Application for Marine Mammal Protection Act Incidental Harassment Authorization

Metlakatla Seaplane Facility Refurbishment Project

State Project #: SFAPT00270

Submitted to:
National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway
Silver Spring, Maryland 20910-3226

November 2020 (Revised)

Prepared for:
Alaska Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801

Prepared by:
HDR
2525 C Street, Suite 500
Anchorage, AK 99503

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Acronyms and Abbreviations

ADF&G	Alaska Department of Fish and Game
CI	confidence interval
dB	decibels
dBA	A-weighted decibels
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	Distinct Population Segment
DTH	down-the-hole
eDPS	eastern Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FR	*Federal Register*
Hz	Hertz
IHA	Incidental Harassment Authorization
kHz	kilohertz
LOA	Letter of Authorization
MIC	Metlakatla Indian Community
µPa	microPascals
MMO	Marine Mammal Observer
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
Pa	Pascals
PTS	permanent threshold shift
rms	root mean square
SEL	sound exposure level
SEL_{cum}	cumulative Single Strike Equivalent
SPL	sound pressure level
SSL	sound source level
TL	transmission loss
TTS	temporary threshold shift
wDPS	western Distinct Population Segment

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1 DESCRIPTION OF SPECIFIED ACTIVITY

1.1 Introduction

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Alaska Division of the Federal Aviation Administration, is proposing maintenance improvements to the existing Metlakatla Seaplane Facility as part of the Metlakatla Seaplane Facility Refurbishment Project (Project). The in-water portion of the Project includes removal of 11 existing steel piles and installation of 6 permanent steel piles to support replacement of the floating dock structure. Four temporary steel piles will be installed to support permanent pile installation and will be removed following completion of permanent pile installation. In addition, above-water construction will include repairs to the vehicle gangway and installation of electrical lighting system for the approach and the new floating dock.

The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) regulations governing the issuance of Incidental Harassment Authorizations (IHAs) and Letters of Authorization (LOAs) permitting the incidental take of marine mammals under certain circumstances are codified in 50 Code of Federal Regulations Part 216, Subpart I (Sections 216.101–216.108). The Marine Mammal Protection Act (MMPA) defines “take” to mean “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 United States Code Chapter 31, Section 1362(13)). Section 216.104 sets out 14 specific items that must be addressed in requests for rulemaking and renewal of regulations pursuant to Section 101(a)(5) of the MMPA. The 14 items are addressed in Sections 1 through 14 of this application for an IHA and include the following:

1. Description of Specified Activity
2. Dates, Duration, and Geographical Region of Activities
3. Species and Abundance of Marine Mammals
4. Affected Species Status and Distribution
5. Type of Incidental Take Authorization Requested
6. Take Estimates for Marine Mammals
7. Description of Potential Impacts on Marine Mammals
8. Description of Potential Impacts on Subsistence Uses
9. Description of Potential Impacts on Marine Mammal Habitat
10. Description of Potential Impacts from Loss or Modification of Habitat on Marine Mammals
11. Mitigation Measures
12. Measures to Reduce Impacts on Subsistence Users
13. Monitoring and Reporting
14. Suggested Means of Coordination

This application was prepared on behalf of the DOT&PF by HDR, Inc.

1.2 Project Purpose and Need

Metlakatla is located approximately 24 kilometers (15 miles) south of Ketchikan, in Southeast Alaska (Figure 1-1). The Metlakatla Seaplane Facility is centrally located in the village of Metlakatla on the south shore of Port Chester (Figure 1-2). The existing facility has experienced deterioration in recent years and DOT&PF has conducted several repair projects. The facility is near the end of its useful life, and replacement of all the existing float structures is required to continue safe operation in the future.

The following project description and engineering plan drawings (see Appendix A) are preliminary and may change as engineering and design progress. Actual numbers and sizes of piles, installation times, numbers of impact strikes, and other design and construction details and methods may vary slightly from the estimates outlined in this document. Descriptions of design and construction in this document are as accurate as possible at this stage of the Project, but may vary slightly as construction advances. It is not anticipated that the Project will change such that potential impacts to marine mammals will change from those described below. If substantial changes occur, the DOT&PF will inform NMFS of those changes.

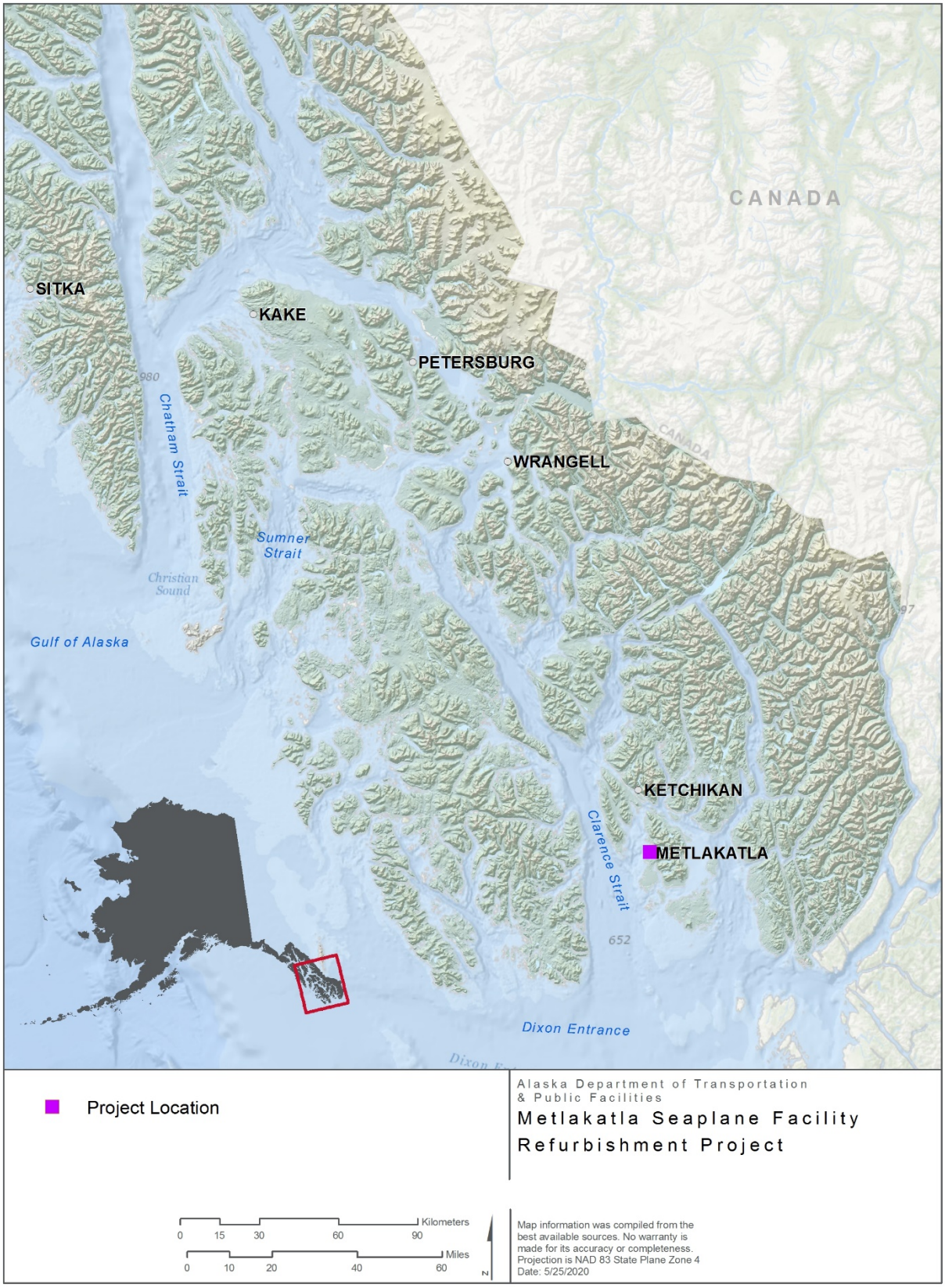

Figure 1-1. Site Location and Vicinity

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Figure 1-2. Location of Seaplane Facility in Metlakatla, Alaska

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1.3 Project Activities

Proposed activities included as part of the Project with potential to affect marine mammals include the noise generated by vibratory removal of steel pipe piles, down-the-hole (DTH) pile installation, and vibratory and impact installation of steel pipe piles. Such in-water activities could result in harassment to marine mammals as defined under the MMPA of 1972, as amended in 2007 (16 United States Code 31). The proposed pile installation and removal is described in detail in the following section.

In this IHA application, the units of measure reported for construction activities are U.S. customary units, which are typically used in construction. Units of measure for scientific information, including acoustics, are metric. When appropriate, units are reported as both U.S. customary and metric.

1.3.1 Pile Removal and Installation

The Project will involve the removal of 11 existing steel pipe piles (16-inch-diameter) that support the existing multiple-float structure. The multiple-float timber structure, which covers 8,600 square feet, will also be removed. A new 4,800-square-foot single-float timber structure will be installed in the same general location. Six 24-inch-diameter steel pipe piles will be installed to act as restraints for the new seaplane float. Four piles will be installed vertically (plumb), and 2 will be installed at an angle (battered). In addition, 4 temporary 24-inch steel piles will be installed to support pile installation and removed following completion of construction.

DTH pile installation involves drilling rock sockets into the bedrock to support installation of the six permanent piles and four temporary piles. Rock sockets consist of inserting the pile in a drilled hole into the underlying bedrock after the pile has been driven through the overlying softer sediments to refusal by vibratory or impact methods. The pile is advanced farther into this drilled hole to properly secure the bottom portion of the pile into the rock. The depth of the rock socket varies, but 10–15 feet is commonly required. The diameter of the rock socket is slightly larger than the pile being driven. Rock sockets are constructed using a DTH device with both rotary and percussion-type actions. Each device consists of a drill bit that drills through the bedrock using both rotary and pulse impact mechanisms. This breaks up the rock to allow removal of the fragments and insertion of the pile. The pile is usually advanced at the same time that drilling occurs. Drill cuttings are expelled from the top of the pile using compressed air. It is estimated that drilling rock sockets into the bedrock will take about 1–3 hours per pile.

Tension anchors will be installed in each of the six permanent piles. Tension anchors are installed within piles that are drilled into the bedrock below the elevation of the pile tip after the pile has been driven through the sediment layer to refusal. A 6- or 8-inch-diameter steel pipe casing will be inserted inside the larger diameter production pile. A rock drill will be inserted into the casing, and a 6- to 8-inch-diameter hole will be drilled into bedrock with rotary and percussion drilling methods. The drilling work is contained within the steel pile casing and the steel pipe pile. The typical depth of the drilled hole varies, but 20–30 feet is common. Rock fragments will be removed through the top of the casing with compressed air. A steel rod will then be grouted into the drilled hole and affixed to the top of the pile. The purpose of a tension anchor is to secure the pile to the bedrock to withstand uplift forces. It is estimated that tension anchor installation will take about 1–2 hours per pile. Table 1-1 indicates the expected number and locations where tension anchors are required. Figure 1-3 depicts a schematic of DTH pile installation and tension anchor installation techniques. Current NMFS guidance (B. Laws, personal communication, 22 July 2020) recommends that the noise generated from tension

anchor installation be treated in the same manner as the noise from DTH pile installation (see Section 6.3.2). Throughout this document, DTH pile installation generally refers to both rock socket drilling and tension anchor installation, unless specified.

Pile removal will be conducted using a vibratory hammer. Pile installation will be conducted using both a vibratory and impact hammer and DTH pile installation methods. Piles will be advanced to refusal using a vibratory hammer. After DTH pile installation, the final approximately 10 feet of driving will be conducted using an impact hammer so that the structural capacity of the pile embedment can be verified. The pile installation methods used will depend on sediment depth and conditions at each pile location. Pile installation and removal will occur in waters approximately 6–7 meters (20–23 feet) in depth. Plan drawings of all Project components are provided in Appendix A.

Table 1-1. Numbers and Types of Piles to be Installed and Removed

Pile Diameter and Type	Number of Piles	Rock Sockets	Tension Anchors	Impact Strikes per Pile (duration in minutes)	Vibratory Duration per Pile (minutes)	DTH Pile Installation (Rock Socket) Duration per Pile (minutes)	DTH Pile Installation (Tension Anchor) Duration per Pile (minutes)	Total Duration of Activity per Pile (hours)	Production Rate Piles per Day (Range)	Days of Installation or Removal
Pile Installation										
24" Steel Plumb Piles (Permanent)	4	4	4	20 (15)	15	180	120	5.5	0.5 (0-1)	8
24" Steel Batter Piles (Permanent)	2	2	2	20 (15)	15	90	120	4	0.5 (0-1)	4
24" Steel Piles (Temporary)	4	4	0	20 (15)	15	60	N/A	1.5	2 (1-3)	2
Pile Removal										
16" Steel Piles	11	N/A	N/A	N/A	30	N/A	N/A	0.5	3 (2-4)	4
24" Steel Piles (Temporary)	4	N/A	N/A	N/A	30	N/A	N/A	0.5	3 (2-4)	2
TOTALS	**21**	**10**	**6**	N/A	N/A	N/A	N/A	N/A	N/A	**20**

Note: DTH = down-the-hole; N/A = not applicable

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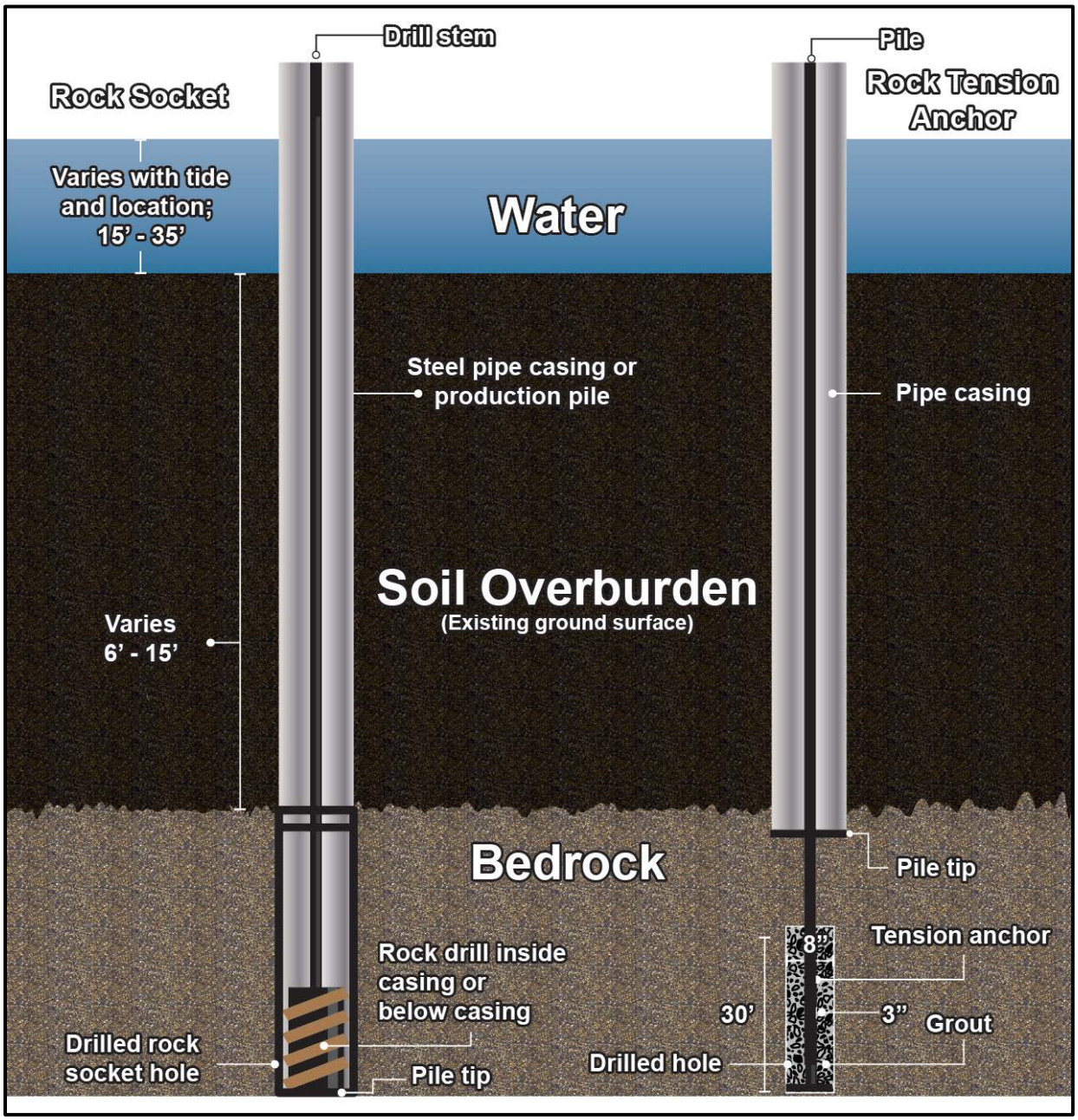

Figure 1-3. Schematic of DTH Pile Installation Method and Tension Anchor Installation

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1.3.2 Above-water Activities

The facility approach structure and 100-foot-long vehicle gangway will remain in place and undergo minor repairs. An electrical lighting system will be installed on the approach and seaplane float.

1.4 Applicable Permits/Authorizations

The following permits/authorizations are applicable to in-water work addressed by this application:

- United States Army Corps of Engineers Section 10 of the Rivers and Harbors Act of 1899
- Section 404 of the Clean Water Act
- Section 401 of the Clean Water Act
- NMFS Endangered Species Act (ESA) Section 7 Consultation
- MMPA
- Magnuson-Stephens Fishery Conservation and Management Act

2 DATES, DURATION, AND GEOGRAPHICAL REGION OF ACTIVITIES

2.1 Dates and Durations of Activities

Construction of the Project is anticipated to occur over approximately 2 months beginning in fall 2021. Pile installation and removal will be intermittent during this period, depending on weather, construction and mechanical delays, protected species shutdowns, and other potential delays and logistical constraints. Pile installation will occur intermittently during the work period, for durations of minutes to hours at a time. Pile installation and removal will occur over 20 non-consecutive days within the 2-month construction window. To account for potential Project delays, the IHA is requested for 1 year, from 01 August 2021 through 31 July 2022.

2.2 Geographical Setting

The Project site is located within Section 5, Township 78 South, Range 92 East of the Copper River Meridian; United States Geological Survey Quad Map Ketchikan A-5; Latitude 55° 7' 50.30" North, 131° 34' 28.08" West. The Project site is located in the community of Metlakatla, on Annette Island, in the Prince of Whales-Hyder Census Area of Southeast Alaska.

2.2.1 Physical Environment

Port Chester is a bay located on the east shore of Nichols Passage and on the west side of Annette Island. Port Chester contains numerous small islands and reefs. The bay is one of many that lead to a larger system of glacial fjords connecting various channels with the open ocean via Nichol's Passage, Clarence Strait, and Dixon Entrance. Port Chester is generally characterized by semidiurnal tides with mean tidal ranges of more than 5 meters (16 feet). Freshwater inputs to Port Chester originate from Trout Lake, Melanson Lake, Chester Lake, and

other minor drainages from Annette Island. Three anadromous streams terminate in Port Chester: Hemlock Creek, Trout Lake Creek, and an unnamed creek that originates from Melanson Lake (Giefer and Blossom 2020). The bathymetry of the bay is variable depending on location and proximity to shore, islands, or rocks. Depths approach 350 to 400 feet on the west side of the bay near Nichols Passage. Nichols Passage is a wide and deep channel that runs between Gravina Island and Annette Island. Depths can exceed 1,000 feet towards the south end of the channel.

2.2.2 Acoustic Environment

Ongoing vessel activities in Nichols Passage and Port Chester, as well as land-based industrial and commercial activities, result in elevated in-air and underwater sound conditions in the Project area that likely increase with proximity to the Project site. Background sound levels likely vary seasonally, with elevated levels during summer when the tourism and fishing industries are at their peaks. Tour vessels routinely transit Nichols Passage from Ketchikan towards Dixon Entrance, and Nichols Passage is a main access route for large cruise ships and ferry vessels accessing Ketchikan.

3 SPECIES AND ABUNDANCE OF MARINE MAMMALS

The following eight species could occur within the Project area: Steller sea lion (*Eumetopias jubatus*), harbor seal (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), killer whale (*Orcinus orca*), humpback whale (*Megaptera novaeangliae*), and minke whale (*Balaenoptera acutorostrata*; Table 3-1). The Alaska Protected Resources Division of NMFS provides an online interactive mapping tool to identify species protected by the MMPA based on broadly generalized species ranges (NOAA 2018). This tool identified the eight species listed above, as well as gray whales (*Eschrichtius robustus*) and fin whales (*Balaenoptera physalus*). In addition, sperm whales (*Physeter macrocephalus*), which usually are restricted to deep waters of the continental slope in the Gulf of Alaska, have occurred in northern Southeast Alaska in recent years. However, it is highly unlikely that these three species will occur in the project area; recent NMFS IHAs for activities near Metlakatla have not included these species, and therefore they are not discussed further in this document. Each of the marine mammal species that may occur in the Project area is discussed in more detail in Section 4.

When available, peer-reviewed scientific publications are used to quantitatively estimate marine mammal abundance in the Project area. However, scientific surveys and resulting data such as population estimates, densities, and other quantitative information are lacking for most marine mammal populations and most areas of Southeast Alaska. Therefore, qualitative information was gathered from discussions with knowledgeable local people in the Metlakatla community, including biologists, the harbormaster, a tour operator, and other individuals familiar with marine mammals in the Project area. Throughout the following sections, the anecdotal reports refer to information obtained from discussions with these individuals. People who were interviewed include:

- Dustin R. Winter – Director, Department of Fish and Wildlife, Metlakatla Indian Community (MIC)
- Richard G. Cook – Fisheries Biologist, MIC
- Lee Bethel – Captain, Allen Marine Tours
- Representative of Silver Bay Seafoods, Metlakatla

A description of each species and its presence in the Project area is provided in Section 4.

