Marine Mammal Monitoring and Mitigation Plan

Duck Point Development II, LLC
Hoonah Berth II Project
Icy Strait, Hoonah, Alaska

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U.S. Fish and Wildlife Service

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ACRONYMS AND ABBREVIATIONS

4MP	Marine Mammal Monitoring and Mitigation Plan
BO	Biological Opinion
DPD	Duck Point Development II, LLC
DPS	distinct population segment
ESA	Endangered Species Act
HDPE	high-density polyethylene
IHA	Incidental Harassment Authorization
ITS	Incidental Take Statement
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NMFS AKR	National Marine Fisheries Service Alaska Region
OPR	Office of Protected Resources (NMFS)
PSO	protected species observer
rms	root mean square
SPL	sound pressure level
UHMW	ultra-high-molecular-weight polyethylene
USACE	U.S. Army Corp of Engineers
USFWS	U.S. Fish and Wildlife Service
WDPS	Western Distinct Population Segment

1 INTRODUCTION

Duck Point Development II, LLC (DPD) proposes the following Marine Mammal Monitoring and Mitigation Plan (4MP) for use during pile installation to construct a second cruise ship berth and a small-craft lightering float at Cannery Point (Icy Strait Point) on Chichagof Island near Hoonah, Alaska. The project is in waters of the U.S., within the range of Endangered Species Act (ESA)- and Marine Mammal Protection Act (MMPA)-listed marine mammals and has the potential to generate noise that could exceed Level A and B harassment thresholds established by the National Marine Fisheries Service (NMFS). Monitoring and shutdown zones will be implemented to reduce Level A and Level B impacts to marine mammals.

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

- U.S Army of Engineers (USACE) Permit POA-2018-576, Port Frederick for activities in Waters of the U.S. (requested);
- NMFS Office of Protected Resources (OPR) Incidental Harassment Authorization (IHA) (requested);
- NMFS Alaska Region Protected Resources Division (NMFS AKR) ESA Section 7(a)(2) Biological Opinion (BO) and Incidental Take Statement (ITS) (requested); and
- U.S. Fish and Wildlife Service (USFWS) IHA (requested).

The species that are most common in the project area; as well as species for which take is authorized, and the number and type of authorized take are shown in Table 1.

Table 1. Species Most Likely to Occur in Project Area and Requested Take Numbers, by Species and Manner of Take

Species Most Likely to Occur	Level A Take	Level B Take
Minke Whale (*Balaenoptera acutorostrata*)	0	9
Humpback Whale (*Megaptera novaeangliae*)	0	460
Gray Whale (*Eschrichtius robustus*)	0	3
Killer Whale (*Orcinus orca*)	0	570
Pacific White-Sided Dolphin (*Lagenorhynchus obliquidens*)	0	328
Dall's Porpoise (*Phocoenoides dalli*)	0	1,038
Harbor Porpoise (*Phocoena phocoena*)	64	1,932
Harbor Seal (*Phoca vitulina*)	48	156
Steller Sea Lion (*Eumatopia jubatus*	598	16
Northern Sea Otter (*Enhydra lutris*)	0	1,116

2 MONITORING AND SHUTDOWN ZONES

Because species are impacted by noise in different ways, species-specific monitoring and shutdown zones have been calculated for this project. These monitoring and shutdown zones are shown in Figures 1 - 8 and are summarized in Tables 2, 3, and 4. The zones shown in Figures 1-4 apply to all marine mammal species other than sea otters. The zones shown in Figure 5-8 apply to northern sea otters.

2.1 Level A Shutdown and Monitoring Zones

Level A shutdown zones are intended to protect marine mammals from auditory injury. They define an area in which sound pressure levels (SPLs) equal or exceed the level that would cause auditory injury to marine mammals present. Pile driving activity would be halted upon sighting of a marine mammal within the zone (or in anticipation of an animal entering the zone).

Because of their small size, harbor seal, harbor porpoise, and Dall's porpoise can be difficult to see at great distances. During impact pile driving, their Level A harassment zone is large enough that they may be difficult to spot. Level A take has been requested for Dall's porpoises, harbor porpoises and harbor seals in those instances in which they occur within the Level A harassment zone but outside of the shutdown zone *or* if they were to occur within the shutdown zone and were not visualized in time for the project to be shut down.[1,2] Steller sea lions also occur in the action area with high frequency. Level A take has been requested for Steller sea lions in the rare case that they are not visualized in the Level A harassment zone before the project is shut down.

Further, there will be a nominal 10-meter shutdown zone for construction-related activity where acoustic injury is not the primary concern. This type of work could include (but is not limited to) the following activities: (1) movement of the barge to the pile location; (2) positioning of the pile on the substrate via a crane (i.e., stabbing the pile); (3) removal of the pile from the water column/substrate via a crane (i.e., deadpull); or (4) the placement of sound attenuation devices around the piles. For these activities, monitoring would take place from 15 minutes prior to initiation until the action is complete. Radial distances to Level A shutdown zone boundaries are defined in Table 2 and shown in Figures 1-2.

[1] Level A take for Dall's porpoise is not requested. This species is infrequently sited in the action area. During the 2015 construction of the first cruise ship berth, a total of two Dall's porpoise were observed during construction activities. In the rare event that Dall's porpoise are observed within the Level A zone during pile driving, construction operations would be shut down until the animals have vacated the zone.

[2] Although humpback whales are also common in the action area, the proposed shutdown zone is equal to the Level A threshold for this species since 1,000 m is considered to be a reasonable monitoring distance for these larger animals.

