DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG36

Small Takes of Marine Mammals Incidental to Specified Activities; Port of Anchorage Marine Terminal Redevelopment Project, Anchorage, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; receipt of application for subsequent letters of authorization; request for comments.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), notification is hereby given that NMFS has received an application from the Port of Anchorage (herein after ''Port'') to take small numbers of marine mammals, by Level B harassment, incidental to the 5–year Phase II portion of the Marine Terminal Redevelopment Project (herein after ''Project'') at the Port, Anchorage, Alaska. Species which could be potentially taken from Port construction include the beluga whale (*Delphinapterus leucas*), harbor seal (*Phoca vitulina*), harbor porpoise (*Phocoena phocoena*), and killer whale (*Orcinus orca*). NMFS is requesting comments on its proposal to issue a 1–year incidental harassment authorization (IHA) for the 2008 construction season (April-October) and its intent to promulgate regulations in 2009 governing the take of marine mammals over a 5–year period incidental to the activities described herein.

DATES: Comments and information must be received no later than April 17, 2008.

ADDRESSES: Comments on the application should be addressed to Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225. The mailbox address for providing email comments is *PR1.0648–XG36@noaa.gov*. NMFS is not responsible for e-mail comments sent to addresses other than the one provided here. Comments sent via e-mail, including all attachments, must not exceed a 10–megabyte file size.

A copy of the application containing a list of the references used in this document may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm*.

Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Jaclyn Daly or Jolie Harrison, Office of Protected Resources, NMFS, (301) 713–2289.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings may be granted for up to 5 years if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for certain subsistence uses, and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 as: an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

Under 50 CFR 216.104(b) of NMFS' implementing regulations for the MMPA, NMFS must publish in the **Federal Register** a notice of a proposed IHA and a notice of receipt for a request for the implementation of regulations governing the incidental taking. Information gathered during the associated comment period is considered by NMFS in developing, if appropriate, regulations governing the issuance of Letters of Authorizations (LOAs) for the proposed activity.

Summary of Request

The Project is divided into 2 phases. Phase I of the project did not involve any substantive in-water noise-producing activities, however, and on May 9, 2006, NMFS concurred with the Port that incidental take of marine mammals was not likely to occur and an IHA was not necessary if operations ceased if marine mammals were seen within 50 m of in-water fill activities. In contrast to phase I, phase II of the Port expansion project involves considerable in-water construction, including pile driving, which will introduce a sound into the marine environment and could harass marine mammals. Following several delays and design changes, on September 13, 2007, the Port re-applied for an IHA for the 2008 construction season and a 5–year rulemaking and letters of authorization (LOAs) for the subsequent 2009–2012 construction seasons. The Project is scheduled to be complete in 2012.

The Project is designed to upgrade and expand the Port by replacing aging and obsolete structures and provide additional dock and backland areas. Located on the east bank of Knik Arm in upper Cook Inlet (CI), the 129–acre Port is operating at or above sustainable practical capacity. The expansion of the Port is necessary to adequately support the economic growth of Anchorage and the state of Alaska through 2025. The Port currently serves 80 percent of Alaska's populated area, and it handles over 90 percent of consumer goods sold within the Alaskan Railroad distribution area (the Alaska Railroad runs from Seward through Anchorage, Denali, and Fairbanks to North Pole, with spurs to Whittier and Palmer (locally known as ''The Railbelt'').

Construction activities that will alter the environmental baseline include pile driving, dredging, and backfilling and compaction of fill. These activities have the potential to affect marine mammals from sounds generated from construction, alteration of habitat, and increased vessel noise due to Port expansion. Of the activities listed above, pile driving has the potential to result in harassment to marine mammals due to source levels and nature of operations, and the Port has requested authorization for takes resulting from this activity. Because pile driving has the potential to result in behavioral harassment of marine mammals located in Knik Arm, an authorization under section 101(a)(5)(A) or (D) of the MMPA is warranted.

Action Area

Cook Inlet is a semi-enclosed tidal estuary, extending roughly 370 km (200 nm.) southwest from Knik and Turnagain Arms, which almost surround the city of Anchorage, to Kamishak and Kachemak Bays. The inlet has marine connections with Shelikof Strait and the Gulf of Alaska

(GOA), and freshwater input from many large rivers (Muench *et al.*, 1978). The shoreline of Cook Inlet is irregular, comprised of a series of channels, coves, flats, and marshes. The Port is located within the Municipality of Anchorage between Ship Creek and Elemendorf Air Force Base on the eastern shore of Knik Arm. Knik Arm, is a relatively shallow, 30 mile long waterway that is 2–6 miles in width. This estuary is extremely silty and exhibits some of the strongest currents (up to 8 kts) and tidal variations (30+ft) in the world. Knik Arm contains many gyres created by predominant headlands that are important to beluga prey distribution.

Construction Process

The Project calls for an open cell sheet pile (OCSP) design. Pile driving of steel 36–inch (91.4 cm) and H-piles, along with open cell sheet piles, will occur in Phase II of the Project from April to October, annually, and is proposed to be completed in 2012. Pile driving is necessary to construct the waterfront bulkhead structure that will facilitate increased dock space and the fendering system. The bulkhead will be comprised of conjoining face and tail sheet-pile cells, forming a row of U-shaped, open cell sheet pile structures. The cells will serve to retain the fill material and provide the vertical bulkhead docking structure for berthing barges and ships. Approximately 17 face sheets and one tail wall per 27.5 linear ft (8.4 m) of dock face will be used. Each tail wall will extend up to 183 ft (55.8 m) landward from the dock face and include up to 110 tail sheets. Approximately 30 linear ft. of open cell sheet pile wall will be constructed in a 10 hour period. In 2008, it is estimated that 1,807 open cell face sheets and 8,175 tail sheets will be erected at the Port. These conjoining sheets will equate to 2,923 ft. (891 m) (face length) of open cell sheet piles weighing approximately 13,412 tons. A pile-driving hammer will be used to install sheet piles to the desired tip elevation (*i.e.*, how far the sheet pile extrudes from the substrate). Sheet piles will be driven with a vibratory hammer to the maximum extent possible (*i.e.*, until desired depth is achieved and/or to refusal, prior to using an impact hammer). Standard tip elevation for a dredge depth of -35 ft (10.7 m) and -45 ft (13.7 m) mean low low water are -50 and -60 ft (15–18 m), respectively.

Two methods of pile driving, impact and vibratory, will occur. Impact pile driving will only occur when vibratory driving is not sufficient. It is estimated that pile driving will be 40 percent vibratory and 60 percent impact for the first year of construction (2008) due to the dense clay substrate in the North Extension and Barge Berths areas. The percentage of impact pile driving will decrease in subsequent years. Work hours for pile driving are anticipated to be 6 a.m. to 10 p.m., up to seven days a week; however, proposed mitigation will restrict impact pile driving on two hours either side of low tide due to high beluga use during this time (see Mitigation section).

Backfilling and compaction of fill material will involve placing clean sand, gravel, or stone immediately behind the sheet-pile face up to an elevation of 30 ft (9.14 m). Upon completion, 135 acres of wetland would be filled, eliminating 9,000 linear ft (2.74 km) of intertidal habitat. To complete the 2008 Project tasks, approximately 1,600,000 cubic yards (cy) of suitable engineered and common fill material will be placed behind vertical steel or rock retaining features at the North Extension area which will result in the fill of as much as 18.4 acres of tideland. A vibratory probe and pile driving hammer will be used at evenly spaced locations to consolidate the fill. NMFS does not anticipate that this activity (i.e., fill compaction) will acoustically harass marine mammals due to the absorption of sound by the fill which will appreciably reduce sound energy released into the water.

