

Marine Mammal Monitoring and Mitigation Plan

Turnagain Marine Construction

Whittier Head of the Bay Cruise Ship Dock

Passage Canal, Whittier, Alaska

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ACRONYMS AND ABBREVIATIONS

| | |
|----------|---|
| 4MP | Marine Mammal Monitoring and Mitigation Plan |
| BA | Biological Assessment |
| DPS | distinct population segment |
| ESA | Endangered Species Act |
| IHA | Incidental Harassment Authorization |
| MMPA | Marine Mammal Protection Act |
| NMFS | National Marine Fisheries Service |
| NMFS AKR | National Marine Fisheries Service Alaska Region |
| OPR | Office of Protected Resources (NMFS) |
| OSI | Offshore Systems, Inc. |
| PSO | protected species observer |
| rms | root mean square |
| SPL | sound pressure level |
| USACE | U.S. Army Corp of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| WDPS | western distinct population segment |

INTRODUCTION

Turnagain Marine Construction (TMC) proposes the following Marine Mammal Monitoring and Mitigation Plan (4MP) for use during pile installation/removal during construction of the Whittier Head of the Bay Cruise Ship Dock Project in Whittier, Alaska (Figure 1). The project is in waters of the U.S., within the ranges of marine mammals listed in the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA), and has the potential to generate noise that could exceed Level A and B harassment thresholds established by the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). This 4MP supports the Biological Assessment, in accordance with the ESA, and the Incidental Harassment Authorization (IHA) applications, in accordance with the MMPA (Section 101(a)(5)(D) permitting). Monitoring and shutdown zones will be implemented to minimize Level A and Level B harassment of marine mammals.

The goal of this 4MP is to ensure compliance with the ESA and the MMPA when implemented by the protected species observers (PSOs) at the project site. The project will comply with the terms and conditions outlined in the following requested permits and authorizations:

- U.S. Army Corps of Engineers (USACE), Passage Canal for activities in Waters of the U.S. (POA-2022-00233; issued 3/31/23)
- NMFS Office of Protected Resources (OPR) IHA (issued 4/1/23)
- NMFS Alaska Region, ESA Section 7(a)(2) Biological Opinion (AKRO-2022-02953; issued 3/28/23)
- USFWS Marine Mammal Management IHA (requested)

PROJECT DESCRIPTION

Under contract with Huna Totem Corporation, Turnagain Marine Construction (TMC) proposes to construct a cruise ship berth and associated facilities on the western shore of Passage Canal, approximately 1.2 kilometers (km) northwest of downtown Whittier, Alaska (Figure 1).

The cruise ship berth would consist of a 500-foot by 70-foot floating dock structure supported by 2 float restraints on either end and 2 mooring dolphins in marine waters that support several marine mammal species. Pile driving may result in auditory injury (Level A harassment) and behavioral harassment (Level B harassment) of select marine mammal species. Construction would begin in April 2023 and continue through April 2024. Pile installation activities are expected to occur for a total of approximately 202 hours over 85 days (not necessarily consecutive days). The project would occur within waters of the United States. No blasting is proposed as part of this project. Table 1 provides a more detailed overview of the project components.

Figure 1. Whittier Head of the Bay Cruise Ship Dock Project Location and Action Area

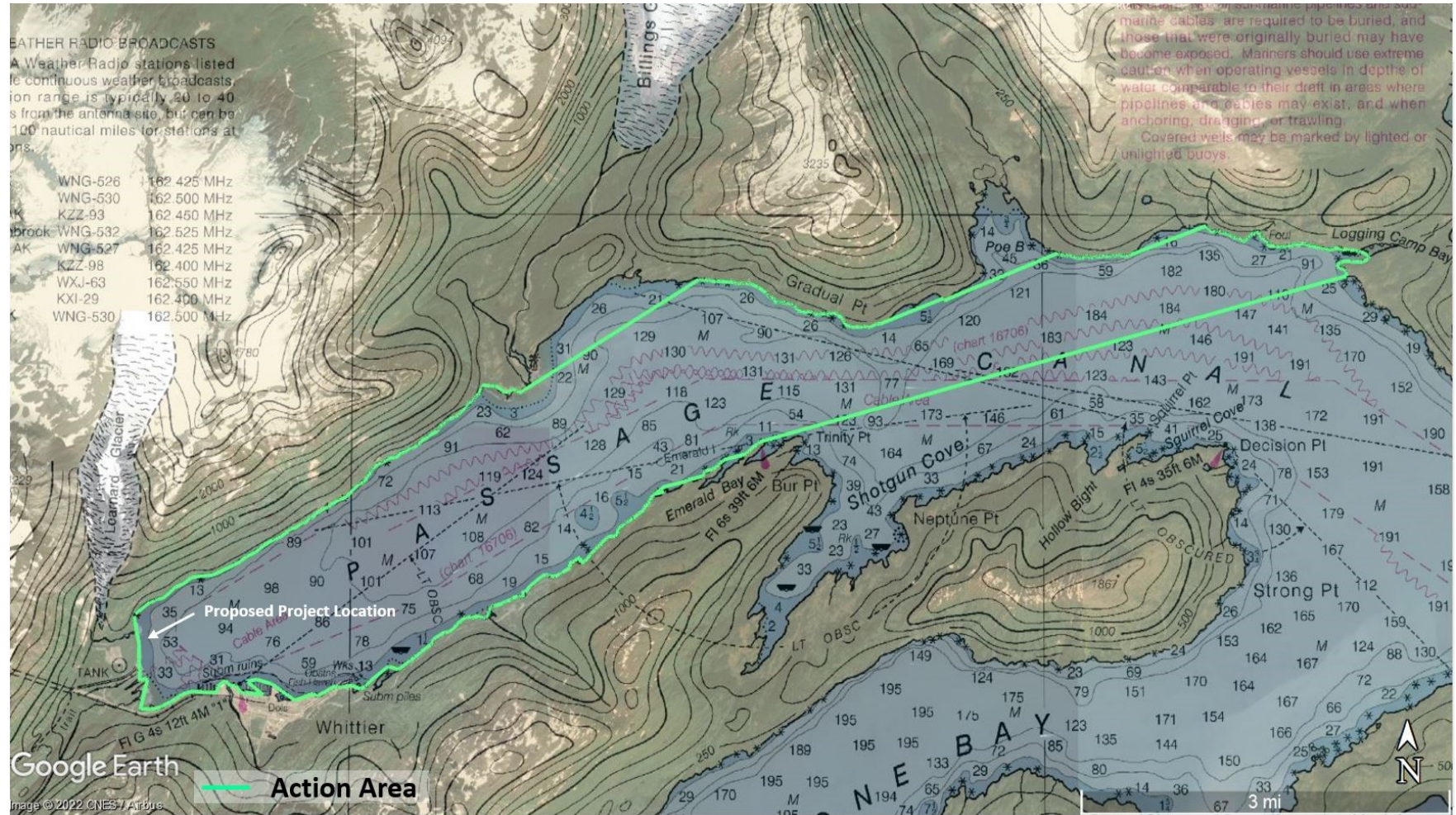


Table 1. Whittier Head of the Bay Cruise Ship Dock Project Pile Size, Quantity, and Installation Method

| | Temp Pile Installation | Temp Pile Removal | 36-Inch Perm Pile Installation | 42-Inch Perm Pile Installation | 48-Inch Perm Pile Installation | Totals |
|--|------------------------|-------------------|--------------------------------|--------------------------------|--------------------------------|--------|
| # of Piles | 72 | 72 | 36 | 16 | 20 | |
| Diameter of Steel Pile (inches) | 36 | 36 | 36 | 42 | 48 | |
| Vibratory Pile Driving | | | | | | |
| Total Quantity | 72 | 72 | 36 | 16 | 20 | |
| Max # Piles Vibrated per Day | 4 | 4 | 4 | 4 | 2 | |
| Vibratory Time per Pile (minutes) | 10 | 10 | 15 | 15 | 15 | |
| Vibratory Time per Day (minutes) | 40 | 40 | 60 | 60 | 30 | |
| Area 1: # of Days | 9 | 9 | 9 | 0 | 0 | 27 |
| Area 2: # of Days | 9 | 9 | 0 | 4 | 10 | 32 |
| Area 1: Vibratory Time Total (hours) | 6 | 6 | 9 | 0 | 0 | 21 |
| Area 2: Vibratory Time Total (hours) | 6 | 6 | 0 | 4 | 5 | 21 |
| Impact Pile Driving | | | | | | |
| Total Quantity | 0 | 0 | 36 | 16 | 20 | |
| Max # Piles Impacted Per Day | 0 | 0 | 4 | 3 | 2 | |
| # of Strikes per Pile | 0 | 0 | 1,800 | 2,400 | 2,400 | |
| Impact Time per Pile (minutes) | 0 | 0 | 45 | 60 | 60 | |
| Impact Time per Day (minutes) | 0 | 0 | 180 | 180 | 120 | |
| Area 1: # of Days | 0 | 0 | 9 | 0 | 0 | 9 |
| Area 2: # of Days | 0 | 0 | 0 | 5.3 | 10 | 15.3 |
| Area 1: Impact Time Total (hours) | 0 | 0 | 27 | 0.0 | 0 | 27 |
| Area 2: Impact Time Total (hours) | 0 | 0 | 0 | 16 | 20 | 36 |
| Down-the-Hole Drilling | | | | | | |
| Total Quantity | 36 | 0 | 36 | 16 | 20 | |
| Max # Piles Installed Per Day | 4 | 0 | 2 | 2 | 2 | |
| Time per Pile (minutes) | 60 | 0 | 150 | 150 | 150 | |
| Time per Day (minutes) | 240 | 0 | 300 | 300 | 300 | |
| Area 1: # of Days | 4.5 | 0 | 18 | 0 | 0 | 22.5 |
| Area 2: # of Days | 4.5 | 0 | 0 | 8 | 10 | 22.5 |
| Area 1: DTH Drilling Time Total (hours) | 18 | 0 | 90 | 0 | 0 | 108 |
| Area 2: DTH Drilling Time Total (hours) | 18 | 0 | 0 | 40 | 50 | 108 |

SPECIES COVERED UNDER THE IHA

There are 13 species under NMFS jurisdiction and 1 species under USFWS jurisdiction that have ranges that extend into the project area. Take has been requested for the species known to frequent the area, broken down by stock or distinct population segment (DPS; Table 2).

The shutdown of work following Level B thresholds will occur if any other marine mammal or avian species enters the project action area (Tables 3 and 4). Other species that may occur are listed in Appendix A.