Table 2. Pile Driving Shutdown and Monitoring Zones Designed to Avoid Level A Take

Source	Shutdown Zones in Meters (*monitoring zone, if different, in meters*)				
	Low-Frequency Cetaceans (humpback whale, gray whale, minke whale)	Mid-Frequency Cetaceans (killer whale, Pacific white-sided dolphin)	High-Frequency Cetaceans (Dall's porpoise, harbor porpoise)	Phocid (harbor seal)	Otariid (sea lion)
In-Water Construction Activities*					
Barge movements, pile positioning, sound attenuation placement*	10	10	10	10	10
Vibratory Pile Driving/Removal					
24-inch steel installation (18 piles; ~40 minutes per day on 4.5 days)	25	10	25	10	10
30-inch steel temporary installation (62 piles; ~2 hours per day on 10.5 days)	25	10	25	10	10
30-inch steel removal (62 piles; ~1 hour per day on 10.5 days)	25	10	25	10	10
30-inch steel permanent installation (3 piles; ~1 hour per day on 1.5 days)	25	10	25	10	10
36-inch steel permanent installation (16 piles; ~1 hour per day on 8 days)	25	10	50	25	10
42-inch steel permanent installation (8 piles; ~2 hours per day on 4 days)	50	10	50	25	10
Impact Pile Driving					
36-inch steel permanent installation (16 piles; ~10 minutes per day on 4 days)	1,000	50	100 (*1,200*)	50 (*525*)	50
42-inch steel permanent installation (8 piles; ~6 minutes per day on 4 days)	750	50	100 (*900*)	50 (*400*)	50
Socketed Pile Installation					
24-inch steel permanent installation (18 piles; ~2 hours per day on 9 days)	25	10	50	15	10
30-inch steel temporary installation (up to 10 piles; ~2 hours per day on 5 days)	25	10	50	15	10
Rock Anchor Installation					
8-inch anchor permanent installation (for 24-inch piles, 2 anchors; ~1 hour per day on 2 days)	25	10	25	10	10
33-inch anchor permanent installation (for 36- and 42-inch piles, 24 anchors; ~8 hours per day on 12 days)	100	10	100	50	10

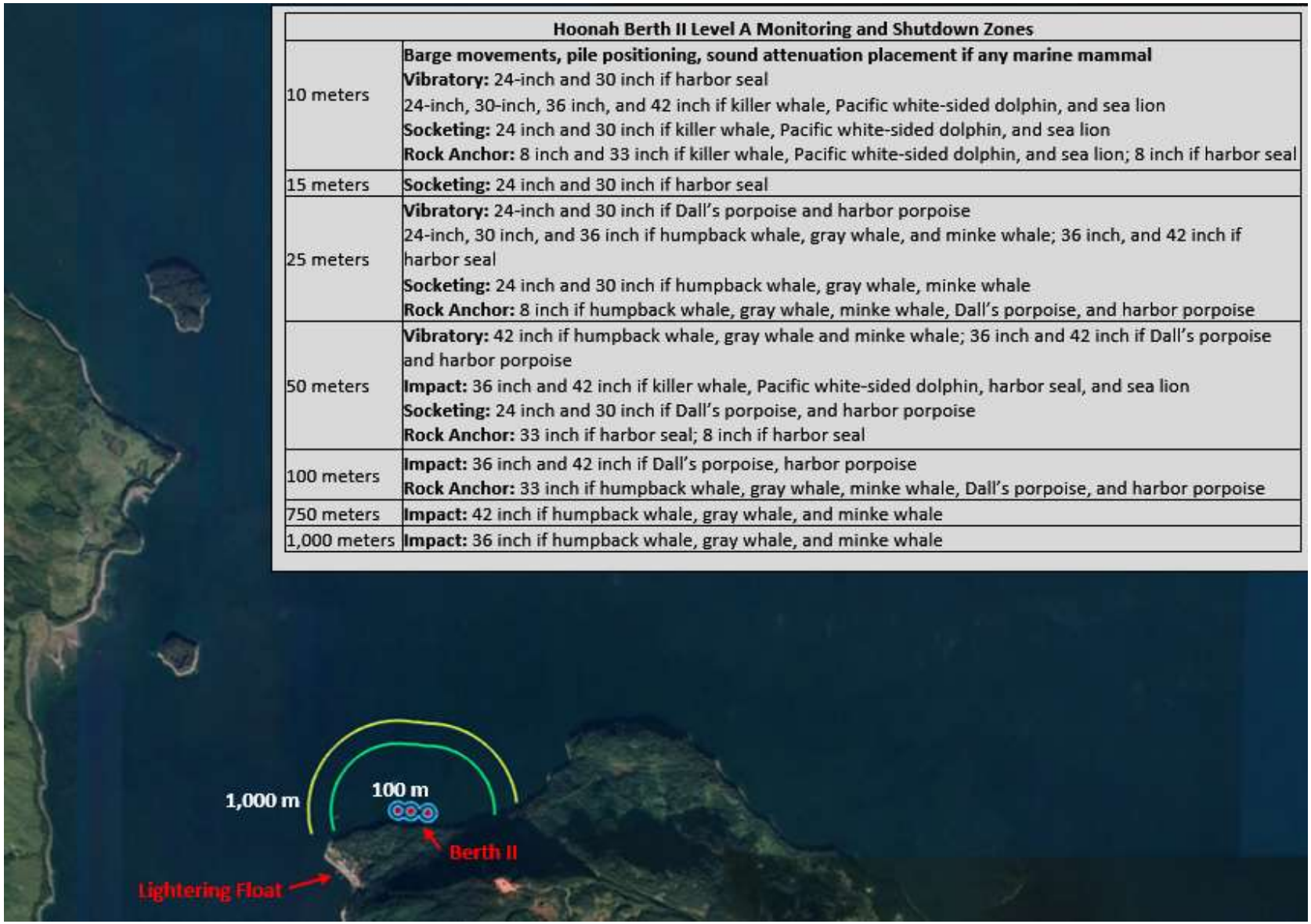
Shutdown zone distances rounded, in meters, refer to the maximum radius of the zone.