Upon completion of Phase II of the Project, which will require additional take authorization such as subsequent LOAs, approximately 7,900 linear ft. (2.41 km) of dock parallel to and approximately 400 ft (122 m) west of the face of the existing dock structure, along with backfilling, will have been added to the Port. The new dock face will include 7,430 ft (2.26 km) of vertical sheet-pile wharf and 470 ft (143 m) for a dry barge berth. The completed marine terminal will include seven modern dedicated ship berths; two dedicated barge berths; rail access; modern shore-side facilities; equipment to accommodate cruise passengers; cement bulk, roll on/roll off and load on/load off cargo; containers; general cargo, military deployments, general cargo on barges, petroleum, oil, and lubricants; and additional land use area to support expanding military and commercial operations. More information on the Project design, phasing plan, and construction can be found at www.portofanchorage.org.

Marine Mammals Affected by the Project

Cook Inlet is utilized by several species of marine mammals; however, most of these are confined to the Lower Inlet and would not be affected by the Project. In Knik Arm, the CI beluga whale is the most abundant marine mammal. Harbor seals, harbor porpoise, and killer whales are also found in the Inlet but they do not display a regular presence in Knik Arm. There have been no published sightings of Steller sea lions (*Eumetopias jubatus*) in Knik Arm, only a single adult male in the Susitna Flats area; therefore, Steller sea lions are not anticipated to be affected by the Project and will not be considered further. If, by chance, a marine mammal not authorized to be taken is seen around the construction area, shut down will be required so as to avoid unlawful take.

NMFS is proposing to allow 34 beluga whale takes, 20 harbor seals takes, 20 harbor porpoise takes, and 5 killer whales takes, by Level B harassment only, incidental to the activities occurring in the 2008 construction year. Beluga take numbers for future LOAs, if issued, will be calculated upon gathering further information from monitoring and acoustic data as pile driving hours will change as well as percentage of impact and vibratory driving. Take numbers for other marine mammals are expected to remain the same throughout the construction phase of the Project. Further information on the status and distribution of Alaskan marine mammals can be found in the 2006 NMFS' Alaskan Stock Assessment Report (*http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2006.pdf*) and *http://www.fakr.noaa.gov/protectedresources*.

Beluga Whales

Status and Abundance

In the U.S. waters, beluga whales comprise five distinct stocks: Beaufort Sea, Eastern Chukchi Sea, Eastern Bering Sea, Bristol Bay, and Cook Inlet (Angliss and Outlaw, 2006). The only stock likely to be affected by the proposed construction activities at the Port is the CI stock. This population is genetically isolated from other populations by the geographic barrier of the Alaska peninsula and by their year-round residency in the Inlet (Hobbs *et al.*, 2006).

The CI beluga population has declined significantly over the years. Historical data suggest this population once numbered around 1,300 (Calkins, 1988). NMFS systematic aerial surveys documented a decline in abundance of nearly 50 percent between 1994 and 1998, from an estimate of 653 whales to 347 whales (Hobbs *et al.*, 2000). Aerial annual abundance surveys conducted each June/July from 1999 to 2005 have resulted in abundance estimates of 367,

435, 386, 313, 357, 366, and 278 whales for each year, respectively (Rugh *et al.*, 2005, NMFS unpublished data). According to NMFS 2006 stock assessment report, the population estimate for CI belugas is 278 with a minimum population estimate of 238; however, more recent surveys estimate the current population as of 2006 to be 302 belugas (Rugh *et al.*, 2006). This stock is listed as depleted under the MMPA and was proposed for listing under the ESA on April 20, 2007 (72 FR 19854).

Subsistence harvest is believed to have been the major contributor to the population decline (NMFS 2006). NMFS estimated that the average annual take for subsistence harvest, including whales that were struck and lost, was 67 whales per year from 1994 through 1998. Annual harvest estimates for 1994 thru 1998 are 21 whales (1994), 70 whales (1995), 98 whales (1996), 70 whales (1997) and 50 whales (1998). The harvest, which was as high as 20 percent of the stock in 1996, was sufficiently high to account for the 14 percent annual rate of decline in the stock during the period from 1994 through 1998 (Hobbs *et al.* 2000). The last year in which unregulated subsistence harvests occurred was 1998. In 1999 and 2000, Public Laws 106–31 and 106–553 established a moratorium on CI beluga whale harvests except for subsistence hunts by Alaska Natives and conducted under cooperative management agreements between NMFS and affected Alaska Native Organizations. This moratorium was made permanent in December 2000. In 2003 and 2004, respectively, a Final Environmental Impact Statement (EIS) (68 FR 55604, September 26, 2003) and Final Interim Regulations Governing the Taking of Cook Inlet Beluga Whale by Alaska Natives for Subsistence Purposes (69 FR 17973, April 6, 2004) were completed to address prior beluga whale harvests. In keeping with sections 101(b) and 103(d) of the MMPA, NMFS Alaska Region convened a formal administrative hearing on the proposed harvest regulations before an Administrative Law Judge and seven interested parties in December 2000, in Anchorage, Alaska. That administrative hearing process culminated in 2005 with the Administrative Law Judge's final decision recommending a long-term plan for managing the subsistence harvests of CI belugas by Alaska Natives. NMFS has since then completed a Draft Supplemental EIS (72 FR 73798, December 28, 2007) proposing long-term harvest regulations through recovery. Despite strict harvest limits since 1999, the population has not recovered. Factors inhibiting recovery include vessel traffic, small stock size, restricted summer range, habitat alteration, and natural mortality (NMFS, 2006).

Distribution

The CI beluga's range is believed to be largely confined to CI with a high occurrence of animals in the upper Inlet and Knik Arm during the spring, summer, and fall seasons. These whales demonstrate site fidelity to regular summer concentration areas (Seaman *et al.*, 1985), typically near river mouths and associated shallow, warm and low salinity waters (Moore *et al.*, 2000). In the winter, beluga whales concentrate in deeper waters in mid- Inlet down to Kalgin Island with occasional forays into the upper Inlet, even to the upper ends of Knik and Turnagain Arms.

In Knik Arm, beluga whales generally are observed arriving in May and often use the area all summer, feeding on the various salmon runs and moving with the tides. There may be more intensive use of Knik Arm in August and through the fall, coinciding with the coho run. Whales will gather in Eagle Bay and elsewhere on the east side of Knik Arm and sometimes in Goose Bay on the west side of Knik Arm. During high tides, belugas are generally concentrated around prime feeding habitats in the upper reaches of the Arm, an area unaffected by the Project. They often retreat to the lower portion of Knik Arm during low tides.

Fourteen belugas were satellite-tagged in upper CI in Knik Arm between late July and early September 2000–2002. These tags provided location and movement data through the fall and winter and into May. During summer and autumn, whales were concentrated in river and bays in Upper CI with whales traveling back and forth between Knik Arm (*e.g.*, Eagle River), Chichaloon Bay, and upper Turnagain Arm, although some whales also spent time offshore. When in these areas, whales made rapid movements between distinct bays or river mouths (moving either to the east or to the west of Fire Island, past Pt. Woronzof and the Port of Anchorage) and often remained stationary in one area for many weeks followed by a rapid movement to another area (within a day). One whale tracked in 2001 moved back and forth between the three bodies of water listed above seven times in three months. Area use in August was the most limited of all months (approximately 50–75 percent of the recorded locations in August were in Knik Arm, concentrated near Eagle River. In September they continued to use Knik Arm and increased use of the Susitna delta, Turnagain Arm and Chickaloon Bay, and also extended use along the west coast of the upper Inlet to the Beluga River. In October, beluga whales ranged widely down the Inlet in coastal areas, reaching Chinitna Bay, and Tuxedni Bay and continued to use Knik Arm, Turnagain Arm, Chickaloon Bay, and Trading Bay (MacArthur River). November use was similar to September. In December, beluga whales moved offshore with locations distributed throughout the upper to mid-Inlet and in January, February, and March, they used the central offshore waters moving as far south as Kalgin Island and slightly beyond. Belugas also ranged widely during February and March with excursions to Knik and Turnagain Arms, in spite of greater than 90 percent ice coverage. Average daily travel distance ranged from 11–30 km per day. No satellite tags were on animals from April-mid July.