Table 2. Species Known to Occur in Whittier Head of the Bay Cruise Ship Dock Project Area and Requested Take Types and Numbers (may be updated following issuance of IHAs)

| Species | Stock/DPS | Level A | Level B |
|--|---------------------------|---------|---------|
| Humpback Whale (<i>Megaptera novaeangliae</i>) | Hawaii DPS | 0 | 22 |
| | Western North Pacific DPS | 0 | 1 |
| | Mexico DPS | 0 | 2 |
| Dall's Porpoise (<i>Phocoenoides dalli</i>) | Alaska | 9 | 36 |
| Killer Whale (<i>Orcinus orca</i>) | Alaska Resident | 0 | 116 |
| | Gulf of Alaska Transient | 0 | 29 |
| | AT1 Transient | 0 | 0 |
| Harbor Seal (<i>Phoca vitulina</i>) | Prince William Sound | 40 | 170 |
| Steller Sea Lion (<i>Eumetopias jubatus</i>) | Western DPS (WDPS) | 0 | 218 |
| Northern Sea Otter (<i>Enhydra lutris kenyoni</i>) | Southcentral Alaska | 35 | 466 |

MONITORING AND SHUTDOWN ZONES

The harassment zones will be monitored throughout the permitted in-water or over-water construction activity. The following mitigation measures will be taken based on species, in-water activity, and distance of the mammalian or avian species from the project location:

- The work area is divided up into two areas by depth; those piles installed within the 60-foot isobath or shallower (Area 1), and those installed in depths greater than the 60-foot isobath (Area 2). The 36-inch permanent piles (36) supporting the approach trestle and the 36-inch temporary piles used as template guides for them (estimated 36) would fall within Area 1. The 42-inch (16 piles) and 48-inch (20 piles) for the mooring trestle and dolphins (and the 36-inch temporary piles used as template guides for these, an estimated 36 piles) would fall within Area 2. A bubble curtain deployed to a depth of 60 feet would be used during all pile-driving activities within Area 1 and during impact pile driving only in Area 2 (see mitigation measures). There will be different Level A and Level B monitoring zones depending on if the work is occurring in Area 1 or Area 2.
- If a permitted marine mammal enters a Level B monitoring zone, a Level B take will be recorded and animal behaviors documented. Permitted construction activities would continue without cessation unless the animal approaches or enters the shutdown zone.
- If a marine mammal approaches or appears in a Level A shutdown zone, all permitted construction activities will immediately halt until the marine mammal has left the

shutdown zone or has not been sighted for 15 minutes (pinnipeds and small cetaceans) or 30 minutes (large cetaceans and sea otters).

- If a non-permitted marine mammal or an avian species approaches or appears in a Level B zone, all permitted construction activities will immediately halt until the animal has left the Level B zone or has not been sighted for 15 minutes (pinnipeds, small cetaceans, and otters) or 30 minutes (large cetaceans and sea otters).

Takes, in the form of Level A or Level B harassment, of marine mammals other than permitted species are not authorized and will be avoided by shutting down construction activities before these species enter the Level B monitoring zone.

Because species are impacted differently by noise, species-specific monitoring and shutdown zones have been calculated for this project. These monitoring and shutdown zones are shown in Figure 2.

Monitoring Zones

Level B monitoring zones have been determined based on in-water activity type. For NMFS species, Level B monitoring zones represent areas where the sound pressure levels (SPLs) generated from pile driving activities meet or exceed 120 dB root mean square (rms) during vibratory pile driving and 160 dB rms during impact pile driving. Level B monitoring zones for USFWS species apply to northern sea otters and were established using the USFWS *Observer Protocols for Pile Driving, Dredging, and Placement of Fill* and the distance at which SPLs meet or exceed 160 dB rms.

These monitoring zones serve as an area within which instances of permitted marine mammal harassment (Level B take) will be documented, if in-water work is actively occurring. Alternatively, for non-permitted marine mammals and avian species, it acts as an area in which in-water work should cease if they approach or appear likely to enter. These Level B zones also allow PSOs to be aware of the presence of permitted marine mammals as they near the shutdown zone and prepare for shutdowns if required.

Level B monitoring/shutdown zones are presented in Table 3 and 4 and Figures 2, 3, and 4 below.

Table 3. Whittier Head of the Bay Cruise Ship Dock Project Level A Shutdown Zones and Level B Monitoring Zones for Area 1 (60-foot isobath or shallower)^a

| Source | Humpback Whales | Dall's Porpoises | Harbor Seals | Other NMFS-Jurisdiction Species | Northern Sea Otters |
|---|--------------------|--------------------|--------------------|---------------------------------|---------------------|
| In-Water Construction Activities | | | | | |
| Barge movements, pile positioning, etc. ^b | 10 | 10 | 10 | 10 | 10 |
| Vibratory Pile Driving/Removal | | | | | |
| 36-inch temporary pile installation (36 piles; ~40 mins per day on 9 days) | 5,415 | 5,415 | 5,415 | 5,415 | 25 |
| 36-inch temporary pile removal (36 piles; ~40 mins per day on 9 days) | 5,415 | 5,415 | 5,415 | 5,415 | 25 |
| 36-inch steel permanent installation (36 piles; ~60 mins per day on 9 days) | 5,415 | 5,415 | 5,415 | 5,415 | 25 |
| In-air ^c (all pile sizes) | N/A | N/A | 70 | 70 | 25 |
| Impact Pile Driving | | | | | |
| 36-inch steel permanent installation (36 piles; ~180 mins per day on 9 days) | 2,055 ^d | 2,400 ^d | 1,100 ^d | 635 | 1,360 |
| In-air ^c (all pile sizes) | N/A | N/A | 55 | 55 | 25 |
| DTH Drilling | | | | | |
| 36-inch temporary pile installation (18 piles; ~240 mins per day on 4.5 days) | 16,345 | 16,345 | 16,345 | 16,345 | 70 ^d |
| 36-inch steel permanent installation (36 piles; ~300 mins per day on 18 days) | 16,345 | 16,345 | 16,345 | 16,345 | 70 ^d |

^a Distances, in meters, apply to all marine mammal and avian species under NMFS and USFWS jurisdiction. The distances will act as a monitoring zone for species with authorized Level B take and as shutdown distances for species without authorized take, or in the case of humpback whales, during impact pile driving (see note d).

^b Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.

^c In-air distances apply to marine mammals that spend significant amounts of time hauled out (Steller sea lions and harbor seals) or at the water surface (northern sea otters).

^d For certain species and certain pile driving activities, the Level A shutdown zones are larger than the Level B monitoring zones due to differences in calculation methods used by NMFS. Therefore, the Level B monitoring zones shown here represent the Level A shutdown zone for this activity.

Table 4. Whittier Head of the Bay Cruise Ship Dock Project Level B Monitoring and Shutdown Zones for Area 2 (60-foot isobath or deeper)^a

| Source | Humpback Whales | Dall's Porpoises | Harbor Seals | Other NMFS-Jurisdiction Species | Northern Sea Otters |
|--|--------------------|--------------------|--------------|---------------------------------|---------------------|
| In-Water Construction Activities | | | | | |
| Barge movements, pile positioning, etc. ^b | 10 | 10 | 10 | 10 | 10 |
| Vibratory Pile Driving/Removal | | | | | |
| 36-inch temporary pile installation (36 piles; ~40 mins per day on 9 days) | 11,660 | 11,660 | 11,660 | 11,660 | 25 |
| 36-inch temporary pile removal (36 piles; ~40 mins per day on 9 days) | 11,660 | 11,660 | 11,660 | 11,660 | 25 |
| 42-inch steel permanent installation (16 piles; ~60 mins per day on 4 days) | 16,345 | 16,345 | 16,345 | 16,345 | 35 |
| 48-inch steel permanent installation (20 piles; ~30 mins per day on 10 days) | 16,345 | 16,345 | 16,345 | 16,345 | 35 |
| In-air ^c (all pile sizes) | N/A | N/A | 70 | 70 | 25 |
| Impact Pile Driving | | | | | |
| 42-inch steel permanent installation (16 piles; ~180 mins per day on 5.5 days) | 6,575 ^d | 7,830 ^d | 3,745 | 3,745 | 3,745 |
| 48-inch steel permanent installation (20 piles; ~120 mins per day on 10 days) | 5,015 ^d | 5,975 ^d | 3,745 | 3,745 | 3,745 |
| In-air ^c (all pile sizes) | N/A | N/A | 55 | 55 | 25 |
| DTH Drilling | | | | | |
| 36-inch temporary pile installation (18 piles; ~240 mins per day on 4.5 days) | 16,345 | 16,345 | 16,345 | 16,345 | 70 ^d |
| 42-inch steel permanent installation (16 piles; ~300 mins per day on 8 days) | 16,345 | 16,345 | 16,345 | 16,345 | 70 ^d |
| 48-inch steel permanent installation (20 piles; ~300 mins per day on 10 days) | 16,345 | 16,345 | 16,345 | 16,345 | 200 ^d |

^a Distances, in meters, apply to all marine mammal and avian species under NMFS and USFWS jurisdiction. The distances will act as a monitoring zone for species with authorized Level B take and as shutdown distances for species without authorized take, or in the case of humpback whales, during impact pile driving (see note d).

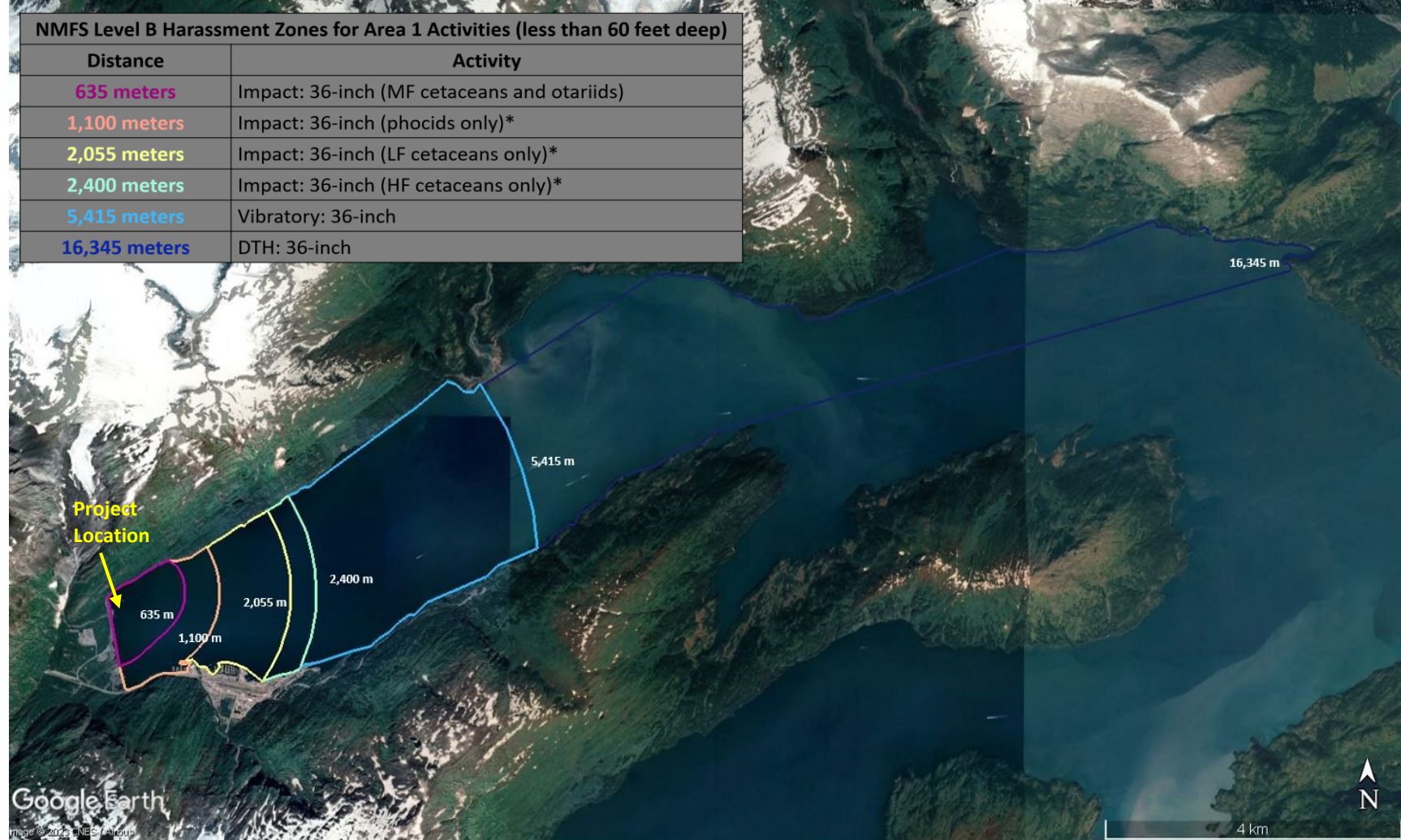
| Source | Humpback Whales | Dall's Porpoises | Harbor Seals | Other NMFS-Jurisdiction Species | Northern Sea Otters |
|--------|-----------------|------------------|--------------|---------------------------------|---------------------|
|--------|-----------------|------------------|--------------|---------------------------------|---------------------|

^b Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species.