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

Figure 1. Lightering Float Level A Shutdown Zones for NMFS-Managed Species

Hoonah Lightering Float Level A Shutdown Zones	
10 meters	**Barge movements, pile positioning, sound attenuation placement if any marine mammal** **Vibratory:** 30-inch if killer whale, Pacific white-sided dolphin, harbor seal, and sea lion
25 meters	**Vibratory:** 30 inch if humpback whale, gray whale, minke whale, Dall's porpoise, and harbor porpoise

Figure 2. Berth II Level A Shut Down Zones for NMFS-Managed Species



Hoonah Berth II Level A Monitoring and Shutdown Zones	
10 meters	**Barge movements, pile positioning, sound attenuation placement if any marine mammal** **Vibratory:** 24-inch and 30 inch if harbor seal 24-inch, 30-inch, 36 inch, and 42 inch if killer whale, Pacific white-sided dolphin, and sea lion **Socketing:** 24 inch and 30 inch if killer whale, Pacific white-sided dolphin, and sea lion **Rock Anchor:** 8 inch and 33 inch if killer whale, Pacific white-sided dolphin, and sea lion; 8 inch if harbor seal
15 meters	**Socketing:** 24 inch and 30 inch if harbor seal
25 meters	**Vibratory:** 24-inch and 30 inch if Dall's porpoise and harbor porpoise 24-inch, 30 inch, and 36 inch if humpback whale, gray whale, and minke whale; 36 inch, and 42 inch if harbor seal **Socketing:** 24 inch and 30 inch if humpback whale, gray whale, minke whale **Rock Anchor:** 8 inch if humpback whale, gray whale, minke whale, Dall's porpoise, and harbor porpoise
50 meters	**Vibratory:** 42 inch if humpback whale, gray whale and minke whale; 36 inch and 42 inch if Dall's porpoise and harbor porpoise **Impact:** 36 inch and 42 inch if killer whale, Pacific white-sided dolphin, harbor seal, and sea lion **Socketing:** 24 inch and 30 inch if Dall's porpoise, and harbor porpoise **Rock Anchor:** 33 inch if harbor seal; 8 inch if harbor seal
100 meters	**Impact:** 36 inch and 42 inch if Dall's porpoise, harbor porpoise **Rock Anchor:** 33 inch if humpback whale, gray whale, minke whale, Dall's porpoise, and harbor porpoise
750 meters	**Impact:** 42 inch if humpback whale, gray whale, and minke whale
1,000 meters	**Impact:** 36 inch if humpback whale, gray whale, and minke whale

2.2 Level B Monitoring Zones

DPD will establish and observe different Level B monitoring zones depending on the type of pile driving activity that is occurring. Level B monitoring zones represent areas where the 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. These monitoring zones serve as an area within which to document instances of marine mammal harassment, and enable PSOs to be aware of the presence of marine mammals near the project's shutdown zone and prepare for communication of required shutdowns.

Level B monitoring zones for the project are presented in Table 3 below and shown in Figures 3 and 4.

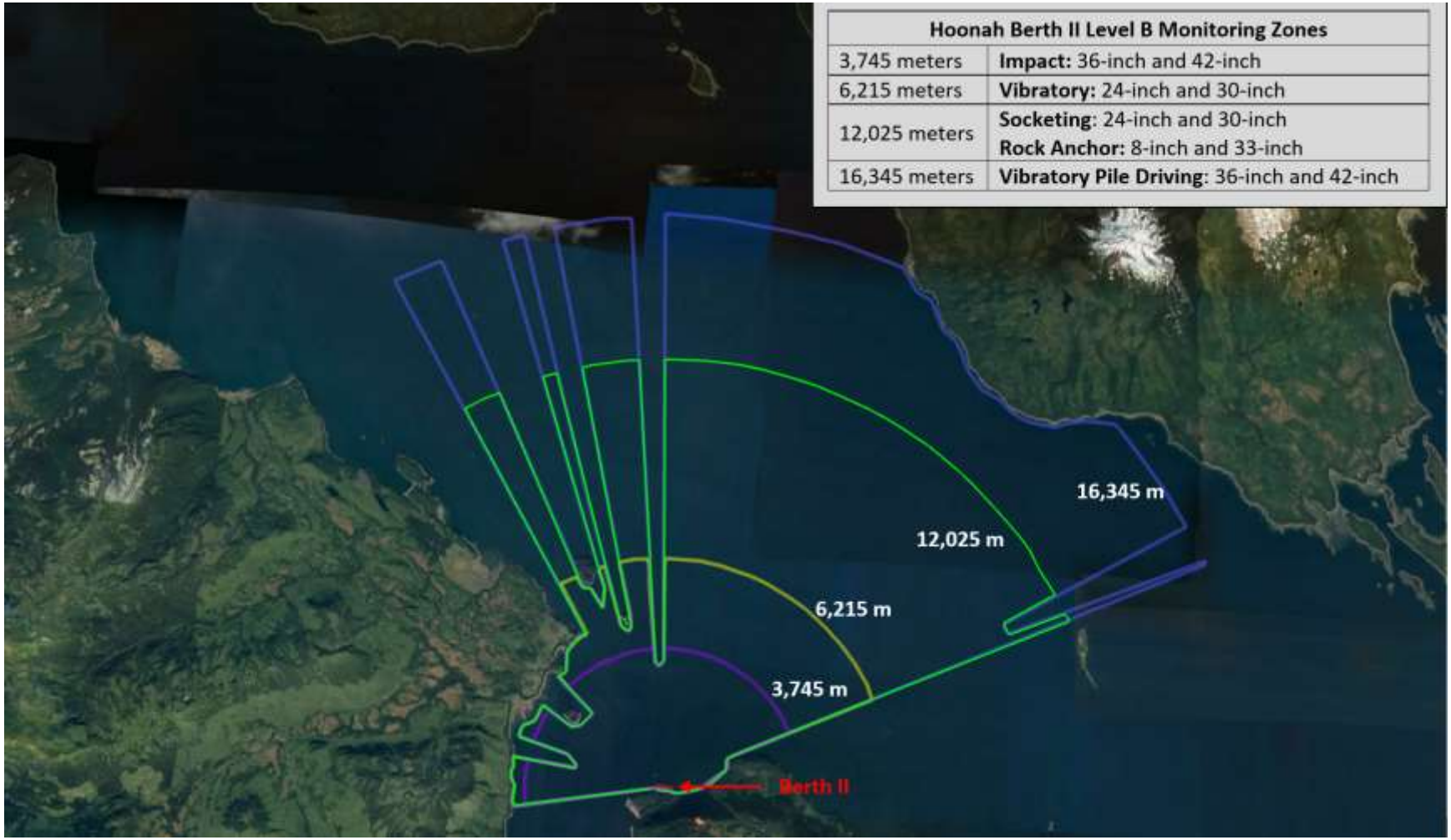
Table 3. Level B Monitoring Zones for NMFS-Managed Species*