Social Dynamics

Beluga whales are extremely social animals that typically migrate, hunt, and interact together. Nowak (1991) reports the average pod size as 10 animals, although beluga whales may occasionally form larger groups, often during migrations. Groups of 10 to several hundred beluga whales have often been observed during summers in CI; however solitary animals and smaller groups are not uncommon around the Port (LGL 2005, 2006, 2007). Native hunters have stated that beluga whale form family groups and suggest that there are four types of beluga whales in CI, distinguished by their size and habits (Huntington 2000); however, this has not been confirmed.

Feeding

Beluga whales are opportunistic feeders known to prey on a wide variety of animals. They eat octopus, squid, crabs, shrimp, clams, mussels, snails, sandworms, and fish such as capelin, cod, herring, smelt, flounder, sole, sculpin, lamprey, lingcod and salmon (Perez, 1990; Haley, 1986; Klinkhart, 1966). Natives also report that CI beluga whale feed on freshwater fish: trout, whitefish, northern pike, and grayling (Huntington, 2000), and on tomcod during the spring (Fay *et al.*, 1984).

Salmon and eulachon species are high quality prey that have high lipid (fat) content, up to 21 percent (Payne *et al.*, 1999). Calkins (1989) recovered 13 salmon tags from the stomach of an adult beluga whale found dead in Turnagain Arm. These salmon had been tagged in upper Susitna River. Beluga

whales in captivity may consume 2.5–3 percent of their body weight daily, or approximately 40–60 pounds (18.2- 27.3 kg). Wild beluga whale populations, faced with an irregular supply of food or with increased metabolic needs, may easily exceed these amounts while feeding on concentrations of eulachon and salmon. Beluga whale hunters in CI reported one whale having 19 adult king salmon in its stomach (Huntington 2000) and an adult male beluga whale had 12 adult coho salmon in its stomach at a weight of 27.8 kg (61.5 lbs).

Herring may be another important forage fish for beluga whales as identified by a 1993 smolt survey of the upper Inlet which found juvenile herring to be the second-most abundant fish species collected. These herring were primarily caught along the northwest shore, including the Susitna delta (Moulton, 1994).

Beluga whales capture and swallow their prey whole, using their blunt teeth only to grab. These whales often feed cooperatively. At the Port, beluga whales have been observed positioning one whale along a rip rap dock, while a second whale herds salmon along the structure toward the stationary beluga whale. The concentrations of CI beluga whales offshore of several important salmon streams in the upper Inlet is assumed to be a feeding strategy which takes advantage of the bathymetry of the area. The fish are funneled into the channels formed by the river mouths and the shallow waters act as a gauntlet for salmon as they move past waiting beluga whales. Dense concentrations of prey appear essential to beluga whale feeding behavior. Hazard (1988) hypothesized that beluga whales were more successful feeding in rivers where prey were concentrated than in bays where prey were dispersed.

Habitat

Since their rapid population decline, CI beluga distribution has also decreased (Rugh *et al.*, 2000); however, there is obvious and repeated use of certain habitats. From April through November whales concentrate at river mouths and tidal flat areas, moving in and out with the tides. The timing and location of eulachon and salmon runs affect beluga whale feeding behavior and have a strong influence on their summer movements. Beluga and prey distribution is heavily dependent upon tides in Knik Arm with approximately 70 percent of sightings at the Port from monitoring data in 2006 being around low tide. The range of tides at Anchorage is extreme at about 29 feet and the observed extreme low water is 6.4 feet below mean low low water. Tidal energy is the most dominant force driving water circulation in Knik Arm. Because of predominantly shallow depths, tides within Knik Arm have a much larger range than in the main body of Cook Inlet (KABATA, 2006). Maximum current speeds in Knik Arm, observed during spring ebb tide, exceed 7 knots (12 feet/second).

Beluga whale concentration areas correspond with prey availability. Beluga whales frequently move in and out of deeper water and between feeding, calving, and nursery areas throughout the mid and upper Inlet. Access to these areas and corridors in between these areas is important. Knik Arm, Turnagain Arm, Chickaloon River and the Susitna River delta areas are used extensively. It is possible these sites provide for other biological needs, such as calving or molting. Such habitat sites and use have been reported elsewhere in Alaska, although there is not adequate information to identify these calving and molting habitat attributes in Knik Arm.

NMFS has characterized the relative value of four habitats as part of the management and recovery strategy in its ''Draft Conservation Plan for the CI Beluga Whale (Delphinapterus leucas)'' (NMFS, 2006). These are sites where beluga whales are most consistently observed, where feeding behavior has been documented, and where dense numbers of whales occur within a relatively confined area of the Inlet. Type 1 habitat is termed ''High Value/ High Sensitivity'' and includes what NMFS believes to be the most important and sensitive areas of the Inlet for beluga whales. Type 2 is termed ''High Value,'' and includes summer feeding areas and winter habitats in waters where whales typically occur in lesser densities or in deeper waters. Type 3 habitat occurs in the offshore areas of the mid and upper Inlet and also includes wintering habitat. Type 4 habitat describes the remaining portions of the range of these whales within Cook Inlet. The habitat within the Project footprint that will be directly impacted from construction is considered Type 2 habitat while just north of the Port is classified as Type 1.

Beluga Hearing Sensitivity

Beluga whales are characterized as mid-frequency odontocetes but have an excellent range of hearing. Hearing of belugas is believed to be in the frequency range of 40 Hz–150kHz with keen hearing at 10–100kHz. Above 100 kHz their sensitivity drops off very fast (Au, 1993) and below 8 kHz the decrease in sensitivity is more gradual at approximately 11 dB per octave (Awbrey *et al.*, 1988). While their peak sensitivity range is outside of most industrial sounds, studies have shown that belugas can hear and react to such low frequency noise, dependent upon intensity (i.e., decibels). Awbrey *et al.* (1988) conducted a study on captive, trained belugas to discern low frequency threshold levels. Belugas reacted, on average, to 125 Hz, 25 Hz, and 500Hz at 121dB, 118dB, and 108 dB, respectively. Therefore, as frequency increases, sensitivity also increases.

Harbor Seals

Harbor seals are important upper-trophic marine predators that occupy a broad range in Alaska from approximately 130° W to 172° E (over 3,500 km east to west) and from 61° N to 51° N (over 1,000 km north to south). Currently, harbor seals in Alaska are divided into three stocks: Bearing Sea, Gulf of Alaska (GOA), and Southeast Alaska. While new genetic information has lead to a reassessment of this delineation, it has not yet been finalized. Harbor seals which could be affected by the Project belong to the Gulf of Alaska stock. Based on aerial GOA and Aleutian Islands surveys, in 1996 and 1999 respectively, the current abundance estimate for this stock is 45,975 (CV = 0.04) with a minimum population estimate of 44,453 (NMFS, 2006). Sources of anthropogenic caused mortality for this stock include interactions with fishing gear (mean annual mortality is approximately 24 animals), subsistence hunting (mean annual harvest equals 795), and, to a lesser degree, illegal intentional killing.

Harbor seals haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuaries, and occasionally fresh waters. They are generally non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction; however, some long-distance movements have been recorded from tagged animals (mostly juveniles). The major haul-out sites for harbor seals are located in Lower CI with the closest identified harbor seal haul-out site to the Port approximately 25 miles south along Chickaloon Bay in the southern portion of Turnagain Arm. However, harbor seals have been observed around the Port. In 2004–2005, 22 harbor seal sightings were reported over a 13–month period comprising of 14,000 survey hours. From these surveys, it is estimated that harbor seals occur in a density of approximately 1.7 animals per month in Knik Arm (LGL unpubl. data).

Pinniped hearing is measured for 2 mediums, air and water. In water hearing ranges from 1–180 kHz with peak sensitivity around 32kHz. In air, hearing capabilities are greatly reduced to 1–22kHz with sensitivity at 12kHz. This range is comparable to human hearing (0.02 to 20 kHz). Harbor seals have the potential to be affected by in-air and in-water noise associated with construction activities.