Table 3-1. Marine Mammals Known to Occur in or near the Project Area

Species	Abundance (Population/Stock)	MMPA Designation	ESA Listing	Occurrence in Project Area
Steller sea lion	41,638 (Eastern DPS)	Protected	None	Common
Harbor seal	31,634 (Clarence Strait Stock)	Protected	None	Common
Harbor porpoise	975 (Southeast Alaska inland waters)	Strategic	None	Rare
Dall's porpoise	83,400 (Alaska)	Protected	None	Rare
Pacific white-sided dolphin	26,880 (North Pacific stock)	Protected	None	Rare
Killer whale (Orca)	2,347 (Eastern North Pacific Alaska Resident)	Protected	None	Rare
	261 (Northern Resident)	Protected	None	Rare
	243 (West Coast Transient)	Protected	None	Rare
Gray whale	20,990 (Eastern North Pacific)	Protected	None	Unlikely[a]
Fin whale	2,554 (Northeast Pacific)	Depleted & Strategic	Endangered	Unlikely[a]
Sperm whale	244 (North Pacific)	Depleted & Strategic	Endangered	Unlikely[a]
Humpback whale (Central North Pacific Stock)	11,571 (Hawaii DPS)	Depleted & Strategic	None	Common
	2,806 (Mexico DPS)	Depleted & Strategic	Threatened	Rare
Minke whale	Unknown (Alaska)	Protected	None	Rare

Sources: Humpback whale abundance estimates: Wade 2017. Gray whale abundance estimate: Carretta et al. 2018. All other abundance estimates: Muto et al. 2018, 2019.

Note: DPS = Distinct Population Segment; ESA = Endangered Species Act; MMPA = Marine Mammal Protection Act.

[a] Excluded from further discussion in this IHA Application.

4 AFFECTED SPECIES STATUS AND DISTRIBUTION

4.1 Steller Sea Lion

4.1.1 Status and Distribution

Steller sea lions are found throughout the northern Pacific Ocean, including coastal and inland waters from Russia (Kuril Islands and the Sea of Okhotsk), east to Alaska, and south to central California (Año Nuevo Island). Steller sea lions were listed as threatened range-wide under the ESA on November 26, 1990 (55 *Federal Register* [FR] 49204); they were subsequently partitioned into the western and eastern Distinct Population Segments (wDPS and eDPS, respectively) in 1997 (Allen and Angliss 2010). The eDPS remained classified as threatened (62 FR 24345) until it was delisted in November 2013, while the wDPS (those individuals west of 144° W longitude or Cape Suckling, Alaska) was upgraded to endangered status following separation of the stocks, and it remains listed as endangered.

The majority of Steller sea lions that inhabit Southeast Alaska are part of the eDPS; however, branded individuals from the wDPS make regular movements across the 144° longitude boundary to the northern "mixing zone" haulouts and rookeries within southeast Alaska (Jemison et al. 2013). While haulouts and rookeries in the northern portion of Southeast Alaska may be important areas for wDPS animals, there continues to be little evidence that their regular range extends to the southern haulouts and rookeries in Southeast Alaska (Jemison et al. 2018). Further, wDPS use of southern Southeast Alaska haulouts and rookeries also appears to be limited to the outer coast, with very few wDPS animals entering into the "South Inside" region documented in Hastings et al. (2020). NMFS Protected Resources Division policy is that wDPS individuals are not typically found south of Sumner Strait (D. Gann, personal communication, July 10, 2020; NMFS 2020). Therefore, it is likely that only eDPS Steller sea lions are present as far south as the project area.

The current minimum abundance estimate for the eDPS of Steller sea lions is 41,638 individuals (Muto et al. 2019). NMFS estimates that the eDPS stock increased in population at a rate of 4.76 percent per year between 1989 and 2015 based on pup counts in Southeast Alaska, British Columbia, Oregon, and California (Muto et al. 2019).

4.1.2 Presence in Project Area

Steller sea lions are common within the Project area; however, systematic counts or surveys have not been completed in the area directly surrounding Metlakatla. Three haulouts are located within 150 kilometers (93 miles) of the Project area (Fritz et al. 2016a; Figure 4-1); the nearest documented haulout is West Rock, about 45 kilometers (28 miles) south of Metlakatla. West Rock had a count of 703 individuals during a June 2017 survey and 1,101 individuals during a June 2019 survey (Sweeney et al. 2017, 2019). Aerial surveys occurred intermittently between 1994 and 2015, and averaged 982 adult Steller sea lions (Fritz et al. 2016b). Anecdotal evidence provided by local captains and biologists indicate that 3 to 4 Steller sea lions utilize a buoy as a haulout near the entrance of Port Chester, about 3.2 kilometers (2 miles) from the Project location (L. Bethel, personal communication, June 11, 2020). Steller sea lions are not known to congregate near the cannery in Metlakatla. NMFS estimated that one group of 10 Steller sea lions could be present in Tongass Narrows (approximately 20 kilometers north of Metlakatla) each day, and double that rate during herring and salmon runs in March through May and July through September (85 FR 673). The local contacts in Metlakatla indicated that the species assemblages and abundance in Metlakatla are similar to Tongass Narrows.

4.1.3 Life History

Steller sea lions are opportunistic predators, feeding primarily on a wide variety of fishes and cephalopods, including Pacific herring (*Clupea pallasi*), walleye pollock (*Gadus chalcogramma*), capelin (*Mallotus villosus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific cod (*Gadus macrocephalus*), salmon (*Oncorhynchus* spp.), and squid (*Teuthida* spp.; Jefferson et al. 2008; Wynne et al. 2011). Steller sea lions do not generally eat every day, but tend to forage every 1–2 days and return to haulouts to rest between foraging trips (Merrick and Loughlin 1997; Rehberg et al. 2009).

4.1.4 Hearing Ability

Steller sea lions' hearing ability is comparable to that of other otariids. Steller sea lions use both in-air and underwater vocalizations during mating, competition for territory, and rearing of pups (Kastelein et al. 2005). Steller sea lion in-air hearing ability ranges from approximately 0.25 to 30 kilohertz (kHz); however, empirical studies have shown that the hearing of one individual was found to be most sensitive from 5 to 14.1 kHz. Underwater, Steller sea lions' most sensitive hearing range has been measured from 1 to 16 kHz in males and at 25 kHz in females (Muslow and Reichmuth 2010).

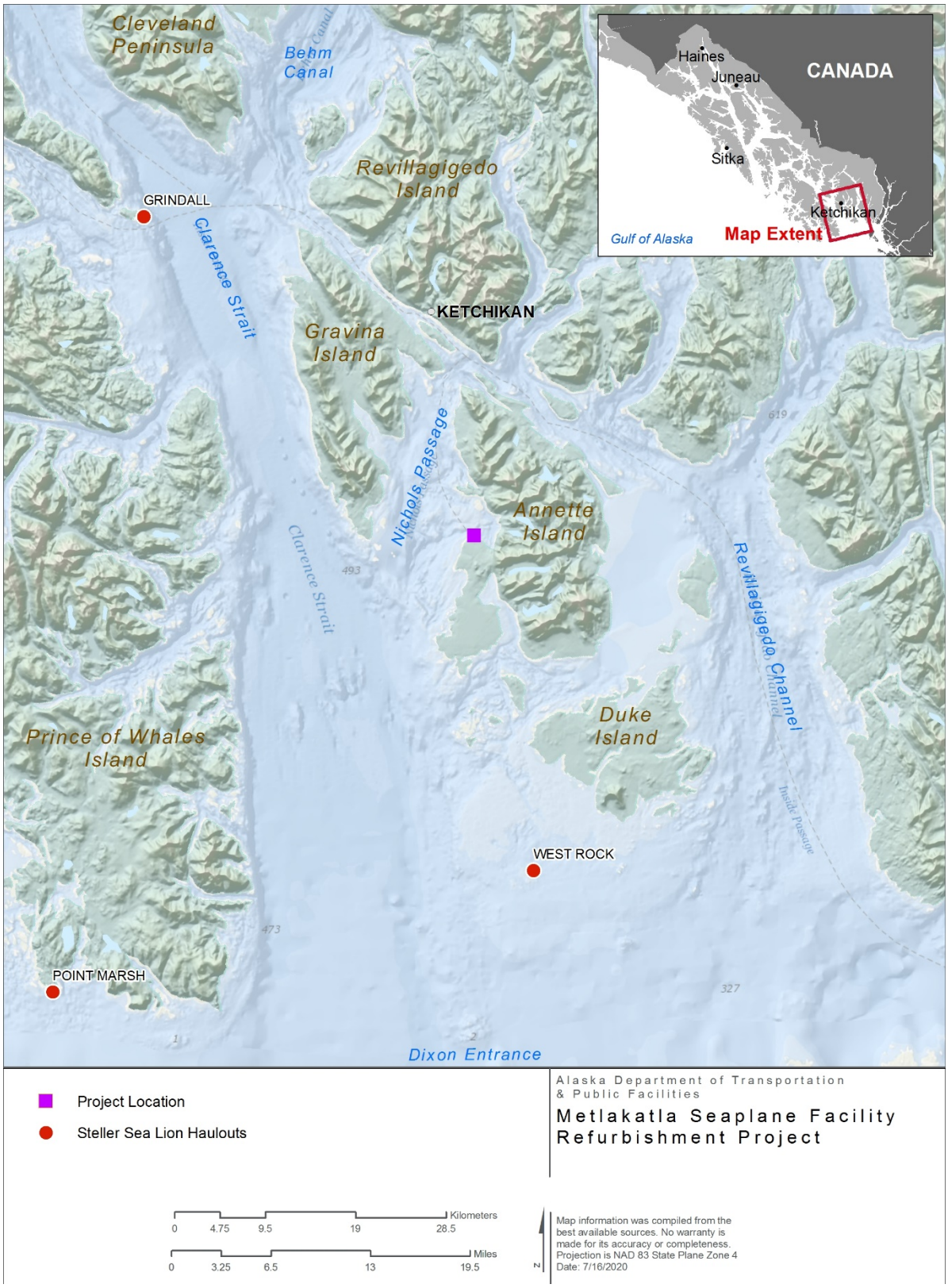

Figure 4-1. Steller Sea Lion Haulouts Located Nearest to the Project Area

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4.2 Harbor Seal

4.2.1 Status and Distribution

Harbor seals range from Baja California north along the west coasts of California, Oregon, Washington, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands. In 2010, harbor seals in Alaska were partitioned into 12 separate stocks based largely on genetic structure (Allen and Angliss 2010). Harbor seals are not designated as strategic or depleted under the MMPA and are not listed under the ESA, but like all other marine mammals, they are protected under the MMPA. The status of all 12 stocks of harbor seals identified in Alaska relative to their optimum sustainable population size is unknown. The current statewide abundance estimate for Alaskan harbor seals is 205,090, based on aerial survey data collected during 1998–2011 (Boveng et al. in press, as cited in Muto et al. 2018).

The Clarence Strait stock of harbor seals is present within the Project area. The most recent population estimate for this stock is 31,634 individuals (Muto et al. 2019). No other stocks of harbor seals are present in the Project area, so only the Clarence Strait stock is considered in this application.

4.2.2 Presence in Project Area

Harbor seals are commonly sighted in the waters of the inside passages throughout Southeast Alaska. Surveys in 2015 estimated 429 (95% Confidence Interval [CI]: 102–1,203) harbor seals on the northwest coast of Annettte Island, between Metlakatla and Walden Point. An additional 90 (95% CI: 18–292) were observed along the southwest coast of Annette Island, between Metlakatla and Tamgas Harbor (NOAA 2019). The Alaska Fisheries Science Center identifies three haulouts in Port Chester and three additional haulouts north of Driest Point (Figure 4-2). Abundance estimates for these haulouts are not available, but they are all denoted as having had more than 50 harbor seals at one point in time (NOAA 2020). However, local biologists report only small numbers (fewer than 10) of harbor seals are regularly observed in Port Chester. As many as 10 to 15 harbor seals may utilize Sylburn Harbor, located 6 kilometers (3.7 miles) north of Metlakatla across Driest Point (R. Cook, personal communication, date), as a haulout location. NMFS estimated that two groups of three harbor seals would be present in nearby Tongass Narrows every day (85 FR 673). Harbor seals are known to be curious and may approach novel activity, so it is possible some may enter the Project area during pile installation and removal.

4.2.3 Life History

Harbor seals forage on fish and invertebrates (Orr et al. 2004), including capelin, eulachon (*Thaleichthys pacificus*), cod, pollock, flatfish, shrimp, octopus, and squid (Wynne 2012). They are opportunistic feeders that forage in marine, estuarine, and occasionally freshwater habitat, adjusting their foraging behavior to take advantage of prey that are locally and seasonally abundant (Payne and Selzer 1989). Depending on prey availability, research has demonstrated that harbor seals conduct both shallow and deep dives while foraging (Tollit et al. 1997). Harbor seals usually give birth to a single pup between May and mid-July; birthing locations are dispersed over several haulout sites and not confined to major rookeries (Klinkhart et al. 2008). Harbor seals haul out on rocks, reefs, beaches, and drifting glacial ice. They are non-migratory; their local movements are associated with tides, weather, season, food availability, and reproduction, as well as sex and age class (Boveng et al. 2012; Lowry et al. 2001; Swain et al. 1996).

4.2.4 Hearing Ability

In general, phocids have a functional hearing range between approximately 50 Hertz (Hz) and 86 kHz, although it is most acute below 60 kHz (Møhl 1968). Harbor seals produce social calls at 0.5 to 3.5 kHz and clicks from 8 to 150 kHz (Richardson et al. 1995). Recent research by Kastelein et al. (2018) suggests that harbor seals may experience a temporary threshold shift (TTS) when exposed to broadband pile-driving noise, but that hearing is recovered within 60 minutes post-exposure.

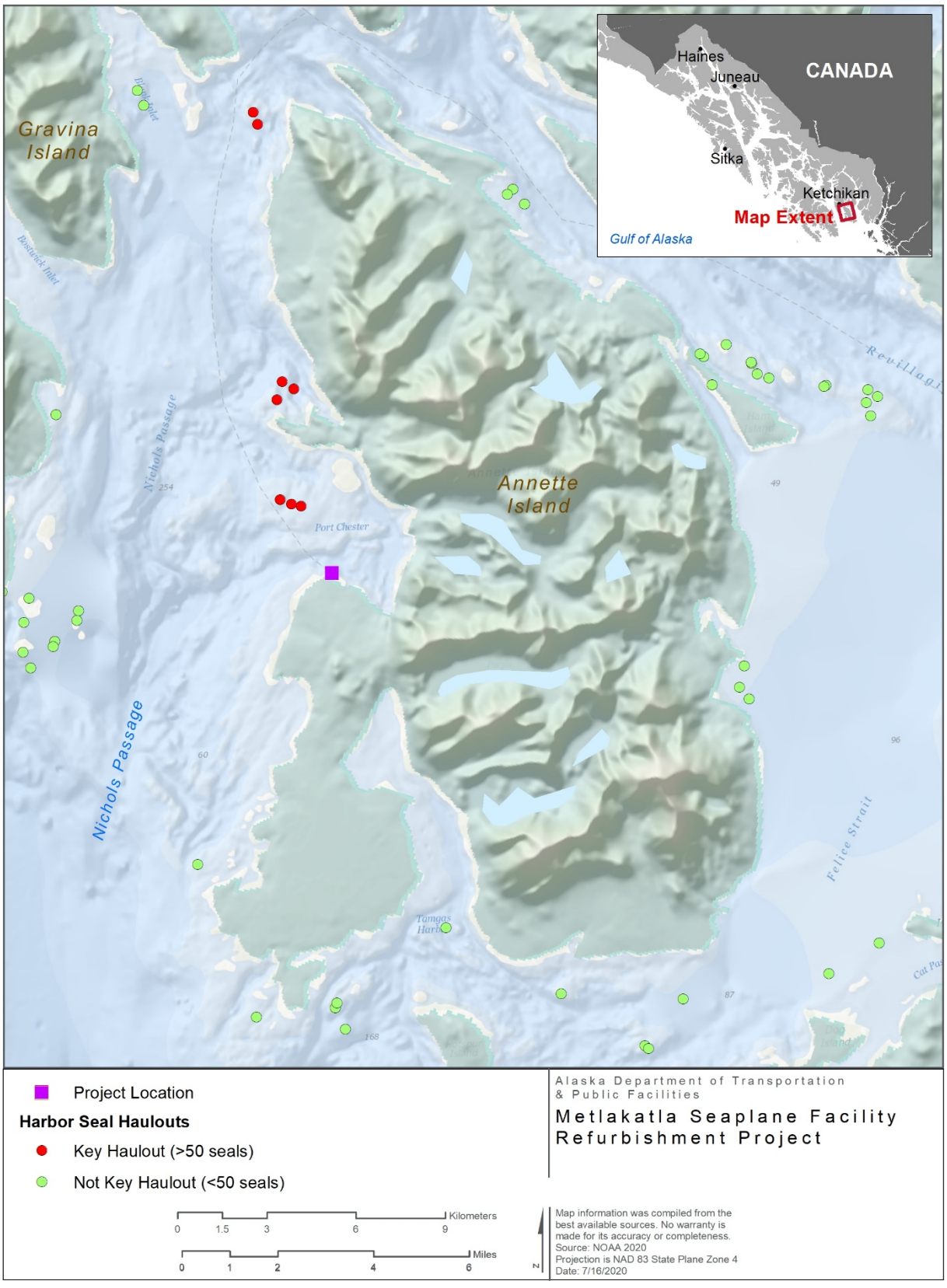

Figure 4-2. Known Harbor Seal Haulouts Located Nearest to the Project Area

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4.3 Harbor Porpoise

4.3.1 Status and Distribution

In the eastern North Pacific Ocean, the harbor porpoise ranges from Point Barrow, along the Alaska coast, and down the west coast of North America to Point Conception, California. In Alaska, harbor porpoises are currently divided into three stocks, based primarily on geography: the Bering Sea stock, the Southeast Alaska stock, and the Gulf of Alaska stock. The Southeast Alaska stock ranges from Cape Suckling to the Canada boundary (Muto et al. 2018). Only the Southeast Alaska stock is considered in this application because the other stocks occur outside the geographic area under consideration. Harbor porpoises frequent primarily coastal waters in Southeast Alaska (Dahlheim et al. 2009) and occur most frequently in waters less than 100 meters deep (Hobbs and Waite 2010).

Harbor porpoises are neither designated as depleted under the MMPA nor listed under the ESA, but the Southeast Alaska stock is denoted as "strategic" under the MMPA. The "strategic" designation indicates that the stock is declining, or that human-caused mortality exceeds the potential biological removal level. The current corrected abundance estimate for harbor porpoises in the Southeast Alaska stock is 11,146 individuals, based on estimates completed in 1997 (Muto et al. 2018). Based on shipboard surveys completed in 2010–2012, the minimum population estimate for the Southeast Alaska stock of harbor porpoise is 897 animals (Muto et al. 2019). No reliable information is available to determine trends in abundance.

4.3.2 Presence in Project Area

Although there have been no systematic studies or observations of harbor porpoises specific to Port Chester or Nichols Passage, there is potential for them to occur within the Project area. Abundance data for harbor porpoises in Southeast Alaska were collected during 18 seasonal surveys spanning 22 years, from 1991 to 2012 (Dahlheim et al. 2015). During that study, a total of 81 harbor porpoises were observed in the southern inland waters of Southeast Alaska, including Clarence Strait. The average density estimate for all survey years in Clarence Strait was 0.02 harbor porpoises per square kilometer. There does not appear to be any seasonal variation in harbor porpoise density for the inland waters of Southeast Alaska (Dahlheim et al. 2015).

Approximately one to two groups of harbor porpoises are observed each week in group sizes of up to 10 animals around Driest Point, located 5 kilometers (3.1 miles) north of the Project location (L. Bethel, personal communication, June 11, 2020). Their small overall size, lack of a visible blow, low dorsal fins and overall low profile, and short surfacing time make harbor porpoises difficult to spot (Dahlheim et al. 2015), likely reducing identification and reporting of this species, and these estimates therefore may be low. Harbor porpoises prefer shallower waters (Dahlheim et al. 2015) and generally are not attracted to areas with elevated levels of vessel activity and noise such as Port Chester. NMFS estimated that two groups of five harbor porpoises per month could be present in nearby Tongass Narrows (85 FR 673).

4.3.3 Life History

Harbor porpoises forage in waters less than 200 meters deep on small pelagic schooling fish such as herring, cod, pollock, octopus, smelt, and bottom-dwelling fish, occasionally feeding on squid and crustaceans (Bjørge and Tolley 2009; Wynne et al. 2011).

Calving occurs from May to August; however, this can vary by region. According to aerial surveys of harbor porpoise abundance in Southeast Alaska conducted in 1991–1993, mean group size was calculated to be 1.2 animals (Dahlheim et al. 2000).

4.3.4 Hearing Ability

Analyses of harbor porpoise echolocation clicks and buzzes have been measured at peak frequencies between 130 and 140 kHz, with a bandwidth of 6–26 kHz (Villadsgaard et al. 2007). Similar to other toothed whales, their hearing sensitivity improves with increasing frequency and is best between 10 and 120 kHz (Au and Hastings 2008). Unlike most odontocetes, harbor porpoises do not produce whistles. Recent data suggest that harbor porpoises communicate using clicks and buzzes that, despite being in the lower end of their frequency range, are of a frequency sufficiently high so as to attenuate very rapidly, thereby not alerting predators at longer distances (Sørensen et al. 2018).

4.4 Dall's Porpoise

4.4.1 Status and Distribution

Dall's porpoises are found throughout the North Pacific, from southern Japan to southern California and north to the Bering Sea. All Dall's porpoises in Alaska are members of the Alaska stock, and those off California, Oregon, and Washington are part of a separate stock. This species can be found in offshore, inshore, and nearshore habitat, but prefers waters more than 183 meters deep (Dahlheim et al. 2009; Jefferson 2009).

Dall's porpoises, like all marine mammals, are protected under the MMPA, but are not listed under the ESA. Insufficient data are available to estimate current population trends, but the species is considered reasonably abundant. The current population estimate for the species is 1.2 million, and the Alaska stock was last estimated at 83,400 individuals in 1993 (Muto et al. 2018).

4.4.2 Presence in Project Area

No systematic studies of Dall's porpoise abundance or distribution have occurred in Port Chester or Nichols Passage; however, Dall's porpoises have been consistently observed in Lynn Canal, Stephens Passage, upper Chatham Strait, Frederick Sound, and Clarence Strait (Dahlheim et al. 2009). The species is generally found in waters in excess of 600 feet (183 meters) deep, which do not occur in Port Chester. Despite generalized water depth preferences, Dall's porpoises may occur in shallower waters. Moran et al. (2018) recently mapped Dall's porpoise distributions in bays, shallow water, and nearshore areas of Prince William Sound, habitats not typically utilized by this species. If Dall's porpoises occur in the Project area, they will likely be present in March or April, given the strong seasonal patterns observed in nearby areas of Southeast Alaska (Dahlheim et al. 2009). Dall's porpoises are seen once a month or less within Port Chester and Nichols Passage in groups of less than 10 animals (L. Bethel, personal communication, June 11, 2020). NMFS estimated that 15 Dall's porpoises per month may be present in nearby Tongass Narrows (85 FR 673).