Source	Monitoring Zones (m)
Vibratory Pile Driving/Removal	
24-inch steel installation (18 piles) (~40 minutes per day on 4.5 days)	6,215
30-inch steel temporary installation (72 piles) (~2 hours per day on 12 days)	6,215
30-inch steel removal (72 piles) (~1 hour per day on 12 days)	6,215
30-inch steel permanent installation (3 piles) (~1 hour per day on 2 days)	6,215
36-inch steel permanent installation (20 piles) (~1 hour per day on 10 days)	16,345
42-inch steel permanent installation (10 piles) (~2 hours per day on 5 days)	16,345
Impact Pile Driving	
36-inch steel (20 piles) (~10 minutes per day on 5 days)	3,745
42-inch steel (10 piles) (~6 minutes per day on 5 days)	3,745
Socketed Pile Installation	
24-inch steel (18 piles) (~2 hours per day on 9 days)	12,025
30-inch steel temporary installation (up to 10 piles) (~2 hours per day on 5 days)	12,025
Rock Anchor Installation	
8-inch anchor (for 24-inch piles, 2 anchors) (~1 hour per day on 2 days)	12,025
33-inch anchor (for 36- and 42-inch piles, 30 anchors) (~8 hours per day on 15 days)	12,025

* Numbers rounded up to nearest 5 meters; see Table 4 for calculated distances. These monitoring zones apply to all species other than northern sea otters (see Table 4 and Figure 7 for sea otter shutdown zones).

Figure 3. Lightering Float Level B Monitoring Zone for NMFS-Managed Species

Figure 4. Berth II Level B Monitoring Zones for NMFS-Managed Species



Hoonah Berth II Level B Monitoring Zones	
3,745 meters	**Impact:** 36-inch and 42-inch
6,215 meters	**Vibratory:** 24-inch and 30-inch
12,025 meters	**Socketing**: 24-inch and 30-inch **Rock Anchor:** 8-inch and 33-inch
16,345 meters	**Vibratory Pile Driving**: 36-inch and 42-inch

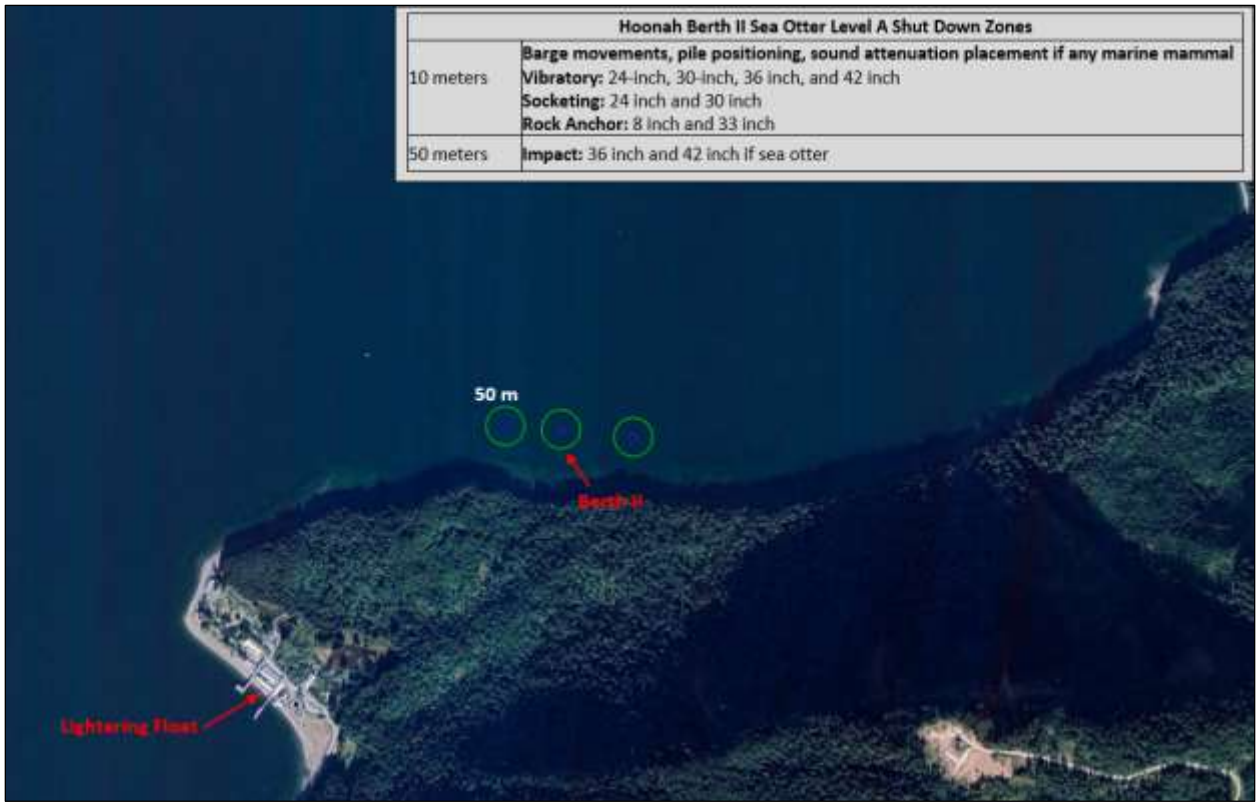
Table 4. Level A Shutdown Zones and Level B Monitoring Zones for Northern Sea Otters