Harbor Porpoise

Harbor porpoise are found within Cook Inlet but in low abundance, especially in Knik Arm. Currently, the population estimate for the Gulf of Alaska harbor porpoise stock is 41,854 with a minimum population estimate of 34,740 (NMFS 2006). Estimated density of harbor porpoise in Cook Inlet is only 7.2 per 1000 square kilometers (Dahlheim *et al.* 2000). The highest monthly count recorded in upper Cook Inlet between April and October is 18 (LGL 2006).

Harbor porpoise have a wide hearing range and the highest upper-frequency limit of all odontocetes studied. They have a hearing range of 250 Hz–180kHz with maximum sensitivity between 16–140 kHz.

Killer Whales

Killer whales in the Gulf of Alaska are divided into two ecotypes: resident and transient. Killer whales are relatively common in lower Cook Inlet (at least 100 sightings from 1975 to 2002), but in the upper Inlet, north of Kalgin Island, sightings are infrequent (11 in 25 yrs). Transient killer whales are known to feed on the Cook Inlet stock of beluga whales and all recorded predation events have occurred in the upper Inlet. Transient killer whales seen in Cook Inlet belong to the Gulf of Alaska, Aleutian Islands, and Bering Sea Transient Stock or the small AT1 Stock. Based on the 2006 NMFS stock assessment reports, the minimum population estimate for the Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock of killer whales is 314 animals based on the count of individuals using photo-identification. As of 2004, the AT1 population size is eight animals, a 64–percent decrease from 22 whales in 1989.

The hearing of killer whales is well developed. They have hearing ranges of 0.05 to 100 kHz which is lower than many other odontocetes. Peak sensitivity is around 15 kHz.

Impacts to Marine Mammals

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water. Sound levels are compared to a reference sound pressure to identify the medium. For air and water, these reference pressures are ''re 20 μPa'' and ''re 1 μPa'', respectively (unless otherwise noted, sound levels should be considered as measured in water, *i.e.*, re 1 μPa). Sound is generally characterized by several variables, including frequency and sound level. Frequency describes the sound's pitch and is measured in hertz (Hz) or kilohertz (kHz), while sound level describes the sound's loudness and is measured in decibels (dB). Sound level increases or decreases exponentially with each dB of change. For example, 10–dB yields a sound level 10 times more intense than 1 dB, while a 20 dB level equates to 100 times more intense, and a 30 dB level is 1,000 times more intense. However, it should be noted that humans perceive a 10 dB increase in sound level as only a doubling of sound loudness, and a 10 dB decrease in sound level as a halving of sound loudness. More information on sound can be found at *www.dosits.org*.

As stated, noise from pile driving is expected to harass marine mammals present in the exposure area. Marine mammals use sound for vital life functions, and introducing sound into their environment could be disrupting to those behaviors. Sound (hearing and vocalization/echolocation) serves 4 main functions for odontocetes (toothed whales and dolphins). These functions include (1) providing information about their environment; (2) communication; (3) enabling remote detection of prey; and (4) enabling detection of predators. Sounds and non-acoustic stimuli will be generated and emitted into the aquatic environment by vehicle traffic, vessel operations, roadbed construction, and vibratory and impact pile driving. The distances to which these sounds are audible depend on source levels, ambient noise levels, and sensitivity of the receptor (Richardson *et al.* 1995). As stated, pile driving will affect marine mammals at a level which could cause behavioral harassment. Mitigation measures (see Mitigation section) are expected to prevent injurious exposure.

In an acoustic study conducted at the Port in October 2007, hydrophones were used to measure sound propagation during both impact and vibratory pile-driving. For impact pile-driving, the most conservative measurement showed that at 19m the received level was 177 dB re 1 μPa (root mean square (rms) ranging from 100–15,000 Hz. For vibratory pile-driving, the most conservative measurement showed that at 20m the received level was 162 dB ranging from 400–2,500 Hz. These measurements were used to estimate the distances at which animals might be exposed to received levels that could lead to injury or behavioral harassment. Impact pile driving requires much more energy (*i.e.*, louder) than vibratory pile-driving due to the nature of the operations. However, low frequency sound travels poorly in shallow water, so transmission of these sounds in Knik Arm is expected to be confined to relatively short ranges.

Sounds generated from pile driving, dredging, and other construction activities will be detectable underwater and/or in air some distance away from the area of activity. Audible distance, or received levels (RLs) will depend on the nature of the sound source, ambient noise conditions, and the sensitivity of the receptor to the sound (Richardson *et al.*, 1995). Type and significance of marine mammal behavioral reactions are likely to be dependent upon, among other parameters, the behavioral state (e.g., feeding, traveling, etc.) of the animal at the time it receives the stimulus, as well as the distance from the sound source and the level of the sound relative to ambient conditions (Southall *et al.*, 2007).

Hearing Impairment and Other Physical Effects

Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very loud sounds, but no studies have been conducted that examine impacts to marine mammal from pile driving noise. Current NMFS practice regarding exposure of marine mammals to high-level sounds is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB rms or above, respectively, are considered to have been taken by Level A (*i.e.*, injurious) harassment. Behavioral harassment (Level B) is considered to have occurred when marine mammals are exposed to sounds at or above 160dB rms for impulse sounds (*e.g.*, impact pile driving) and 120dB rms for continuous noise (*e.g.*, vibratory pile driving), but below injurious thresholds. These levels are considered precautionary.

Several aspects of the planned monitoring and mitigation measures for this project are designed to detect marine mammals occurring near pile driving, and to avoid exposing them to sound that could potentially cause hearing impairment (*e.g.*, mandatory shut down zones). In addition, marine mammals will be given a chance to leave the area during ''soft start'' and ''ramp-up'' procedures to avoid exposure to full energy pile driving. In those cases, the avoidance responses of the animals themselves will reduce or

eliminate any possibility of hearing impairment. Hearing impairment is measured in two forms: temporary threshold shift and permanent threshold shift.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a loud sound (Kryter, 1985). Southall *et al.* (2007) considers a 6 dB TTS (*i.e.*, baseline thresholds are elevated by 6 dB) sufficient to be recognized as an unequivocal deviation and thus a sufficient definition of TTS-onset. Auditory fatigue (*i.e.*, TTS) in mid-frequency cetaceans has been measured after exposure to tones, impulsive sounds, and octave-band noise. Because it is non-injurious, NMFS considers TTS as Level B harassment that is mediated by physiological effects on the auditory system; however, NMFS does not consider onset TTS to be the lowest level at which Level B Harassment may occur.

While experiencing TTS, the hearing threshold rises and a sound must be louder in order to be heard. TTS can last from minutes or hours to (in cases of strong TTS) days. For sound exposures at or somewhat above the TTS-onset threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals. For toothed whales exposed to single short pulses, the TTS threshold appears to be, to a first approximation, a function of the energy content of the pulse (Finneran *et al.*, 2002).

Laboratory experiments investigating TTS onset for belugas have been conducted for both pulse and non-pulse sounds. Finneran *et al.* (2000) exposed a trained captive beluga whale to a single pulse from an explosion simulator. No TTS threshold shifts were observed at the highest received exposure levels (179dB re 1 µPa2–s [SEL]; approximately 199 dB rms). It should be noted in this study that amplitudes at frequencies below 1 kHz were not produced accurately to represent predictions for the explosions. Another study was done using seismic waterguns with a single acoustic pulse (Finneran *et al.* 2002). Measured TTS was 7 and 6 dB in the beluga at 0.4 and 30 kHz, respectively, after exposure to intense single pulses (186 dB SEL; ~ 208 dB rms). Schlud*t et al.*, 2000 demonstrated temporary shifts in masked hearing thresholds for belugas occurring generally between 192 and 201 dB rms (192–201 dB SEL) after exposure to intense, non-pulse, 1–s tones at , 3, 10, and 20 kHz. TTS onset occurred at mean sound exposure level of 195 dB rms (195 dB SEL). To date, no studies relating TTS onset to pile driving sounds have been conducted for any cetacean species.

