nesting bird survey was conducted on August 25, 2023, in accordance with CDFW ITP No. 2081-2016-056-07, the NMFS BO, as well as a mitigation measure imposed in the Initial Study/ Mitigated Negative Declaration that was prepared by the California State Lands Commission for the Project to comply with the California Environmental Quality Act. There was a high level of bird activity on and around the Long Wharf, however, no active nests were observed during this survey. Given that construction activities, and therefore the pre-construction survey, was scheduled close to the end of the nesting season, the lack of nesting activity was to be expected. Incidental bird species observed during the baseline surveys included western gull, California gull, American crow, barn swallow, brown pelican, pigeon guillemot, osprey, rock pigeon, common loon, pelagic cormorant, and double-crested cormorant.

Table 1 Summary of 2023 Monitored Covered Activities

Date	Covered Activities [1]
8/28/2023	A total of one steel pile was installed with a vibratory hammer (4B). The total driving time was approximately 6 minutes.
8/29/2023	A total of three steel piles were installed with a vibratory hammer (1A, 2B, 3A). The total driving time was approximately 18 minutes.
9/12/2023	A total of three steel piles were installed with a vibratory hammer (3MS, 4NM, 6NE). The total driving time was approximately 35 minutes. One concrete pile was installed with an impact hammer (3B). The total driving time was approximately 24 minutes.
9/13/2023	A total of three steel piles were installed with a vibratory hammer (1SW, 2NW, 5SE). The total driving time was approximately 31 minutes. Three concrete piles were installed with an impact hammer (1B, 2B, 3B). The total driving time was approximately 27 minutes.
9/14/2023	A total of 4 concrete piles were installed with an impact hammer (1A, 2B, 3A, 4A). The total driving time was approximately 32 minutes.
9/15/2023	One concrete pile was installed with an impact hammer (3B). The total driving time was approximately 1 minute.
10/12/2023	One concrete pile was installed with an impact hammer (1B). The total driving time was approximately 15 minutes.
10/17/2023	One concrete pile was installed with an impact hammer (6B). The total driving time was approximately 68 minutes.
10/18/2023	A total of two concrete piles were installed with an impact hammer (1B, 4C). The total driving time was approximately 29 minutes.
10/29/2023	A total of two concrete piles were installed with an impact hammer (4C, 5A). The total driving time was approximately 37 minutes.
10/30/2023	One concrete pile was installed with an impact hammer (3A). The total driving time was approximately 32 minutes.
11/1/2023	A total of two concrete piles were installed with an impact hammer (3A, 7B). The total driving time was approximately 30 minutes.
11/3/2023	One concrete pile was installed with an impact hammer (2D). The total driving time was approximately 35 minutes.
11/4/2023	A total of three concrete piles were installed with an impact hammer (2B, 4A, 7B). The total driving time was approximately 63 minutes.
11/10/2023	One concrete pile was installed with an impact hammer (1D). The total driving time was approximately 8 minutes.
11/11/2023	One concrete pile was installed with an impact hammer (1D). The total driving time was approximately 20 minutes.
11/12/2023	One concrete pile was installed with an impact hammer (7C). The total driving time was approximately 7 minutes.
11/13/2023	One concrete pile was installed with an impact hammer (7C). The total driving time was approximately 71 minutes.
11/17/2023	One concrete pile was installed with an impact hammer (7D). The total driving time was approximately 24 minutes.
11/18/2023	One concrete pile was installed with an impact hammer (7C). The total driving time was approximately 13 minutes.

11/19/2023	One concrete pile was installed with an impact hammer (4D). The total driving time was approximately 35 minutes.
11/20/2023	One concrete pile was installed with an impact hammer (6D). The total driving time was approximately 20 minutes.
11/26/2023	One concrete pile was installed with an impact hammer (3E). The total driving time was approximately 27 minutes.
11/27/2023	One concrete pile was installed with an impact hammer (5E). The total driving time was approximately 25 minutes.
11/28/2023	One concrete pile was installed with an impact hammer (1C). The total driving time was approximately 24 minutes.