4.4.3 Life History

Dall's porpoises generally occur in groups of 2 to 20 individuals, but have also been recorded in groups numbering in the hundreds. In Alaska, the average group size ranges from 2.7 to 3.7 individuals (Wade et al. 2003). Common prey include a variety of small, schooling fishes (such as herrings and mackerels) and cephalopods. Dall's porpoises may migrate between inshore

and offshore areas and make latitudinal movements or short seasonal migrations, but these movements are generally not consistent (Jefferson 2009).

4.4.4 Hearing Ability

Similar to other porpoises, Dall's porpoises produce echolocation clicks at high frequencies from 135 to 149 kHz, but can also produce relatively low-frequency communication clicks ranging from 0.04 to 12 kHz (Richardson 1995). Dall's porpoise vocalizations have not been widely studied; however, recent research from wild porpoise recordings showed that echolocation click frequencies were centered between 117 and 141 kHz, with some as high as 198 kHz (Bassett et al. 2009). Spectral banding patterns have also been observed in this species, similar to Risso's and Pacific white-sided dolphins, which may assist with population classification for Dall's porpoises across geographic regions.

4.5 Pacific White-Sided Dolphin

4.5.1 Status and Distribution

Pacific white-sided dolphins are a pelagic species inhabiting temperate waters of the North Pacific Ocean and along the coasts of California, Oregon, Washington, and Alaska (Muto et al. 2018). Despite their distribution mostly in deep, offshore waters, they may also be found over the continental shelf and in nearshore waters, including inland waters of Southeast Alaska (Ferrero and Walker 1996).

Pacific white-sided dolphins are not listed as threatened or endangered under the ESA, but are protected under the MMPA. They are managed as two distinct stocks: the California/Oregon/Washington stock, and the North Pacific stock (north of 45° N, including Alaska).

The most complete population abundance estimate, based on line-transect surveys conducted from 1987 to 1990, is 931,000 animals and most likely reflects a range-wide estimate (Buckland et al. 1993). This estimate does not take into account the two management stocks; thus, according to Muto et al. (2018), a more reasonable estimate for the North Pacific stock is approximately 26,880 individuals. Currently, there is no reliable information on trends in the abundance of Pacific white-sided dolphins.

4.5.2 Presence in Project Area

Scientific studies and data are lacking relative to the presence or abundance of Pacific white-sided dolphins in or near Nichols Passage. Although they generally prefer deeper and more-offshore waters, anecdotal reports suggest that Pacific white-sided dolphins have previously been observed in Nichols Passage, although they have not been observed in Nichols Passage or nearby inter-island waterways for 15 to 20 years. When Pacific white-sided dolphins have been observed, sighting rates were highest in spring and decreased throughout summer and fall (Dahlheim et al 2009).

Most observations of Pacific white-sided dolphins occur off the outer coast or in inland waterways near entrances to the open ocean. According to Muto (2018), aerial surveys in 1997 sighted one group of 164 Pacific white-sided dolphins in Dixon entrance to the south of Metlakatla. Surveys in April and May from 1991 to 1993 identified Pacific white-sided dolphins in Revillagigedo Channel, Behm Canal, and Clarence Strait (Dahlheim and Towell 1994). These areas are contiguous with the open ocean waters of Dixon Entrance. These observational data, combined with anecdotal information, indicate that there is a small potential for Pacific white-

sided dolphins to occur in the Project area. NMFS estimated that one group of 92 Pacific white-sided dolphin may occur in nearby Tongass Narrows over a period of 1 year (85 FR 673).

4.5.3 Life History

Pacific white-sided dolphins prey on squid and small schooling fish such as capelin, sardines, and herring (Morton 2006). They are known to work in groups to herd schools of fish, and can dive underwater for up to 6 minutes to feed (Morton 2006). Group sizes have been reported to range from 40 to over 1,000 animals, but groups of between 10 and 100 individuals (Stacey and Baird 1991) occur most commonly. Seasonal movements of Pacific white-sided dolphins are not well understood, but there is evidence of both north-south seasonal movement (Leatherwood et al. 1984) and inshore-offshore seasonal movement (Stacey and Baird 1991).

4.5.4 Hearing Ability

NMFS classifies Pacific white-sided dolphins as a mid-frequency hearing cetaceans, having hearing sensitivity that is best between 2 kHz and 128 kHz (Tremel et al 1998). They produce echolocation clicks that range in frequency from 20 Hz to more than 100 kHz (Soldevilla et al. 2008) and also produce burst pulses and buzzes (Lammers et al. 2006). However, there is ongoing debate regarding whether Pacific white-sided dolphins produce whistles (Rankin et al 2007).

4.6 Killer Whale

4.6.1 Status and Distribution

Killer whales have been observed in all the world's oceans, but the highest densities occur in colder and more productive waters found at high latitudes (NMFS 2016a). Killer whales occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (NMFS 2016a).

There are three distinct ecotypes, or forms, of killer whales recognized: resident, transient, and offshore. The three ecotypes differ morphologically, ecologically, behaviorally, and genetically. Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized within the Pacific U.S. Exclusive Economic Zone. This application considers only the Eastern North Pacific Alaska Resident stock (Alaska Resident stock), Eastern North Pacific Northern Resident stock (Northern Resident stock), and West Coast Transient stock, because all other stocks occur outside the geographic area under consideration (Muto et al. 2018). None of these three stocks of killer whales are designated as depleted or strategic under the MMPA, or listed as threatened or endangered under the ESA.

The Alaska Resident stock occurs from Southeast Alaska to the Aleutian Islands and Bering Sea. Photo-identification studies between 2005 and 2009 identified 2,347 individuals in this stock, including approximately 121 in Southeast Alaska (Muto et al. 2018). The Northern Resident stock occurs from Washington north through part of Southeast Alaska, and consists of 261 individuals. The West Coast Transient stock occurs from California north through Southeast Alaska. Between 1975 and 2012, surveys identified 521 individual West Coast Transient killer whales. In the most recent stock assessment (Muto et al. 2018), the minimum population for the transient stock is estimated to be 243 individuals. Dahlheim et al. (2009) noted a 5.2 percent annual decline in transient killer whales observed in Southeast Alaska between 1991 and 2007.

Surveys between 1991 and 2007 encountered resident killer whales during all seasons throughout Southeast Alaska. Both residents and transients were common in a variety of

habitats and all major waterways, including protected bays and inlets. There does not appear to be strong seasonal variation in abundance or distribution of killer whales, but there was substantial variability between years during this study (Dahlheim et al. 2009).

4.6.2 Presence in Project Area

No systematic studies of killer whales have been conducted in or around Port Chester. Dahlheim et al. (2009) observed transient killer whales within Lynn Canal, Icy Strait, Stephens Passage, Frederick Sound, and upper Chatham Strait. Anecdotal local information suggests that killer whales are rarely seen within the Port Chester area, but may be present more frequently in Nichols Passage and other areas around Gravina Island (L. Bethel, personal communication, June 11, 2020).

NMFS estimated that one pod of 12 killer whales may be present in nearby Tongass Narrows each month, and two pods of 12 animals during May, June, and July (85 FR 673).

4.6.3 Life History

Transient killer whales hunt and feed primarily on marine mammals, while residents forage primarily on fish. Transient killer whales feed primarily on harbor seals, Dall's porpoises, harbor porpoises, and sea lions. Resident killer whale populations in the eastern North Pacific feed mainly on salmonids, showing a strong preference for Chinook salmon (NMFS 2016a).

Transient killer whales are often found in long-term stable social units (pods) of 1 to 16 whales. Average pod sizes in Southeast Alaska were 6 in spring, 5 in summer, and 4 in fall. Pod sizes of transient whales are generally smaller than those of resident social groups. Resident killer whales occur in pods ranging from 7 to 70 whales that are seen in association with one another more than 50 percent of the time (Dahlheim et al. 2009; NMFS 2016b). In Southeast Alaska, resident killer whale mean pod size was approximately 21.5 in spring, 32.3 in summer, and 19.3 in fall (Dahlheim et al. 2009).

4.6.4 Hearing Ability

Killer whales are categorized as mid-frequency hearing cetaceans, although they hear best at the higher end of that spectrum, between 80 and 120 kHz (Richardson et al. 1995). The ability to hear most acutely in this frequency range is related to their use of high-frequency sound for echolocation. Killer whale vocalizations include clicks and whistles, but are most often high-energy rapid pulsed sounds in the 500-Hz to 25-kHz range, with pulse duration varying between echolocation clicks and other pulsed calls (Ford and Fisher 1982). North Pacific killer whales are known to produce whistles from 1 to 18 kHz (Thomsen et al. 2001).

4.7 Humpback Whale

4.7.1 Status and Distribution

Humpback whales worldwide were designated as endangered under the Endangered Species Conservation Act in 1970, and had been listed as a species under the ESA since its inception in 1973. On 08 September 2016, NMFS published a final decision that changed the status of humpback whales under the ESA (81 FR 62259), effective 11 October 2016. The decision recognized the existence of 14 DPSs based on distinct breeding areas in tropical and temperate waters. Five of the 14 DPSs were classified under the ESA (4 endangered and 1 threatened), while the other 9 DPSs were delisted. Stocks of humpback whales under the MMPA do not directly equate to the DPSs defined under the ESA. The stock delineations of humpback whales under the MMPA are currently under review. NMFS currently considers humpback whales in

Southeast Alaska to be part of the Central North Pacific stock. This stock is designated as strategic and depleted under the MMPA (Muto et al. 2018).

Humpback whales found in the Project area are predominantly members of the Hawaii DPS, which is not listed under the ESA. However, based on a comprehensive photo-identification study, members of the Mexico DPS, which is listed as threatened, are known to occur in Southeast Alaska. Members of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales. Approximately 6.1 percent (or fewer than 1 in every 16) of all humpback whales in Southeast Alaska and northern British Columbia are members of the Mexico DPS, while all others are assumed to be members of the Hawaii DPS (Wade et al. 2016).

Humpback whales experienced large population declines in the early twentieth century due to commercial whaling operations. Johnson and Wolman (1984) estimated the population of humpback whales at approximately 1,200 animals in 1966. The North Pacific population grew to between 6,000 and 8,000 individuals by the mid-1990s.

The population of the Hawaii DPS is currently estimated at 11,571 individuals (CV of 0.042), and the Mexico DPS is estimated at 2,806 individuals (CV of 0.055) (Wade 2017). The population of humpback whales from both the Hawaii and Mexico DPSs that are found in the summer feeding grounds of Southeast Alaska is approximately 6,137 individuals (95% CI = 5,352–7,038; Wade et al. 2016). Current threats to humpback whales include vessel strikes, spills, climate change, and commercial fishing operations (Muto et al. 2018).

In October 2019, NMFS proposed to designate critical habitat for the threatened Mexico DPS, endangered Western North Pacific DPS, and endangered Central America DPS of humpback whales, which would include nearly 175,812 square nautical miles (603,018 square kilometers) of marine habitat within portions of Bristol Bay, the Bering Sea, the Gulf of Alaska, and the California Current Ecosystem (84 FR 54354). This proposed critical habitat designation is based primarily on abundance and availability of prey items, and would include the marine habitat within and surrounding the Project area. Specifically, the Project area would be contained within proposed Unit 10, Southeastern Alaska, which includes 22,152 square nautical miles (75,979 square kilometers) of marine habitat designated as critical habitat for the threatened Mexico DPS (84 FR 54354).

Humpback whales are found throughout Southeast Alaska in a variety of marine environments, including open ocean, nearshore waters, and areas with strong tidal currents (Dahlheim et al. 2009). Humpback whales migrate to Southeast Alaska in spring to feed after months of fasting in equatorial breeding grounds such as Hawaii and Mexico. Peak abundance of humpback whales in Southeast Alaska typically occurs during late summer to early fall. Most humpback whales begin returning to southern breeding grounds in fall or winter. However, due to temporal overlap between whales departing and returning, humpbacks can be found in Alaska feeding grounds in every month of the year (Baker et al. 1985; Straley 1990; Wynne and Witteveen 2009). It is also common for some humpback whales to overwinter in areas of Southeast Alaska. It is thought that those humpbacks that remain in Southeast Alaska do so in response to the availability of winter schools of fish prey, such as herring (Straley 1990). There have been no recent estimates of humpback whale density across the region (84 FR 34134).

4.7.2 Presence in Project Area

No systematic studies have documented humpback whale abundance near Metlakatla. Anecdotal information from Metlakatla and Ketchikan suggest that humpback whales' utilization of the area is intermittent year-round. Their abundance, distribution, and occurrence are

dependent on and fluctuate with fish prey. Local mariners estimate that one to two humpback whales may be present in the Port Chester area on a daily basis during summer months (L. Bethel, personal communication, June 11, 2020). This is consistent with reports from Ketchikan, which suggest that humpback whales occur alone or in groups of two or three individuals and abundance is highest in August and September (84 FR 34134). NMFS estimated that approximately four humpback whales may transit through nearby Tongass Narrows each week (84 FR 34134). However, anecdotal reports suggest that humpback whale abundance is higher and occurrence is more regular in Metlakatla.

4.7.3 Life History

Southeast Alaska is considered a biologically important area for feeding humpback whales between March and May (Ellison et al. 2012). Most humpback whales migrate to other regions during winter to breed, but over-wintering (non-breeding) humpback whales have been noted and may be increasingly common (Straley 1990). In Alaska, humpback whales filter feed on tiny crustaceans, plankton, and small fish such as walleye pollock, Pacific sand lance, herring (*Clupea pallasii*), eulachon (*Thaleichthys pacificus*), and capelin (Witteveen et al. 2012). It is common to observe groups of humpback whales cooperatively bubble feeding. Group sizes in Southeast Alaska generally range from one to four individuals (Dahlheim et al. 2009).

4.7.4 Hearing Ability

Humpbacks are classified in the low-frequency cetacean functional hearing group, able to perceive frequencies between 7 Hz and 35 kHz (Richardson et al.1995). Humpback whales create several types of vocalizations ranging from 20 Hz to 10 kHz in order to forage for prey, organize collaborative feeding efforts, facilitate mother-calf communication, and select and attract potential mates (Winn et al. 1970; Au et al. 2006; Vu et al. 2012). Anthropogenic noise has the potential to result in social disturbance, physical discomfort or trauma, and masking of communication with conspecifics. Underwater activities, such as pile driving, vessel traffic, and seismic surveys, may cause humpbacks to modify their acoustic behavior in the more complex sound-scape (Fleming and Jackson 2011; Blair et al. 2016; Dunlop et al. 2016; Fournet et al. 2018).

4.8 Minke Whale

4.8.1 Status and Distribution

Minke whales, like all other marine mammals, are protected under the MMPA, but are not listed under the ESA. The population status of minke whales is considered stable throughout most of their range. Historically, commercial whaling reduced the population size of this species, but given their small size, they were never a primary target of whaling and did not experience the severe population declines that larger cetaceans did. Minke whales are found throughout the northern hemisphere in polar, temperate, and tropical waters (Jefferson et al. 2008).

The International Whaling Commission has identified three minke whale stocks in the North Pacific: one near the Sea of Japan, a second in the rest of the western Pacific (west of 180° W), and a third, less concentrated, stock throughout the eastern Pacific. NOAA further splits this third stock between Alaska whales and resident whales of California, Oregon, and Washington (Muto et al. 2018). Minke whales in Southeast Alaska are part of the Alaska stock (Muto et al. 2018). Minke whales are found in all Alaska waters, although there are no population estimates for minke whales in Southeast Alaska. Surveys in Southeast Alaska have consistently identified individuals throughout inland waters in low numbers (Dahlheim et al. 2009).

4.8.2 Presence in Project Area

Dedicated surveys for cetaceans in Southeast Alaska found that minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with small concentrations near the entrance of Glacier Bay (Dahlheim et al. 2009). All sightings were of single minke whales, except for a single sighting of multiple minke whales. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years. No information appears to be available on the winter occurrence of minke whales in Southeast Alaska. Anecdotal observations suggest that minke whales do not enter Port Chester, and so are expected to occur rarely in the Project area (L. Bethel, personal communication, June 11, 2020). NMFS estimated an occurrence rate of three individuals every 4 months in nearby Tongass Narrows (84 FR 34134).

4.8.3 Life History

In Alaska, the minke whale diet consists primarily of euphausiids and walleye pollock. Minke whales are generally found in shallow, coastal waters within 200 meters of shore (Zerbini et al. 2006) and are almost always solitary or in small groups of two to three. Rarely, loose aggregations of up to 400 animals have been associated with feeding areas in Arctic latitudes.

4.8.4 Hearing Ability

Similar to other baleen whales, minke whale hearing is optimized in the low frequencies, ranging from 7 Hz to 35 kHz. Recent research by Yamato et al. (2012) exploring minke whale auditory physiology has shown that minke whales may be able to hear more acutely at higher frequencies than previously thought, perhaps as a defense mechanism to hear predatory killer whale vocalizations.

5 TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

5.1 Incidental Harassment Authorization

Under Section 101(a)(5)(D) of the MMPA, the DOT&PF requests an IHA for the take of small numbers of marine mammals, incidental to installation and removal of steel piles associated with the Metlakatla Seaplane Facility Refurbishment Project in Metlakatla, Alaska. The IHA is requested from 01 August 2021 through 31 July 2022. The DOT&PF is not requesting an LOA at this time because the Project will not occur for more than 1 calendar year, and the impacts described herein are not expected to rise to the level of serious injury or mortality, which would require an LOA.

5.2 Take Authorization Request

The DOT&PF requests the issuance of an IHA for Level B take (behavioral harassment) of small numbers of Steller sea lions, harbor seals, harbor porpoises, Dall's porpoises, killer whales, humpback whales, and minke whales that may occur incidentally during the Project. In addition, the DOT&PF requests small numbers of Level A take (potential injury) of harbor seals and harbor porpoises that may occur incidentally during the Project. Level A take is not anticipated, and shutdown protocols are intended to prevent exposure to such noise levels. However, Level A take is requested to ensure compliance in the unlikely event that a harbor seal or harbor porpoise enters a Level A harassment zone undetected. Several of the species for which take is requested are uncommon in the Project area. The request for a small number of takes for each species that is rarely or occasionally observed in the Project area reduces the risk of the Project being shut down if one of these species enters the Level B harassment zone during pile installation or removal. It is unlikely, however, that take of these species will occur.

The methodology described in Section 6 estimates potential noise exposures of marine mammals resulting from pile installation and removal in the marine environment. Potential exposures tend to be overestimated because all animals are assumed to be available to exposure while piles are being installed and removed, and the formulas used to estimate transmission loss use idealized parameters. Additionally, this approach assumes that all exposed individuals are "taken," contributing to an overestimation of "take."

The analysis for the Project predicts 904 potential exposures to Level B harassment and predicts 56 potential exposures to Level A harassment (960 total exposures) during pile installation and removal. DOT&PF mitigation measures for the Project (Section 11) include monitoring of Level B and Level A harassment zones prior to the initiation of pile installation and removal, and "soft starts" or ramp-up procedures designed to allow marine mammals to leave the Project area before noise levels reach the threshold for harassment. In addition, "shutdown zones" have been established for pile installation and removal to avoid injury to marine mammals. These mitigation measures decrease the likelihood that marine mammals will be exposed to sound pressure levels that will cause harassment or harm, although the amount of that decrease cannot be quantified.

The DOT&PF does not expect that all potential exposures to Level B and Level A harassment will result from Project activities. However, to allow for uncertainty regarding the exact mechanisms of the physical and behavioral effects, and as a conservative approach, the DOT&PF is requesting authorization for incidental harassment of 960 marine mammals during

Project activities. As described in Section 6.6, most takes are expected to result from repeated exposures of a small number of individuals.

5.3 Method of Incidental Taking

Pile installation and removal activities as outlined in Section 1 have the potential to disturb or displace small numbers of marine mammals. Specifically, the proposed activities may result in take in the form of Level B harassment from underwater sounds generated from vibratory, impact and DTH pile installation, and vibratory pile removal. In addition, harbor seals and harbor porpoises may be incidentally exposed to Project-related underwater noise levels that exceed species-specific thresholds for Level A harassment. Section 11 provides details on the impact minimization and reduction measures proposed.

Detectable effects of the Project on marine mammal habitat will be minor (Section 9). Indirect effects to prey will be insignificant and discountable due to recolonization and the temporary nature of the activity, and are expected to be undetectable. The Project is not expected to lead to any increases in marine vessel traffic in the region; therefore, ship strikes were not evaluated.

6 TAKE ESTIMATES FOR MARINE MAMMALS

The NMFS application for IHAs requires applicants to determine the number and species of marine mammals that are expected to be incidentally harassed by an action and the nature of the harassment (Level A or Level B). Project construction activities as outlined earlier have the potential to take marine mammals during pile installation and removal. Other activities are not expected to result in take as defined under the MMPA. In-water pile installation and removal will temporarily increase the local underwater and airborne noise environment in the Project area. Research suggests that increased noise may impact marine mammals in several ways and that the likelihood of impacts depends on many factors (Section 7).

6.1 In-Air and Underwater Sound Descriptors

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium such as air or water. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in Hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale.

Underwater sounds are described by a number of common terms that specific to this field of study (Table 6-1). Two common descriptors are the instantaneous peak sound pressure level (SPL) and the root-mean-square SPL (dB rms) during the pulse or over a defined averaging period. The peak sound pressure is the instantaneous maximum or minimum overpressure observed during each pulse or sound event and is presented in Pascals (Pa) or dB referenced to a pressure of 1 microPascal (dB re 1 µPa). The rms level is the square root of the energy divided by a defined time period. All in-water sound levels throughout this report are presented in dB re 1 µPa rms unless otherwise specified.

Transmission loss is the accumulated decrease in acoustic intensity as an acoustic pressure wave propagates outward from a source such as a pile during installation. The intensity of the sound at its source is reduced because it spreads as it moves away from the source. Cylindrical spreading occurs when sound energy spreads outward in a cylindrical fashion, bounded by the bottom sediment and water surface, such as in shallow water, resulting in a 3-dB reduction per doubling of distance. Spherical spreading occurs when the source encounters little to no refraction or reflection from boundaries (e.g., bottom or surface), such as in deep water, resulting in a 6-dB reduction per doubling of distance.