^c In-air distances apply to marine mammals that spend significant amounts of time hauled out (Steller sea lions and harbor seals) or at the water surface (northern sea otters).

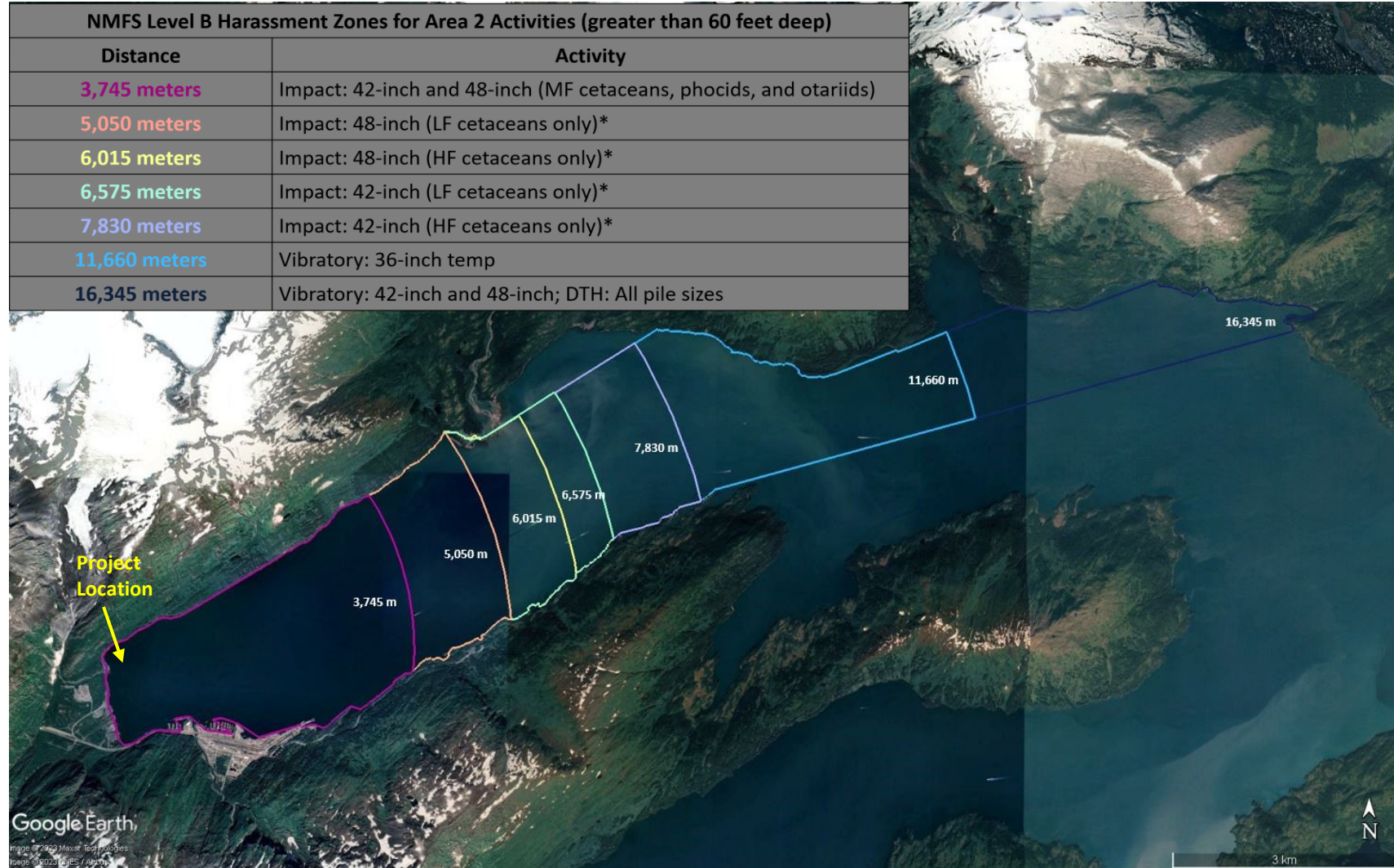
^d For certain species and certain pile driving activities, the Level A shutdown zones are larger than the Level B monitoring zones due to differences in calculation methods used by NMFS. Therefore, the Level B monitoring zones shown here represent the Level A shutdown zone for this activity.

Figure 2. Whittier Head of the Bay Cruise Ship Dock Project Level B Monitoring Zones for Area 1



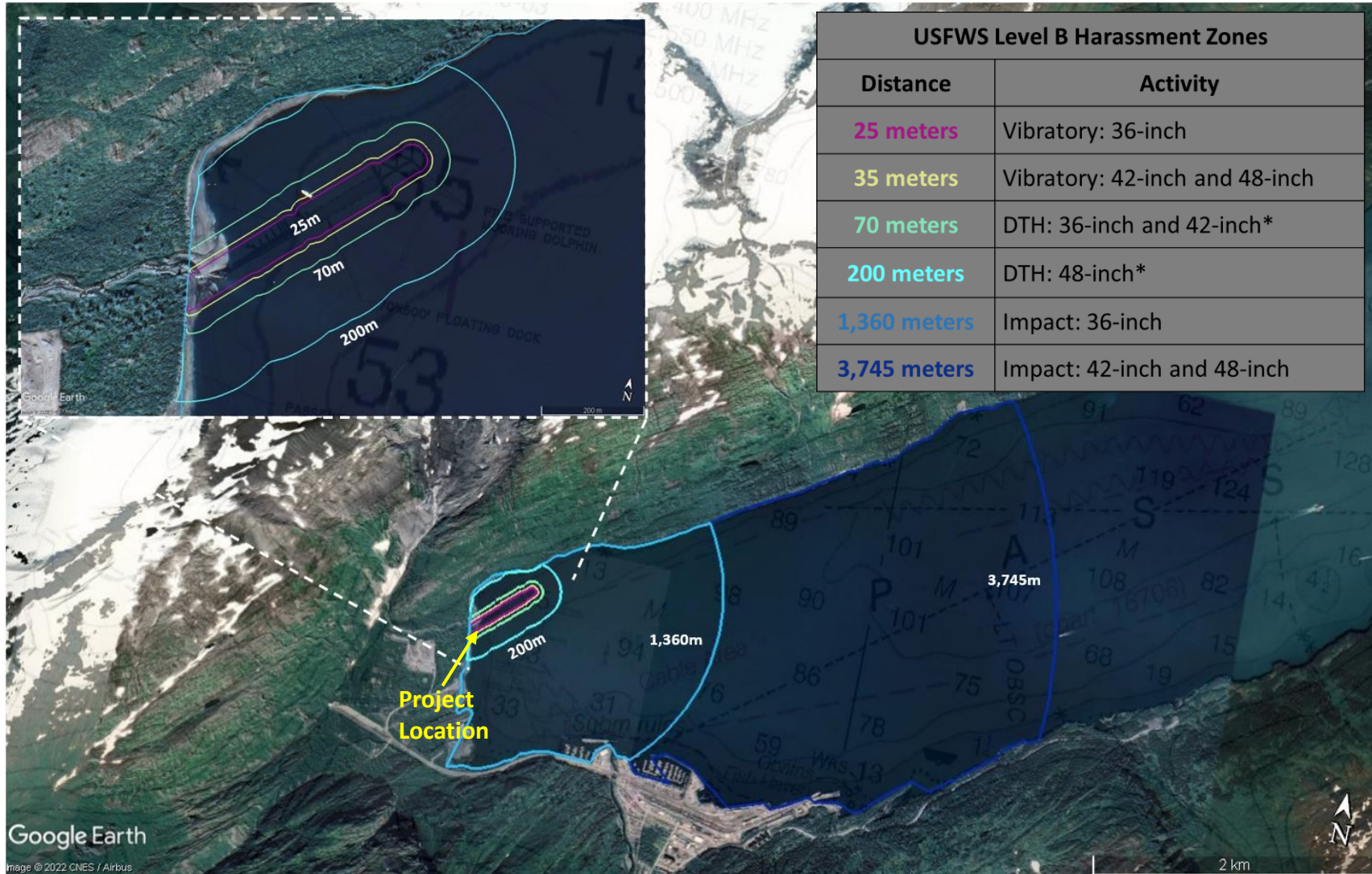
*Indicates Level A zone. Where Level A zone radii are larger than the corresponding Level B radii, the Level A zone is shown.
 MF = mid-frequency; LF = low-frequency; HF = high-frequency

Figure 3. Whittier Head of the Bay Cruise Ship Dock Project Level B Monitoring Zones for Area 2



*Indicates Level A zone. Where Level A zone radii are larger than the corresponding Level B radii, the Level A zone is shown.
 MF = mid-frequency; LF = low-frequency; HF = high-frequency

Figure 4. Whittier Head of the Bay Cruise Ship Dock Project Northern Sea Otters Monitoring Zones



*Indicates a Level A zone. Where Level A zone radii are larger than the corresponding Level B radii, the Level A zone is shown.

Shutdown Zones

Shutdown zones are defined as areas where SPLs meet or exceed the level that would cause auditory injury to marine mammals and avian species. Shutdown zones are intended to protect marine mammals and avian species from auditory injury. In-water activities would be halted upon the sighting of a marine mammal or avian species that is in (or anticipated to enter) the shutdown zone.

Further, there will be a nominal 10-meter shutdown zone for construction activity where acoustic injury is not the primary concern. This type of work could include (but is not limited to) the following activities: movement of the barge to the pile location; positioning of the pile on the substrate via a crane (i.e., stabbing the pile); and removal of the pile from the water column/substrate via a crane (i.e., deadpull). For these activities, monitoring would take place starting 15 minutes before initiation and ending when the action is complete. This can be monitored by the vessel operator when a PSO is not present. Radial distances to Level A shutdown zone boundaries are defined in Table 5 and 6 and shown in Figures 5, 6, and 7.