[1] Drive time estimates are derived from the daily drive logs and may not match the drive time estimates reported in the MMO daily reports. The daily drive logs present a more accurate representation of the total driving times. Steel piles installed were 36-inch diameter steel pile piles, and concrete piles installed were 24-inch square concrete piles.

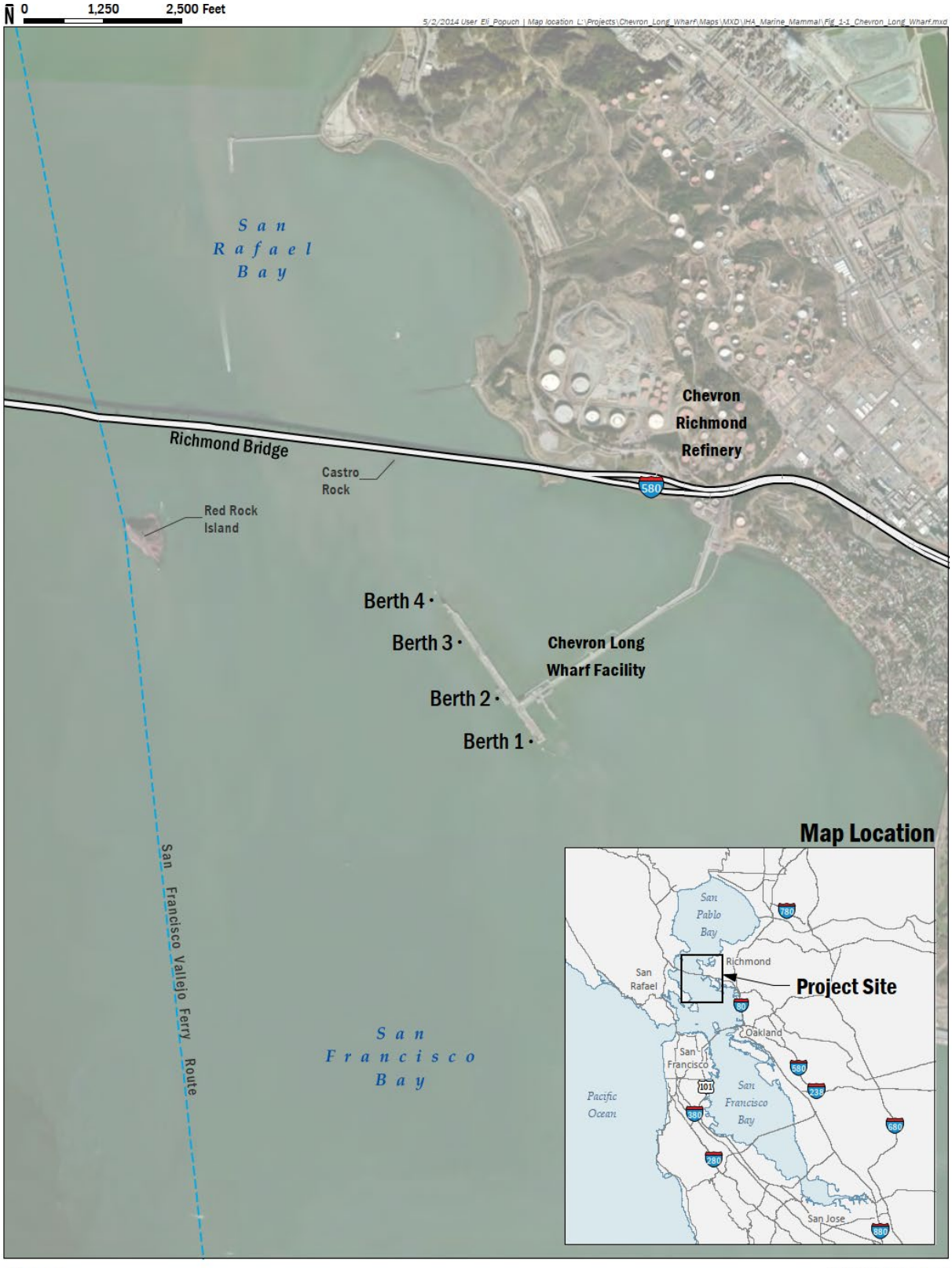

Figure 1 Project Location

3.1.2 Marine Mammal Baseline Observations

The use of pile driving hammers occurred first in August 2023. A baseline marine mammal survey was initially conducted in August, before the start of in-water work.

