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**To:** Stefan Galvez, California Department of Transportation

**From:** Phil Thorson

**Date:** August 27, 2013

**RE:** San Francisco-Oakland Bay Bridge East Span Seismic Safety Project, Yerba Buena Island Transition Structure II Contract – Marine Mammal Observations during Vibratory Driving of Test Piles on August 20, 2013

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### **Introduction**

The San Francisco-Oakland Bay Bridge East Span Seismic Safety Project (SFOBB Project) is a multi-year effort that will involve a number of construction and dismantling activities on land as well as in San Francisco Bay. The California Department of Transportation (Department) is preparing to dismantle the existing East Span of the San Francisco-Oakland Bay Bridge (SFOBB). Temporary falsework is needed to support the existing bridge structure during dismantling. Falsework installation requires driving of temporary piles.

Pursuant to the Marine Mammal Protection Act, the Department requested and received an Incidental Harassment Authorization (IHA) from the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NMFS) to incidentally take, by harassment, a small number of California sea lions, Pacific harbor seals, gray whales and harbor porpoises (IHA 2013).

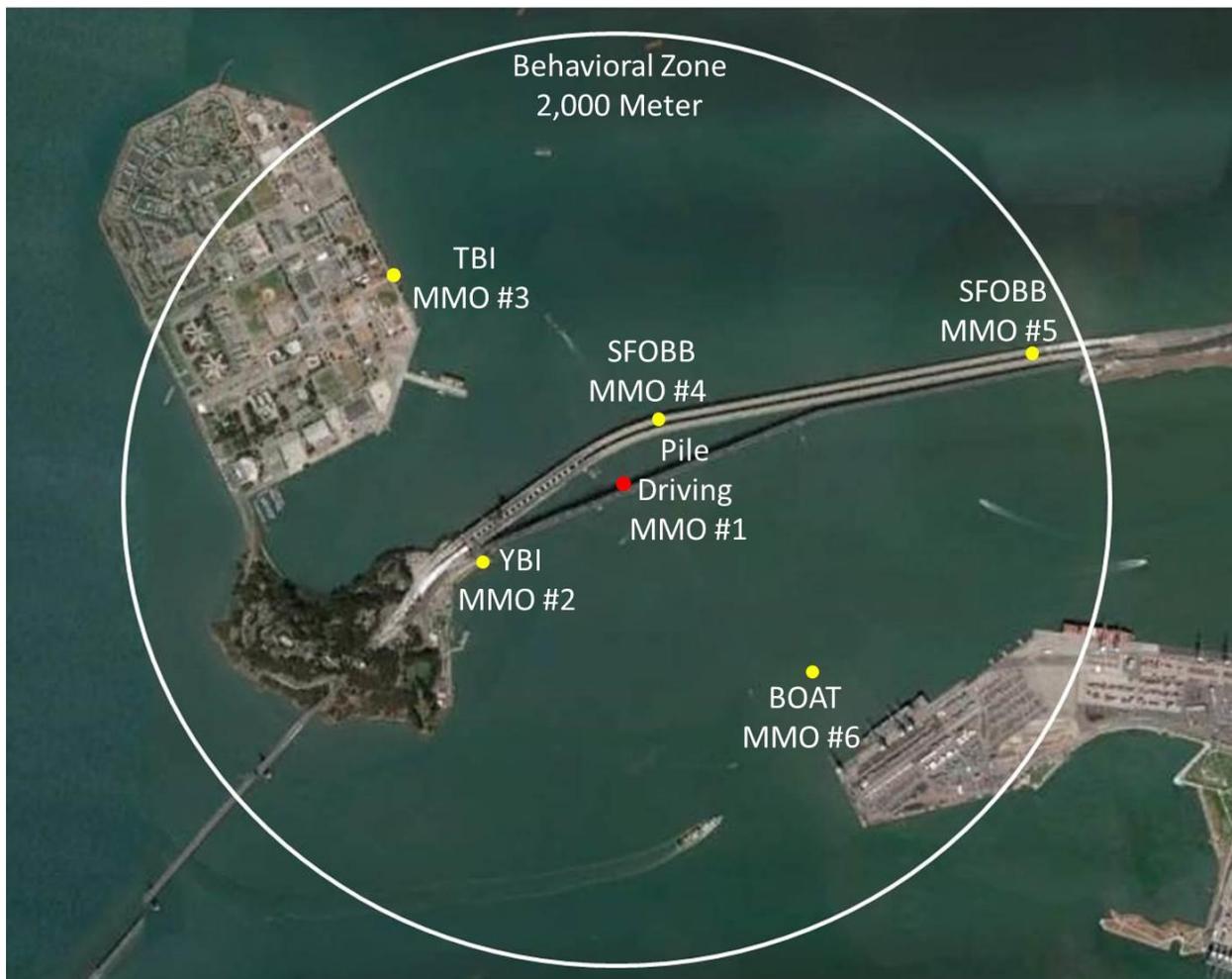
While the IHA does not require an Exclusion Zone for vibratory driving, it does require a Behavioral Harassment Zone based on a 120 dB re 1 micro Pa RMS isopleth for both cetaceans and pinnipeds. The IHA estimates the distance to the 120 dB RMS isopleth at 2,000 meters (6,562 feet). Once underwater sound level measurements are collected, the size of the Behavioral Harassment Zone can be adjusted to correspond with actual distances to sound level thresholds.