Source	Shutdown Zones to Prevent Level A take (meters)	Monitoring Zones for Level B Take (meters) [1]
In-Water Construction Activities[2]		
Barge movements, pile positioning, sound attenuation placement	10	n/a
Vibratory Pile Driving/Removal[3]		
24-inch steel installation (18 piles; ~40 minutes per day on 4.5 days)	10	25
30-inch steel temporary installation (72 piles; ~2 hours per day on 12 days)	10	25
30-inch steel removal (72 piles; ~1 hour per day on 12 days)	10	25
30-inch steel permanent installation (3 piles; ~1 hour per day on 2 days)	10	25
36-inch steel permanent installation (20 piles; ~1 hour per day on 10 days)	10	50
42-inch steel permanent installation (10 piles; ~2 hours per day on 5days)	10	50
Impact Pile Driving		
36-inch steel permanent installation (20 piles; ~10 minutes per day on 5 days)	50	3,745
42-inch steel permanent installation (510 piles; ~6 minutes per day on 5 days)	50	3,745
Socketed Pile Installation		
24-inch steel permanent installation (18 piles; ~2 hours per day on 9 days)	10	50
30-inch steel temporary installation (up to 10 piles; ~2 hours per day on 5 days)	10	50
Rock Anchor Installation		
8-inch anchor permanent installation (for 24-inch piles, 2 anchors; ~1 hour per day on 2 days)	10	50
33-inch anchor permanent installation (for 36- and 42-inch piles, 30 anchors; ~8 hours per day on 15 days)	10	50

Numbers are rounded up to for ease of monitoring; see Table 4 for calculated distances.

[1] DBD is not proposing shutdowns associated with Level B disturbance.
[2] Although acoustic injury is not the primary concern with these in-water construction activities, shutdowns will be implemented to avoid impacts to sea otters.
[2] Construction of the lightering float only requires in-water construction activities and vibratory pile driving; construction of Berth II requires all the installation methods listed.

Figure 5. Berth II Level A Shut Down Zones for Northern Sea Otters



Hoonah Berth II Sea Otter Level A Shut Down Zones	
10 meters	**Barge movements, pile positioning, sound attenuation placement if any marine mammal** **Vibratory:** 24-inch, 30-inch, 36 inch, and 42 inch **Socketing:** 24 inch and 30 inch **Rock Anchor:** 8 inch and 33 inch
50 meters	**Impact:** 36 inch and 42 inch if sea otter

Figure 6. Berth II Level B Monitoring Zones for Northern Sea Otters

Hoonah Berth II Sea Otter Level B Monitoring Zones	
25 meters	**Vibratory:** 24-inch, 30-inch, 36 inch, and 42 inch
50 meters	**Vibratory:** 36-inch and 42-inch **Socketing:** 24-inch and 30-inch **Rock Anchor:** 8-inch and 33-inch
3,745 meters	**Impact:** 36-inch and 42-inch

Figure 7. Lightering Float Level A Shutdown Zone and Level B Monitoring Zone for Northern Sea Otters

3 MITIGATION MEASURES

In order to limit impacts to marine mammals, including ESA-listed species, DPD would implement the following mitigation measures during pile driving activities.

3.1 General Conditions

- To minimize noise during impact pile driving, pile caps (pile softening material) will be used. Much of the noise generated during pile installation comes from contact between the pile being driven and the steel template used to hold the pile in place. The contractor will use high-density polyethylene (HDPE) or ultra-high-molecular-weight polyethylene (UHMW) softening material on all templates to eliminate steel on steel noise generation.

- To minimize impact to marine mammals, a "soft start" technique would be used when impact pile driving with an initial set of three strikes from the impact hammer at 40 percent energy, followed by a one-minute waiting period, then two subsequent 3-strike sets.The above list provides an overview of requirements for this project. Use the requested USACE Permit and the requested IHAs and BO for detailed terms and conditions.

3.2 Visual Monitoring by PSOs

3.2.1 General requirements – visual monitoring

- DPD, through the use of NMFS-approved PSOs, must monitor for the presence and behavior of marine mammals prior to, during, and after all pile driving and removal.

- All work will be performed during daylight hours to allow for visual monitoring. Pile driving activities will not be conducted when weather conditions or darkness do not allow for observation of all waters within Level A zones.