The pre-Project baseline biological survey was conducted by two Project biologists on August 25, 2023, 3 days prior to the start of work at Berth 1 on August 28, 2023. The baseline survey was conducted in accordance with the IHA. The surveys consisted of a baseline marine mammal observation survey of the waters surrounding the Long Wharf, including but not limited to the Berth 1 area. This survey was conducted on foot from the Long Wharf, from 10:44 a.m. to 12:46 p.m. with a tide of 3.76 feet at 10:44 a.m. Weather conditions began with slightly hazy, cloudy skies and a temperature of 66 degrees Fahrenheit (°F) at the start that transitioned to clear, hazy skies and a temperature of 70°F. The Beaufort scale report was between a 2 and 3 with a light-to-gentle breezes and small-to-large wavelets on the surface of the water. The survey area had ships positioned at Berth 1 and Berth 2 which obstructed some of the view along the west side of the Long Wharf. Observers walked along the entire length of Berth 1 and portions of Berth 2. A distance of approximately 50 meters between each ship was not obstructed so that observers could see different angles around the width of the ships. Beyond the width of a ship (approximately 30 meters wide), the view of the water was not obstructed to the west. Views to Red Rock and Castro Rocks to the north were obstructed from Berth 1, which is at the south end of the Long Wharf. Surrounding work activity at the neighboring berths and Long Wharf in general was minimal.

One harbor seal (*Phoca vitulina*) was observed in the water near the Long Wharf during the baseline survey. The individual was observed at 11:30 a.m. swimming at the surface south of Berth 1 before diving again at a distance of approximately 40 meters from the Wharf. No other marine mammals were observed during the survey.

3.2 Worker Education Program

In accordance with Permit conditions, an education program was given on August 24, 2023, before performing any work, to all persons employed or that otherwise would be working in the Project Area. Materials were prepared by the Designated Biologist describing the biology and general behavior of the Covered Species, the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, Covered Species legal protection, recovery efforts, and penalties for violations were provided to all site workers. All trained site workers signed a form stating they completed the training and understand all protection measures. The signature forms and training materials can be found in Appendices A and B.

3.3 Monitoring during Pile-Driving Activities

3.3.1 Marine Mammal Monitoring

Monitoring was conducted in accordance with the Project Marine Mammal Monitoring Plan.[1] Monitoring during each pile-driving event started at least 30 minutes prior to pile-driving (or removal) initiation and ended 30 minutes after such work was completed for the day, or when there was a pause in the work of 2 hours or more.

Two qualified, NMFS-approved marine mammal observers (MMOs)/fish monitors were on-site daily during in-water work, for a total of 25 days in 2023. With the written approval of NMFS, when two MMOs were not available due to scheduling restrictions, one qualified NMFS-approved MMO was on-site on two occasions (November 18, November 26). Work took place at Berth 1 exclusively for all covered work activities.

The MMOs were stationed at monitoring locations that afforded the best view of the Project Area and adjacent waters and adjusted these locations during barge positioning to ensure the most unobstructed

[1] AECOM (2023). Marine Mammal Monitoring Plan, Chevron Richmond Refinery Long Wharf Maintenance and Efficiency Project. April 2023. 40 pp.

views. Monitoring locations for work at Berth 1 typically included one on either the west side or southwest corner of the work area and one on the south side of the work area atop an elevated stairway to view different angles and minimize any potential blind spots. These locations are noted on the figures below. On the two occasions when only one MMO was on-site, they positioned themselves atop an elevated catwalk overlooking the southwest corner of the work area. This position afforded a near 360 degree view of the water surrounding the Wharf. Cell phones were used to communicate among the MMOs and construction team. MMOs used binoculars to continuously scan the monitoring zone for marine mammals. Field data sheets summarizing environmental conditions, pile-driving activities, and observations of marine mammals were prepared daily by both MMOs (Appendix C).