Table 6-1. Definitions of Some Common Acoustical Terms

Term	Definition
Decibel, dB	A decibel is a unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for water is 1 microPascal (µPa) and for air is 20 µPa (approximate threshold of human audibility).
Sound Pressure Level, SPL	Sound pressure is the force per unit area, usually expressed in microPascals (or 20 microNewtons per square meter [m^2]), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 m^2. The SPL is expressed in decibels as 20 times the logarithm to the base 10 of the ratio of the pressure exerted by the sound to a reference sound pressure. SPL is the quantity that is directly measured by a sound level meter.
Frequency, Hz	Frequency is expressed in terms of oscillations, or cycles, per second. Cycles per second are commonly referred to as Hertz (Hz). Typical human hearing ranges from 20 to 20,000 Hz.
Peak Sound Pressure (unweighted), dB re 1 µPa	Peak sound pressure level is based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 to 20,000 Hz. This pressure is expressed in this report as dB re 1 µPa.
Root-Mean-Square (rms), dB re 1 µPa	The rms level is the square root of the energy divided by a defined time period. For pulses, the rms has been defined as the average of the squared pressures over the time that comprises that portion of waveform containing 90 percent of the sound energy for one impact pile installation impulse.
Ambient Noise Level	The ambient noise level is the background sound level, which is a composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Transmission Loss, TL	TL underwater is the accumulated decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water chemistry, water depth, bottom composition and topography, and underwater objects in the area.

6.2 Applicable Noise Criteria

NMFS published updated *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* (Technical Guidance) in April 2018 that identifies the received levels, or thresholds, above which individual marine mammals are predicted to experience changes in their hearing sensitivity (either temporary or permanent) for underwater anthropogenic noise sources (i.e., Level A harassment; NMFS 2018). The 2018 guidance contains the same criteria included in the 2016 guidance (NMFS 2016b). To assess Level B harassment levels, NMFS continues to use its interim criteria.

Level A harassment is defined as “any act of pursuit, torment, or annoyance which has the potential to *injure* a marine mammal or marine mammal stock in the wild.” Level B harassment is defined as “any act of pursuit, torment, or annoyance which has the potential to *disturb* a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding or

sheltering, but which *does not* have the potential to injure a marine mammal or marine mammal stock in the wild."

6.2.1 Level A Harassment

For underwater noise exposure, this IHA application uses the NMFS Technical Guidance (revised 2018). Received levels, or thresholds, above which individual marine mammals are predicted to experience permanent changes in their hearing sensitivity (or a permanent threshold shift [PTS]) due to underwater anthropogenic sound sources have been weighted by functional hearing groups as defined in the Technical Guidance (Table 6-2; NMFS 2018). Under the Technical Guidance, these levels are considered thresholds for Level A (injury) harassment. Calculation of Level A harassment isopleth distances based on PTS onset acoustic thresholds requires information on characteristics of the sound and the local environment.

Table 6-2. Summary of Permanent Threshold Shift Onset Acoustic Thresholds for Assessing Level A Harassment of Marine Mammals from Exposure to Noise from Continuous and Pulsed Underwater Sound Sources

Functional Hearing Group Frequency Range Species Groups	Impulsive (Impact Hammer)	Non-Impulsive (Vibratory Hammer)
Low-Frequency (LF) Cetaceans *7 Hz to 35 kHz* Humpback whales, minke whales, other baleen whales	$L_{pk,flat}$: 219 dB $L_{E, LF, 24h}$: 183 dB	$L_{E, LF, 24h}$: 199 dB
Mid-Frequency (MF) Cetaceans *150 Hz to 160 kHz* Dolphins, beluga whales, killer whales, beaked whales	$L_{pk,flat}$: 230 dB $L_{E, MF, 24h}$: 185 dB	$L_{E, MF, 24h}$: 198 dB
High-Frequency (HF) Cetaceans *275 Hz to 160 kHz* Dall's porpoises, harbor porpoises, Pacific white-sided dolphins	$L_{pk,flat}$: 202 dB $L_{E, HF, 24h}$: 155 dB	$L_{E, HF, 24h}$: 173 dB
Phocid Pinnipeds (PW) Underwater *50 Hz to 86 kHz* Harbor seals, other true seals	$L_{pk,flat}$: 218 dB $L_{E, PW, 24h}$: 185 dB	$L_{E, PW, 24h}$: 201 dB
Otariid Pinnipeds (OW) Underwater *60 Hz to 39 kHz* Sea lions, fur seals	$L_{pk,flat}$: 232 dB $L_{E, OW, 24h}$: 203 dB	$L_{E, OW, 24h}$: 219 dB

$L_{pk,flat}$ = peak sound pressure level (unweighted); $L_{E,24h}$ = sound exposure level, cumulative 24 hours; Hz = Hertz; kHz = kilohertz
Source: NMFS 2018.

6.2.2 Level B Harassment

To assess Level B harassment levels, this document uses the NMFS interim criteria for exposure of marine mammals to various underwater sound sources. For impulsive noise (e.g., impact pile installation), the Level B harassment threshold is set at an SPL value of 160 dB re 1 µPa rms. For non-pulsed and continuous noise (e.g., vibratory pile installation), the Level B harassment threshold is set at an SPL of 120 dB re 1 µPa rms.

For airborne noise exposure of hauled-out pinnipeds, NMFS uses criteria for Level B harassment of 90 dB re 20 µPa for harbor seals and 100 dB re 20 µPa for all other pinnipeds. These criteria do not differentiate among noise types.

6.3 Description of Noise Sources

The Project will temporarily increase the existing in-air and underwater acoustic levels of Port Chester, which is an industrial area with frequent marine vessel traffic, seaplane traffic, and

associated activities. The soundscape in the vicinity of the Project includes existing ambient sound, plus construction noise from the Project. The primary component of the Project that may affect marine mammals is the noise generated by vibratory removal of steel pipe piles, vibratory and impact installation of steel pipe piles, and DTH pile installation. Refer to Section 1.3 for a description of these pile installation and removal techniques. Other activities associated with the Project (e.g., upland and above-water construction activities, vessel activities) do not produce in-air or underwater noise levels expected to exceed Level A or Level B harassment levels for any marine mammal hearing group.

6.3.1 Ambient Sound

Ambient (or background) sound is composed of sound from many sources and from multiple locations (Richardson et al. 1995). In general, ambient sound levels in the marine environment are variable over time due to a number of biological, physical, and anthropogenic (e.g., man-made) sources. Ambient noise can vary with location, time of day, tide, weather, season, and frequency on scales ranging from a second to a year. Underwater sound types in the Project area include physical noise, biological noise, and anthropogenic noise. Physical noise includes noise from waves at the water surface, rain, and currents; moving rocks, sediment, and silt; and atmospheric noise. Biological sound includes vocalizations and other sounds produced by marine mammals, fishes, seabirds, and invertebrates. Anthropogenic noise includes noise from vessels (small and large), shore-based processing plants, marine fueling facilities, ferry and barge cargo loading/unloading operations, maintenance dredging, aircraft overflights, construction noise, and other sources, which produce varying noise levels and frequency ranges (Table 6-3).

Table 6-3. Representative Noise Levels of Anthropogenic Sources of Noise Commonly Encountered in Marine Environments

Noise Source	Frequency Range (Hz)	Underwater Noise Level (dB rms re 1 µPa)	Reference
Small vessels	250–1,000	151 dB at 1 meter	Richardson et al. (1995)
Tug docking gravel barge	200–1,000	149 dB at 100 meters	Blackwell and Greene (2002)
Container/cruise ship	100–500	180 dB at 1 meter	Richardson et al. (1995)
Dredging operations	50–3,000	120–140 dB at 500 meters; 156.9 dB at 30 meters	URS (2007); SFS (2009)

Note: Hz = Hertz; dB = decibels; rms re 1 µPa = root mean square referenced to 1 microPascal

Ongoing vessel activities throughout Port Chester, as well as land-based industrial and commercial activities, result in elevated in-air and underwater sound conditions in the Project area that increase with proximity to the Project site. Sound levels likely vary seasonally, with elevated levels during summer, when the tourism and fishing industries are at their peaks. The 120 dB rms ambient sound level is used by NMFS in the absence of empirical data, and is the default for regulatory purposes, including incidental take estimation under the MMPA, and will be used for this Project.

6.3.2 Underwater Noise Levels

Pile Installation/Removal Noise Levels

The Project includes vibratory and impact pile installation of steel pipe piles, DTH pile installation, and vibratory removal of steel pipe piles. Sound source levels (SSLs) for each type

of activity were estimated using empirical measurements from similar activities elsewhere in Alaska or outside of Alaska, and relied on the best available and most relevant sound source verification studies (Table 6-4). Recently proposed and issued IHAs from Southeast Alaska were also reviewed to identify the most appropriate sound source levels for use in this application.

Table 6-4. Estimates of Underwater Sound Source Levels Generated during Vibratory and Impact Pile Installation, DTH Pile Installation, and Vibratory Pile Removal

Method and Pile Type	SSL at 10 meters			Literature Source	*Federal Register* Sources[a]
Continuous	**dB rms**				
16-inch Steel Piles	161			Navy 2012, 2015	A, B, C, H
24-inch Steel Piles	161			Navy 2012, 2015	C, D, E, H, I
24-inch DTH[b]	166			Denes et al. 2016 (Table 72) [b]	B, C, F, G
8-inch DTH[c]	166			NMFS[c]	--
Impulsive	**dB rms**	**dB SEL**	**dB Peak**		
24-inch Steel Piles	193	181	210	Navy 2015	D, H, I
24-inch DTH[b]	--	154	--	Denes et al. 2016[b]	--
8-inch DTH[c]	--	144	170	Reyff (2020)	--

[a] *Federal Register* (FR) sources:
A: 84 FR 24490, City of Juneau Waterfront Improvement Project, Juneau, Alaska
B: 85 FR 4278, Statter Harbor Improvement Project, Auke Bay, Alaska
C: 85 FR 673, Tongass Narrows Ferry Berth Improvements, Ketchikan, Alaska
D: 85 FR 19294, Port of Alaska's Petroleum and Cement Terminal, Anchorage, Alaska
E: 84 FR 56767, Auke Bay Ferry Terminal Modifications and Improvements Project, Juneau, Alaska
F: 85 FR 18196, Gastineau Channel Historical Society Sentinel Island Moorage Float Project, Juneau, Alaska
G: 85 FR 12523, Ward Cove Cruise Ship Dock Project, Juneau, Alaska
H: 83 FR 29749, City Dock and Ferry Terminal, Tenakee Springs, Alaska
I: 82 FR 48987, Sand Point City Dock Replacement Project, Sand Point, Alaska

[b] DTH pile installation is treated as a continuous sound for Level B calculations and impulsive for Level A calculations (B. Laws, personal communication, 22 July 2020).

[C] Tension anchor installation (8-inch DTH) is currently treated as DTH pile installation (B. Laws, personal communication, 22 July 2020).

Notes: DTH = down-the-hole pile installation; SSL = sound source = level; dB = decibel; rms = root mean square; SEL = sound exposure level

Because DTH pile installation includes both impulsive and continuous components, NMFS guidance currently recommends that it be treated as a continuous sound for Level B calculations and impulsive for Level A calculations. Underwater noise from tension anchor construction is typically low. The bedrock is overlain with sediments, which together attenuate noise production from drilling and reduce noise propagation into the water column. Additionally, the casing used during drilling is inside the larger-diameter pile, further reducing noise levels. In the past, NMFS IHAs have determined that tension anchor installation would not reach levels that might harass marine mammals (82 FR 34632; 83 FR 12152). However, in the absence of data specific to small-bore hole sizes, current NMFS guidance recommends that calculation of Level B zones for tension anchor installation use the same continuous SSL for all hole sizes. Reyff (2020) reported impulsive SSLs from 8-inch-diameter bore holes as shown in Table 6-4,

and current NMFS guidance recommends the use of this value for calculation of Level A thresholds for installation of tension anchors 8 inches or less in diameter (B. Laws, personal communication, 22 July 2020).

6.3.3 In-Air Noise Levels

The Washington State Department of Transportation recorded airborne noise levels from impact installation of 24-inch piles in December 2015 at the Vashon Ferry Terminal near Seattle, Washington (WSDOT 2018). In-air noise levels during impact installation were 108 dBA as measured at 50 feet (15.24 meters). This value was chosen as the estimate for impact installation of 24-inch-diameter steel piles for the Project. Ambient in-air noise is assumed to average 55 dBA at the Metlakatla Seaplane Facility during daylight hours. This is similar to an area with light automobile traffic and conversational speech. It is likely that ambient sound levels exceed this for short durations on regular occasions. To determine the distance that in-air construction noise will travel before it attenuates to the ambient sound level, the following equation is used:

$$D = D_o * 10^{((\text{Construction Noise} - \text{Ambient Sound Level})/\alpha)}$$

where D is the distance from the noise source, D_o is the reference measurement distance (15 meters in this case), and α is the transmission loss per doubling of distance (estimated at 20 dBA for hard-site conditions [over water] and 25 dBA for soft-site conditions [forested or urbanized terrain]). For this analysis, hard-site conditions were assumed above the surface of the ocean, and soft-site conditions were assumed over land, which results in the maximum possible distance that noise from pile installation could be discernable above ambient levels. Based on this model, in-air noise from impact installation of 24-inch piles could extend up to 6.7 kilometers (4.2 miles) from the noise source over open water until it is no longer discernible above estimated ambient sound level. Over land, the maximum distance that in-air noise will be discernable above ambient is 1,977 meters (6,486 feet) due to absorption and scattering from vegetation, buildings, and other surfaces. A viewshed analysis was conducted using a geographic information system to approximate the distance that in-air noise could travel before it would be impeded by local topography, which reduced the in-air action area in some directions.

6.4 Distances to Sound Thresholds

6.4.1 Underwater Noise

Vibratory, impact, and DTH pile installation will generate underwater noise that could disturb marine mammals in the Project area. Ambient underwater sound levels were assumed to be 120 dB rms for this evaluation (Section 6.3.1). The SSLs for pile installation were estimated by using the results of measurements from the best available and most relevant sound source verification studies (Table 6-4).

The attenuation of underwater noise (transmission loss [TL]) is estimated using the practical spreading loss model. The formula for transmission loss is:

$$TL = X \log 10^{(R/D)}$$

where R is the distance from the source, D is the distance of the known or measured noise level, and X is the TL coefficient. NMFS typically recommends a TL coefficient of 15 dB per tenfold increase in distance when site-specific empirical data are unavailable. Site-specific data for 16- and 24-inch piles are unavailable; therefore, this document adopts the default NMFS TL

coefficient of 15 log for 16- and 24-inch piles. This model, based on the default practical spreading loss assumption and applicable TL coefficient, can be rearranged to estimate the propagation of underwater noise as follows:

$$R = D * 10^{(\Delta/TL)}$$

where Δ is the difference between the SSL and the noise level at which behavioral harassment may occur (i.e., approximately 120 dB for vibratory sources or 160 dB for impulsive sources). The SSL and the propagation of underwater noise vary by pile size and installation method (Table 6-4).

Land forms (including causeways, breakwaters, islands, and other land masses) impede the transmission of underwater sound and create shadows behind them where sound from construction is not audible. In Port Chester, sound from the Project will be blocked by Gull Island, Murdo Island, Scrub Island, Hemlock Island, Driest Point, and the coastline both east and west of the Project site (Figure 1-2). The monitoring zones (see Section 11) will be inclusive of all areas that may be exposed to noise levels in excess of 120 dB for vibratory sources and 160 dB for impulsive sources.

Level A Harassment

Sound propagation and the distances to the sound isopleths defined by NMFS for Level A harassment of marine mammals under the current Technical Guidance were estimated using the User Spreadsheet developed by NMFS for this purpose (NMFS 2018). The method uses estimates of SPL and duration of the activity to calculate the threshold distances at which a marine mammal exposed to those values would experience a PTS. Differences in hearing abilities among marine mammals are accounted for by use of weighting factor adjustments for the five functional hearing groups (NMFS 2016b). Pulse duration from the sound source verification studies used for source level estimates are unknown. All necessary parameters were available for the cumulative Single Strike Equivalent (SEL_{cum}) method for calculating isopleths, and therefore this method was selected. The SEL_{cum} method resulted in isopleths that were larger than those calculated using the peak source level method, and therefore the SEL_{cum} isopleths were selected for the Project.

As described above, NMFS typically recommends a TL coefficient of 15 dB per tenfold increase in distance when site-specific empirical data are unavailable. Because site-specific data for 16- and 24-inch piles are unavailable this document adopts the default NMFS TL coefficient of 15 for calculation of Level A zone sizes.

To account for potential variations in daily productivity during impact installation, isopleths were calculated for different numbers of piles that could be installed each day (Table 6-5). Therefore, if the contractor installs fewer piles in a day than the maximum anticipated, the Level A harassment zone will be smaller. Similarly, if no marine mammals enter their respective Level A zones during impact installation of the first pile of the day, the monitoring zone for the next pile that same day will be smaller (e.g., the Level A zones for a three-pile day will be reduced in size to the Level A zones for a two-pile day for the second pile). Level A zones will be further reduced in size to those for a one-pile day for the final and third pile of the day, as long as no marine mammals have been exposed to Level A noise levels that day. The number of strikes per pile during impact installation is expected to not exceed 20 per pile. The pulse rate or frequency for DTH pile installation is generally negatively correlated with bore hole diameter but varies by the equipment used. It is estimated that 24-inch diameter bore holes will be constructed by equipment operating at approximately 15 Hz, or 15 cycles per second, which is equivalent to 900 strikes per minute. In the absence of pulse rate data for 8-inch bore holes, we

assume they are also on the order of 900 strikes per minute. DTH pile installation production rates vary by the type of pile (Table 1-1). Level A distances are provided in Table 6-5 for three production rates.

To avoid and minimize potential incidental Level A exposure of marine mammals, pile installation or removal will cease prior to a marine mammal entering the Level A harassment isopleth specific to the species and the in-water activity (including production rate) underway (Table 6-5). Shutdown zones will be implemented to prevent injury to marine mammals (Table 6-6; Figure 6-1 and Figure 6-2). The shutdown zones are larger than the species-specific Level A harassment zones as defined under the MMPA.

Table 6-5. Calculated Distances to Level A Harassment Isopleths during Pile Installation and Removal

Activity	Pile Diameter(s)	Minutes per Pile or Strikes per Pile	Piles Installed or Removed per day	Level A Harassment Isopleth Distance (meters)				
				Cetaceans			Pinnipeds	
				LF	MF	HF	PW	OW
Vibratory Installation or Removal	24-inch, battered and plumb	15-30 Minutes	4 piles	11	1	16	7	1
DTH (Rock Socket)	24-inch	60 Minutes	Based on Minutes of DTH	167	6	199	89	7
		90 Minutes		218	8	260	117	9
		180 Minutes		346	13	413	186	14
DTH (Tension Anchor)	8-inch	60 Minutes		36	2	43	20	2
		120 Minutes		57	2	68	31	3
		180 Minutes		75	3	89	40	3
Impact	24-inch	20 Strikes	3 piles	113	4	135	61	5
			2 piles	86	4	103	46	4
			1 pile	55	2	65	29	3

Note: LF = low frequency; MF = mid-frequency; HF = high frequency; PW = phocid in water; OW = otariid in water; DTH = down-the-hole pile installation.

Table 6-6. Shutdown Zones during Pile Installation and Removal

Activity	Pile Diameter	Pile Type or Number of Piles	Shutdown Distance (meters)	
			Cetaceans	Pinnipeds
Vibratory Installation or Removal	16- and 24-inch	Battered and Plumb	100	100
DTH (Rock Socket)	24-inch	Temporary	200	200
		Battered, Permanent	260	120
		Plumb, Permanent	415	200
DTH (Tension Anchor)	8-inch	Permanent	100	100
Impact	24-inch	3 piles	135	100
		2 piles		
		1 pile	100	

Note: DTH = down-the-hole pile installation.

Level B Harassment

Sound propagation and distances to the sound isopleths defined by NMFS for Level B harassment of marine mammals were estimated using the practical spreading loss model described above. The source levels for pile installation and removal were estimated using the results of measurements from the best available and most relevant sound source verification studies (Table 6-4). The Level B harassment zones for the Project are presented in Table 6-7 and shown in Figure 6-3.

Table 6-7. Distances to and Areas of Level B Harassment Isopleths for Different Pile Sizes and Types and Methods of Installation/Removal

Method and Pile Type	Distance to Level B Isopleth (meters)	Area of Level B Isopleth (km^2)
Vibratory Hammer (Level B Isopleth = 120 dB)		
16-inch steel piles	5,412	14.0
24-inch steel piles	5,412	14.0
8- and 24-inch DTH	11,659	23.7
Impact Hammer (Level B Isopleth = 160 dB)		
24-inch steel piles	1,585	3.9

Note: km^2 = square kilometers; dB = decibels; DTH = down-the-hole pile installation.