- To aid in observing, determining the location of, and communicating the presence of protected species within the action area, PSOs will have the following supplies:
    - binoculars
    - range finder
    - GPS
    - compass
    - two-way radio communication with construction foreman/superintendent
    - log book to record all activities that may be submitted to agencies (NMFS, USACE) upon request

- DPD is required to conduct briefings between construction supervisors and crews, marine mammal monitoring team, and DPD staff prior to the start of all pile driving activities and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures. The crew will be requested to alert the PSO when a marine mammal is spotted in the action area.

- Each day prior to commencing pile driving activities, the lead PSO will conduct a radio check with the construction foreman or superintendent to confirm the activities and zones to be monitored that day. The construction foreman and lead PSO will maintain radio communications throughout the day so that the PSOs may be alerted to any changes in the planned construction activities and zones to be monitored.

- On-shift PSOs will have no other primary duties than to watch for and report on events related to marine mammals during monitoring periods.

- PSOs will work in shifts lasting no longer than 4 hours with at least a 1-hour break between shifts, and will not perform duties as a PSO for more than 12 hours in a 24-hour period (to reduce PSO fatigue).

- Pre-activity monitoring: PSOs shall scan for the presence of marine mammals for 30 minutes before any pile driving activities take place for the day or if more than 30 minutes has elapsed in absence of pile activity.
    - If the shutdown zone has been observed to be clear of marine mammals for 30 minutes, pile driving activities may commence and work can continue even if visibility becomes impaired within the Level B monitoring zone.
    - If any marine mammals are present within the Level A zone, pile driving activities will not begin until the animal(s) has left the shutdown zone or has not been observed in the shutdown zone for 15 minutes.
    - If the monitoring zone has been observed for 30 minutes and no marine mammals (for which take has not been authorized) are present within the zone, work can continue even if visibility becomes impaired within the Level B monitoring zone.
    - When a marine mammal for which for Level B take has been permitted is present in the monitoring zone, pile driving activities may begin and the PSO will record Level B take for that species.

- For all pile driving activities and in-water heavy machinery work, DPD will implement the appropriate shutdown zone (Table 2) around the pile or work zone. If a marine mammal comes within or approaches the shutdown zone, such operations will cease.

- For in-water heavy machinery and construction work (e.g., barge movements, pile positioning, dead-pulling, and sound attenuation), a minimum 10 meter shutdown zone will be implemented. If a marine mammal comes within 10 meters of such operations, operations will cease and vessels will reduce speed to the minimum level required to maintain steerage and safe working conditions.
- After a shutdown occurs, pile driving activities can only begin after the animal is observed leaving the shutdown zone or has not been observed for 15 minutes after the commencement of the shutdown.

- If waters exceed a sea state that restricts the observers' ability to make observations within the marine mammal shutdown zone, pile driving activities will cease. Pile driving activities will not be initiated or continue until the entire largest shutdown zone for the activity is visible.

- Throughout all pile driving activity, the PSO(s) will continuously scan the shutdown zones to monitor for the presence or approach marine mammals.
    - If any marine mammals enter, or appear likely to enter, their respective shutdown zones during pile driving activities, all pile driving activities will cease immediately. Pile driving activities may resume when the animal(s) has been observed leaving the area on its own accord. If the animal(s) is not observed leaving the area, pile-driving activity may begin 15 minutes after the animal is last observed in the area.
        - For Steller sea lions, a small amount of Level A take is authorized, in the unlikely event that an animal were to enter the Level A shutdown zone prior to observation by the PSOs.
        - During impact pile driving of 36- or 42-inch piles, the Level A harassment zone radius for harbor porpoise, Dall's porpoise, and harbor seal is larger than the Level A shutdown zones (Table 2). This is due to the difficulty of visualization of these smaller species at great distances. Because they are more difficult to see and due to the high likelihood of their presence within the project area, a small amount of Level A take has been authorized for harbor porpoises and harbor seals in those instances in which they occur within the Level A harassment zone but outside of the shutdown zone *or* if they were to occur within the shutdown zone and were not visualized in time for the project to be shut down. (Level A take of Dall's porpoise has not been requested or authorized, due to the rarity of their presence within their Level A zones.)

- Throughout all pile driving activity, the Level B monitoring zone will be scanned to monitor for the presence of marine mammals.
    - If the entire Level B monitoring zone is not visible, pile driving activities may continue, and the number of individual listed animals within the Level B zone will be estimated and recorded. Estimated numbers of individuals will be extrapolated by dividing the number of observed individuals by the percentage of the monitoring zone that was visible.
        - For example, if wind and sea state increased causing visibility to diminish to a point that only 40 percent of the monitoring zone were visible, and 2 humpback whales were observed entering the Level B zone, the PSO would estimate that 5 humpback whales were present in the Level B zone (2 whales observed in Level B zone ÷ 40% of zone visible = 5 whales estimated to be within Level B zone). (Note that the estimated number of individuals does not equal the estimated number of takes for humpback whales. See next bullet for further explanation.)

  - Estimated takes for ESA-listed humpback whales will be calculated based on the total number of humpback whales observed (or estimated) in the Level B monitoring zone in a month multiplied by 6.1 percent (the percentage of humpback whales in the action area estimated to be from the listed Mexico Distinct Population Segment [DPS; Wade et al. 2016]).
  - Estimated takes for ESA-listed Western DPS (WDPS) Steller sea lions will be calculated based on the total number of Steller sea lions observed (or estimated) in the Level A or B monitoring zones in a month multiplied by 56 percent (the percentage of Steller sea lions in the action area estimated to be from the listed WDPS [Muto et al. 2018]).
  - If a marine mammal species enters or approaches the Level B zone and that species is either not authorized for take or its number of authorized takes has been met, pile driving activities must shut down immediately using delay and shut-down procedures. Activities must not resume until the animal has been confirmed to have left the area or an observation time period of 15 minutes since the animal was last seen has elapsed.