Permanent Threshold Shift (PTS)

When permanent threshold shift (PTS) occurs, there is physical damage to the sound receptors in the ear. In some cases, there can be total or partial deafness, whereas in other cases, the animal has an impaired ability to hear sounds in specific frequency ranges. PTS consists of non-recoverable physical damage to the sound receptors in the ear and is therefore classified as Level A harassment under the MMPA. Level A harassment of marine mammals is not expected due to proposed mitigation measures and source levels, nor will it be authorized under this IHA.

There is no empirical data for onset of PTS in any marine mammal, and therefore, PTS- onset must be estimated from TTS-onset measurements and from the rate of TTS growth with increasing exposure levels above the level eliciting TTS-onset. PTS is presumed to be likely if the threshold is reduced by ≥ 40 dB (*i.e.*, 40 dB of TTS).

Relationships between TTS and PTS thresholds have not been studied in marine mammals, but are assumed to be similar to those in humans and other terrestrial mammals. PTS might occur at a received sound level 20 dB or more above that of inducing mild TTS if the animal were exposed to the strong sound for an extended period, or to a strong sound with rather rapid rise time. Due to proposed mitigation measures and source levels for the Project, NMFS does not expect that marine mammals will be exposed to levels that could elicit PTS.

Non-auditory Physiological Effects

Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, resonance effects, and other types of organ or tissue damage. Due to proposed mitigation measures (e.g., mandatory shut downs) marine mammals would not be exposed to sound at or above 180dB; therefore, it is not expected that severe physiological effects from exposure to sound would be expected; however, a hormonal stress response is possible. Romano *et al.* (2004) demonstrated that belugas exposed to seismic water gun and (or) single pure tones (up to 201 dB rms) resembling sonar pings showed increased stress hormone levels of norepinephrine, epinephrine, and dopamine. While RLs would not be as strong as the ones in that study, a stress response would not be unexpected. Studies have also demonstrated that reactions of animals to sounds could result in physical injury. For example, it has recently been reported that stranded deep diving marine mammals displayed physical attributes similar to the bends (*e.g.*, in vivo gas bubble formation) (Ferndandez *et al.*, 2005, 2006). Marine mammals may experience these symptoms if surfacing rapidly from deep dives in response to loud sounds. Because Knik Arm is a shallow water estuary, marine mammals found there are not considered deep divers, and due to proposed mitigation measures, non-auditory physiological impacts, other than stress, are not expected.

Impacts to Beluga Whales

The marine mammal species or stock that could be most affected from the Project is the beluga whale. Observation and tagging data both indicate that the northernmost parts of upper Cook Inlet, including Knik Arm, are the focus of the stock's distribution in both summer (Rugh *et al.*, 2000) and winter (Hobbs *et al.*, 2005). Because of the very restricted range of this stock, CI belugas can be assumed to be sensitive to human-induced or natural perturbations. Contaminants from a variety of sources, sound, onshore or offshore development, and construction have the potential to impact this stock or its habitat.

There are no consistent observed threshold levels at which belugas, and marine mammals in general, respond to an introduced sound. Beluga responses to sound stimuli have been noted to be highly dependent upon behavioral state and motivation to remain or leave an area. Few field studies involving industrial sounds have been conducted on beluga whales. Reactions of belugas in those studies varied. For example, in Awbrey and Stewart (1983) (as summarized in Southall *et al.*, 2007), recordings of noise from SEDCO 708 drilling platform (non-pulse) were projected underwater at a source level of 163 dB rms. Beluga whales less than 1.5 km from the source usually reacted to onset of the noise by swimming away (RLs approximately 115.4 dB rms). In two instances groups of whales that were at least 3.5 km from the noise source when playback started continued to approach (RLs approximately 109.8 dB rms). One group approached within 300 m (RLs approximately 125.8 dB rms) before all or part turned back. The other group submerged and passed within 15m of the projector (RL

approximately 145.3 dB). Richardson *et al.* (1990), as summarized in Southall *et al.*, 2007, played back drilling platform sounds (source level: 163 dB) while approximately 100 belugas were in the area of several hundred to meters to several hundred kilometers. No obvious reactions were noted; however, moderate changes in behavior for three groups swimming within 200m of the sound projector were observed. In other studies, belugas exposed to seismic airguns (multiple pulse) at RLs of 100 to 120 dB rms were determined to have had no observable reaction; however, RLs between 120 and 150 dB rms were determined to have induced temporary avoidance behavior, based on vessel-based and aerial observations (Miller *et al.*, 2005).

TTS experiments have also documented behavioral responses by trained belugas. These responses included reluctance to return to experimental stations when exposed to watergun pulse sounds at approximately 185.3 dB rms (171dB SEL) (Finneran *et al.*, 2002) and behavioral changes when exposed to sounds from the explosion simulator at approximately 200 dB rms (177 dB SEL) (Finneran *et al.*, 2000). In a non-pulse exposure experiment (*i.e.*, 1 s tones), belugas displayed altered behavior when exposed to 180 196 dB rms (180–196 dB SEL) (Schlundt *et al.*, 2000).

While no studies have been conducted for belugas in response to pile driving, bottlenose dolphin and humpback dolphin behavior has been observed in relation to this activity. These species are also considered mid frequency odontocetes and have hearing capabilities similar to that of beluga whales. McIwen (2006) observed a temporary displacement of bottlenose dolphins during pile driving activities, although it could not be determined if this was a result of the pile driving noise itself or displacement of prey. Mhenni (1993) reported bottlenose dolphins appeared to be repelled by noise pulses obtained by striking an iron pipe held in the water. Furthermore, Wursig *et al.* (2000) reported Indo-Pacific humpback dolphins increased speeds of travel during pile driving and were found in lower abundance immediately after pile driving; however, no overt changes in behavior were observed.

Masking of whale calls or other sounds potentially relevant to whale vital functions may occur. Masking occurs when the background noise is elevated to a level which reduces an animal's ability to detect relevant sounds. The impacts of masking are expected to be limited by the intermittent nature of the impact pile driver noise, the whales' directional hearing, and their ability to adjust vocalization amplitude, frequency, and the structured content of their signals (McIwem, 2006). Belugas have been known to increase their levels of vocalization as a function of background noise by increasing call repetition and shifting to higher frequencies (Lesage *et al.*, 1999; Scheifele *et al.*, 2005). Another adaptive method to combat masking was demonstrated in a beluga whale which reflected its sonar signal off the water surface to ensonify to an object on which it was trained to echolocate (Au *et al.*, 1987). Due to the low frequencies of construction noise and the ability of belugas to adapt vocally to increased background noise, it is anticipated that masking, and therefore interruption of behaviors such as feeding and communication, will be minimized.

Many marine mammals, including beluga whales, perform vital functions (e.g., feeding, resting, traveling, socializing) on a diel (i.e., 24 hr) cycle. Repeated or sustained disruption of these functions is more likely to have a demonstrable impact than a single exposure (Southall *et al.*, 2007). However, it is possible that marine mammals exposed to repetitious construction sounds from the proposed construction activities will become habituated and tolerant after initial exposure to these sounds, as demonstrated by beluga vessel tolerance (Richardson *et al.*, 1995, Blackwell and Green, 2002). Habituation is found to be common in marine mammals faced with introduced sounds into their environment. For example, bowhead whales (Balaena mysticetus) have continued to use pathways where drilling ships are working (RLs: 131 dB) so that they can continue their eastward migration (Richardson *et al.*, 1991). In addition, harbor porpoise, dolphins, and seals have become habituated to acoustic harassment deterrent devices such as pingers and ''seal bombs'' after repeated exposure (Mate and Harvey, 1987; Cox *et al.*, 2001).