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Figure 6-1. Shutdown Zones for Cetaceans during Pile Installation and Removal at Metlakatla Seaplane Facility

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Figure 6-2. Shutdown Zones for Pinnipeds during Pile Installation and Removal at Metlakatla Seaplane Facility

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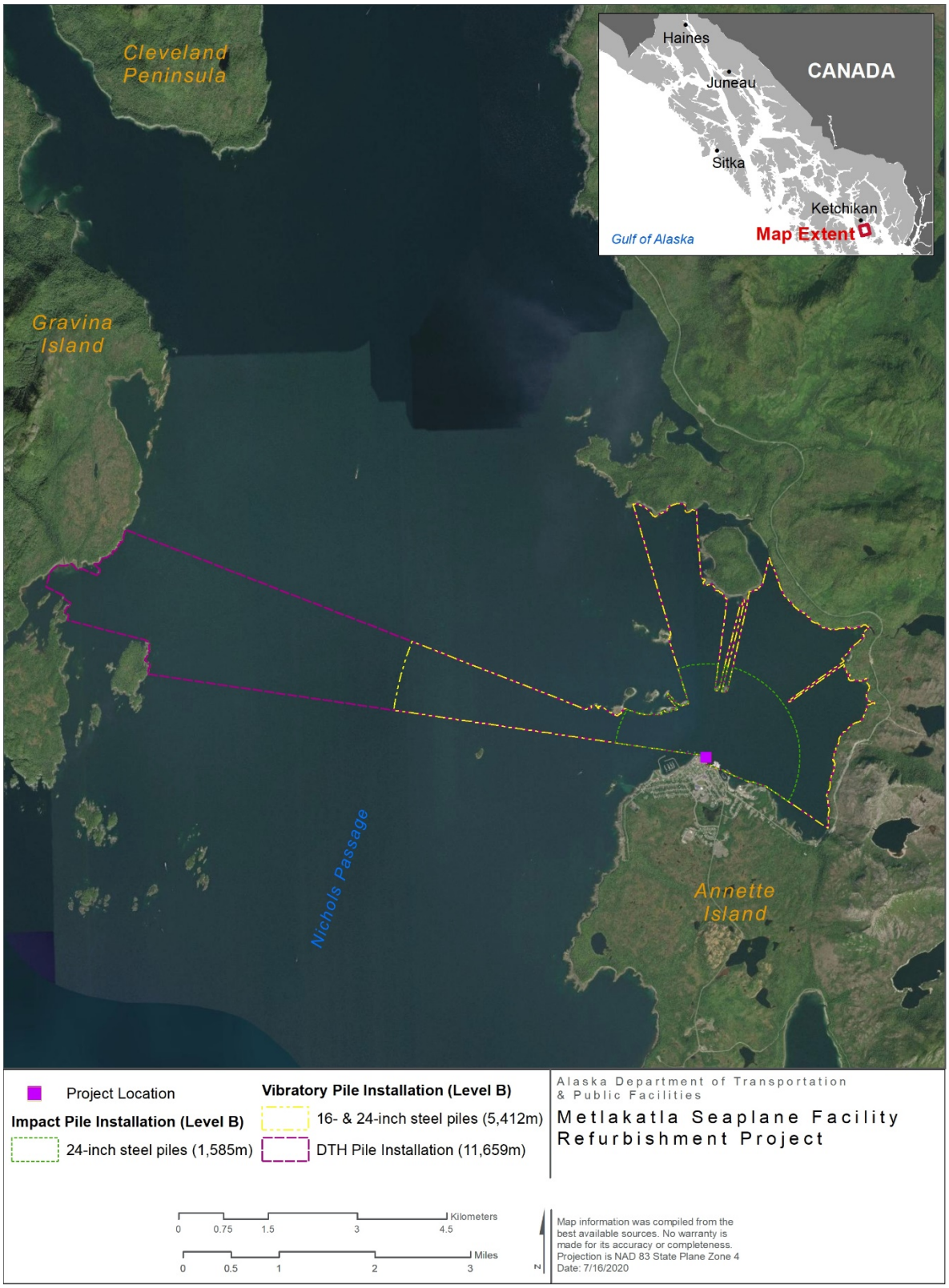

Figure 6-3. Level B Harassment Zones during Pile Installation and Removal at Metlakatla Seaplane Facility

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6.4.2 Airborne Noise

Pinnipeds can be affected by in-air noise when they are hauled out. Loud noises can cause hauled-out pinnipeds to panic back into the water, leading to disturbance and possible injury. For airborne sound exposure of hauled-out pinnipeds, NMFS uses criteria for Level B harassment of 90 dB re 20 µPa rms for harbor seals and 100 dB re 20 µPa rms for all other pinnipeds, including Steller sea lions.

The spherical spreading model described in Section 6.3.3 was revised to estimate noise threshold distances from the maximum anticipated in-air noise source level. The revised equation replaced ambient sound level with NMFS-defined noise thresholds as follows:

$$D = D_o * 10^{((\text{Construction Noise} - \text{Noise Threshold})/\alpha)}$$

Given the conservative source level of 108 dBA chosen for impact pile installation of 24-inch steel piles, the calculated isopleths for in-air noise can be used for all pile sizes and types associated with the Project. Installation of smaller piles is generally assumed to produce lower sound levels than installation of larger piles. The estimated distance to the airborne sound level threshold from pile installation of all pile types and sizes for the Project is 120 meters for seals and 38 meters for Steller sea lions (Table 6-8).

Table 6-8. Distances to which Airborne Sound will Attenuate to NMFS Threshold for Level B Harassment

Method, pile type	Harbor Seals (90 dB)	Other Pinnipeds (100 dB)
Impact Hammer		
All Project piles	120 meters (394 feet)	38 meters (125 feet)

Note: dB = decibels.

6.5 Estimated Takes

Estimated exposure and take of marine mammals associated with the Project is based on presence/absence, distribution, and abundance information presented in Section 4. Although construction is currently planned to begin in fall 2021, it is possible that delays may push the construction window later in 2021 or into 2022. To account for this uncertainty, the following exposure estimates assume that construction would occur during the periods of peak abundance for each species, for those species for which abundance varies seasonally.

Estimated exposures are primarily by Level B harassment, as use of the acoustic source (i.e., vibratory or impact pile driving or DTH pile installation) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for low- and high-frequency cetaceans because predicted auditory injury zones are larger than for mid -frequency species and pinnipeds. Although a minimum 100-meter shutdown zone will be implemented during pile installation and removal, Level A take will not occur until an individual crosses the Level A harassment isopleth specific to the in-water activity underway (Table 6-5).

6.5.1 Steller Sea Lion

We conservatively estimate that two groups of 10 individuals each (20 individuals; see Section 4.1.2) of Steller sea lions may be exposed to Project-related underwater noise once per day during pile installation and removal activities, for a total of 400 exposures (20 days * 20 sea

lions per day = 400). It is expected that the same individuals will be exposed on multiple days; therefore, the total number of individuals exposed by the Project will likely be fewer than 400.

The largest Level A harassment zone for otariid pinnipeds extends 14 meters from the noise source (Table 6-5). Since the Project will implement a minimum 100-meter shutdown zone during all pile installation and removal (Table 6-6), no Level A take is requested for Steller sea lions.

The in-air Level B harassment zone extends 38 meters from the noise source (Table 6-8). No Steller sea lions are known to haul out within 38 meters of any of the Project component locations; therefore, exposure of hauled-out Steller sea lions to in-air noise is not anticipated.

6.5.2 Harbor Seal

Up to three known harbor seal haulouts are located within or near the Level B harassment zone for vibratory pile installation activities as described in Section 4.2.2. Harbor seals are regularly sighted in Port Chester by local residents (Section 4.2.2). For these reasons, we conservatively estimate that up to 15 harbor seals could be exposed to noise levels in excess of the Level B harassment threshold each day, for a total of 300 exposures (20 days * 15 seals per day = 300).

The largest Level A harassment zone for phocid pinnipeds extends 186 meters from the noise source (Table 6-5). There are no haulouts located within the Level A harassment zone, and although it is unlikely that harbor seals will enter this area without detection while underwater activities are underway, it is possible that harbor seals may approach and enter the Level A zone undetected. For this reason, the DOT&PF requests a small number of Level A takes to safeguard against the possibility of Marine Mammal Observers (MMOs) being unable to detect a harbor seal within the Level A harassment zone (Table 6-5). Similar to other projects in Alaska (85 FR 673), we estimate that up to one small group of three seals per day could occur within the Level A harassment zone during impact or DTH pile installation, for a total of 42 exposures (3 seals per day * 14 days of impact pile installation = 42).

The in-air Level B harassment zone for harbor seals extends 120 meters from the noise source (Table 6-8). No harbor seals are known to haul out within 120 meters of the Project; therefore, exposure of hauled out harbor seals to in-air noise is not anticipated.

6.5.3 Harbor Porpoise

Sightings of harbor porpoises in Port Chester occur with some regularity (Section 4.3.2). As such, there is potential for them to occur in the Project area. Based on information synthesized in Section 4.3.2, we assume that 2 groups of 5 harbor porpoises per 5 days of in-water work could enter the Level B harassment zone, and therefore we estimate 40 exposures over the course of the Project (20 days * 10 porpoises every 5 days = 40).

The largest Level A harassment zone for harbor porpoises extends 413 meters from the noise source (Table 6-5). Harbor porpoises are an inconspicuous species and are challenging for MMOs to sight, making any approach to a monitoring zone potentially difficult to detect. Because harbor porpoises move quickly and elusively, it is possible, but unlikely, that harbor porpoises may enter the Level A harassment zone (Table 6-5) without detection. As such, the DOT&PF requests small numbers of Level A take for harbor porpoises during the Project. We conservatively assume that one pair of harbor porpoises may enter the Level A harassment zone every other day (or equivalent to one each day), and therefore estimate a total of 14 exposures to Level A harassment levels over the 14 days of impact or DTH pile installation (14 days * 1 porpoises each day = 14).

6.5.4 Dall's Porpoise

Dall's porpoises are not expected to occur in Port Chester because the shallow water habitat of the bay is atypical of areas where Dall's porpoises usually occur (see Section 4.4.2). However, recent research indicates that Dall's porpoises may opportunistically exploit nearshore habitats when predators, such as killer whales, are absent (Moran et al. 2018). Therefore, we anticipate approximately one observation of one large Dall's porpoise pod (15 individuals) in the Project area during in-water construction per month. Therefore, we estimate that two pods may be exposed to Level B harassment for a total of 30 Dall's porpoises during the 20 days of in-water construction (2 months * 15 porpoises per month = 30).

The largest Level A harassment zone for Dall's porpoises extends 413 meters from the noise source (Table 6-5). Given the larger group size and more conspicuous rooster-tails generated by swimming Dall's porpoises, which make them more noticeable than harbor porpoises, Level A take for Dall's porpoises is not requested.

6.5.5 Pacific White-sided Dolphins

Pacific white-sided dolphins do not generally occur in the shallow, inland waterways of Southeast Alaska. There are no records of this species occurring in Port Chester, and it is uncommon for individuals to occur in the Project area (see Section 4.5.2). However, recent fluctuations in distribution and abundance decrease the certainty in this prediction. In order to reduce risk to the Project, we conservatively predict that one large group (92 individuals) of Pacific white-sided dolphins may be exposed to Level B harassment noise during the in-water construction period, for a total of 92 Level B exposures.

The largest Level A harassment zone for Pacific white-sided dolphins extends 413 meters from the noise source (Table 6-5). Given the large group size and more conspicuous nature of Pacific white-sided dolphins, Level A take for this species is not requested.

6.5.6 Killer Whale

Killer whales are observed occasionally during summer throughout Nichols Passage (see Section 4.6.2), but their presence in Port Chester is unlikely. As a precaution, because Level B harassment zones extend into Nichols Passage, the DOT&PF requests Level B take for one killer whale pod of up to 15 individuals once during the Project (15 exposures total).

Because killer whales are unlikely to enter Port Chester and are a relatively conspicuous species, all pile installation/removal will be shut down prior to a killer whale entering the shutdown zone implemented for the specific pile installation or removal method underway (Table 6-6). No Level A take is requested for killer whales.

6.5.7 Humpback Whale

Use of Nichols Passage and Port Chester by humpback whales is common but intermittent and dependent on the presence of prey fish. Based on the available information synthesized in Section 4.7.2, the DOT&PF predicts that two group of two whales, up to four individuals per day, may be exposed to Project-related underwater noise each day during the 20 days of the Project, or a total of 80 individuals (4 per day * 20 days = 80 humpback whales). It is likely that some individuals will be exposed more than once during the Project, so the total number of individual whales exposed is likely to be less than 80.

Wade et al. (2016) estimated that approximately 6.1 percent of humpback whales in Southeast Alaska are members of the Mexico DPS, while all others are members of the Hawaii DPS.

Therefore, we predict that 5 of the exposures (80 whales x 0.061 = 4.9) will be of Mexico DPS individuals and 75 exposures will be of Hawaii DPS individuals.

The largest Level A harassment zone for humpback whales extends 346 meters from the noise source (Table 6-5). All pile installation/removal will be shut down prior to a humpback whale entering the shutdown zone specific to the in-water activity underway at the time (Table 6-6). No Level A take is requested for humpback whales.

6.5.8 Minke Whales

Minke whale abundance throughout Southeast Alaska is low, and anecdotal reports have not included minke whales near the Project area. However, minke whales are distributed throughout a wide variety of habitats and have been observed elsewhere in Southeast Alaska; therefore, this species could occur near the Project area. NMFS estimated that three individual minke whales could occur in Tongass Narrows or Clarence Strait every 4 months (85 FR 673), so the DOT&PF conservatively estimates that up to three minke whales may be exposed to Level B harassment over the entire project. Level A take is not requested for minke whales.

6.6 All Marine Mammal Takes Requested

6.6.1 Pile Installation and Removal

The analysis of marine mammal take predicts 904 potential exposures of marine mammals to Level B harassment and 56 potential exposures of marine mammals to Level A harassment (Table 6-9). Estimated Level A takes were subtracted from Level B takes to get the total number of unique Level B takes that do not double-count the Level A takes.

Table 6-9. Summary of the Estimated Numbers of Marine Mammals Potentially Exposed to Level B Harassment Sound Levels

Species	DPS/Stock	Estimated Number of Exposures to Level B Harassment	Estimated Number of Exposures to Level A Harassment	Total Estimated Exposures (Level A and Level B)	Stock Abundance	Percent of Population
Steller sea lion	Eastern DPS	400	0	400	41,638	1.0
Harbor seal	Clarence Strait	258	42	300	31,634	0.9
Harbor porpoise	Southeast Alaska	26	14	40	975	4.1
Dall's porpoise	Alaska	30	0	30	83,400	<0.1
Pacific white-sided dolphin	North Pacific	92	0	92	26,880	0.3
Killer whale	West Coast Transient	15	0	15	243	6.2 [a]
	Alaska Resident				2,347	0.6 [a]
	Northern Resident				261	5.7 [a]

Species	DPS/Stock	Estimated Number of Exposures to Level B Harassment	Estimated Number of Exposures to Level A Harassment	Total Estimated Exposures (Level A and Level B)	Stock Abundance	Percent of Population
Humpback whale	Hawaii DPS	75	0	75	11,571	0.6[b]
	Mexico DPS	5	0	5	2,806	0.2[b]
Minke whale	Alaska	3	0	3	Unknown	--
Total	**N/A**	**904**	**56**	**960**	**N/A**	**N/A**

Note: DPS = Distinct Population Segment; N/A = not applicable.

[a] These percentages assume that all takes come from each individual killer whale stock; thus the percentage should be adjusted down if multiple stocks are actually affected.

[b] Assumes that 6.1 percent of humpback whales exposed are members of the Mexico DPS (Wade et al. 2016).

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7 DESCRIPTION OF POTENTIAL IMPACTS ON MARINE MAMMALS

The ability to hear and transmit sound (echolocation/vocalization) is vital for marine mammals to perform several life functions. Marine mammals use sound to gather and understand information about their current environment, including detecting prey and predators. They also use sound to communicate with one another. The distance a sound travels through the water depends highly on existing environmental conditions (sea floor topography and ambient noise levels) and characteristics of the sound (source levels and frequency; Richardson et al. 1995). Impacts on marine mammals can vary among species, based on their sensitivity to sound and their ability to hear different frequencies. The Project may impact marine mammals behaviorally and physiologically from temporary increases in underwater and airborne noises during construction activities. The level of impact on marine mammals from construction activities will vary depending on the species of marine mammal, the distance between the marine mammal and the construction activity, the intensity and duration of the construction activity, and the environmental conditions.

7.1 Assessment of Potential Acoustic Impacts

Behavioral and physiological impacts from noise exposure differ among species. Differences in responses have also been documented between age and sex classes. Young animals are often more sensitive to noise disturbance, and noise can therefore have a greater effect on them (NRC 2003).

Behavioral and physiological changes that may result from increased noise levels include changes in tolerance levels; masking of natural sounds; behavioral disturbances; and temporary or permanent hearing impairment, or non-auditory physical effects (Richardson et al. 1995). Richardson et al. (1995) have suggested four zones (described below) to assess the potential effects of noise on marine mammals.

7.1.1 Zone of Hearing Loss, Discomfort, or Injury

This is the area within which the received sound level is high enough to cause discomfort or tissue damage to auditory or other systems. Temporary or permanent reduction in hearing sensitivity may result from high levels of received sound. An animal may experience TTS when hearing loss is temporary, or PTS when partial or full hearing loss is permanent. The level of hearing loss depends on the sound frequency, intensity, and duration (see Section 6.2.1). Marine mammals exposed to high received sound levels may also experience non-auditory physiological effects such as increased stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage. PTS and TTS may reduce an animal's ability to avoid predators, communicate with others, or forage effectively. TTS is not considered injurious and constitutes a Level B take.

Kastak and Schusterman (1995) tested in-air auditory thresholds by exposing a harbor seal inadvertently to broadband construction noise for 6 days, with intermittent exposure averaging 6 to 7 hours per day. When the harbor seal was tested immediately upon cessation of the noise, a TTS of 8 dB at 100 Hz was evident. Following 1 week of recovery, the harbor seal's hearing threshold was within 2 dB of its original level.

Pure-tone sound detection thresholds were obtained in water for harbor seals before and immediately following exposure to octave-band noise (Kastak et al. 1999). Test frequencies

ranged from 100 Hz to 2 kHz, and octave-band sound exposure levels (SELs) were approximately 60 to 75 dB. Each harbor seal was trained to dive into a noise field and remain stationed underwater during a noise-exposure period that lasted a total of 20 to 22 minutes. The average threshold shift relative to baseline thresholds for the harbor seals following noise exposure was 4.8 dB, and the average shift following the recovery period was 20.8 dB (Kastak et al. 1999).

Given the short duration and intermittent nature of potentially injurious sound, PTS and TTS are not expected to occur in any marine mammal species as a result of the Project. Furthermore, implementation of mitigation measures will help avoid the potential for close approaches of animals to activities that could result in Level A takes (i.e., injury/mortality) and will limit the time an animal is exposed to that level of sound.

7.1.2 Zone of Masking

This is the area within which noise is strong enough to interfere with the detection of other sounds, including communication calls, prey or predator sounds, and other environmental sounds. Masking is considered Level B harassment and is usually considered 160 dB for impact noise and 120 dB for continuous noise.

Marine mammal signals may be masked by increased noise levels or overlapping frequencies. Research has indicated that the majority of vibratory activity falls within 400 to 2,500 Hz (Blackwell 2005; URS 2007). The frequency range of Steller sea lions' vocalization is unknown; however, Steller sea lions have been documented producing low-frequency vocalizations (Kastelein et al. 2005). Harbor seals produce social calls at 500 to 3,500 Hz and clicks from 8 to 150 kHz (reviewed in Richardson et al. 1995). Harbor porpoises produce acoustic signals in a very broad frequency range, <100 Hz to 160 kHz (Verboom and Kastelein 2004). Killer whales produce whistles between 1.5 and 18 kHz, and pulsed calls between 500 Hz and 25 kHz. Echolocation clicks are far above the frequency range of the sounds produced by vibratory pile installation.

The Project is located near two harbor areas with regular vessel activity, including recreational craft, tourist cruises, and commercial fishing vessels. It is likely that marine mammals in the Project area have become habituated to increased noise levels. In general, pinnipeds seem to habituate more readily to disruptive underwater sounds than cetaceans do (Southall et al. 2007).Implementation of the proposed mitigation measures (Section 11) will reduce impacts on marine mammals, with any minor masking occurring near the sound source, if at all.

7.1.3 Zone of Responsiveness

This is the area within which marine mammals react behaviorally or physiologically from exposure to increased noise levels. The level of effect is dependent on the acoustical characteristics of the noise, current physical and behavioral state of the animals, ambient noise levels and environmental conditions, and context of the sound (e.g., if it sounds similar to a predator; Richardson et al. 1995; Southall et al. 2007). Behavioral effects that are temporary may indicate that the animal has simply heard a sound, and the effect may not be long term (Southall et al. 2007). Behavioral and physiological effects described here are considered Level B harassment.

Responses from marine mammals in the presence of pile installation and removal might include a reduction of acoustic activity, a reduction in the number of individuals in the area, and avoidance of the area. Of these, temporary avoidance of the noise-impacted area is the most

common response. Avoidance responses may be initially strong if the marine mammals move rapidly away from the source, or weak if movement is only slightly deflected away from the source. Noise from pile installation could displace marine mammals from the immediate area of the activity; however, they will likely return after pile installation is completed, as demonstrated by a variety of studies on temporary displacement of marine mammals by industrial activity (reviewed in Richardson et al. 1995). Any masking events that could possibly rise to Level B harassment under the MMPA will occur concurrently within the zones of behavioral harassment already estimated for vibratory and impact pile installation, and have already been taken into account in the exposure analysis.

7.1.4 Zone of Audibility

This is the area within which the animal might hear the noise; it is the most extensive of the four zones. Marine mammals as a group have functional hearing ranges of 10 Hz to 180 kHz, with thresholds of best hearing near 40 dB (Southall et al. 2007). Marine mammals can typically be divided into three groups that have consistent patterns of hearing sensitivity: small odontocetes (e.g., harbor porpoises), medium-sized odontocetes (e.g., killer whales), and pinnipeds (e.g., Steller sea lions and harbor seals). Difficulties in human ability to determine the audibility of a particular noise for other species has so far precluded development of applicable criteria for the zone of audibility. This zone does not fall in the sound range of a "take" as defined by NMFS.

Repeated or sustained disruption of important behaviors (e.g., feeding, resting, traveling, and socializing) is more likely to have a demonstrable impact than a single exposure (Southall et al. 2007). However, it is likely that marine mammals exposed to repetitious construction sounds will become habituated, desensitized, and tolerant after initial exposure to these sounds. Marine mammals residing in and transiting this area are routinely exposed to sounds louder than the ambient 120-dB sound level and continue to use this area; therefore, they do not appear to be harassed by these sounds, or they have become habituated.

7.2 Conclusions Regarding Impacts to Species or Stocks

Incidental take is expected to result in only short-term changes in behavior, such as avoidance of the Project area, changes in swimming speed or direction, and changes in foraging behavior. Such impacts are unlikely to have any effect on recruitment or survival and, therefore, will have a negligible impact on the affected stocks of Steller sea lions, harbor seals, harbor porpoises, Dall's porpoises, killer whales, humpback whales, and minke whales. Implementation of the mitigation measures proposed in Section 11 is likely to minimize most potential adverse impacts to individual marine mammals from pile installation or removal. Impacts on individual Steller sea lions, harbor seals, harbor porpoises, Dall's porpoises, killer whales, humpback whales, and minke whales are expected to be small and of short duration. Nevertheless, some level of disturbance impact is unavoidable. The expected level of unavoidable impact (defined as an acoustic or harassment "take") is defined in Section 6.

Requested Level B take of marine mammals will likely include multiple (estimated as daily) takes of the same individual(s), resulting in estimates of take (as percentage of the DPS/stock) that are high compared to actual take.