Work at Berth 1 included impact driving a total of 22 square (24-inch) concrete piles with associated shutdown zones of 10 meters for bottlenose dolphin, California sea lion and northern fur seal; 20 meters for Pacific harbor seal and northern elephant seal; and 40 meters for harbor porpoise and gray whale (Figure 2). Additionally, 10 steel piles (36-inch) were installed via vibratory driving with a 10 meter shutdown zone for all species (Figure 2).

Figure 2 Berth 1 Shutdown Zones for 24-inch Concrete Pile Installation (top) and 36-inch Steel Pile Installation and Extraction (bottom)

3.3.2 Monitoring for Listed Fish Species

Monitoring was conducted for the following Covered Species subject to take authorization: Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), longfin smelt (*Spirinchus thaleichthys*), and green sturgeon (*Acipenser medirostris*). Monitoring consist of visual observations during pile driving activities to note any distressed or injured fish. Listed fish species covered under the CDFW ITP observed during the 2023 monitoring activities are discussed in Section 4.3.

4. Monitoring Results

4.1 Marine Mammal Monitoring

4.1.1 Monitoring Conditions and Monitored Activities

Conditions during observation periods were variable but generally favorable for marine mammal observations. There were a few days in November that MMOs encountered fog, wind, and precipitation conditions; however, visibility for the MMOs was not impaired and pile driving took place. Generally, MMOs were reliably able to observe the waters within 400-500 meters of all active pile driving activities. For a summary of daily work activities, see Table 1.

In August and September of 2023, four steel pipe template piles were installed with a vibratory driver and eight concrete piles were installed with an impact hammer at the Berth 1 Inner Breasting Point. In September, October, and November of 2023, six steel pipe template piles were installed with a vibratory driver and 17 concrete piles were driven with an impact hammer at the Berth 1 Inner Breasting Dolphin (Figure 2). A bubble curtain attenuation system was in operation during all impact pile driving.

Movement and repositioning of barges throughout Project activities would sometimes partially and temporarily obstruct small portions of the Project Area. MMOs moved along the Berth 1 dolphin walkways, staircases, and used elevated platforms to optimize views. MMOs also used cell phones to communicate blind spots and to confirm that at least one MMO could see around obstructions. Continuous communication and movement around Berth 1 ensured that MMOs observations could continue reliably.

4.1.2 Marine Mammal Observations and Take

Marine Mammal Observations – The marine mammal Monitoring Period during construction activities was defined as 30 minutes prior to pile-driving (or removal) initiation and ended 30 minutes after such work was completed for the day, or when there was a pause in the work of 2 hours or more. Data sheets with routine observations are included in Appendix C for completeness. Harbor seals (*Phoca vitulina*) and California sea lions (*Zalophus californianus*) were the only marine mammal species commonly observed during the construction season, with a few harbor porpoise (*Phocoena phocoena*) observations along the west side of the wharf on a few occasions.

Across all monitoring dates, most of the harbor seals observed at Berth 1 were observed on the mainland side of the wharf (east side), approximately 40 to 300 meters from the Long Wharf. Seals were rarely seen on the open Bay side, west of the Wharf surrounding the crane and materials barges. In contrast, most sea lion sightings occurred on the Bay side of the wharf, west of the Long Wharf and typically less than 100 meters from the construction activities and monitoring locations. Based on documented behavior and direction of travel, sea lions generally appeared to move through the Project Area at a faster travel speed than harbor seals.

On September 13, 2023, an adult sea lion was observed surfacing on the Bay side of the wharf, 90 meters from the Long Wharf, and spent eleven minutes at the water surface eating a salmon. On this

date, the observation took place outside of construction activities and the monitoring period associated with pile driving and/or extraction.

Harbor porpoises were observed swimming past the Bay side of the Long Wharf on two monitoring dates between August and November 2023. On each of these dates, the observations were made outside of construction activities and the Monitoring Period associated with pile driving and/or extraction. On August 29, 2023, one adult accompanied by a juvenile were observed porpoising and traveling northeast about 30 meters from the barge and away from the work area. On November 17, 2023, one adult and a second individual (whose age was not determinable) were observed 30 meters away traveling southeast parallel to the Long Wharf.