Although the Port is a highly industrialized area supporting a large amount of ship trafic, belugas are present almost year round. It is anticipated that belugas will become increasingly habituated to the Project sounds. CI belugas have demonstrated a tolerance to ship traffic around the Port, as documented in numerous surveys conducted by LGL in this area. Animals will be exposed to greater than background noise levels from pile driving; however background sound levels in Knik Arm are already higher than most other marine and estuarine systems due to strong currents and eddies, recreational vessel traffic, and commercial shipping traffic entering and leaving the Port. During the acoustic study for this Project, carried out by URS, ambient sound levels (in absence of any vessels) were recorded between 105 and 120dB. A tug pushing a barge raised those measurements to about 135dB when it was 200m from the recording vessel. Based on the already elevated background noise around the Port and beluga's ability to compensate for masking, it can be reasonably expected that belugas will become habituated to the daily pile driving, as they have for vessel traffic. It is expected that frequency and intensity of behavioral reactions will decrease when habituation occurs.

Lack of behavioral reaction indicating habituation does not necessarily mean that the animals are not being harassed or injured. For example, in Newfoundland, seafloor blasting occurred in an area utilized by foraging humpback whales (Megaptera novaeangliae), yet the whales did not show any behavioral reaction to the blasting in terms of movement or residency times. Despite a lack of behavioral reaction, two humpbacks entangled in fishing gear were found in that area to have had experienced significant blast trauma to the temporal bones, although the seafloor blasting could not be determined to be causal (Ketten *et al.*, 1993). However, pile driving activities do not release the same type of, or as much energy as seafloor blasting and, due to proposed mitigation measures, marine mammals will not be exposed to such intense sounds at the Port. Therefore, injury or other physical effects will not likely occur.

NMFS believes responses of beluga whales to pile driving activities would be behavioral in nature and could likely include altered headings, fast swimming, changes in dive, surfacing, respiration, and feeding patterns, and changes in vocalizations. However, NMFS anticipates that belugas would not alter their behavior in a way that prevents them from entering and/or transiting throughout Knik Arm. Belugas are currently known to associate with vessels emitting loud low frequency sounds around the Port. Belugas, and other marine mammals, may undergo a hormonal stress response when exposed to pile driving sounds; however, NMFS believes this stress response would be short term and not lead to any long-term effects Furthermore, NMFS does not anticipate that more serious effects (*e.g.*, neurological effects, organ/tissue

damage) would occur. Due to proposed mitigation measures, marine mammals would not be exposed to high energy sounds, thereby minimizing physiological impairments. There is no evidence of injuries occurring in marine mammals exposed to sound from pile driving and there have been no direct studies of the potential for pile driving to elicit any of those effects.

Impacts to Other Marine Mammals

Harbor seals, harbor porpoise, and killer whales could also potentially be impacted from the Project. Hauled out harbor seals may flush into the water from in-air noise, disturbing their resting and warming behaviors. Killer whales and harbor porpoise may be harassed by construction noise if they are in the area of the Port. Behavioral reactions by these species may be similar to belugas whales (*e.g.*, change in direction, vocalizations, etc.). For example, while construction will emit low frequency sounds outside of harbor porpoise peak sensitivity rage, these animals have elicited behavioral responses to simulated wind turbine noise, also outside peak sensitivity range (max. Energy between 30–800 Hz; spectral density source levels of 128dB at 80 and 160Hz) (Koschinski *et al.*, 2003). During this study, animals were sighted at greater ranges during playbacks of simulated wind turbine noise and observed animals more frequently used echolocation signals.

It is likely that marine mammals will be temporarily displaced or disturbed by construction activities during the terminal expansion project. Takes will be by Level B harassment (behavioral disturbance) as defined in the 1994 amendments to the MMPA. No take by serious injury or death is likely, given the planned monitoring and mitigation procedures described in the application and summarized in this document.

Estimated Take

Monitoring of beluga presence, behavior, and group composition specifically for the Project began in 2005 and continued through 2007. Theodolite tracking and grid cell mapping were used to determine the number of belugas present within the Project footprint and within a 1 x 6 km^2 area around the Port (*i.e.*, nearshore). Belugas were sighted during all months the Project will be conducting activities (April-October) but most frequently around low tide and the months of August and September, coinciding with salmon runs. These data augment those of the Hobbs *et al.* (2005) satellite tag study.

During the 2006 monitoring year, 79 percent of all beluga groups sighted were within the project footprint, despite the average 4–km detection range. The high sighting rate of belugas within or near the Port is most likely attributed to eddy formation during the ebb tide which concentrates prey in this area. Beluga monitoring also occurred in 2004/05 for the Knik Arm Bridge Toll Authority bridge project. These data were considered when calculating take numbers; however, density of whales was less than that of nearshore areas as monitored specifically for the Port. Therefore, to be conservative, the applicant, in collaboration with NMFS, used the more conservative higher nearshore density to calculate take numbers.

Based on 2005–2007 LGL monitoring data, it is calculated that, without tidally influenced mitigation, up to 21 takes of beluga whales by Level B behavioral harassment may occur (either 21 individuals harassed one time each or a lower number of individuals harassed a couple or few times each, but totaling 21) due to Port expansion for the 2008 construction year (April-October) (Table 1). These take numbers are based on the impact and vibratory pile driving isopleths of 350m (1148ft,) and 800m (2625ft.), respectively. Monthly counts of whales per hour of effort were calculated in the nearshore area (1 x 6 km2) and then divided by the area to equal a probable density of animals in any given 1 km2 per hour (rounded up). This number was then multiplied by the hours of each type of pile driving per month. Total take for the month was calculated by multiplying this number by the estimated area ensonified (around each pile-driver type) at or above the level NMFS believes will result in harassment. Because an average of 70 percent of beluga occurrences in the project footprint are estimated to occur within 2 hours of either side of low tide, takes are actually estimated to be lower due to the proposed requirement to prohibit impact pile-drivers within 2 hours on either side of low tide. However, to allow for the social dynamics of beluga whales (*e.g.*, large group sizes), NMFS is proposing to authorize 34 beluga whale takes per year. This number is considered small when compared to the current population estimate of 302 individuals.

TABLE 1.—CALCULATED EXPECTED TAKE, BASED ON NEARSHORE DENSITY, OF BELUGA WHALES FROM PILE DRIVING ACTIVITIES AT THE PORT OF ANCHORAGE IN 2008

Port of Anchorage Take Table- 2008							
Month	Impact Hours	Vibratory Hours	Avg. Whales/hr/km^2 nearshore*	Area within 160dB Impact (350m)	Expected Take (impact)	Area within 120dB Vibratory (800m)	Expected Take (vibratory)
April	86	58	0.014	0.192	0.230	1.0048	0.809
May	60	39	0.006	0.192	0.064	1.0048	0.218
June	60	39	0.011	0.192	0.125	1.0048	0.423
July	86	58	0.004	0.192	0.066	1.0048	0.231
August	86	58	0.062	0.192	1.031	1.0048	3.633
September	86	58	0.043	0.192	0.718	1.0048	2.529
October	86	58	0.020	0.192	0.335	1.0048	1.179
Total*	550	368			8		13

*The total number of authorized take is calculated by rounding up each take per month (*e.g.*, a take of 0.230 animals in April is equal to 1 take).

Based on the sighting rates of other marine mammals around the Port, other marine mammals would not be expected to be harassed from Project activities mathematically. However, because these species have been sighted in the area, NMFS is proposing to authorize a small number, relevant to the population size, of takes for harbor seals (20), harbor porpoise (20), and killer whales (5).

Effects to Marine Mammal Habitat

Beluga whales primarily use the area around the Port for traveling and foraging (LGL 2005, 2006, 2007; Port Monitoring Data, unpubl.). The primary

aquatic habitat resource losses associated with the Project are the losses and degradation of intertidal and nearshore habitat, including essential fish habitat (EFH). Noise from pile driving would result in habitat degradation; however, based on the identified behavioral harassment isopleth distances, impact and vibratory pile driving sounds above marine mammal behavioral harassment levels are expected to propagate out to only 350m and 800m, respectively. Due to the already noisy characteristics of this habitat (*e.g.*, currents, ships and recreational vessel presence), it is not expected that marine mammals, especially belugas, would be as greatly affected as if the ambient and background sound level was lower. It can be reasonably expected that marine mammals will continue to travel past the Port even when pile driving activities are occurring. However, it is possible they would do so further out towards the middle or west side of Knik Arm.