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8 DESCRIPTION OF POTENTIAL IMPACTS ON SUBSISTENCE USES

Alaska Natives have traditionally harvested subsistence resources in Southeast Alaska for many hundreds of years, particularly large terrestrial mammals, marine mammals, salmon, and other fish (ADF&G 1997). There are no subsistence activities that target humpback whales, and subsistence hunters rarely target Steller sea lions near the Project area; however, harbor seals have been harvested for subsistence in the waters surrounding Metlakatla in the past. Currently, the MIC does not authorize the harvest of marine mammals for subsistence use (R. Cook, personal communication, June 5, 2020).

Changes to availability of subsistence resources will be negligible or non-existent as a result of Project activities.

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9 DESCRIPTION OF POTENTIAL IMPACTS ON MARINE MAMMAL HABITAT

9.1 Effects of Project Activities on Marine Mammal Habitat

The Project will occur within the same footprint as existing marine infrastructure. The nearshore and intertidal habitat where the Project will occur is an area of relatively high marine vessel traffic. Most marine mammals do not generally use the area within the footprint of the Project area. Temporary, intermittent, and short-term habitat alteration may result from increased noise levels within the Level A and Level B harassment zones. Effects on marine mammals, as described above, will be limited to temporary displacement from pile installation and removal noise, and effects on prey species (Section 9.2).

Although Southeast Alaska in its entirety is listed as a Biologically Important Area for humpback whales, the Project area is not unusually important for the species. Much of Southeast Alaska has been proposed as designated critical habitat by NMFS for the Mexico DPS, given that whales from the Mexico DPS utilize Southeast Alaska feeding grounds (84 FR 54354). Mitigation measures (Section 11), such as marine mammal monitoring and implementation of shutdowns, will limit the number of humpback whales exposed to underwater noise as a result of the Project. Avoidance of the Project area by humpback whales is possible, but will be temporary and intermittent in duration.

9.2 Effects of Project Activities on Marine Mammal Prey Habitat

Essential Fish Habitat (EFH) has been designated within the Project area for all five species of salmon (i.e., chum salmon, pink salmon, coho salmon, sockeye salmon, and Chinook salmon; NMFS 2017), which are common prey of marine mammals. Three creeks flowing into Port Chester are known to contain salmonids: Hemlock Creek, Trout Lake Creek, and Melanson Lake outflow (Giefer and Blossom 2020); however, adverse effects on EFH in this area are not expected. Fish populations in the Project area that serve as marine mammal prey could be temporarily affected by noise from pile installation and removal. The frequency range in which fish generally perceive underwater sounds is 50 to 2,000 Hz, with peak sensitivities below 800 Hz (Popper and Hastings 2009). Fish behavior or distribution may change, especially with strong and/or intermittent sounds that could harm fish. High underwater SPLs have been documented to alter behavior, cause hearing loss, and injure or kill individual fish by causing serious internal injury (Hastings and Popper 2005).

Pile installation and removal may result in a small increase in sedimentation within a few feet of the piles. A small amount of sediment may be deposited in proximity to each pile. Minor and temporary increases in turbidity may result from this process, but the effects on fish and marine mammal prey will be negligible. Indirect effects on prey will be insignificant and discountable due to the temporary nature of the activity, and are expected to be undetectable to marine mammals. In addition, DOT&PF will adhere to a no pile installation work window from April 1 to June 15 to minimize any potential impacts to salmon during critical life stages.

In general, impacts on marine mammal prey species are expected to be minor and temporary. The area likely impacted by the Project is relatively small compared to the available habitat in Port Chester and throughout Southeast Alaska. The most likely impact to fish from the Project will be temporary behavioral avoidance of the immediate area, although any behavioral avoidance of the disturbed area will still leave significantly large areas of fish and marine

mammal foraging habitat. Therefore, the impact on marine mammal prey during the Project is expected to be negligible.

10 DESCRIPTION OF POTENTIAL IMPACTS FROM LOSS OR MODIFICATION OF HABITAT ON MARINE MAMMALS

The potential impacts of the Project on marine mammal habitat are discussed in Section 9. The effects of the Project on marine mammal habitat are expected to be short term and minor. Permanent loss of habitat is limited to the footprint of the piles only. One potential impact on marine mammals associated with the Project could be a temporary loss of habitat because of elevated noise levels. Displacement of marine mammals by noise will not be permanent and will not have long-term effects. The Project is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations, because pile installation and removal will be temporary and intermittent.

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11 MITIGATION MEASURES

The estimates outlined in Section 6 represent the maximum potential numbers of marine mammals exposed to Project-related noise, including multiple takes of the same resident individuals that could be exposed to acoustic sources reaching Level B harassment levels. The DOTP&F proposes to employ a number of mitigation measures to minimize the number of marine mammals affected. Mitigation measures will include those that address all phases of construction in general, those that are specific to physical pile installation/removal, those that pertain to Level A and Level B harassment zones, and those that involve observation of marine mammals in the Project area. Marine mammal monitoring and mitigation methods are described in more detail in the Marine Mammal Monitoring Plan (Appendix B).

11.1 Pile Installation and Associated Activities

Pile installation mitigation measures include:

- Marine Mammal Observers (MMOs) will be employed as described in Section 13 and the Marine Mammal Monitoring Plan (Appendix B).
- Prior to the beginning of pile installation/removal, MMOs will visually inspect the Level B harassment zone from strategic locations for the presence of marine mammals. The Level B harassment zone will vary based on the size of pile and installation method underway. If a marine mammal is observed, it will be monitored until it has departed the Level B harassment zone. Ramp-up procedures may be initiated while the marine mammal is within the Level B harassment zone. As long as the marine mammal does not approach the construction site in such a way that injury or harm is possible, and assuming that take has not exceeded the number authorized, all pile installation and removal may continue while the marine mammal is within the Level B harassment zone (each individual will be considered a Level B take as allowed under the IHA to be issued by NMFS).
- In order to prevent harm or injury to marine mammals, the Contractor will implement conservative shutdown zones for marine mammals during pile installation and removal (Table 6-6). All shutdown zones are larger than the corresponding Level A harassment zone calculated for the species group and pile installation/removal method (Table 6-5). If a marine mammal approaches the shutdown zone specific to the species group and pile installation/removal method underway, the activity will cease until the marine mammal has voluntarily left the shutdown zone or 15 minutes (30 minutes for humpback whales, killer whales, and minke whales) have passed without subsequent detections.
- Ongoing in-water pile installation/removal will be stopped during periods when conditions such as low light, darkness, high sea state, fog, ice, rain, glare, or other conditions prevent effective marine mammal monitoring within the shutdown zones described above.
- Before impact pile installation occurs, the Contractor will employ a ramp-up procedure to minimize impacts. The following guidelines will be employed by the Contractor:
    - When the impact hammer is used, operators will provide an initial set of three strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, and then two subsequent three-strike sets.

- If a marine mammal is present within the Level A harassment zone, ramping up will be delayed until the animal(s) leaves the Level A harassment zone. Activity will begin only after the MMO has determined, through sighting, that the animal(s) has moved outside the Level A harassment zone.
- If a marine mammal is present in the Level B harassment zone, ramping up may begin and a Level B take will be recorded. Ramping up may occur when these species are in the Level B harassment zone, whether they enter the Level B zone from the Level A zone or from outside the Project area.
- If a marine mammal is present in the Level B harassment zone, the Contractor may elect to delay ramping up to avoid a Level B take. To avoid a Level B take, ramping up will begin only after the MMO has determined, through sighting, that the animal(s) has moved outside the Level B harassment zone or 15 minutes has elapsed without resighting the marine mammal.
- No vibratory ramping up is required.

11.2 Harassment Zones

Modeling results for Level A and Level B harassment zones discussed in Section 6 were used to develop mitigation measures for pile installation and removal. During pile installation and removal, the shutdown zone will include all areas where the underwater SPLs have the potential to equal or exceed the Level A (injury) harassment criteria (see Table 6-5).

For those marine mammals for which Level B take has not been requested, in-water pile installation/removal will shut down immediately when an animal is sighted and before the animal has entered the Level B harassment zone. In-water pile installation and removal will remain shut down until marine mammals for which no take has been authorized have left the harassment zone per the procedures described in Section 11.1. If a marine mammal authorized for Level B take is present in the Level B harassment zone, in-water pile installation and removal may continue, and a Level B take will be recorded. Pile installation and removal may occur when these species are in the Level B harassment zone, whether they entered the Level B zone from the Level A zone (if relevant), or from outside the Project area. If Level B take reaches the authorized limit, pile installation will be stopped as these species approach, to avoid additional take of these species.

Implementation of the above mitigation measures will be completed by MMOs as described in Section 13.

12 MEASURES TO REDUCE IMPACTS ON SUBSISTENCE USERS

The Project is not known to occur in an important subsistence hunting area. The Project area is a developed area with regular marine vessel traffic. However, the DOT&PF plans to provide advance public notice of construction activities to reduce construction impacts on local residents, adjacent businesses, and other users of Port Chester and nearby areas. This will include notification to nearby Alaska Native tribes that may have members who hunt marine mammals for subsistence. Of the marine mammals considered in this IHA application, only harbor seals are known to be used for subsistence in the region; however, the MIC does not authorize subsistence harvest of marine mammals (R. Cook, personal communication, June 5, 2020), so it is unlikely that the Project will interrupt any subsistence activity. If any tribes express concerns regarding Project impacts to subsistence hunting of marine mammals, further communication with the DOT&PF will take place, including provision of any Project information, and clarification of any mitigation and minimization measures that may reduce potential impacts to marine mammals used for subsistence.

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13 MONITORING AND REPORTING

Monitoring measures will be implemented along with mitigation measures (Section 11) to avoid and minimize impacts on marine mammals during the Project, as discussed in detail in the Marine Mammal Monitoring Plan (Appendix B).

One or more trained MMOs will collect sighting data and behavioral responses to pile installation and removal for all marine mammals observed within the harassment zones during these activities. MMOs will meet with the Contractor and DOT&PF to determine the most appropriate observation location(s) for monitoring during pile installation and removal.

Trained or experienced MMOs will be present during all pile installation and removal using impact, vibratory, and DTH methods. MMOs must be able to positively identify the marine mammals in the area and have prior training or expertise in monitoring and surveying marine mammals, with credentials available for review. MMOs must maintain verbal contact with construction personnel to immediately call for a halt of pile installation and removal to avoid exposures to noise, as described in Section 11.2.

The Contractor, MMOs, and DOT&PF (or DOT&PF's designee) will conduct a briefing prior to the start of in-water construction, or when new staff join the work, in order to explain responsibilities, communication procedures, the marine mammal monitoring protocol, and operational procedures.

13.1 MMO Qualifications

Marine mammal monitoring will be conducted by one or more MMOs who meet or exceed the minimum qualifications identified by NMFS in the final IHA. These include the following:

- MMOs will be independent observers (i.e., not construction personnel).
- The MMO or one MMO (if more than one) must have prior experience working as an observer.
- Other observers may substitute education (undergraduate degree in biological science or related field) or training for experience.
- If more than one MMO, one MMO will be designated as the lead MMO or monitoring coordinator. The lead MMO must have prior experience working as an observer.
- MMOs must have:
    - The ability to conduct field observations and collect data according to assigned protocols.
    - Experience or training in the field identification of marine mammals, including the identification of behaviors.
    - Sufficient training, orientation, or experience with construction operations to provide for personal safety during observations.
    - Lead MMOs must have writing skills sufficient to prepare a report of observations, including, but not limited to:
        - The number, species, and behavior of marine mammals observed

    - Dates and times when in-water pile installation and removal were conducted
    - Dates and times when in-water pile installation and removal were suspended to avoid potential harassment of marine mammals observed within the harassment zones
  - The ability to communicate orally, by radio, or in person with Project personnel to provide real-time information on marine mammals observed in the area.

13.2 Observations

MMOs will be positioned at the best practical vantage point(s). Monitoring locations will be selected by the Contractor during pre-construction. MMOs will monitor for marine mammals entering the Level B harassment zones; the position(s) may vary based on construction activity and location of piles or equipment. At least one of the monitoring locations will have the following characteristics:

- An unobstructed view of the pile being driven, and
- An unobstructed view of the Level A harassment zones.

This central position will generally be staffed by the lead MMO, who will monitor the shutdown zones and communicate with construction personnel about shutdowns and management of take. The MMO at this location will be able to see at least a 500-meter radius, which exceeds the largest Level A zone, around the construction site. Walking or otherwise moving around the general construction site may be helpful for monitoring the shutdown zones in their entirety. The other MMO(s) will watch for marine mammals entering and leaving the Level B zone(s) and will alert the lead MMO of the number and species sighted, so that no unexpected marine mammals will approach the construction site. This will avoid and minimize Level A take of all species.

The MMOs will begin observations 30 minutes prior to the start of pile installation/removal and 30 minutes following completion each day. Pile installation/removal may commence when MMOs have declared the shutdown zone clear of marine mammals. In the event of a delay or shutdown resulting from marine mammals in the shutdown zone, their behavior must be monitored and documented until they leave of their own volition, at which point pile installation or removal may begin.

At least two MMOs will be available to observe during rotating shifts of no more than 4 hours without a break, and no more than 12 hours each day to prevent fatigue. While the 4-hour time limit is required by NMFS, pile driving is intermittent in nature, and it is expected that MMOs on watch will be able to take more frequent breaks as needed while still being able to maintain sufficient coverage of the Project area.

MMOs will have no other construction-related tasks or responsibilities while monitoring for marine mammals. MMOs will understand their roles and responsibilities before beginning observations. Each MMO will be trained and provided with reference materials to ensure standardized and accurate observations and data collection. A clear authorization and communication system will be in place to ensure that MMOs and construction crew members understand their respective roles and responsibilities.

Specific aspects and protocols of observations will also include the following:

- If waters exceed a sea-state that restricts the MMO's ability to make observations within the Level A harassment zone of pile driving (e.g., if there is excessive wind or fog), pile

installation and removal will be halted. Pile driving will not be initiated until the entire Level A harassment zone is visible.

- If any marine mammal species not authorized for take is encountered during pile installation or removal and is likely to be exposed to Level B harassment, in-water pile installation or removal will be halted. If take occurs, the observations will be reported to NMFS' Office of Protected Resources.
- When a marine mammal is observed, its location will be determined using tools to verify distance and heading (e.g., rangefinder, reticle binoculars, GPS, compass).
- The MMOs will record any authorized cetacean or pinniped present during monitoring and the harassment zone within which it is located, if applicable. The harassment zones are described in Table 6-5 and Table 6-7 and shown on Figure 6-1, Figure 6-2, and Figure 6-3.
- Ongoing in-water pile installation/removal may be continued during periods when conditions such as low light, high sea state, fog, ice, rain, or glare prevent effective marine mammal monitoring of the entire Level B harassment zone. MMOs will continue to monitor the visible portion of the Level B harassment zone throughout pile installation and removal.

13.3 Data Collection

NMFS requires that MMOs use NMFS-approved sighting forms (see Appendix B) that contain the following information:

- Date and time that pile installation begins or ends
- Construction activities occurring during each observation period
- Weather (e.g., wind, precipitation, fog)
- Tide state and water currents
- Visibility
- Species, numbers, and, if possible, sex and age class of marine mammals
- Marine mammal behavior patterns observed, including bearing and direction of travel, and, if possible, the correlation to SPLs
- Distance from pile installation site to marine mammals, if pile installation is occurring during marine mammal observations; and
- Other human activity in the area.

13.4 Reporting

A draft report will be submitted to NMFS within 90 calendar days of the completion of marine mammal monitoring. A final report will be prepared and submitted to NMFS within 30 days following receipt of comments on the draft report from NMFS. To the extent practicable, the MMOs will record behavioral observations that may make it possible to determine if the same or different individuals are being “taken” as a result of Project activities over the course of a day.

In general, reporting will include:

- Descriptions of any observable marine mammal behavior in the Level A and Level B harassment zones
- Descriptions of in-water and in-air construction activities occurring at the time of the observable behavior
- Actions performed to minimize impacts to marine mammals (e.g., shutdowns)
- Times when work was stopped and resumed due to the presence of marine mammals
- Results, which include the detections of marine mammals, species and numbers observed, sighting rates and distances, and behavioral reactions within the Level A and Level B harassment zones
- A refined take estimate based on the number of marine mammals observed during the course of construction

See the Marine Mammal Monitoring Plan (Appendix B) for more detail.

14 SUGGESTED MEANS OF COORDINATION

To minimize the likelihood that impacts will occur to the species, stocks, and subsistence use of marine mammals, all Project activities will be conducted in accordance with federal, state, and local regulations. To further minimize potential impacts from the planned Project, the DOT&PF will continue to cooperate with NMFS and other appropriate federal agencies (e.g., U.S. Fish and Wildlife Service, United States Army Corps of Engineers), and the State of Alaska. DOT&PF will also coordinate with the MIC. While the MIC does not authorize subsistence harvest, DOT&PF will also coordinate with MIC regarding Project activities in order to minimize impacts on the community.

The DOT&PF will cooperate with any other marine mammal monitoring and research programs in Southeast Alaska that may take place in the Metlakatla area. The DOT&PF will also assess mitigation measures that can be implemented to eliminate or minimize impacts from these activities.

The DOT&PF will make available its field data and behavioral observations on marine mammals that occur in the Project area. The draft summary report described in Section 13.4 documents the results of monitoring efforts and will be provided to NMFS within 90 calendar days of the conclusion of monitoring. This information will be made available to regional, state, and federal resource agencies, universities, and other interested private parties upon written request to NMFS.

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Appendix A
Project Site Plan Drawings

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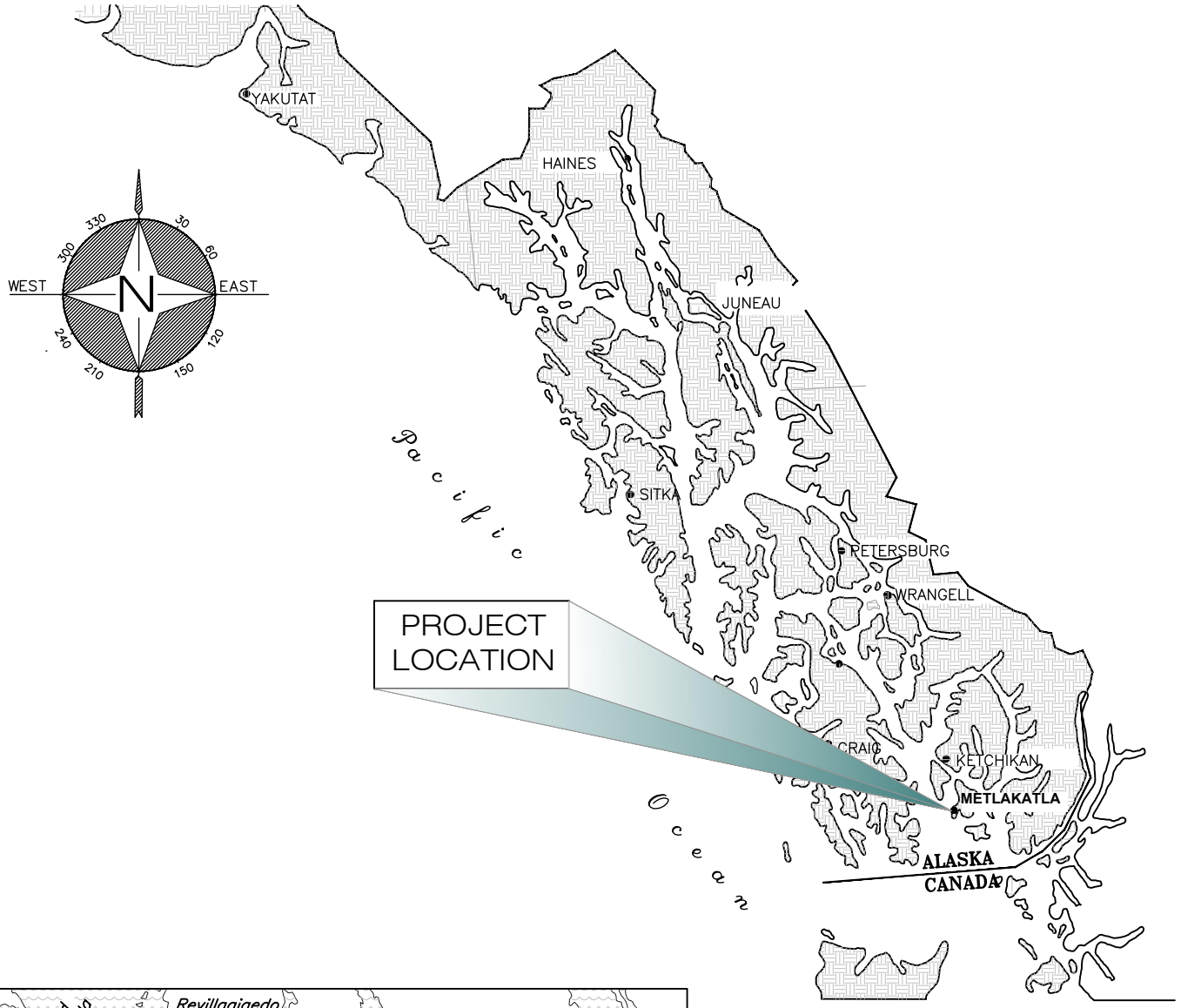
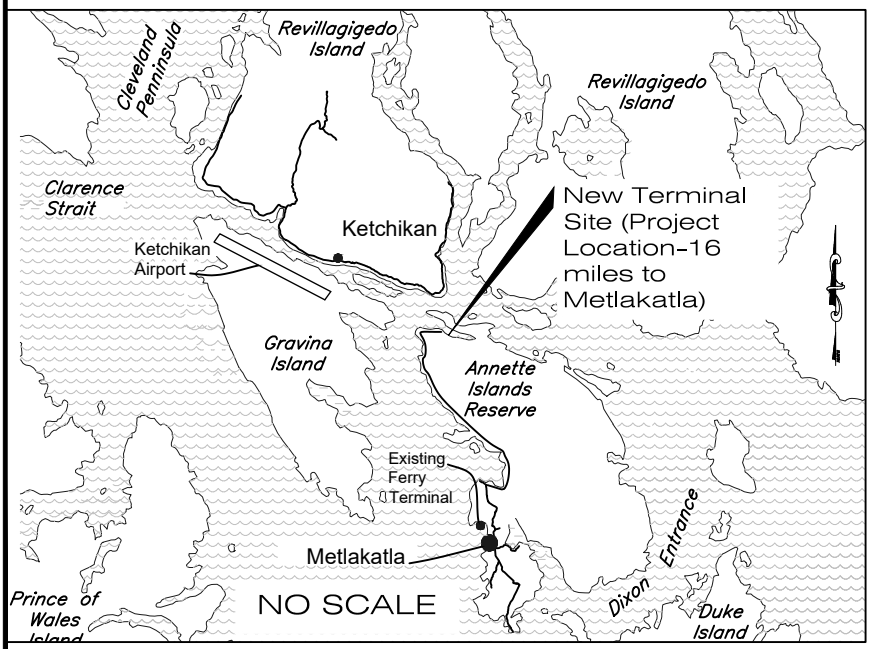