Table 5. Whittier Head of the Bay Cruise Ship Dock Project Distances to Level A Shutdown Zones for Area 1 (60-foot isobath or shallower)

| Activity | Distance (in meters, m) to Level A | | | | | |
|---|------------------------------------|---------------------------------|----------------------------------|--------|---------|------------------------|
| | Low-Frequency (LF) Cetaceans | Mid-Frequency (MF) Cetaceans | High-Frequency (HF) Cetaceans | Phocid | Otariid | Northern Sea Otters |
| In-Water Construction Activities | | | | | | |
| Barge movements, pile positioning, etc. ^a (throughout construction) | 10 | 10 | 10 | 10 | 10 | 10 |
| Vibratory Pile Driving/Removal | | | | | | |
| 36-inch temporary pile installation (36 piles; ~40 mins per day on 9 days) | 10 | 10 | 10 | 10 | 10 | 15 |
| 36-inch temporary pile removal (36 piles; ~40 mins per day on 9 days) | 10 | 10 | 10 | 10 | 10 | 15 |
| 36-inch steel permanent installation (36 piles; ~60 mins per day on 9 days) | 10 | 10 | 10 | 10 | 10 | 15 |
| Impact Pile Driving | | | | | | |
| 36-inch steel permanent installation (36 piles; ~180 mins per day on 9 days) | 2,055 | 2,400 ^b | 2,400 | 1,100 | 80 | 170 |
| DTH Drilling | | | | | | |
| 36-inch temporary pile installation (18 piles; ~240 mins per day on 4.5 days) | 700 | 35 | 825 | 370 | 35 | 70 |
| 36-inch steel permanent installation (36 piles; ~300 mins per day on 18 days) | 800 | 35 | 1,000 | 430 | 35 | 70 |

Shutdown zone distances refer to the maximum radius of the zone and are rounded.

^a Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species. Due to the scale of the figures, this zone is not shown on every figure.

^b TMC has elected to conservatively apply thresholds for HF cetaceans to killer whales for impact pile driving. This species is an infrequent visitor to Passage Canal and is often highly visible, allowing for easier application of more conservative shutdown zones. This measure will reduce potential impacts to the highly vulnerable AT-1 killer whale stock that is found in this region should they enter the Passage Canal during the in-water work period.

Table 6. Whittier Head of the Bay Cruise Ship Dock Project Distances to Level A Shutdown Zones for Area 2 (60-foot isobath or deeper)

| Activity | Distance (in meters, m) to Level A | | | | | |
|---|------------------------------------|---------------------------------|----------------------------------|--------------------|---------|------------------------|
| | Low-Frequency (LF) Cetaceans | Mid-Frequency (MF) Cetaceans | High-Frequency (HF) Cetaceans | Phocid | Otariid | Northern Sea Otters |
| In-Water Construction Activities | | | | | | |
| Barge movements, pile positioning, etc. ^a (throughout construction) | 10 | 10 | 10 | 10 | 10 | 10 |
| Vibratory Pile Driving/Removal | | | | | | |
| 36-inch temporary pile installation (36 piles; ~40 mins per day on 9 days) | 35 | 35 | 35 | 15 | 15 | 15 |
| 36-inch temporary pile removal (36 piles; ~40 mins per day on 9 days) | 35 | 35 | 35 | 15 | 15 | 15 |
| 42-inch steel permanent installation (16 piles; ~60 mins per day on 4 days) | 35 | 35 | 35 | 15 | 15 | 15 |
| 48-inch steel permanent installation (20 piles; ~30 mins per day on 10 days) | 35 | 35 | 35 | 15 | 15 | 15 |
| Impact Pile Driving | | | | | | |
| 42-inch steel permanent installation (16 piles; ~180 mins per day on 5.5 days) | 6,575 | 7,830 ^b | 7,830 | 1,360 ^c | 260 | 260 |
| 48-inch steel permanent installation (20 piles; ~120 mins per day on 10 days) | 5,050 | 6,015 ^b | 6,015 | 1,360 ^c | 200 | 200 |
| DTH Drilling | | | | | | |
| 36-inch temporary pile installation (18 piles; ~240 mins per day on 4.5 days) | 1,485 | 70 | 1,770 | 795 | 70 | 70 |
| 42-inch steel permanent installation (16 piles; ~300 mins per day on 8 days) | 1,770 | 70 | 2,055 | 925 | 70 | 70 |
| 48-inch steel permanent installation (20 piles; ~300 mins per day on 10 days) | 5,050 | 200 | 6,015 | 1,360 ¹ | 200 | 200 |

| Activity | Distance (in meters, m) to Level A | | | | | |
|----------|------------------------------------|------------------------------|-------------------------------|--------|---------|---------------------|
| | Low-Frequency (LF) Cetaceans | Mid-Frequency (MF) Cetaceans | High-Frequency (HF) Cetaceans | Phocid | Otariid | Northern Sea Otters |

Shutdown zone distances refer to the maximum radius of the zone and are rounded.

^a Although acoustic injury is not the primary concern with these activities, shutdowns will be implemented to avoid impacts to species. Due to the scale of the figures, this zone is not shown on every figure.

^b TMC has elected to conservatively apply thresholds for HF cetaceans to killer whales for impact pile driving. This species is an infrequent visitor to Passage Canal and is often highly visible, allowing for easier application of more conservative shutdown zones. This measure will reduce potential impacts to the highly vulnerable AT-1 killer whale stock that is found in this region should they enter the Passage Canal during the in-water work period.

^c For phocids (harbor seals) only, the Level A shutdown zone would be reduced to 1,360 m for impact pile driving of 42- and 48-inch piles and DTH drilling of 48-inch piles to exclude the Whittier Public Boat Harbor.

Figure 5. Whittier Head of the Bay Cruise Ship Dock Project Level A Shutdown Zones for Area 1

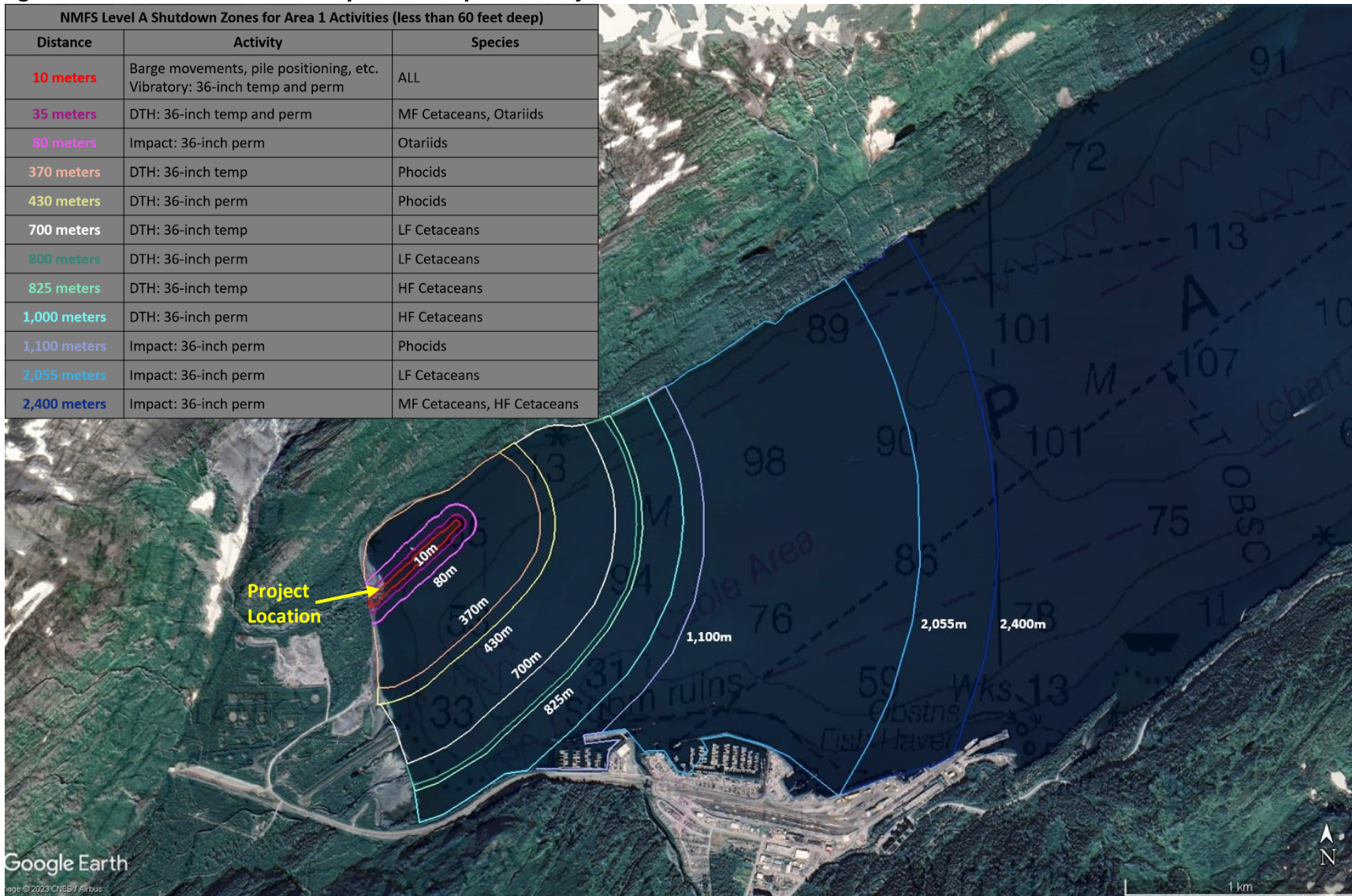


Figure 6. Whittier Head of the Bay Cruise Ship Dock Project Level A Shutdown Zones for Area 2