The Behavioral Harassment Zone will be monitored during 20% of vibratory pile driving. Pile driving will not be delayed for marine mammals observed in the Behavioral Harassment Zone.

### Marine Mammal Monitoring Activities

Monitoring was conducted by NMFS-approved marine mammal observers on August 20, 2013 in the vicinity of Piers E3 and E4 of the existing SFOBB. A 2,000 meter (6,562 foot) Behavioral Harassment Zone was used for the vibratory hammer to correspond with the estimated 120 dB isopleth required in the 2013 IHA issued to the Department (Figure 1).

Figure 1. Temporary pile project area with 2,000 meter (6,562 foot) (120 dB vibratory) Behavioral Harassment Zone extending out from the pile driving area and marine mammal monitor observation sites for August 20, 2013.



Observer #1 was located on the pile driving barge, Observer #2 was on the east side of Yerba Buena Island (YBI), Observer #3 was located on the south-east end of Treasure Island (TI), Observer #4 was located on the new SFOBB just east of the Self-Anchored Suspension, Observer #5 was on the new SFOBB near the Oakland Touchdown, and Observer # 6 was located on the boat used for acoustic measurements as shown on Figure 1. Observer #1 on the pile driving barge had limited visibility due to barges, boats and the new and existing bridges and acted primarily to alert the other observers to the start and ending of pile driving, coordinate sightings from the other observers, and for communication with the pile driving crew. Pile driving was conducted on two piles from 1107-1212 hours and 1416-1428 hours Pacific Daylight Time (PDT) using the vibratory hammer. Observations were made from 0825 to 1500 hours PDT.

### **August 20, 2013**

Eleven harbor seals and two sea lions were observed during the monitoring period. Seven harbor seals and one sea lion were observed within the Behavioral Harassment Zone during pile driving. None of the animals showed a response to pile driving with the exception of one harbor seal that dove at the start of pile driving for the second pile.

YBI: Harbor seals were continuously in the cove adjacent to the U.S. Coast Guard station on YBI from 0825-1425 hours, at a distance of 600-800 meters (1,969-2,625 feet) east of the pile driving barge. Up to three harbor seals were observed at one time with an estimated total of six seals in the area, and the main behavior observed was most likely resting as most seals moved little and would surface in the same location.

### **Pinniped Sightings**

1023: One California sea lion was observed 800 meters (2,625 feet) northeast of the pile driving barge. The sea lion was swimming north-northwest and had left the Behavioral Harassment Zone before pile driving began.

1035-1050: One adult harbor seal was observed 1,000 meters (3,281 feet) northeast of the pile driving barge off of Treasure Island and was swimming north-northwest.

1107: Pile driving begins on Pile #1.

1132-1045: One California sea lion was observed 1,000 meters (3,281 feet) northeast of the pile driving barge off of Treasure Island. The sea lion was swimming north-northwest and did not show any response to the pile driving.

1146-1205: Two harbor seals were observed 1,100 meters (3,609 feet) northeast of the pile driving barge off of Treasure Island. The seals were observed moving north-northwest and did not show any response to the pile driving.

1212: End of pile driving for Pile #1.

1350: One adult harbor seal was observed 1,000 meters (3,281 feet) north-northeast of the pile driving barge and was moving south-southeast toward the Oakland end of the new SFOBB.

1415-1416: One harbor seal was observed near Treasure Island, 750 meters (2,461 feet) north of the pile driving barge. When pile driving began the seal dove and was not seen again.

1416: Start of pile driving on Pile #2.

1428: End of pile driving.

The air temperature ranged from 16.7 to 20.1°C (62.1 to 68.2°F) and the winds were mostly calm to moderate ranging from 2.5 to 16.9 kilometers per hour (1.6 to 10.5 miles per hour).

Temperature and wind data were acquired from the NOAA National Ocean Service Physical Oceanographic Real Time System (PORTS).