Belugas whales' diet is primarily comprised of fish, specifically salmon. Fish habitats, including EFH, in upper Cook Inlet have not been studied comprehensively, but the studies completed to date indicate that the area immediately around the Port supports a wide diversity of marine and anadromous fish species, in particular providing migrating, rearing, and foraging habitat. The intertidal and nearshore subtidal waters of the Project area are used by juvenile and adult salmonids for refuge from the strong currents of Knik Arm, as a migration corridor for adult salmonids, and as rearing and migratory habitat for several streams that drain into Knik Arm, in upper Cook Inlet. Therefore, the elimination of this habitat and alteration of hydrology would adversely impact fish, especially juveniles and smolt taking refuge in the area to be filled; however, based on the following reasons, these changes are not likely to appreciably reduce prey availability to marine mammals, particularly belugas.

The project area is located approximately 2000 feet (609.4 m) north of the mouth of Ship Creek, a stocked creek, and the proposed action would remove most of the remaining intertidal and shallow subtidal waters north of the mouth to Cairn Point. If a decrease in fish abundance occurs, this could result in decreased foraging opportunities for belugas and increased beluga energy expenditure to find prey. However, juvenile chinook salmon sampled between Cairn Point and Point Woronzof were primarily of Ship Creek hatchery origin. Juvenile salmonids are reared at the hatchery for two years prior to release at the smolt stage. Smolts released from the hatchery are ready for out migration and it is believed that the smolts reside in the Ship Creek area for a limited period before migrating elsewhere in the Knik Arm and/or Cook Inlet estuaries. Because this creek is stocked, fish would be replenished from the hatchery. Furthermore, the area directly surrounding the Port is not considered primary feeding habitat, unlike the upper reaches of Knik Arm.

Design of the sheet pile wall may provide some refuge for fish which could enhance survival. The face of each sheet-pile cell is curved outward, creating a scalloped surface. Fender pile and fender-system structural components would protrude from the face of the sheet pile approximately eight feet, which would provide some limited fish refuge. In addition, the Port is evaluating various methods for constructing joint systems between OCSP cells that would provide open water areas along the face of the dock by leaving a space between the construction joints in the sheet pile wall. These breaks in the sheet pile wall profile would create alcoves with armor rock slopes of varying sizes and shapes that would provide refuge opportunities for salmonids.

To offset direct habitat loss and degradation, the Port is required to carry out certain mitigation procedures as condition in the Army Corps of Engineers' Permit No. POA–2003–502–N. For all construction seasons, including 2008, these include, but are not limited to: (1) no in water fill placement or pile driving activities shall occur within a one week period following smolt releases from the Ship Creek hatchery; (2) fill material shall consist of clean fill, free of unsuitable material (e.g., trash, debris, asphalt, etc.), and free of toxic pollutants; and (3) the Municipality of Anchorage, in collaboration with the Corps, would execute compensatory mitigation projects that will contribute toward offsetting the functional losses attributed to the Project. These projects would support salmon populations through restoration, enhancement, creation and/or preservation (listed in order of priority) of existing nearby estuarine and associated lower riparian habitats.

NMFS has determined that fish and fish habitat, including EFH, would be adversely affected both short and long-term from the current Project design plan. Short term impacts are habitat destruction and damage to fish primarily related to filling intertidal and subtidal areas, as well as noise from pile driving. Long term impacts include permanent habitat alteration and destruction and the resulting negative impacts on fish. The degree of impact to fish populations is difficult to quantify; however, the Project will most likely decrease survival of juvenile fish emanating from Ship Creek, reducing the number of adult salmon returning to Ship Creek. However, as stated, this is a stocked creek and will be replenished. Therefore, beluga prey abundance is not expected to be significantly affected. In addition, NMFS has determined that habitat degradation from pile driving will result in only short term behavioral affects to marine mammals and not prevent belugas from transiting through the area.

Effects to Subsistence Hunting

Subsistence hunting and fishing are economically and culturally important for many Alaskan families and communities. Marine mammals taken by subsistent hunts include pinnipeds, cetaceans, and polar bears. In Cook Inlet, Alaskan natives have traditionally relied on the CI beluga whale for subsistence purposes. For several decades prior to the 1980s, the Native Village of Tyonek residents were the primary hunters harvesting Cook Inlet beluga whales; however, other tribes have since been active in the hunt. In Knik Arm, Tyonek natives remain primary subsistence users in the Knik Arm and may harvest beluga whales that pass through the Project footprint; however, no hunting will take place in or near the Project area. As stated, subsistence hunting as been greatly reduced to 1–2 whales per year. No belugas are expected to be injured or killed as a result of the Project, nor is distribution expected to be altered dramatically in Knik Arm. The disturbance and potential displacement of beluga whales by noise from 2008 construction activities are the principal concerns related to subsistence use. However, since all anticipated takes from implementation of the Project would be takes by harassment involving temporary changes in behavior, construction activities associated with the Project would not have an unmitigable adverse impact the availability of a marine mammal species or stock for taking for subsistence uses.

Proposed Mitigation

The Port, in working with NMFS, proposes the following mitigation measures for the entire Project construction (2008–2012). These measures are designed to eliminate potential for injury and reduce

harassment levels to beluga whales. Sound deterrent/minimization techniques such as bubble curtains were considered for mitigation; however, due to the strong current in Knik Arm (up to 11.2ft (3.4 m)/sec) these techniques would be inefficient. The Port continues to work with contractors to develop sound attenuation minimization techniques.

(1) Scheduling of construction activities during low use period of belugas around the Port

Tides have been shown to be an important physical characteristic in determining beluga movement within Knik Arm. During the 2004 and 2005 monitoring years, beluga sightings varied significantly with tide height at two stations near the Port (West Crossing and Cairn Point). Whales were sighted most frequently (approximately 70%) during the period around low tide at these stations and as the tide flooded, belugas typically moved into the upper reaches of the Arm. Opportunistic sightings also support the highest beluga use near the point around low tide.

Due to tidally influence habitat use around the Port, in-water impact pile driving will not occur during the 2 hours on either side of low tide (i.e., from two hours before low tide until two hours after low tide). Belugas are expected to be foraging well north of the Port during the flood and high tide. However, these northern areas are exposed during the ebb and low tide; therefore, animals move south toward Eagle Bay and the Knik Arm entrance to avoid being stranded and to feed on fish flowing out of creeks and rivers. Restricting impact pile driving during this time will reduce the number of beluga whales exposed to sounds where Level B harassment could result.

(2) Establishment of safety zones and shut down requirements

In October, 2007, the Port contracted an outside company to determine reliable estimates of distances for 190 (pinniped injury threshold), 180 (cetacean injury threshold), 160 (impact pile driving behavioral harassment threshold) and 120 dB (vibratory pile driving behavioral harassment threshold) isopleths from impact and vibratory pile driving. From this study, it has been preliminarily determined that these isopleths are 10, 20, 350, and 800 m, respectively. All threshold isopleths will also be verified with future sound index profiling studies and adjusted if necessary. Although the 190 and 180dB isopleths are within 20m for both types of pile driving, NMFS is proposing a conservative 200m mandatory shut down safety zone which would require the Port to shut down anytime a marine mammal enters this isopleth. Furthermore, to reduce chance of the Port reaching or exceeding authorized take, if a group of 5 or more belugas are sighted within the Level B harassment isopleths, shut down is required. If maximum authorized take is reached or exceeded for the year, any beluga entering into the harassment isopleths will trigger mandatory shut down.