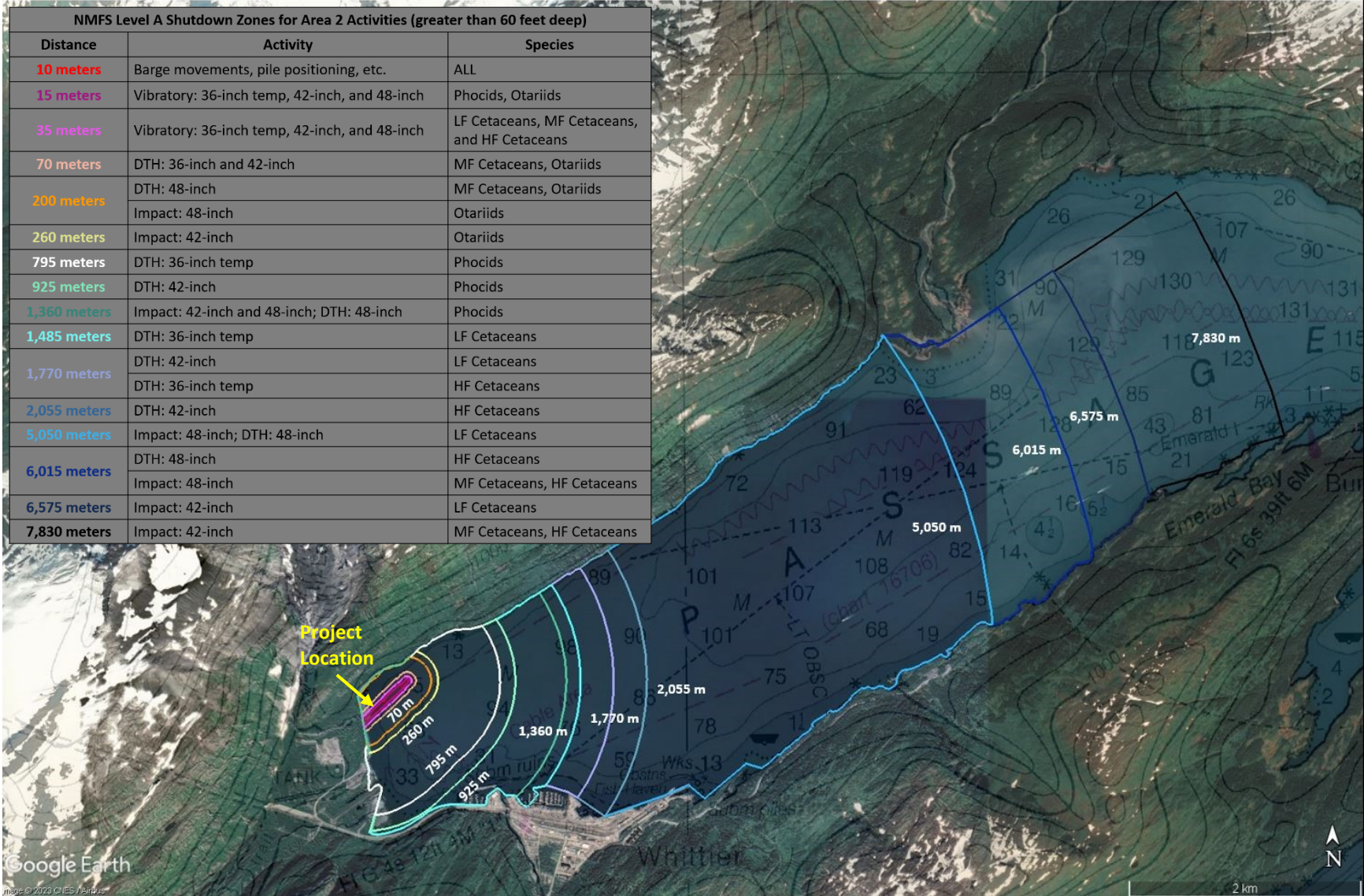
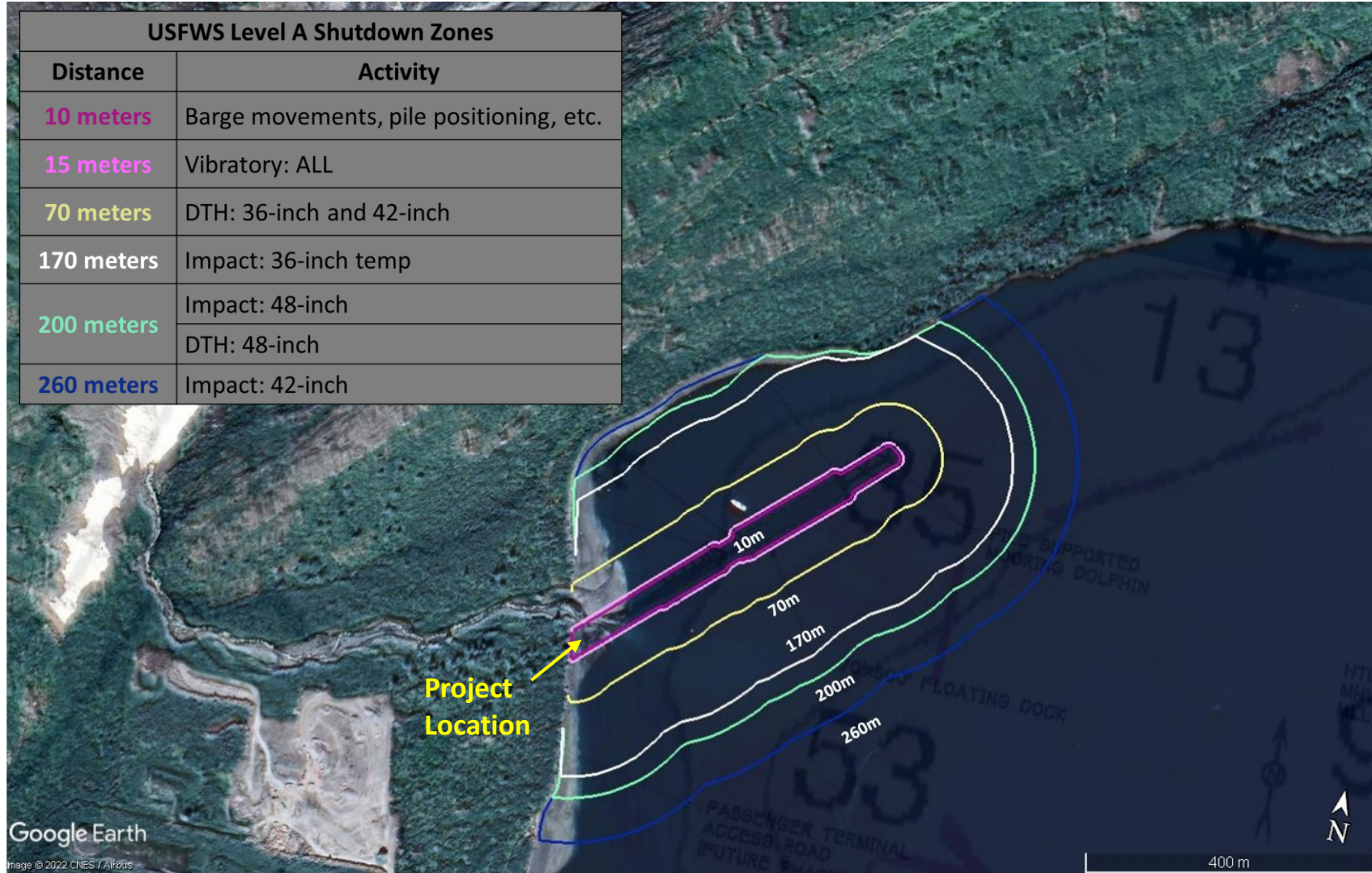


Figure 7. Whittier Head of the Bay Cruise Ship Dock Project Level A Shutdown Zones for Northern Sea Otter



MITIGATION MEASURES

The purpose of a marine mammal monitoring plan is to observe for marine mammals and avian species in the area where potential sound effects may occur. Work will be stopped or delayed if a non-permitted marine mammal or avian species is sighted in the Level B monitoring area or Level A shutdown area. Work will not begin or resume until the marine mammal or avian species has moved out of the monitoring area on its own accord.

The following mitigation measures will be implemented during in-water activities to limit impacts to marine mammals and avian species, including ESA-listed species.

General Conditions and Requirements

- Turnagain will employ a 60-foot-deep bubble curtain during installation (all pile driving methods) of piles occurring at the 60-foot isobath or shallower. This includes all temporary and permanent piles to support the approach trestle (Area 1). Through consultation and coordination with NMFS, a 5 dB reduction would be applied to the estimated sound source levels for driving these piles only with a subsequent reduction in Level B monitoring zones and Level A shutdown zones.
- Turnagain will attempt to minimize the use of an impact hammer to the extent possible by utilizing a vibratory hammer to advance the piling as deep as possible prior to switching to impact driving.
- Turnagain will also employ pile caps and the 60-foot-deep bubble curtain during impact pile driving to reduce noise impacts. Sound source levels used in the application to estimate sound isopleths and action areas were not reduced due to use of either the pile caps or bubble curtain when depths were greater than 60 feet.
- Pile caps (pile softening material) will be used to minimize noise during impact pile driving. Much of the noise generated during pile installation comes from contact between the pile and the steel template used to stabilize the pile. The contractor will use high-density polyethylene or ultra-high-molecular-weight polyethylene softening material on all templates to eliminate steel-on-steel noise.
- The contractor is required to conduct briefings for construction supervisors and crews and the monitoring team prior to the start of all pile driving activity, and upon hiring new personnel, to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.
- The contractor is required to employ PSOs during all in-water construction activities.
- Marine mammal monitoring must take place starting 30 minutes prior to initiation of in-water work and ending 30 minutes after completion of in-water work. In-water work may commence when observers have declared the appropriate zones clear of marine mammals or avian species. In the event of a delay or shutdown of activity resulting from marine mammals or avian species in the shutdown zone (Table 5), their behavior must be monitored and documented until they leave of their own volition, at which point the activity may begin or resume.

- In-water work must be halted or delayed if a marine mammal or avian species is observed entering or within an established shutdown zone (Table 5 and 6). Pile driving may not commence or resume until either: the animal has voluntarily left and has been visually confirmed beyond the shutdown zone; 15 minutes have passed without subsequent observations of small cetaceans and pinnipeds; or 30 minutes have passed without subsequent observations of large cetaceans or sea otter.
- The contractor must use soft start techniques when impact pile driving.
- In-water work must be delayed or halted immediately if a species for which authorization has not been granted, or a species for which authorization has been granted but the authorized takes are met, is observed approaching or within the monitoring zone (Table 3 and 4). Activities must not start or resume until the animal has been confirmed to have left the area or the observation time period, as indicated in the conditions above, has elapsed.
- In-water work would only occur during daylight hours.
- Should light or environmental conditions deteriorate such that marine mammals within the entire largest Level A shutdown zone would not be visible (e.g., fog, heavy rain), pile driving and removal must be delayed until the PSOs are confident marine mammals or avian species within the shutdown zone could be detected.
- PSOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform PSO duties for more than 12 hours in a 24-hour period (to reduce PSO fatigue).

Observer Qualifications and Requirements

- Visual acuity in both eyes (correction is permissible) sufficient to discern moving targets at the water's surface and ability to estimate target size and distance. Use of binoculars and/or spotting scope may be necessary to correctly identify the target.
- Advanced education in biological science, wildlife management, mammalogy or related fields (Bachelor's degree or higher is preferred), or equivalent Alaska Native traditional knowledge. PSOs may substitute education or training for experience.
- Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience).
- Experience or training in field identification of marine mammals (cetaceans and pinnipeds).
- Training, knowledge of or experience with vessel operation and pile driving operations sufficient to provide personal safety during observations.
- Writing skills sufficient to prepare a report of observations. Reports should include: 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; dates and

times when in-water construction activities were suspended because of marine mammals; etc.

- Ability to communicate orally as needed, by radio or in person, with project personnel to provide real time information about marine mammals observed in the area.
- PSOs must be independent (*i.e.*, not construction personnel) and have no other assigned tasks during monitoring periods.
- A lead observer or monitoring coordinator must be designated if a team of three or more PSOs are required. The lead observer must have prior experience working as a marine mammal observer during construction.
- The contractor must submit PSO CVs for approval by NMFS and USFWS prior to the onset of pile driving.