VICINITY MAP
NTS



TIDAL DATA	
EHW	19.8'
EHT	18.8'
MHW	14.6'
MLLW	0.0'
ELW	−5.0'

WATER BODIES:
PORT CHESTER

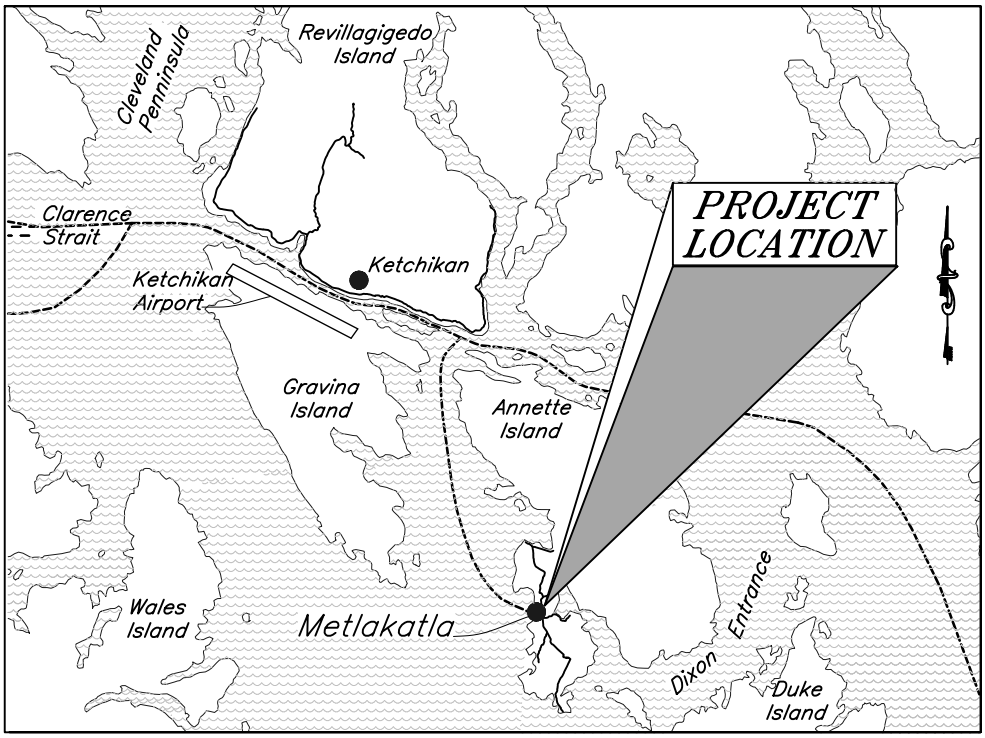
ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

KEY & REGIONAL MAPS

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHCOAST REGION

METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH,
RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 1 OF 7



VICINITY MAP

EXISTING SEAPLANE FLOAT SITE

WATER BODIES:
PORT CHESTER

ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

LOCATION & VICINITY MAPS

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHCOAST REGION

METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH,
RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 2 OF 7

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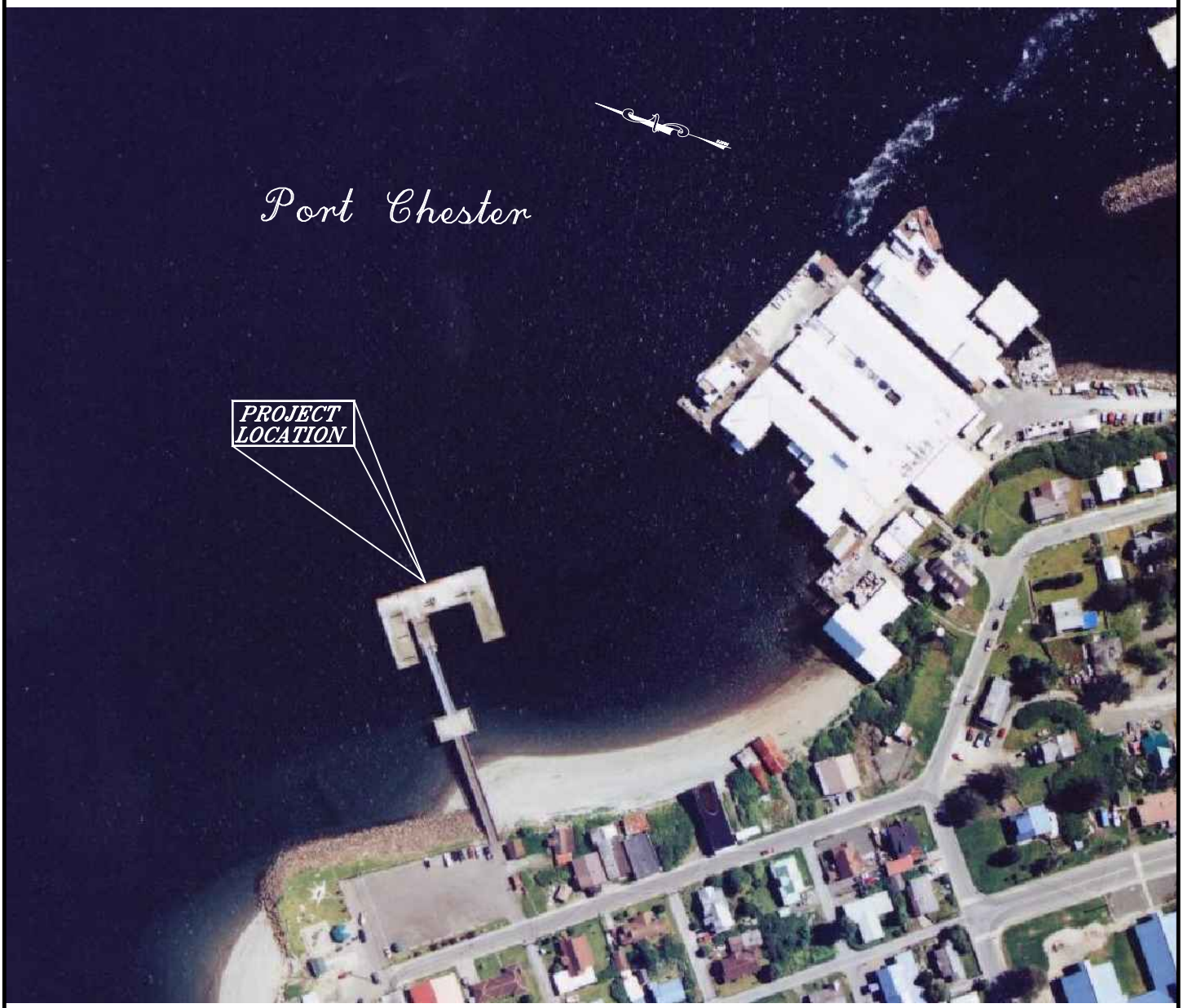

EXISTING SEAPLANE FLOAT SITE

WATER BODIES:
PORT CHESTER

ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

EXISTING SITE MAP

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHCOAST REGION

METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH,
RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 3 OF 7

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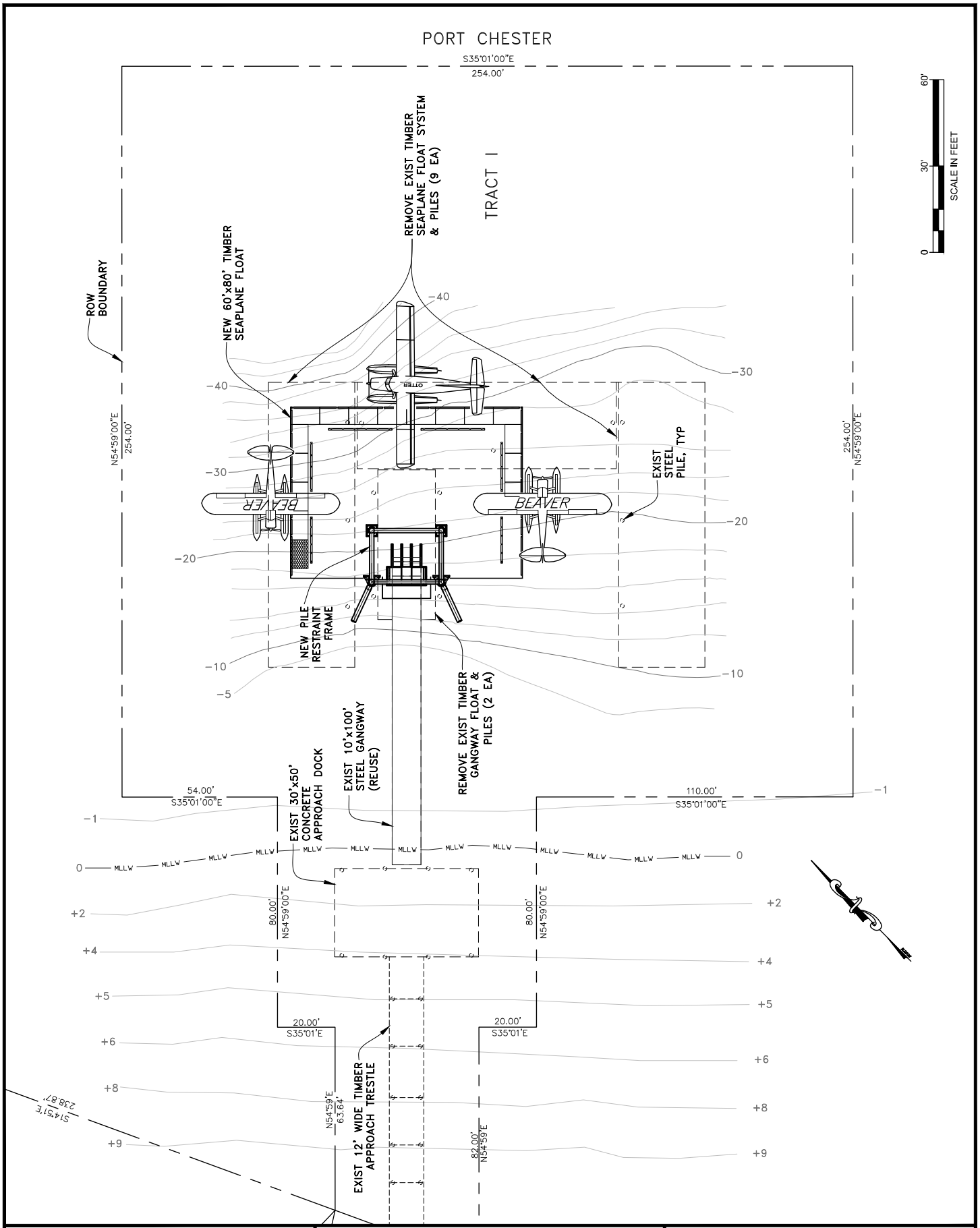


WATER BODIES:
PORT CHESTER

ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

PROPOSED PLAN LAYOUT

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHCOAST REGION

METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH, RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 4 OF 7

WATER BODIES:
PORT CHESTER

ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

ELEVATION & PILE TABLE

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION AND PUBLIC FACILITIES
SOUTHCOAST REGION

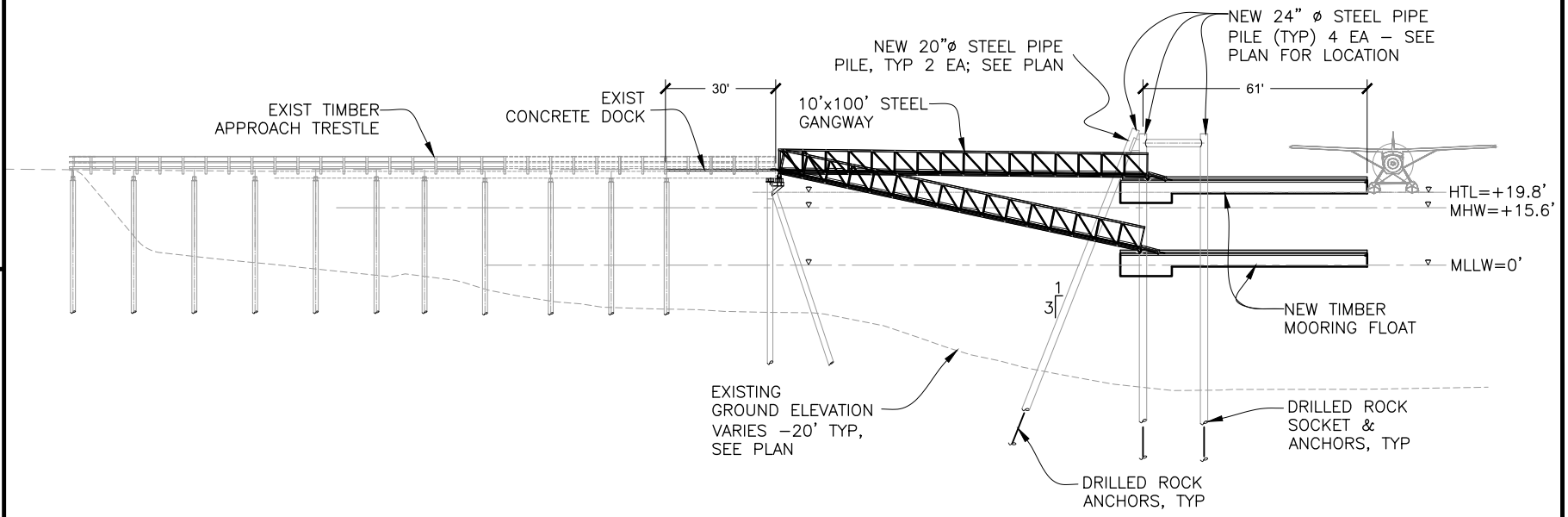
METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH, RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 5 OF 7

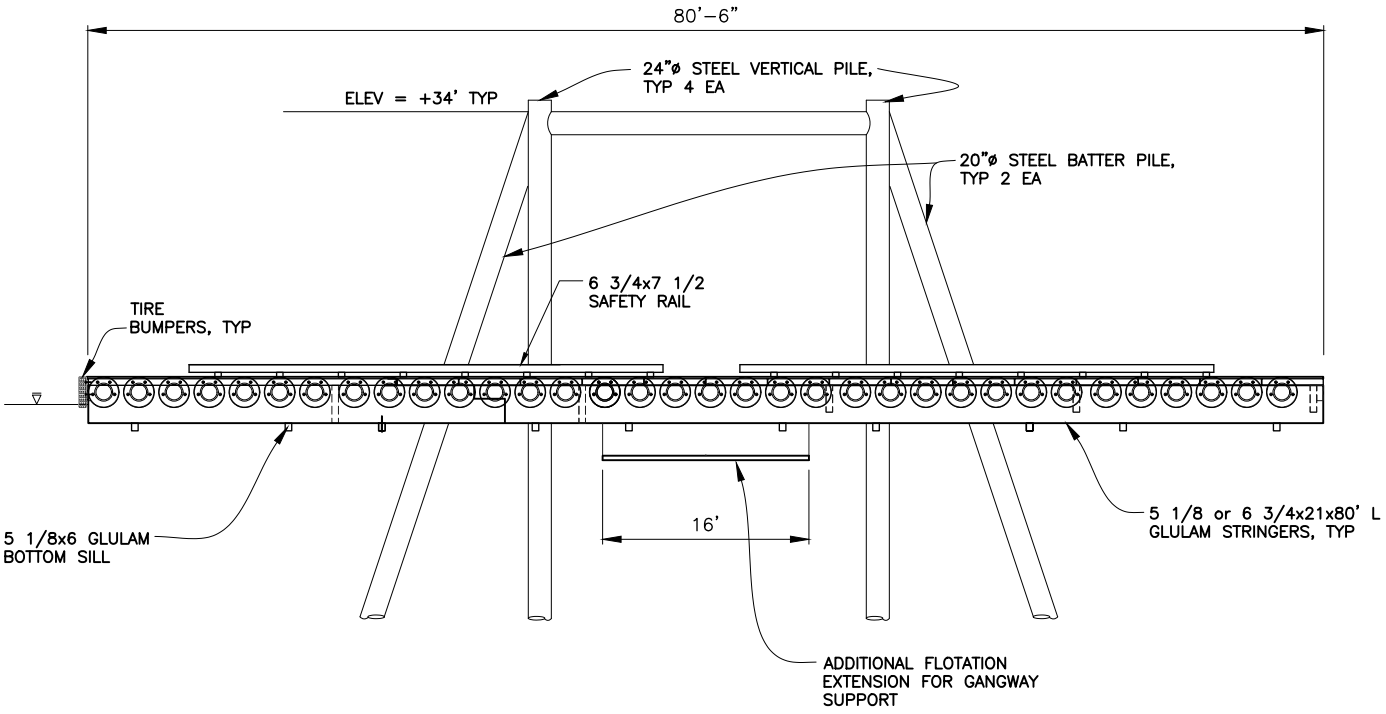
Q:\MET\SFAPT00270\MFIP\PLANSET\CODE PERMIT\00270_05.DWG

PILE INFORMATION

STRUCTURE	REMOVE EXISTING STEEL PIPE PILE (DIA)	NO REQD	NEW STEEL PIPE PILE (DIA)	NO REQD	DRILLED ROCK SOCKET (EA)	DRILLED ROCK ANCHOR (EA)
EXISTING SEAPLANE FLOATS	16"	9	NA	NA	NA	NA
EXISTING GANGWAY FLOAT	16"	2	NA	NA	NA	NA
NEW SEAPLANE FLOAT			24"	4	4	4
NEW SEAPLANE FLOAT			20"	2		2



ELEVATION
NTS

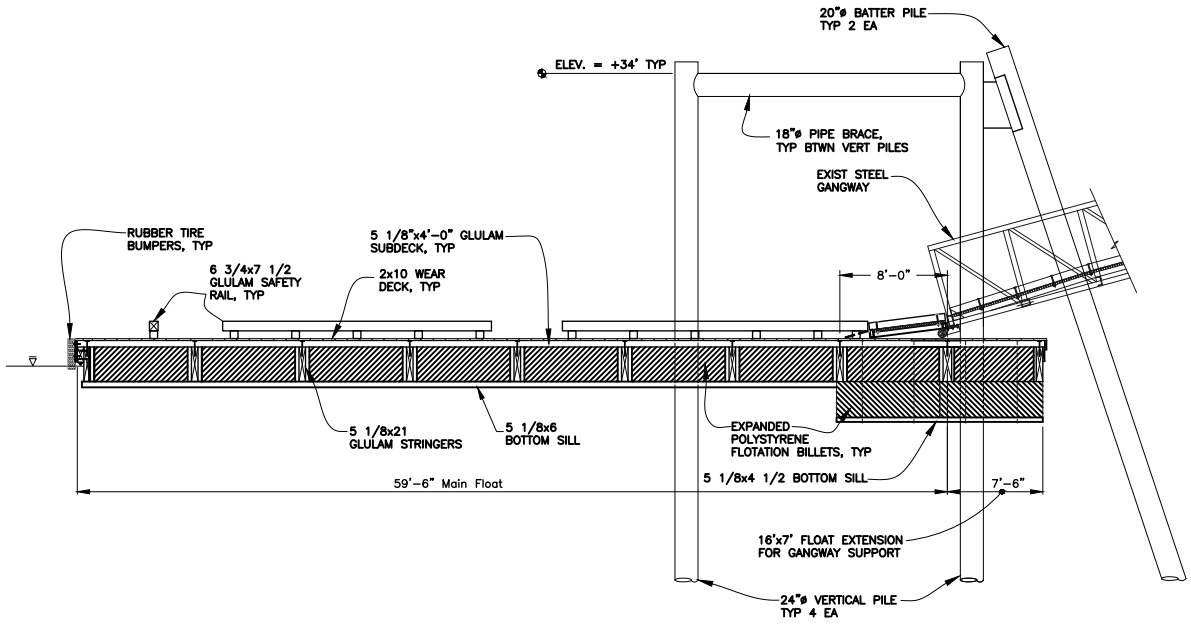


C

TYPICAL FRONT ELEVATION

TIMBER SEAPLANE MOORING FLOAT

WATER BODIES: PORT CHESTER ADJACENT PROPERTY OWNERS: METLAKATLA INDIAN COMMUNITY	**MOORING FLOAT** **TYPICAL ELEVATION** APPLICATION BY: ALASKA STATE DEPT. OF TRANSPORTATION AND PUBLIC FACILITIES SOUTHCOAST REGION	METLAKATLA SEAPLANE FACILITY REFURBISHMENT PROJECT NO. SFAPT00270 AT: METLAKATLA, ALASKA LOCATED IN: TOWNSHIP 78 SOUTH, RANGE 92 EAST CRM, ALASKA DATE: October 30, 2019 SHEET 6 OF 7



D — TYPICAL SECTION

TIMBER SEAPLANE MOORING FLOAT

TIMBER TREATMENT NOTES FOR FLOAT STRUCTURE

1. ALL TIMBER SUBDECK DECK LEVEL & BELOW INCLUDING GLULAM SUBDECK, STRINGERS, DIAPHRAGMS AND BOTTOM SILLS ARE TO BE PRESSURE TREATED WITH CREOSOTE PRESERVATIVE.
2. TIMBER WEAR DECK, GLULAM BLOCKING, BUMPER BOARDS AND SAFETY RAILS WILL BE PRESSURE TREATED WITH ACZA PRESERVATIVE.