- Post-construction monitoring will be conducted for 30 minutes beyond the cessation of pile driving activities at the end of the day.

3.2.2 Number and location of PSOs

The number of PSOs will vary from two to four, depending on the type of activity, method of pile driving, and size of pile, all of which contribute to the establishment the size of the harassment zones. Monitoring locations will be selected to provide an unobstructed view of all water within the shutdown zone and as much of the Level B harassment zone as possible for pile driving activities.

- Three PSOs will monitor during all pile driving activities at the lightering float project site, with locations as follows:
  - PSO #1: stationed at or near the site of pile driving;
  - PSO #2: stationed on Long Island (southwest of Hoonah in Port Frederick Inlet) and positioned to be able to view west into Port Frederick Inlet and north towards the project area;
  - PSO #3: stationed on a vessel traveling a circuitous route through the Level B monitoring zone (Figure 4).

- Three PSOs will monitor during all impact pile driving activities at the Berth II project site, with locations as follows:
  - PSO #1: stationed at or near the site of pile driving;
  - PSO #2: stationed on Halibut Island (northwest of the project site in Port Frederick Inlet) and positioned to be able to view east towards Icy Strait and southeast towards the project area.

- Three PSOs will monitoring during vibratory pile driving of 24- and 30-inch-diameter piles at the Berth II project site.
    - PSO #1: stationed at or near the site of pile driving;
    - PSO #2: stationed on Scraggy Island (northwest of the project site in Port Frederick Inlet) and positioned to be able to view south towards the project area;
    - PSO#3: stationed on a vessel traveling a circuitous route through the Level B monitoring zone (Figure 5).

- Four PSOs will monitor during vibratory pile driving of 36- and 42-inch- diameter piles and during all socket/anchor drilling activities.
    - PSO #1: stationed at or near the site of pile driving;
    - PSO #2: stationed on Hoonah Island (northwest of the project site in Port Frederick Inlet) and positioned to be able to view south towards the project site;
    - PSO #3: stationed across Icy Strait north of the project site (on the mainland or the Porpoise Islands) and positioned to be able to view west into Icy Strait and southwest towards the project site;
    - PSO #4: stationed on a vessel traveling a circuitous route through the Level B monitoring zone (Figure 6).

3.2.3 PSO Qualifications

DPD will adhere to the following conditions when selecting PSOs:

- Independent PSOs will be used (i.e., not construction personnel).
- DPD must submit to NMFS OPR (name to be determined) the curriculum vitae (CV) of all observers prior to monitoring.
- At least one PSO must have prior experience working as a marine mammal observer during construction activities.
- Other PSOs may substitute education (degree in biological science or related field) or training for experience.
- When using a team of three or more observers, one observer will be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.
- DPD will ensure that, and observers must have, the following additional qualifications:
    - Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
    - Experience and ability to conduct field observations and collect data according to assigned protocols (this may include academic experience);
    - Experience or training in the field identification of marine mammals, including the identification of behaviors;
    - Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
    - Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and

times when in-water construction activities were conducted; dates and times and reasons for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior;
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary; and
- Sufficient training, orientation, or experience with the construction operations to provide for personal safety during observations.

3.3 Reporting

3.3.1 Notification of intent to commence construction

DPD will inform NMFS OPR and the NMFS Alaska Region Protected Resources Division one week prior to commencing construction activities (name to be determined).

3.3.2 Daily activity logs

For each day of construction activity that requires a PSO, the following information will be recorded in a log provided by DPD:

1. Date and time that each monitoring period[3] begins and ends;

2. Prevailing environmental conditions in each monitoring period (e.g., wind speed, percent cloud cover, visibility, sea state, tide state);

3. Construction activities occurring during each monitoring period, including how many and what size of piles were driven; and

4. Indication of whether marine mammals were sighted. For each marine mammal sighting, the PSO will complete a "Marine Mammal Sighting Form" as described below, and shown in Appendix A.

3.3.3 Marine Mammal Sighting Form

For each marine mammal sighting, the PSO will complete a "Marine Mammal Sighting Form". The PSO will record the following information:

- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Location and distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Estimated amount of time that the animals remained in the Level B zone;
- Time and description of most recent project activity prior to marine mammal observation;
- Environmental conditions as they existed during each sighting event, including, but not limited to: Beaufort sea state, weather conditions, visibility (km), lighting conditions;

[3] There may be several monitoring periods within a day. If environmental conditions change throughout the day, the PSO should record a new monitoring period to reflect those changes. A new monitoring period would also begin after each break in construction activity.

- Description of implementation of mitigation measures within each monitoring period (e.g., shutdown or delay);
- Other human activity in the area within each monitoring period; and
- A summary of the following:
    - Total number of individuals of each species detected within the Level A zone and the average amount of time that they remained in that zone.

3.3.4 Interim monthly reports

During construction, DPD will submit brief, monthly reports to the NMFS Alaska Region Protected Resources Division that summarize PSO observations and recorded takes. Monthly reporting will allow NMFS to track the amount of take (including extrapolated takes), to allow reinitiation of consultation in a timely manner, if necessary. The monthly reports will be submitted by email to a NMFS representative.

The reporting period for each monthly PSO report will be the entire calendar month, and reports will be submitted by close of business on the fifth day of the month following the end of the reporting period (e.g., the monthly report covering September 1–30, 2019, would be submitted to the NMFS by close of business on October 5, 2019).

3.3.5 Final report

DPD will submit a draft final report by email to NMFS OPR (name to be determined) and NMFS AKR Protected Resources Division (name to be determined) not later than 90 days following the end of construction activities. DPD will provide a final report within 30 days following resolution of NMFS's comments on the draft report. If no comments are received from NMFS within 30 days, the draft final report will be considered the final report.