Data Collection

Environmental Conditions and Construction Activities

PSOs will use the environmental conditions and construction activities log to document the following (Appendix B):

- Environmental Conditions:
 - Environmental conditions will be recorded at the beginning and end of every monitoring period and as conditions change.
 - Recordings will include PSO names, location of the observation station, time and date of the observation, weather conditions, air temperature, sea state, cloud cover, visibility, glare, tide, and ice coverage (if applicable).
- Construction Activities:
 - PSOs will record the time that observations begin and end as well as the durations of shutdowns.
 - PSOs will document the reason for stopping work, time of shutdown, and type of pile installation or other in-water work taking place.
 - PSOs will document other, non-project-related activities that could disturb marine mammals in the area, such as the presence of large and small vessels.

PSOs will record all communications with the construction crew. The environmental conditions and construction activities log will be checked for quality assurance and quality control (QA/QC) by the lead PSO for submission at the end of every monitoring day. Upon request, the data will be submitted to NMFS and USFWS along with the final report.

Sightings

Observers will use an approved marine mammal sighting form and GPS grid maps (Appendices C and D) which will be completed by each observer for each survey day and location. Sighting forms will be used by observers to record the following:

- Date and time that permitted construction activity begins or ends;

- Weather parameters (e.g., percent cloud cover, percent glare, visibility) and sea state (determined by the Beaufort Wind Force Scale);
- Species, numbers, and, if possible, sex and age class of observed marine mammals;
- Construction activities occurring during each sighting;
- Behavioral patterns observed, including bearing and direction of travel;
- Behavioral reactions just prior to, or during, soft-start and shutdown procedures;
- The marine mammal's location, distance from the observer, and distance from pile removal activities;
- Whether mitigation measures, including shutdown procedures, were required by an observation, including the duration of each shutdown;
- Observer rotations including the time of rotation and the initials of the incoming observer.

The observation record forms will be checked for quality assurance and quality control (QA/QC) by the lead PSO for submission at the end of every monitoring day. Upon request, the data will be submitted to NMFS and USFWS along with the final report.

Equipment

The following equipment will be required to conduct observations for this project:

- Appropriate personal protective equipment;
- Portable VHF radios for the observers to communicate with other observers and the pile driving supervisor;
- Cellular phone as backup for radio communication;
- Contact information for the other observers, the pile driving supervisor, and the NMFS and USFWS point of contact;
- Daily tide tables for the project area;
- Binoculars (quality 7 x 50 or better) and a rangefinder;
- Hand-held GPS unit, or grid map along with map and stand-alone compass or clinometer to record locations of marine mammals;
- Copies of the 4MP, IHA, and other relevant permit requirement specifications in a sealed, clear, plastic cover;
- Notebook with pre-standardized monitoring observation record forms and grid maps (Appendices C and D).

Number and Location of PSOs

The number of locations of PSOs are determined to ensure that there is full coverage of the entire action area during all in-water activities. Locations are chosen based on site accessibility and field of vision.

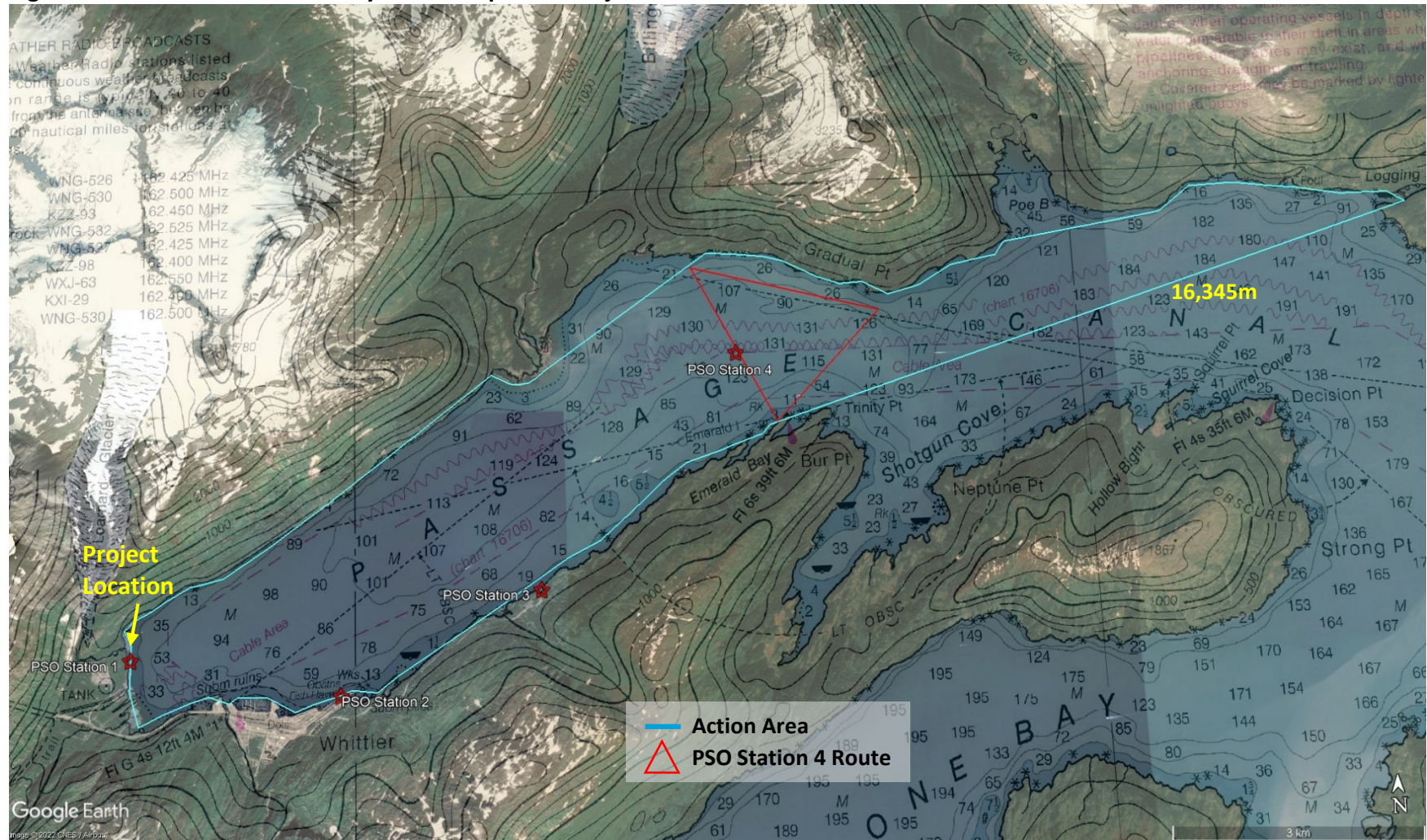
One to four PSOs will be onsite during in-water activities associated with the Whittier Head of the Bay Cruise Ship Dock Project, stationed in the following locations (Figure 8):

- Station 1: stationed just to the south of the site on the shore.
- Station 2: stationed off Depot Road near the freight loading dock.
- Station 3: stationed along the shoreline northeast of the Emerald Cove Trailhead.
- Station 4: stationed on a boat triangulating an area between Emerald Island, the north shore of Passage Canal, southeast towards Gradual Point, and back southwest towards Trinity Point and Emerald Island.

The number and locations of monitors will be based on the following in-water work scenarios:

- Scenario #1: In-water construction not involving pile driving; barge movements, etc.
 - One location: Station 1
- Scenario #3: Impact hammer, vibratory hammer, and DTH drill installation of all pile sizes
 - Four Locations: Stations 1 – 4

Figure 8. Whittier Head of the Bay Cruise Ship Dock Project PSO Locations



Strike Avoidance

Vessels will adhere to the Alaska Humpback Whale Approach Regulations when transiting to and from the project site (see 50 CFR §§ 216.18, 223.214, and 224.103(b)). These regulations require that all vessels:

- Do not approach, or cause a vessel or object to approach, within 100 yards of a humpback whale;
- Do not obstruct the path of oncoming humpback whales causing them to surface within 100 yards of the vessel;
- Do not disrupt the normal behavior or prior activity of a whale; and
- Operate at a slow, safe speed when near a humpback whale (safe speed is defined in regulation 33 CFR § 83.06).

Vessels will follow the NMFS Marine Mammal Code of Conduct for other species of marine mammals, which recommend: maintaining a minimum distance of 100 yards; not encircling or trapping marine mammals between boats, or between boats and the shore; and putting engines in neutral if approached by a whale or other marine mammal to allow the animals to pass.

Monitoring Techniques

Pre-Activity Monitoring

The following monitoring methods will be implemented before permitted construction begins:

- The lead PSO and Contractor Superintendent will meet at the start of each day to discuss planned construction activities for the day and to conduct a radio/phone check.
- Prior to the start of permitted activities, observers will conduct a 30-minute pre-watch of the shutdown and monitoring zones. They will ensure that no marine mammals or avian species are present within the shutdown zone before permitted activities begin.
- The shutdown zone will be cleared when marine mammals have not been observed within the zone for the 30-minute pre-watch period. If a marine mammal is observed within the shutdown zone, a soft-start cannot proceed until the animal has left the zone or has not been observed for 15 minutes (for pinnipeds) or 30 minutes (for cetaceans and sea otters).
- When all applicable exclusion zones are clear, the observers will radio the pile driving supervisor. Permitted activities will not commence until the pile driving supervisor receives verbal confirmation that the zones are clear.
- If permitted species are present within the monitoring zone, work will not be delayed, but observers will monitor and document the behavior of individuals that remain in the monitoring zone.
- In case of fog or reduced visibility, observers must be able to see all of the shutdown zones before permitted activities can begin.

Soft Start Procedures

Soft start procedures will be used prior to periods of impact driving to allow marine mammals to leave the area prior to exposure to maximum noise levels. Soft start procedures for vibratory pile driving will not be implemented and are not required.

- The contractor will initiate approximately three strikes at a reduced energy level, followed by a 30-second waiting period. This procedure would be repeated twice more.
- If work ceases for more than 30 minutes, soft start procedures must be used prior to continuing work.

During Activity Monitoring

If permitted species are observed within the monitoring zone during permitted activities, a Level B takes will be recorded and behaviors will be documented. Work will not stop unless an animal enters or appears likely to enter the shutdown zone.

Inclement Weather

Passage Canal often experiences increased sea states and inclement weather. If inclement weather, limited visibility, or increased sea state restricts the observers' ability to make observations, in-water activities will not be initiated or continued until the largest Level A shutdown zone for the activity is visible.