No other species of marine mammals were observed during the construction season.

Each individual animal observed within the estimated B zones (as reported in the IHA) during active driving was treated as a take event. Multiple sightings of an individual animal were recorded as one observation, provided the animal could be tracked or otherwise individually identified. Table 2 provides a summary of the estimated distances of Level B threshold exceedance, as presented in the IHA.

Table 2 Predicted Underwater Pile Driving Noise Levels and Distances of Threshold Exceedance

Pile Type	Source Levels at 10 meters (dB)		Distance to Threshold 160/120 dB RMS (Level B)* meters
	Peak	RMS/SEL	
Impact Driving			
24-inch-square concrete	191	161	74
Vibratory Driving/Extraction			
36-inch steel pipe pile	196	173	2,727

Notes:

* 160 dB RMS applied to impulse noise such as impact driving and 120 dB RMS applies for continuous noise such as vibratory driving.

dB = decibels
RMS = root mean square
SEL = sound exposure level

For all pile driving, Level B takes were recorded for animals observed only during active pile driving or when the animal was likely to be present in the Level B zone prior to the cessation of the pile driving. A summary of take recorded by the MMOs during the monitoring period is provided in Table 3. There were no indicators of marine mammal injuries observed during the monitoring period. Only 1 instance of Level B harassment for a harbor seal in the observable portion of the Level B zone occurred during vibratory driving of a 36-inch steel piles. As summarized in Table 3, all other marine mammal observations occurred outside of the active pile driving periods or were outside of the Level B zone for the particular pile type during active driving. The number of observed take is much less than the number of authorized takes, as summarized in Table 3.

Table 3 lists the instances when marine mammals were observed in the water surrounding the Project Area and how they reacted to active vibratory or impact pile driving/extraction in the work area around Berth 1.

Table 3 In-Water Marine Mammal Observations and Level B Take

Date/Time	Species	Distance from Pile (meters)	Bearing from MMO	Behavior	Level B Take[1]	Notes on Take
8/25/2023	HASE	40 m	—	(1130-1131) Surfaced, swam for 1 minute and then dove	—	Outside of active drive time
8/29/2023	HASE	80 m	0 º	(0806) Surfaced, then dove immediately	—	Outside of active drive time
8/29/2023	CASL	40 m	270 º	(0844) Surfaced while swimming, then dove immediately	—	Outside of active drive time
8/29/2023	HASE	80 m	0	(1025) Surfaced, then immediately dove	—	Outside of active drive time
8/29/2023	HASE	60 m	30 º	(1037-1038) Surfaced, swam slowly at the surface for 30 seconds, and then dove; no sign of disturbance from work activities	Y	During vibratory driving of 36-inch steel pile.
8/29/2023	HAPO	90 m	30 º	(1310) Adult/juvenile surfaced twice and then dove within 1 minute	—	Outside of active drive time
8/29/2023	HASE	60 m	0 º	(1635) Observed swimming, looked around, and then dove within 1 minute	—	Outside of active drive time
8/29/2023	HASE	65 m	180 º	(1700-1701) Surfaced, then dove within 1 minute	—	Outside of active drive time
9/13/2023	CASL	90 m	352 º	(1318-1329) Rose to the surface with a salmon, whipped it through the air, slapped it upon the water surface to stun and eat the fish	—	Outside of active drive time
9/14/2023	HASE	160 m	—	(1346-1347) Surfaced, looked around, then dove within 1 minute	—	During active impact driving of a concrete pile, but outside of 74m Level B Zone
10/12/2023	HASE	80 – 100 m	50-48 º	(1114) Observed swimming away from wharf toward shore (1148) Observed swimming away from wharf toward shore	—	Outside of active drive time
10/12/2023	HASE	60 m	149 º	(0747) Surfaced, bobbed head, then dove	—	Outside of active drive time
10/17/2023	HASE	100 m	—	(1411) Surfaced, looked around, then dove within 1 minute	—	Outside of active drive time
10/17/2023	CASL	20 m	—	(1438) Surfaced, looked around, then dove within 1 minute	—	Outside of active drive time
10/18/2023	HASE	35 m	—	(1252) Surfaced, swam and dove near the surface, then disappeared within 1 minute	—	Outside of active drive time