(3) Soft start to pile driving activities

A ''soft start'' technique will be used at the beginning of each pile installation to allow any marine mammal that may be in the immediate area to leave before impact piling reaches full energy. The soft start requires contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by 1–minute waiting period. The procedure will be repeated two additional times. If an impact hammer is used, contractors will be required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a one minute waiting period, then two subsequent 3 strike sets (NMFS, 2003). If any marine mammal is sighted within the safety zone (200m) prior to pile-driving, or during the soft start, the contractor (or other authorized individual) will delay pile-driving until the animal has moved outside the safety zone. Furthermore, if marine mammals are sighted within a harassment zone prior to pile driving, operations will be delayed until the animals move outside the zones in order to avoid take exceedence. Piling will resume only after the marine mammal is determined to have moved outside the safety or harassment zone by a qualified observer or after 15 minutes have elapsed since the last sighting of the marine mammal within the safety zone.

(4) For other in-water heavy machinery operations other than pile driving (e.g., dredging), operations will cease if a marine mammal comes within 50 m, to eliminate potential for injury from a working vessel.

Marine Mammal Monitoring

Monitoring for marine mammals will take place concurrent with all pile driving activities. Two contractual observers will be placed at two localities at the Port and will implement shut down/delay procedures when applicable. These observers will be construction contractors but will have no other construction related tasks while conducting monitoring. Each observer will be properly trained in marine mammal species detection, identification and distance estimation, will be equipped with binoculars, and will be located at elevated platforms to increase sightability range. Reports will include all beluga sightings (e.g., group size, location, behavior, time of day, etc) and note if shut down/delay occurred.

Prior to the start of seasonal pile driving activities, the Port will require construction supervisors and crews, the marine mammal monitoring team, the acoustical monitoring team, and all project managers to attend a briefing on responsibilities of each party, defining chains of command, discussing communication procedures, providing overview of monitoring purposes, and reviewing operational procedures regarding belugas.

In addition to Port monitoring, but not required by NMFS, an independent beluga monitoring team from Alaska Pacific University or LGL will be surveying for marine mammals at locations outside of the Port, most likely around Cairn Point. These observers will be monitor for belugas 8 hours per day/ 4 days per week. This study is independent of the Project but will work in collaboration with the Port to communicate any presence of belugas or other marine mammals in the area during pile driving.

Acoustic Monitoring

As mandated by the Army Corps of Engineers permit, a beluga monitoring team will report on the frequency at which beluga whales are present in the project footprint, characterize habitat use and behavior near the Port correlated with construction activities, sound levels and distance attenuation related to Port background noise and expansion activities, and characterize and assess the impacts of received noise on beluga behavior and movements. This will be accomplished from land based and/or vessel based, and passive acoustic monitoring. The Port will install hydrophones (or employ other effective methodologies) necessary to detect and localize passing whales and to determine the proportion of belugas missed from visual surveys. The Port will measure and evaluate construction and operationally generated noise introduced in Knik Arm from the Project. They will also develop a ''Sound Index'' to accurately represent noise levels associated with Port operations and construction activities, which must specifically include noise levels generated from pile driving, dockside activities, vessel traffic in the channel, dredging, and docking activities. The evaluation will characterize current baseline

operational noise levels at the Port and develop an engineering report that identifies structural and operational noise reduction measures, if necessary, to minimize the baseline operational noise levels at the expanded port to the maximum extent practicable. The Port Sound Index will be combined with the beluga whale monitoring program to correlate construction and operationally generated noise exposures with beluga whale presence, absence, and any altered behavior observed during construction and operations (*i.e.*, a dose-response analysis). NMFS is considering requiring reports monthly the first year of construction (*i.e.*, the IHA period) to more closely examine behavioral reactions. An annual review of beluga observations and noise exposure data will also be provided to NMFS no later than 1 Feb. The annual review will also identify relevant technological advances in sound attenuation. The Port will employ practicable noise minimization measures identified in the annual reports for subsequent Port construction activities.

Reporting for 2008

For the 2008 IHA term, monthly reports will be required from the Port regarding mitigation implementation, acoustic propagation measurements, and beluga monitoring. The acoustic and beluga monitoring plans are available at *www.nmfs.noaa.gov/pr*. These plans may be refined by NMFS prior to issuance of the IHA. A final report will be submitted to NMFS no later than 90 days after construction activities cease for the season.

Endangered Species Act

A Section 7 consultation under the ESA is not required as no endangered or threatened species are expected to be within the Project area and therefore will not be affected by the proposed action. However, Cook Inlet beluga whales are a proposed species for listing under the ESA (72 FR 19854, April 20, 2007). A final decision on this listing is pending. The ESA provides some protection for species which are proposed, but not yet listed, to be threatened or endangered. Section 7(a)(4) requires an action agency to ''confer'' with NMFS when its actions are likely to jeopardize the continued existence of a species proposed for listing. Conference may result in the preparation of a conference report and opinion. The Port and the Corps have determined that the Project is not likely to jeopardize the Cook Inlet beluga, and that conference with NMFS pursuant to the ESA, was not necessary. NMFS concurs with this decision and has not recommend conference on this action.

National Environmental Policy Act

The Port and the Maritime Administration prepared an Environmental Assessment (EA) in 2004, which analyzed the anticipated social, economic, and environmental effects of the Project. In 2007, the Corps prepared a similar document for its issuance of Permit POA–2003–502–N which authorizes the Port expansion project. However, NMFS has determined that additional NEPA analysis is necessary to adequately determine whether significant environmental impacts could result from issuance of the proposed IHA; therefore an EA will be prepared. The EA will be available on the NMFS website upon completion.

Preliminary Determinations

NMFS has preliminarily determined that the total taking by the proposed activity will have a negligible impact on the affected species and stocks of marine mammals and will not have an unmitigable adverse impact on availability of those species or stocks of marine mammals intended for subsistence uses. Proposed mitigation, monitoring, and reporting will ensure that Project related activities will result in the least practicable adverse impact on the affected species of marine mammals and their habitat. Furthermore, there will be no adverse impact on the availability of marine mammals for subsistence uses. The taking of marine mammals associated with Port construction is unlikely to cause injury (Level A harassment) or mortality due to proposed mitigation measures that will be in place such as the use of marine mammal observers, mandatory shut down zones, and tidally restricted pile driving. Takes are expected to be limited to Level B harassment. Expected reactions include behavioral changes such as decreased use of the action area, fleeing the area if present before construction activities begin, and altered diving, foraging, movement and vocalization patterns.

Request for Comments

NMFS requests comments on its proposal to issue a one-year IHA to allow the taking of marine mammals, specifically beluga whales, incidental to Project related pile driving activities for the 2008 construction season (April-October). NMFS also requests, in accordance with 50 CFR part 216 subpart I, interested persons to submit comments, suggestions, information, and suggestions concerning the request and the possible structure and content of the regulations to govern the taking for a 5–year period of Project operations. NMFS specifically solicits comments addressing (but not limited to) the following topics: details regarding the habitat use of belugas near the Port; additional or alternative proposed mitigation measures; information addressing the potential effect of repeated exposure to loud noises or other stressful stimuli on both population health and mother/calf interactions; information regarding cetacean habituation to acoustic stimuli, and information on potential habitat impacts as it relates to marine mammals. Prior to submitting comments, NMFS recommends reviewing the Port's application as that document contains information necessary to respond appropriately to this action. If NMFS proposes regulations to allow this take, the public will also be provided with a comment period within which to submit comments on the proposed rule.

Dated: March 12, 2008.

James H. Lecky,

Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XG03

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Rocket Launches at Vandenberg Air Force Base, CA

AGENCY: National Marine Fisheries Service, National Oceanic and Atmospheric Administration, Commerce.

ACTION: Notice of issuance of a Letter of Authorization.

SUMMARY: In accordance with the Marine Mammal Protection Act (MMPA), as amended, and implementing regulations, notification is hereby given that an 11-month letter of authorization (LOA) has been issued to the 30th Space Wing, U.S. Air Force, to take four species of seals and sea lions incidental to rocket and missile launches on Vandenberg Air Force Base (VAFB), California.

DATES: Effective March 17, 2008, through February 6, 2009.

ADDRESSES: The LOA and supporting documentation are available for review