If visibility is diminished, but the parameters for initiating or continuing work (referenced above) are met, the following should occur:

- All appropriate PSO locations for the planned in-water activities should be occupied for the entirety of the monitoring period regardless of visibility.
- All PSO locations should collectively determine what percentage of the Level B zone is visible for use in calculating extrapolations. The lead PSO should document this with time stamps as conditions change and this percentage should be adopted by all PSO locations.
- Extrapolate takes for each species with authorized take using the equation below.

$$\text{Number of individuals sighted in the visible portion of the Level B zone} \div \text{percentage of visible Level B zone} = \text{extrapolated takes for species}$$

Shutdowns

If a marine mammal enters or appears likely to enter its respective shutdown zone:

- The observers will immediately alert the pile driving supervisor.
- All permitted activities will immediately halt.
- In the event of a shutdown, permitted pile installation or removal activities may resume only when the animal(s) within or approaching the shutdown zone has been visually confirmed beyond or heading away from the shutdown zone, or 15 minutes (for pinnipeds) or 30 minutes (for cetaceans and sea otters) have passed without

observation of the animal. Observers will contact the pile driving supervisor and inform them that activities can re-commence.

Breaks in Work

Shutdown and monitoring zones will continue to be monitored during an in-water construction delay. No exposures will be recorded for permitted species in the monitoring zone if there are no concurrent permitted construction activities.

If permitted activities cease for more than 30 minutes and monitoring has not continued, pre-activity monitoring and soft start procedures must recommence. This includes breaks due to scheduled or unforeseen construction practices or breaks due to permit-required shutdown. Work can begin following the 30-minute pre-watch monitoring protocols. Work cannot begin if an animal is within the shutdown zone or if visibility is not clear throughout the Level A shutdown zones.

Post Activity Monitoring

Monitoring of the shutdown and monitoring zones will continue for 30 minutes following completion of in-water activities. PSOs will continue to record observations during this post-watch period, with a focus on observing and reporting unusual or abnormal behaviors.

If construction were to resume during the post-watch period, PSOs will follow pre-watch protocols to ensure that the shutdown and monitoring zones are clear prior to work resuming.

REPORTING

Notification of Intent to Commence Construction

The contractor will inform NMFS OPR, NMFS Alaska Region Protected Resources Division, and USFWS one week prior to commencing construction activities.

Weekly Sighting Counts

A summary of the following will be submitted to the construction project manager at the conclusion of each week of construction activity (Friday evening):

- Completed monitoring forms for the week
- Completed environmental conditions and construction activity logs for the week
- Preliminary counts of sightings and takes per species

Interim Monthly Reports

The contractor will submit brief, monthly reports to the NMFS Alaska Region Protected Resources Division and USFWS summarizing PSO observations and recorded takes during construction. Monthly reporting will allow NMFS and USFWS to track takes (including extrapolated takes) and reinstate consultation in a timely manner, if necessary. Monthly reports will be submitted by email to akr.section7@noaa.gov and USFWS fw7_mmm_reports@fws.gov.

The reporting period for each monthly PSO report will be the entire calendar month, and reports will be submitted by the end of business hours on the tenth day of the month following the end of the reporting period (e.g., the monthly report covering September 1–30, 2023, would be submitted to the NMFS and USFWS by close of business on October 10, 2023).

Final Report

The contractor will submit a draft final report by email to akr.section7@noaa.gov and fw7_mmm_reports@fws.gov no later than 90 days following the end of construction activities. The contractor will provide a final report within 30 days following resolution of NMFS and USFWS's comments on the draft report. If no comments are received from the agencies within 30 days, the draft final report will be considered the final report.

The final reports will contain, at minimum, the following information:

- A summary of construction activities, including start and end dates.
- A description of any deviation from the initially proposed pile numbers, pile types, average driving times, etc.
- A table summarizing all marine mammal sightings during the construction period, including:
 - dates, times, species, numbers, locations, and behaviors of any observed ESA-listed marine mammals, including all observed humpback whales and Steller sea lions;
 - daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B zones, and whether estimated as taken, if appropriate; and
 - the number of shut-downs throughout all monitoring activities.
- A brief description of any impediments to obtaining reliable observations during construction period.
- A description of any impediments to complying with these mitigation measures.
- Appendices containing all PSO daily logs and marine mammal sighting forms.

Reporting Injured or Dead Marine Mammals

If it is clear that project activity has caused the take of a marine mammal in a manner prohibited by the (requested) IHA, such as unauthorized Level A harassment, serious injury, or mortality, the contractor shall immediately cease the specified activities and report the incident to NMFS OPR, the NMFS Alaska Region Protected Resources Division, and the NMFS statewide 24-hour Stranding Hotline (877) 925-7773. If a sea otter, report to the USFWS Marine Mammal Management Office at (800) 362–5148, or the Alaska SeaLife Center in Seward (888) 774–7325, or both.

The report must include the following:

- Time and date of the incident
- Description of the incident
- Environmental conditions (e.g., wind speed and direction, Beaufort Sea state, cloud cover and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;

- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and;
- Photographs or video footage of the animal(s) (if available).

Activities will not resume until NMFS or USFWS is able to review the circumstances of the unauthorized take. NMFS or USFWS would work with the contractor to determine what measures are necessary to minimize the likelihood of further unauthorized take and ensure ESA and MMPA compliance. The contractor may not resume their activities until notified by NMFS or USFWS.

In the event that the contractor discovers an injured or dead marine mammal within the action area, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (e.g., in less than a moderate state of decomposition), the contractor will immediately report the incident to the USFWS or NMFS OPR, and the NMFS Alaska Regional Stranding Coordinator or Hotline.

The report must include the same information identified in the paragraph above. Activities may continue while NMFS or USFWS reviews the circumstances of the incident. NMFS or USFWS will work with the contractor to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that the contractor discovers an injured or dead marine mammal and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the contractor must report the incident to the NMFS OPR and the NMFS Alaska Regional Stranding Coordinator or Hotline within 24 hours of the discovery. If a sea otter, it must be reported to USFWS within 24 hours of the discovery to either the USFWS Marine Mammal Management Office at (800) 362-5148 (business hours), or the Alaska SeaLife Center in Seward (888) 774-7325 (24 hours a day), or both. The contractor will provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS or USFWS.

Appendix A: List of Species with Ranges in the Project Action Area

Species and their Status Listed by the NMFS Mapper and USFWS IPaC Mapper that May Occur in the Project Vicinity

| Species | Status Listing | Jurisdiction | Occurrence | Link to Species Profile |
|---|---|--------------|------------|---|
| Gray Whale (<i>Eschrichtius robustus</i>) | MMPA | NMFS | Very rare | https://www.fisheries.noaa.gov/species/gray-whale |
| North Pacific Right Whale (<i>Eubalaena japonica</i>) | ESA Endangered | NMFS | Very rare | https://www.fisheries.noaa.gov/species/north-pacific-right-whale |
| Minke Whale (<i>Balaenoptera acutorostrata</i>) | MMPA | NMFS | Very rare | https://www.fisheries.noaa.gov/species/minke-whale |
| Fin Whale (<i>Balaenoptera physalus</i>) | ESA Endangered | NMFS | Very rare | https://www.fisheries.noaa.gov/search?q=fin+whale |
| Humpback Whale (<i>Megaptera novaeangliae</i>) | Western North Pacific DPS: ESA Endangered; Mexico DPS: Threatened | NMFS | Infrequent | https://www.fisheries.noaa.gov/species/humpback-whale |
| Sperm Whale (<i>Physeter macrocephalus</i>) | ESA Endangered | NMFS | Very rare | https://www.fisheries.noaa.gov/species/sperm-whale |
| Dall's Porpoise (<i>Phocoenoides dalli</i>) | MMPA | NMFS | Infrequent | https://www.fisheries.noaa.gov/species/dalls-porpoise |
| Harbor Porpoise (<i>Phocoena phocoena</i>) | MMPA | NMFS | Very rare | https://www.fisheries.noaa.gov/species/harbor-porpoise |
| Pacific White-Sided Dolphin (<i>Lagenorhynchus obliquidens</i>) | MMPA | NMFS | Very rare | https://www.fisheries.noaa.gov/species/pacific-white-sided-dolphin |
| Killer Whale (<i>Orcinus orca</i>) | MMPA | NMFS | Infrequent | https://www.fisheries.noaa.gov/species/killer-whale |
| Harbor Seal (<i>Phoca vitulina</i>) | MMPA | NMFS | Common | https://www.fisheries.noaa.gov/species/harbor-seal |
| Northern Fur Seal (<i>Callorhinus ursinus</i>) | MMPA | NMFS | Very rare | https://www.fisheries.noaa.gov/species/northern-fur-seal |
| Steller Sea Lion (<i>Eumetopias jubatus</i>) | WDPS: ESA Endangered | NMFS | Common | https://www.fisheries.noaa.gov/species/steller-sea-lion |

| Species | Status Listing | Jurisdiction | Occurrence | Link to Species Profile |
|--|----------------|--------------|------------|---|
| Northern Sea Otter <i>(Enhydra lutris kenyoni)</i> | ESA | USFWS | Common | https://www.fws.gov/alaska/pages/endangered-species/northern-sea-otter |

Appendix B: Construction Activity and Communication Log

| Filling Out Construction Activity and Communication Logs | |
|---|---|
| Data Columns | Definition and How to Record |
| General Information (<i>top of form</i>) | |
| Project | Time that monitoring by MMOs/PSOs began and ended, without interruption (military time) |
| Project Name | Whittier Head of the Bay Cruise Ship Dock |
| Monitoring Location | See 4MP |
| Observer | Names of Observers at each location |
| Date | MM/DD/YYYY |
| Construction and Communication Activities | |
| Time of event | Time that construction activities and all communications between MMOs/PSOs and construction crews take place |
| Type of construction activity | Type of construction activity occurring, including ramp up, startup, shutdown, type of pile installation technique, pile size, and pile type (permanent or temporary) |
| Communication | Information communicated between MMOs/PSOs and construction crew |

Appendix C: Marine Mammal Sighting Form

MARINE MAMMAL OBSERVATION RECORD

Project Name: _____

Monitoring Location: _____

Date: _____

Time Effort Initiated: _____

Time Effort Completed: _____

Page _____ of _____

| Time | Visibility (distance) | Glare | Weather Condition | Wave Height | BSS | Wind | Swell |
|------|-----------------------|-------|-----------------------------------|-------------|-----|---------|---------|
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |
| : | | % | S - PC - L - R - F - OC - SN - HR | Lt/Mod/Hvy | | N S E W | N S E W |

| Event Code | Sight # (1 or 1.1 if re-sight) | Time/Dur (Start/End time if cont.) | WP/ Grid #/ DIR of travel | Distance from Pile | Obs. | Sighting Cue | Species | Group Size | Behavior Code (see code sheet) | Construction Type | Mitigation Type | Exposure (Y/N) | Behavior Change/ Response to Activity/Comments/Human Activity/Vessel Hull # or Name/ Visibility Notes |
|---|--------------------------------|------------------------------------|---------------------------|--------------------|------|-------------------------------|---------|-----------------------|--------------------------------|-------------------------------|------------------|----------------|---|
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |
| E ON PRE/POST CON S M OR E OFF | | : | Grid N or S W or E | | | BL BO BR DF SA OTHER | | Min: Max: Best: | | DR I V OWC NOWC NONE | DE SD None | | |