Date/Time	Species	Distance from Pile (meters)	Bearing from MMO	Behavior	Level B Take[1]	Notes on Take
10/30/2023	HASE	10 m	—	(1802) Surfaced after work was completed and barge had left the area; swam around lazily exploring the area, and then slowly swam away near the surface, then disappeared within 1 minute	—	Outside of active drive time
11/1/2023	HASE	30 m	—	(1354) Surfaced, then dove	—	Outside of active drive time
11/1/2023	HASE	15 m	152 º	(1553) Surfaced, swam for 1 minute, then dove	—	Outside of active drive time
11/3/2023	HASE	200 m	15 º	(0806) Surfaced immediately after impact work had halted for a brief pause in hammer strikes and no work underway, and then slowly swam away near the surface within 1 minute before hammer strikes resumed	—	During active impact driving of a concrete pile, but outside of 74m Level B Zone
11/17/2023	HAPO	30 m	150 º	(1622-1623) Two HAPO surfaced several time as they traveled SE parallel to the long wharf.	—	Outside of active drive time
11/18/2023	HASE	40 m	189 º	(0810) Observed swimming and surfacing	—	Outside of active drive time
11/18/2023	CASL	40 m	325 º	(0908-0912) Observed swimming fast and surfacing	—	Outside of active drive time
11/19/2023	CASL	10 m	0 º	(0948) Observed swimming sub-surface until it exited the area	—	Outside of active drive time
11/26/2023	HASE	500 m	135 º	(0837) Observed at resting at the surface	—	Outside of active drive time
11/28/2023	HASE	40 m	0 º	(1425) Observed floating at the surface, then dove (1436) Observed floating at the surface, then dove	—	Outside of active drive time
11/28/2023	HASE	40 – 120 m	30 – 330 º	(1513) Surfaced, swam toward the mooring dolphin (= structure) and then dove within 1 minute (1522) Surfaced, swam toward the mooring dolphin and then dove within 1 minute	—	Outside of active drive time
Total Level B Takes: HASE: 1 (of 7,110 takes authorized)						

Notes:

CASL = California sea lion
HASE = Pacific harbor seal
HAPO = Harbor porpoise
m = meters
MMO = marine mammal observer
[1] Recorded for animals observed only during active pile driving or when the animal was likely to be present in the Level B zone prior to the cessation of the pile driving

4.1.3 Pile-Driving Shutdowns

During the 2023 monitoring period, there were no instances where a pile-driving shutdown was required, as no marine mammals entered a shutdown zone during active driving, and no marine mammals entered the minimum safety zone of 10m during active construction.

4.2 Listed Fish Observations and Take

During Covered Activities, monitoring for fish was conducted for the following Covered Species subject to take authorization: Sacramento River winter-run chinook salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*), longfin smelt (*Spirinchus thaleichthys*), and and green sturgeon (*Acipenser medirostris*). During all construction activities in 2023, no Covered Species of fishes covered under the CDFW ITP were observed, and no distressed or injured fish of any species were observed during the 2023 construction season.

5. Discussion

As presented in the IHA application, harbor seals are the most likely species to occur in the vicinity of the Long Wharf and were the most common species observed during all pile driving and work activities in 2021. No Level A take of marine mammal species occurred. Level B take of marine mammal species were within the limits of the 2023-2024 IHA issued by NMFS.

No incapacitated or injured fish were observed within the monitoring area during any Covered Activities. Hydroacoustic monitoring conducted in prior years found that the distances over which underwater noise levels were exceeded were consistently lower than the modeled results for fish presented in the Biological Assessment provided to NMFS and in accordance with the ITP.

The current avoidance and minimization measures, as required in permit conditions, have been demonstrated to effectively minimize take of marine mammals and fish.

Appendix A Worker Environmental Awareness Training Program

Appendix B Training Attendance Record

Appendix C Marine Mammal Monitoring Daily Field Datasheets

Under Separate Cover