WATER BODIES:
PORT CHESTER

ADJACENT PROPERTY OWNERS:
METLAKATLA INDIAN COMMUNITY

MOORING FLOAT
TYPICAL SECTION

APPLICATION BY:
ALASKA STATE DEPT. OF TRANSPORTATION
AND PUBLIC FACILITIES
SOUTHCOAST REGION

METLAKATLA SEAPLANE FACILITY REFURBISHMENT
PROJECT NO. SFAPT00270
AT: METLAKATLA, ALASKA
LOCATED IN: TOWNSHIP 78 SOUTH,
RANGE 92 EAST CRM, ALASKA

DATE: October 30, 2019 SHEET 7 OF 7

Appendix B
Marine Mammal Monitoring and Mitigation Plan

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Marine Mammal Monitoring and Mitigation Plan

Metlakatla Seaplane Facility Refurbishment Project

State Project # SFAPT00270

November 2020

Prepared for:
Alaska Department of Transportation and Public Facilities
6860 Glacier Highway
Juneau, Alaska 99801

Prepared by:
HDR
2525 C Street, Suite 500
Anchorage, Alaska 99503

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Acronyms and Abbreviations

DOT&PF	Alaska Department of Transportation and Public Facilities
FR	*Federal Register*
IHA	Incidental Harassment Authorization
MMO	Marine Mammal Observer
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service

1.0 INTRODUCTION

The Alaska Department of Transportation and Public Facilities (DOT&PF) will implement the following Marine Mammal Monitoring and Mitigation Plan during pile installation and removal for the Metlakatla Seaplane Facility as part of the Metlakatla Seaplane Facility Refurbishment Project (Project) in Metlakatla, Alaska. This Marine Mammal Monitoring and Mitigation Plan was prepared as part of the application for an Incidental Harassment Authorization (IHA) under the Marine Mammal Protection Act (MMPA), and in support of formal consultation with the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act.

The in-water portion of the Project includes removal of 11 steel piles that support the existing multiple-float structure and installation of 6 permanent steel piles to support a new seaplane float. In addition, 4 temporary steel piles will be installed and removed to support construction. It is anticipated that a maximum of 10 hours of vibratory pile installation/removal, a maximum of 2.5 hours of impact installation, and a maximum of 19 hours of rock socket drilling will occur over approximately 20 days of construction within a 2-month construction window. The Project has the potential to generate elevated levels of underwater noise that could exceed Level A (injury) and Level B (disturbance) harassment thresholds established by NMFS under the new Technical Guidance (NMFS 2016) and the interim criteria (70 *Federal Register* [FR] 1871–1875), respectively.

Level A harassment is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild. Level B harassment is any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering, but that does not have the potential to injure a marine mammal or marine mammal stock in the wild.

Steller sea lions (*Eumetopias jubatus*), harbor seals (*Phoca vitulina*), harbor porpoises (*Phocoena phocoena*), Dall's porpoises (*Phocoenoides dalli*), killer whales (*Orcinus orca*), minke whales (*Balaenoptera acutorostrata*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), and humpback whales (*Megaptera novaeangliae*) may occur in the Project area, and a small number of Level B takes was authorized for these marine mammals (see Project IHA). A small number of Level A takes was also authorized for harbor seals and harbor porpoises (see Project IHA).

This Marine Mammal Monitoring and Mitigation Plan describes the methods that have been developed to avoid, minimize, and mitigate potential harassment of marine mammals during pile installation and removal, and to monitor and record the extent of harassment if it does occur. All marine mammal monitoring must be conducted in compliance with the Project IHA, Biological Opinion, and Incidental Take Statement. If differences exist, the Project IHA, Biological Opinion, and Incidental Take Statement supersede this Marine Mammal Monitoring and Mitigation Plan.

2.0 AVOIDANCE AND MINIMIZATION MEASURES

The complete list of required avoidance, minimization, and mitigation measures can be found in the Project IHA. Avoidance and minimization measures described here include soft starts, establishment of Level A and Level B harassment zones, and marine mammal monitoring.

2.1 Soft Starts

Soft start procedures are detailed in the Project IHA. At the beginning of the work day or when pile installation activities have been stopped for longer than 30 minutes, soft-start (ramping-up) procedures will be implemented for impact pile installation. A soft start involves starting the equipment for brief durations to provide marine mammals in the vicinity of a construction site with an audible warning of impending noise, giving them the opportunity to leave the area before noise reaches the threshold of disturbance.

2.2 Monitoring and Shutdown Zones

Shutting down pile installation or removal before a marine mammal crosses an acoustic isopleth into a defined Level A or Level B harassment zone will be used to avoid take. If a shutdown does not occur, the marine mammal will be considered a take upon entering the defined zone (Level A or Level B). All takes (potential exposures to defined sound levels) will be documented.

Distances to Level A and Level B harassment isopleths, as defined by NMFS, are listed in the Project IHA. Distances to Level B harassment thresholds vary by pile installation method, and pile size and type (see Project IHA). Distances to the Level A harassment thresholds vary by pile installation method, pile size and type, and the amount of time or number of strikes required for installation or removal (see Project IHA).

Shutdown zones (Table 2-1) will be used to avoid incidental Level A take of different marine mammal species. Level A shutdown zones differ by pile installation method and species functional hearing group and are listed in the Project IHA. To be precautionary, a larger 100-meter shutdown zone will be implemented for vibratory pile installation and removal and installation of tension anchors. Although every effort will be made to shut down before marine mammals enter the defined shutdown zones and 100-meter shutdown zone, if the Level A isopleth for a species is smaller than the defined shutdown zone, take of that species will not occur unless individuals enter their respective Level A harassment zones (see Project IHA).

Land forms are impenetrable by underwater noise and create shadows where noise from construction will not be audible. At Metlakatla and within Port Chester, noise from vibratory and impact installation will be blocked from ensonifying some marine areas because those areas are located behind land forms. Marine waters will not be monitored if they are located behind landmasses such as islands, headlands, breakwaters, or causeways that block transmission of sound.

Table 2-1. Shutdown Zones during Pile Installation and Removal

Activity	Pile Diameter	Pile Type or Number of Piles	Shutdown Distance (meters)	
			Cetaceans	Pinnipeds
Vibratory Installation or Removal	16- and 24-inch	Battered and Plumb	100	100
DTH (Rock Socket)	24-inch	Temporary	200	200
		Battered, Permanent	260	120
		Plumb, Permanent	415	200
DTH (Tension Anchor)	8-inch	Permanent	100	100
Impact	24-inch	3 piles	135	100
		2 piles		
		1 pile	100	

Note: DTH: down-the-hole

2.3 Marine Mammal Monitoring

To minimize impacts of Project activities on marine mammals, a minimum of two Marine Mammal Observers (MMOs) will be present during vibratory and impact pile installation and pile removal. MMOs will search for, monitor, document, and track marine mammals around and within the shutdown zones and Level B harassment zones (Figure 1, Figure 2, and Figure 3). It should be noted that the titles “Protected Species Observer” and “Marine Mammal Observer” are intended to be synonymous for consultation, documentation, and construction purposes.

2.3.1 Monitoring Overview

Pre-activity monitoring, monitoring during pile installation and removal, and post-activity monitoring must be conducted according to the descriptions in the Project IHA. MMOs will also implement the avoidance and minimization measures as specified in the Biological Opinion as issued from NMFS.

MMOs will begin observations of the appropriate harassment zones 30 minutes prior to the start of pile installation, and will continue to observe for 30 minutes after completion of pile installation, as described in detail in the Project IHA. All MMO observations will occur between civil dawn and civil dusk. During monitoring, MMOs will scan the water every few minutes with high-quality binoculars, and will use the naked eye to scan during the remainder of the time. A high-powered spotting scope will also be available for scanning greater distances, so that any marine mammals swimming toward the harassment zones can be observed.

MMOs will have no other construction-related tasks or responsibilities while monitoring for marine mammals. Each MMO will be trained in marine mammal identification and behaviors, and will be provided with reference materials to ensure standardized and accurate observations and data collection.

Before construction commences, MMOs will meet with the Contractor and DOT&PF to determine the most appropriate observation location(s) for monitoring during pile installation and removal. If necessary, observations may occur simultaneously from more than one location. A primary MMO will always be placed at or near the seaplane facility where pile installation and

removal will occur. Other MMOs may be located at other observation locations as needed to adequately monitor the Level B harassment zones. Selection of monitoring locations will include consideration of the following:

- Safety of the MMOs, construction crews, and other people present during construction;
- Ability to see the harassment zones and maximize field of view;
- Elevation and location; and
- Minimal interference with construction activities.

A clear authorization and communication system will be in place to ensure that both MMOs and the construction crew understand their respective roles and responsibilities. It is expected that if pile installation must be shut down to avoid take, the MMO will contact a designated member of the construction crew. MMOs and the construction manager will be equipped with a hand-held radio and/or phone to ensure immediate communication of a shutdown. A "shutdown" is defined as a period of time when in-water noise from pile installation does not occur. All communications with the construction crew will be documented in the environmental conditions and construction activities log. Although it is the role of the MMOs to watch for marine mammals, DOT&PF construction personnel will be instructed to notify the MMOs immediately if they observe a marine mammal.

Specific aspects and protocols of marine mammal observations will also include the following:

- Monitoring distances will be measured with range finders.
- Distances to marine mammals will be based on the best estimate of the MMO, relative to known distances to objects in the vicinity and the use of the range finder.
- Bearings to marine mammals will be determined by using a compass.

2.3.2 Protected Species Observer Qualifications

MMO qualifications are described in the Project IHA. At a minimum, all MMOs must be capable of spotting and identifying marine mammals and documenting applicable data during all types of weather, including rain, sleet, snow, and wind. All MMOs must also be comfortable with handling the authority to stop work when necessary.

Qualifications include:

- Visual acuity (correction is permissible) sufficient to allow detection and identification of marine mammals at the water's surface. Use of binoculars may be necessary to correctly identify the target to species.
- Demonstrated ability to conduct field observations and collect data according to assigned protocols (this may include academic training), including the ability to use a range finder and compass accurately to determine distances and directions to marine mammals.
- Experience or training in field identification of marine mammals. Sufficient training, orientation, or experience with construction operations to provide for personal safety during observations.
- Ability to communicate orally, by radio or in person, with Project personnel about marine mammals observed in the area.

2.4 Data Collection

2.4.1 Environmental Conditions and Construction Activity

Data collection and reporting are described in the Project IHA. The MMOs will also document environmental conditions, types of construction activities, types of nearby commercial activities, and communications with the construction crew in the environmental conditions and construction activities log. Environmental conditions will be documented at the beginning and end of every monitoring period and at every half hour, or as conditions change. Any nearby commercial activities that could influence marine mammal behavior will be documented at the time of a marine mammal sighting. These could include the presence and number of vessels offloading at the seafood processing facility or the number and type of vessels present. Data collected will also include the MMOs' names; location of the observation station; time of observation; wave height; wind speed; amount and position of glare; weather conditions; and visibility (Table 2-2).

The MMOs will document the time of startup as well as shutdown. The MMOs will also document the reason for stopping work, time of shutdown, and type of pile installation or other in-water work taking place. Additionally, all communications between an MMO and the construction crew will be documented.

Data collected regarding environmental conditions, marine mammal sightings, and mitigation measures will be entered into a spreadsheet. Each data entry will be checked for quality assurance and quality control. Upon request, the data will be submitted to NMFS along with the final monitoring report.

2.4.2 Sightings

Authorized take by species is detailed in the Project IHA. Each marine mammal sighting will be documented on a sighting form, which consists of a data page/table and a map of where the marine mammal was observed (Attachment 1). Alternatively, data can be collected using a laptop, tablet, or similar electronic device that is protected from wet weather. Regardless of the collection platform, data will consist of start and end times of each sighting; number of individuals; sex and age class, if possible; behavior and movement; distance from Project activities to the sighting; type of in-water activity at the time of sighting; and if and when Project activities were stopped in response to the sighting. Monitoring distances will be measured with range finders. MMOs will record if Level A and/or Level B take occurs, including the number of animals and species taken. To the extent practicable, the MMOs will record behavioral observations that may make it possible to determine if the same or different individuals are being taken as a result of Project activities over the course of a single day. While monitoring and tracking a sighting, MMOs will also continue to sweep the water with binoculars and the naked eye to identify other marine mammals potentially entering the area.

Table 2-2. Data Attributes and Definitions

Data Attribute	Attribute Definition and Units Collected
Start and end times of monitoring period	Time monitoring by MMOs began and ended, without interruption
Environmental Conditions	
Weather conditions	Dominant weather conditions, collected every 30 minutes: sunny (S), partly cloudy (PC), light rain (LR), steady rain (R), fog (F), overcast (OC), light snow (LS), snow (SN)
Wind speed	In knots
Wind direction	From the north (N), northeast (NE), east (E), southeast (SE), south (S), southwest (SW), west (W), northwest (NW)
Wave height	Calm, ripples (up to 4 inches), small wavelets (up to 8 inches), large wavelets (up to 2 feet), small waves (up to 3 feet), moderate waves (up to 6 feet), large waves (up to 9 feet)
Cloud cover	Amount of cloud cover (0–100%)
Visibility	Maximum distance at which a marine mammal could be sighted
Glare	Amount of water obstructed by glare (0–100%) and direction of glare (from south, north, or another direction)
Tide	Predicted hourly data information gathered from National Oceanic and Atmospheric Administration will be available on-site
Construction and Communication Activities	
Time of event	Time that construction activities and all communications between MMOs and construction crews take place
Type of construction activity	Type of construction activity occurring, including ramp up, startup, shutdown, and type of pile installation technique
Communication	Information communicated between MMOs and construction crew
Marine Mammal Sighting Data	
Time of initial and last sighting	Time the animals are initially and last sighted
Number of individuals	Minimum and maximum number of animals counted (record the count the MMO believes to be the most accurate)
Sex and age, if possible	Generally, numbers of females with pups or calves
Initial and final heading	Direction animals are headed when initially and last sighted
In-water construction activities at time of sighting	Type of construction activities occurring at time of sighting
Distance from marine mammal to construction activities	Distance from marine mammal to construction activities at initial sighting, closest approach to activities, and final sighting
Commercial activities at time of sighting	Description of nearby commercial activities occurring at time of sighting, such as presence and number of vessels offloading at seafood processing facility dock, number and type of vessels nearby
Behavior	Behaviors observed (indicate the primary and secondary behaviors)
Change in behavior	Changes in behavior (indicate and describe)
Group cohesion	Orientation of animals within the group and the distance between animals

3.0 REPORTING

Reporting requirements are outlined in the Project IHA. A draft report will be submitted to NMFS within 90 calendar days of the completion of marine mammal monitoring. A final report will be prepared and submitted to NMFS within 30 days following receipt of comments on the draft report from NMFS.

The monitoring report will include a description of the monitoring protocol, a summary of the data recorded during monitoring, and an estimate of the number of marine mammals that may have been harassed, including the total number extrapolated from observed animals across the entirety of relevant monitoring zones. The data will include:

- Numbers of days of observations
- Lengths of observation periods
- Locations of observation station(s) used and dates when each location was used
- Numbers, species, dates, group sizes, and locations of marine mammals observed
- Distances to marine mammal sightings, including closest approach to construction activities
- Descriptions of observable marine mammal behavior in the Level A and Level B harassment zones
- Times of shutdown events, including when work was stopped and resumed due to the presence of marine mammals or other reasons
- Descriptions of the type and duration of any pile installation work occurring and soft start procedures used while marine mammals were being observed
- Details of all shutdown events and whether they were due to the presence of marine mammals, inability to clear the hazard area due to low visibility, or other reasons
- Tables, text, and maps to clarify observations

An electronic copy of the data spreadsheet will be available to NMFS upon request.

If a marine mammal stranding is observed, NMFS or the U.S. Fish and Wildlife Service will be contacted immediately through the Alaska Marine Mammal Stranding Hotline (1-877-925-7773).

Figure 1. Shutdown Zones for Cetaceans during Pile Installation and Removal at Metlakatla Seaplane Facility

Figure 2. Shutdown Zones for Pinnipeds during Pile Installation and Removal at Metlakatla Seaplane Facility

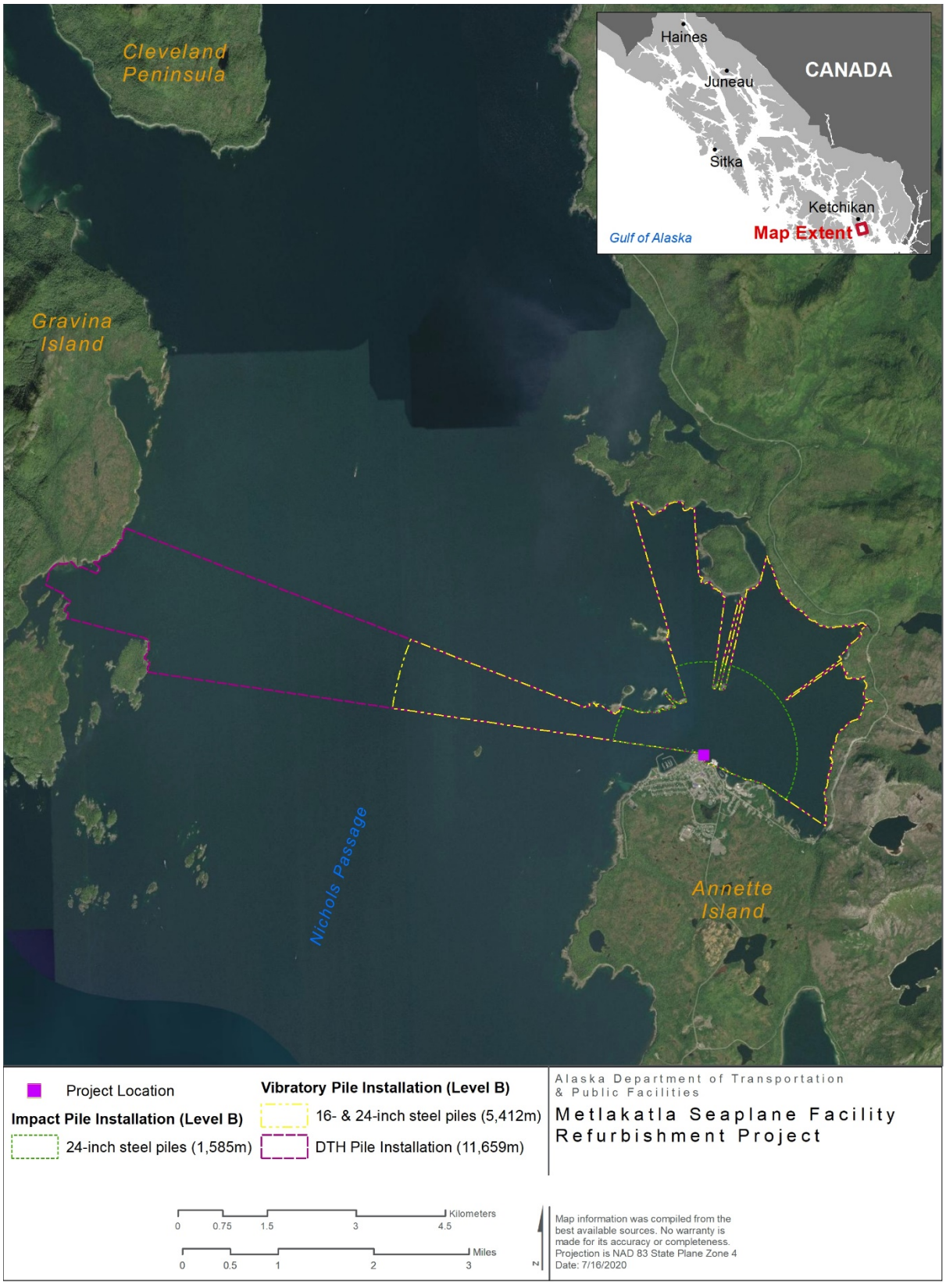

Figure 3. Level B Harassment (Monitoring) Zones during Pile Installation and Removal at Metlakatla Seaplane Facility

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Attachment 1: Example Data Forms

Marine Mammal Sighting Form

Project: **Location:** **Sighting #:**
(1st sighting of the day is Sighting#: 1)

Date: **Observer(s):**

Time *(military)*		**Species** *(circle)*	**Distance** *(animal to activity)*		**Number of Animals**		**Number of Animals in Each Class** *(if possible)*			
Initial Sighting Time		Steller Sea Lion	Initial Distance		Min Count		Adults		Calves/ Pups	
Final Sighting Time		Harbor Seal								
Time Entered H-Zone B		Harbor Porpoise	Closest Distance		Max Count		Juveniles		Unkn. Age	
Time Exited H-Zone B		Dall's Porpoise								
Time Entered H-Zone A		Killer Whale	Final Distance		Best Count		Male		Female	
Time Exited H-Zone A		Humpback								
		Fin Whale					Unknown Sex			
		Gray Whale								
		Minke Whale								
		other: _____								

Behavior of Marine Mammal check all observed behaviors; place a 1 next to primary, 2 next to secondary activity):
Indicate any changes in behavior in the Additional Information section

__ Travel	__ Fight	__ Mill	Other:_____
__ Disoriented	__ Play	__ Dive	
__ Slap	__ Spyhop	__ Unknown	
__ Feeding Observed	__ Swimming Toward	__ Swimming Away from Site	

Group Cohesion (Orientation of animals within the group and the approx. distance between animals) :

Project Activities and Harassment Zone

Entered Harassment Zone A? **Y or N** **Entered Harassment Zone B?** **Y or N**

In-Water Work was occuring at initial sighting? **Y or N** **List In-water Activites**:_____

SHUT DOWN or **DELAYED** from _____ to _____ (time)

NO SHUT DOWN, *EXPLANATION REQUIRED*:

Describe Commerical Activities (# and type of vessels offloading at sea food processing dock, traveling by, refueling at dock):

Additional Information (include more detailed information on behavior):

Draw locations on hardcopy map

Daily Environmental Conditions, Construction, and Communication Activity Log

Page _____ of _____

Project:_____ Location:_____ Observer(s):_____ Date: _____

Environmental Conditions (Recorded every 30 minutes or as conditions change)									Construction and Communication Activities *(include all start up and shut-down activities and all communication to construction crew)*		
Time	Weather Conditions	Wind Speed	Wind Direction	Beaufort Sea State	Glare (%)	Visibility (m)	Cloud Cover (%)	Comments	Time	Type of Construction Activity *(Ramp up, Startup, shutdown, type of pile driving)*	Communication/Comments

Weather Conditions: (S) Sunny, (PC) Partly Cloudy, (L) Light Rain, (R) Steady Rain, (F) Fog, (OC)Overcast, (LS) Light Snow, (SN) Snow
Beaufort Scale: (0) Calm (1) ripples- up to 4 in (2) small wavelets- up to 8 in (3) large wavelets- up to 2 ft, (4) small waves- up to 3 ft (5) moderate waves- up to 6 ft (6) large waves- up to 9 ft