Marine Mammal Observation Record – Sighting Codes

Behavior Codes

| Code | Behavior | Definition |
|----------------------|-----------------------------|---|
| BR | Breaching | Leaps clear of water |
| CD | Change Direction | Suddenly changes direction of travel |
| CH | Chuff | Makes loud, forceful exhalation of air at surface |
| DI | Dive | Forward dives below surface |
| DE | Dead | Shows decomposition or is confirmed as dead by investigation |
| DS | Disorientation | An individual displaying multiple behaviors that have no clear direction or purpose |
| FI | Fight | Agonistic interactions between two or more individuals |
| FO | Foraging | Confirmed by food seen in mouth |
| MI | Milling | Moving slowly at surface, changing direction often, not moving in any particular direction |
| PL | Play | Behavior that does not seem to be directed towards a particular goal; may involve one, two or more individuals |
| PO | Porpoising | Moving rapidly with body breaking surface of water |
| SL | Slap | Vigorously slaps surface of water with body, flippers, tail etc. |
| SP | Spyhopping | Rises vertically in the water to "look" above the water |
| SW | Swimming | General progress in a direction. Note general direction of travel when last seen [Example: "SW (N)" for swimming north] |
| TR | Traveling | Traveling in an obvious direction. Note direction of travel when last seen [Example: "TR (N)" for traveling north] |
| UN | Unknown | Behavior of animal undetermined, does not fit into another behavior |
| AWA | Approach Work | |
| LWA | Leave Work Area | |
| Pinniped only | | |
| EW | Enter Water (from haul out) | Enters water from a haul-out for no obvious reason |
| FL | Flush (from haul out) | Enters water in response to disturbance |
| HO | Haul out (from water) | Hauls out on land |
| RE | Resting | Resting onshore or on surface of water |
| LO | Look | Is upright in water "looking" in several directions or at a single focus |
| SI | Sink | Sinks out of sight below surface without obvious effort (usually from an upright position) |
| VO | Vocalizing | Animal emits barks, squeals, etc. |
| Cetacean only | | |
| LG | Logging | Resting on surface of water with no obvious signs of movement |

Sea State and Wave Height: Use Beaufort Sea State Scale for Sea State. This refers to the surface layer and whether it is glassy in appearance or full of white caps. In the open ocean, it also considers the wave height or swell, but in inland waters the wave height (swells) may never reach the levels that correspond to the correct surface white cap number. Therefore, include wave height for clarity.

Glare: Percent glare should be the total glare of observers' area of responsibility. Determine if observer coverage is covering 90 degrees or 180 degrees and document daily. Then assess total glare for that area. This will provide needed information on what percentage of the field of view was poor due to glare.

Swell Direction: Swell direction should be where the swell is coming from (S for coming from the south). If possible, record direction relative to fixed location (pier). Choose this location at beginning of monitoring project.

Wind Direction: Wind direction should also be where the wind is coming from.

Event

| Code | Activity Type |
|-------|--------------------------|
| E ON | Effort On |
| E OFF | Effort Off |
| PRE | Pre-Construction Watch |
| POST | Post-Construction Watch |
| CON | Construction (see types) |
| S | Sighting |
| M | Mitigation |
| OR | Observer Rotation |

Sighting Cues

| Code | Distance Visible |
|------|------------------|
| BL | Blow |
| BO | Body |
| BR | Breach |
| DF | Dorsal Fin |
| SA | Surface Activity |
| OTHR | Other |

Marine Mammal Species

| Code | Marine Mammal Species |
|-------|-----------------------------|
| STSL | Steller Sea Lion |
| HPBK | Humpback Whale |
| HAPO | Harbor Porpoise |
| DAPO | Dall's Porpoise |
| PSWD | Pacific white-sided dolphin |
| SO | Sea Otter |
| HSEA | Harbor Seal |
| MINKE | Minke Whale |
| ORCA | Killer Whale |

Construction Type

| Code | Activity Type |
|------|----------------------------|
| OWC | Over-Water Construction |
| NOWC | No Over-Water Construction |
| V | Vibratory Hammer |
| I | Impact Hammer |
| DR | Drilling |
| NONE | No Construction |

Mitigation Codes

| Code | Activity Type |
|------|------------------------------|
| DE | Delay onset of In-Water Work |
| SD | Shutdown In-Water Work |

Weather Conditions

| Code | Weather Condition |
|------|-------------------|
| S | Sunny |
| PC | Partly Cloudy |
| L | Light Rain |
| R | Steady Rain |
| F | FOG |
| OC | Overcast |
| SN | Snow |
| HR | Heavy Rain |

Wave Height

| Code | Wave Height |
|----------|-------------|
| Light | 0-3 ft |
| Moderate | 4-6 ft |
| Heavy | >6 ft |

| Filling Out Sighting Forms | |
|---|--|
| Data Columns | Definition and How to Record Data |
| General Information (<i>Top of Form</i>) | |
| Project Name | Whittier Head of the Bay Cruise Ship Dock |
| Monitoring Location | See 4MP |
| Date | MM/DD/YYYY |
| Time effort initiated and completed | Time started pre-watch and time post-watch ended (military time). If there is more than one monitoring period in a day, start a new form for each period. |
| Environmental Conditions | |
| Environmental Conditions | Record at the start of monitoring period, when changes, and at the end of monitoring period. |
| Visibility | Estimate of visibility distance (in meters or kilometers) |
| Glare | Amount of water obstructed by glare (0–100%) and direction of glare (from south, north, or another direction) |
| Weather conditions | Dominant weather conditions: sunny (S), partly cloudy (PC), light rain (LR), steady rain (R), fog (F), overcast (OC), light snow (LS), snow (SN) |
| Wave Height | Lt-light, Mod-moderate, Hvy-heavy |
| Wind and Swell direction | From the north (N), northeast (NE), east (E), southeast (SE), south (S), southwest (SW), west (W), northwest (NW) |
| Beaufort Sea State | Scale 1-12. See BSS sheet. |
| Sightings | |
| Event Code | Indicates what events are happening at the time of the sighting, what events may have occurred due to the sighting, and observer rotations. |
| Time/Duration | Time first sighted and time of last sighting (military time). |
| Sighting Number | Chronological (1,2,3, etc.) If the same marine mammal is resighted at a distance greater than 25 meters from the original sighting location record as a resight (Ex. 1.1- same marine mammal as sighting 1, but sighted for a second time in different location) |
| Waypoint (WP)/Grid #/DIR of Travel | Grid number that marine mammal was sighted in and direction of travel. Format should be grid map letter-grid (Example: If a marine mammal is sighted in grid 2B on Grid Map B this should be denoted by B-2B). |
| Distance from Pile | Distance from pile driving site to the sighted marine mammal. |

| | |
|-------------------|--|
| Observer (Obs.) | Initials of the Observer who sighted the marine mammal or who is coming on shift during a rotation |
| Sighting Cue | How was the marine mammal sighted |
| Species | Appropriate species abbreviation from code sheet |
| Group Size | Record the minimum and maximum number of individuals that were sighted. Then determine and record the best number of individuals. |
| Behavior | Behaviors observed using appropriate abbreviations from code sheet |
| Construction Type | Circle construction type that is actively occurring at the time and for the duration of the sighting. |
| Mitigation Type | Circle mitigation type, if any. Based upon monitoring and shutdown zones does a delay of work (pre-watch and post-watch) or a shutdown (monitoring period) need to occur. |
| Exposure | If a marine mammal enters its Level A or Level B distance and work is actively occurring it will be an exposure indicate yes (Y). If no work is actively occurring indicate no (N) |

Estimating Wind Speed and Sea State with Visual Clues

| Beaufort number | Wind Description | Wind Speed | Wave Height | Visual Clues |
|-----------------|------------------|------------|----------------|--|
| 0 | Calm | 0 knots | 0 feet | Sea is like a mirror. Smoke rises vertically. |
| 1 | Light Air | 1-3 kts | < 1/2 | Ripples with the appearance of scales are formed, but without foam crests. Smoke drifts from funnel. |
| 2 | Light breeze | 4-6 kts | 1/2 ft (max 1) | Small wavelets, still short but more pronounced, crests have glassy appearance and do not break. Wind felt on face. Smoke rises at about 80 degrees. |
| 3 | Gentle Breeze | 7-10 kts | 2 ft (max 3) | Large wavelets, crests begin to break. Foam of glassy appearance. Perhaps scattered white horses (white caps). Wind extends light flag and pennants. Smoke rises at about 70 deg. |
| 4 | Moderate Breeze | 11-16 kts | 3 ft (max 5) | Small waves, becoming longer. Fairly frequent white horses (white caps). Wind raises dust and loose paper on deck. Smoke rises at about 50 deg. No noticeable sound in the rigging. Slack halyards curve and sway. Heavy flag flaps limply. |
| 5 | Fresh Breeze | 17-21kts | 6 ft (max 8) | Moderate waves, taking more pronounced long form. Many white horses (white caps) are formed (chance of some spray). Wind felt strongly on face. Smoke rises at about 30 deg. Slack halyards whip while bending continuously to leeward. Taut halyards maintain slightly bent position. Low whistle in the rigging. Heavy flag doesn't extended but flaps over entire length. |
| 6 | Strong Breeze | 22-27 kts | 9 ft (max 12) | Large waves begin to form. White foam crests are more extensive everywhere (probably some spray). Wind stings face in temperatures below 35 deg F (2C). Slight effort in maintaining balance against wind. Smoke rises at about 15 deg. Both slack and taut halyards whip slightly in bent position. Low moaning, rather than whistle, in the rigging. Heavy flag extends and flaps more vigorous. |
| 7 | Near Gale | 28-33 kts | 13 ft (max 19) | Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of wind. Necessary to lean slightly into the wind to maintain balance. Smoke rises at about 5 to 10 deg. Higher pitched moaning and whistling heard from rigging. Halyards still whip slightly. Heavy flag extends fully and flaps only at the end. Oilskins and loose clothing inflate and pull against the body. |
| 8 | Gale | 34-40 kts | 18 ft (max 25) | Moderately high waves of greater length. Edges of crests begin to break into the spindrift. The foam is blown in well-marked streaks along the direction of the wind. Head pushed back by the force of the wind if allowed to relax. Oilskins and loose clothing inflate and pull strongly. Halyards rigidly bent. Loud whistle from rigging. Heavy flag straight out and whipping. |
| 9 | Strong Gale | 41-47 kts | 23 ft (max 32) | High waves. Dense streaks of foam along direction of wind. Crests of waves begin to topple, tumble and roll over. Spray may affect visibility. |
| 10 | Storm | 48-55 kts | 29 ft (max 41) | Very high waves with long overhanging crests. The resulting foam, in great patches is blown in dense streaks along the direction of the wind. On the whole, the sea takes on a whitish appearance. Tumbling of the sea becomes heavy and shock-like. Visibility affected. |
| 11 | Violent Storm | 56-63 kts | 37 ft (max 52) | Exceptionally high waves (small and medium-sized ships might be for time lost to view behind the waves). The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere, the edges of the wave crests are blown into froth. Visibility greatly affected. |
| 12 | Hurricane | 64+ kts | 45+ ft | The air is filled with foam and spray. The sea is completely white with driving spray. Visibility is seriously affected. |

Appendix D: Grid Maps