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

- Summary of construction activities, including beginning and completion dates;
- Description of any deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Table summarizing all marine mammal sightings during the construction period including:
    a. dates, times, species, number, location, and behavior of any observed ESA-listed marine mammals, including all observed humpback whales and Steller sea lions;
    b. daily average number of individuals of each species (differentiated by month as appropriate) detected within the Level A and Level B zones, and estimated as taken, if appropriate;
- Number of shut-downs throughout all monitoring activities;
- Table summarizing any incidents resulting in take of ESA-listed species;
- Brief description of any impediments to obtaining reliable observations during construction period;
- Description of any impediments to complying with these mitigation measures; and
- Appendices containing all PSO daily logs and marine mammal sighting forms.

3.3.6 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, DPD shall immediately cease the specified activities and report the incident to NMFS OPR, the NMFS Alaska Region Protected Resources Division, and the NOAA Fisheries statewide 24-hour Stranding Hotline (877) 925-7773.

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

In the event that DPD 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), DPD will immediately report the incident to the 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 reviews the circumstances of the incident. NMFS will work with DPD to determine whether additional mitigation measures or modifications to the activities are appropriate.

In the event that DPD 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), DPD must report the incident to the NMFS OPR and the NMFS Alaska Regional Stranding Coordinator or Hotline within 24 hours of the discovery. DPD will provide photographs, video footage (if available), or other documentation of the stranded animal sighting to NMFS.

3.4 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:

- Not approach within 100 yards of a humpback whale, or cause a vessel or other object to approach within 100 yards of a humpback whale,
- Not place vessel in the path of oncoming humpback whales causing them to surface within 100 yards of vessel,
- 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 (see 33 CFR § 83.06)).

Vessels will also 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 boats and shore; and putting engines in neutral if approached by a whale or other marine mammal to allow the animals(s) to pass.

Appendix A.
Marine Mammal Sighting Forms

Project Name:											**Observer:**	**Date:**
Site Location:	**Time Survey Initiated:**											
	Time Survey Completed:										**Page ____ of ____ Pages**	
Event Number	**Time/Duration (start/end time if continuous)**	**Dist/dir to animal (from observer)**	**Construction Activity Type**	**Cloud Cover**	**Precip.**	**Sea State**	**Species**	**Number**	**Behavior**	**Level B Take?* (Y/N)**	**Notes**	

Cloud Cover: 1=clear (<10% cover); 2=Partly Cloudy (10-50% cloud cover); 3=Cloudy (51=90% cloud cover); 4=Overcast >90% cover

Precipitation Codes: 0=None; 1=Light Rain; 2=Heavy Rain; 3=Hail; 4=Fog; 5=Sleet or snow; 6=Other

*** Record a Level B Take only if pile driving is actively occurring at the time of observation. If observations occur during the pre- or post-clearance periods, do not record as Level B take.**

Data Codes

Species Code

Minke Whale = **MW**
Humpback Whale = **HW**
Gray Whale = GW
Killer Whale = KW
Pacific White-Sided Dolphin = PWD
Dall's Porpoise = DP
Harbor Porpoise = HP
Harbor Seal = HS
Steller Sea Lion = SSL
Sea Otter = SO
Unidentified Phocid = PH
Unidentified Pinniped = UP
Unidentified Whale = UW
Other = O

Age Classifications

Unknown Age = UA
Adults
Juveniles
Calves/Pups

Sex

Female = F
Male = M
Mixed
Unknown = U

Construction Activity Type

No Activity
Soft Start = SS
Impact Pile Driving = I
Vibratory Pile Driving = V
Socketed Pile Driving = S
Anchoring = A
Shutdown = SD

Behavior

Dive = DV
Travelling = TR
Mating Suspected = MS
Milling = MI
Resting = RE
Feeding = FE
Breeching = BR
Tail Slap = TS
Enter Water = EN
Exit Water = EX
Hauled Out = HO
Look = LO
Direction Change = DC
Increased Swimming Rate = IS
Surface Active = SA

Beaufort Sea State Number	Observed Sea Surface Condition	Sailor's Term	Effects on Land	Typical Wind Speed (MPH)
0	Mirror smooth and glassy surface	Calm	Calm; smoke rises straight up.	0
1	Small ripples or capillary waves on glassy surface.	Light Air	Smoke drifts with wind direction.	1 - 3
2	Larger ripples or wavelets on glassy surface.	Light Breeze	Leaves begin to rustle; wind felt on face.	4 - 7
3	Wavelets of irregular direction and shape; a few crests break on glassy surface.	Gentle Breeze	Small flags extend; leaves in constant motion.	8 - 12
4	Small chop, defined direction; numerous whitecaps.	Moderate Breeze	Dust, leaves & loose paper move.	13 - 18
5	Heavy chop; many white foaming crests; some spray.	Fresh Breeze	Small trees begin to sway.	19 - 24
6	Larger surface waves form; whitecaps everywhere; more spray.	Strong Breeze	Large branches move; whistling heard in wires.	25 - 31
7	Sea heaps up; white foam starts to blow in streaks along direction of wind; spindrift forms.	Moderate Gale	Resistance strong when walking.	32 - 38
8	Moderately high waves, crests begin to break into spindrift; well marked streaks of foam.	Gale	Twigs and small branches broken off trees.	39 - 46
9	High waves, sea begins to roll; spray begins to reduce visibility; dense streaks of foam.	Strong Gale	Structural damage occurs esp. to roofs.	47 - 54
10	Sea mostly covered in white foam; visibility reduced; exceptionally large waves.	Storm	Trees uprooted; considerable structural damage.	55 - 63