UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

March 22, 2006

Colonel Timothy J. Gallagher
U.S. Army Corps of Engineers
P.O. Box 898
Anchorage, Alaska 99506-0898

Re: POA-2003-502-N, Ship Creek

Dear Colonel Gallagher:

The National Marine Fisheries Service (NMFS) has reviewed the Public Notice for the Port of Anchorage expansion project. As proposed, the complete project using the applicant's preferred alternative (open-cell, sheet-pile design) would discharge fill material over approximately 135 acres of intertidal and subtidal waters of upper Cook Inlet and dredge an additional 235 acres. Phase I of the project was permitted previously and encompasses 27 acres of intertidal fill area on the north end of the port. This Public Notice (Phase II) would permit the discharge of approximately 9.4 million cubic yards of material over the remaining 108 acres of intertidal and subtidal habitat and the dredging of approximately 633,000 cubic yards of material over approximately 47 acres for the construction of the proposed sheet-pile dock. To obtain fill material, an additional 34.5 acres of wetlands would be impacted by development of the Cherry Hill and North End borrow pits. The Maritime Administration (MARAD) completed an Environmental Assessment for the port project and a separate Environmental Assessment for use of the borrow pits.

The Port of Anchorage expansion project is undeniably important to the city and state. NMFS is concerned, however, that the project as proposed does not minimize impacts to valuable habitat for fish and beluga whales in upper Cook Inlet. NMFS offers the following comments and recommendations pursuant to the Fish and Wildlife Coordination Act, Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and Marine Mammal Protection Act (MMPA).

Effects on NMFS Trust Resources

Fish and Essential Fish Habitat

Fish habitats in upper Cook Inlet have not been studied comprehensively, but the studies completed to date indicate that the area immediately around the Port of Anchorage supports a wide diversity of marine and anadromous fish species. These species include some that are targeted directly by recreational and commercial fisheries and others that serve as prey for larger fish and marine mammals. Studies completed for this project (Pentec 2005a) and the proposed Knik Arm bridge (Pentec 2005b), as well as other studies in the vicinity (Dames and Moore 1983, Moulton 1996), document that shallow waters in this area provide migrating, rearing, and foraging habitat for all five species of Pacific salmon, saffron cod, and a variety of prey species such as eulachon and longfin smelt.

NMFS and the North Pacific Fishery Management Council have identified Essential Fish Habitat (EFH) in waters of upper Cook Inlet for anadromous Pacific salmon. Under Section 305(b)(2) of the Magnuson-Stevens Act, federal agencies are required to consult with NMFS regarding any action that may adversely affect EFH. NMFS must provide conservation recommendations for actions that would adversely affect EFH, which may include measures to avoid, minimize, or offset adverse effects.

NMFS is particularly concerned about the potential consequences of the project for Chinook and coho salmon. Fish sampling conducted for this project and the proposed Knik Arm bridge (Pentec 2005a and Pentec 2005b) indicates that Chinook and coho salmon use the inshore habitat at the project site preferentially compared to other sampled habitats. Otoliths from juvenile Chinook salmon sampled between Cairn Point and Point Woronzof showed that 80 to 85% of the fish were of hatchery origin (interpolated from Table 12 of Pentec 2005a), suggesting that waters in this portion of upper Cook Inlet are very important to the hatchery produced Chinook salmon smolts from Ship Creek. The remaining 15 to 20% of the fish that were not of hatchery origin suggest that the port expansion area also provides important habitat for wild Chinook, likely including fish from other Knik Arm tributaries. Filling a large area of intertidal and subtidal habitat directly to the east and adjacent to the mouth of Ship Creek would adversely affect smolts exiting Ship Creek. These effects could be especially pronounced on incoming tides when the fish would be forced east and face nearly two miles of bulkheaded shoreline and deep water, rather than the existing shallower waters where they can acclimate and seek refuge. The port expansion as proposed would likely decrease the survival of juvenile salmon emanating from Ship Creek, potentially reducing adult salmon returns to the popular Ship Creek sport fishery. Further information regarding fish habitat at the project site and potential impacts is included in Enclosure A.

Project alternatives that reduce the amount of fill and incorporate a relatively shallow margin along the shore (even under a pile-supported platform) would reduce impacts to fish habitat by retaining a sheltered migratory corridor for salmon and prey species. Minimizing the loss of fish habitat functions near the port would help support economically important recreational and commercial fisheries for salmon, as well as prey for beluga whales.

Cook Inlet Beluga Whales

The project area also provides high value beluga whale habitat, including summer feeding areas. The Cook Inlet beluga population is a small stock that has been shown to be geographically isolated (Laidre et al. 2000) and genetically distinct (O'Corry-Crowe et al. 1997) from other Alaskan beluga stocks. The Cook Inlet beluga's range appears to be largely confined to Cook Inlet (Rugh et al. 2000, 2005) with high-density concentrations in the upper Inlet. Since 1994, the Cook Inlet beluga population has declined significantly (Hobbs et al. 2000). The Cook Inlet beluga population was designated as depleted under the MMPA in 2000 (65 FR 34590). The latest survey information indicates that just 278 animals comprise the population. NMFS is currently undertaking a status review of the Cook Inlet beluga stock to determine whether this population should be listed under the Endangered Species Act.

The Port of Anchorage expansion project would impact beluga whales directly due to loss of intertidal and subtidal habitat, plus degradation of habitat due to increased noise that could cause injury or disrupt feeding activity. The project would also contribute substantially to the cumulative impacts on Cook Inlet belugas and their habitat (see discussion in Enclosure B).

The Environmental Assessment indicates that the project would require work that can increase the level of in-water sounds to the degree that beluga whales may be harassed or injured due to exposure to high noise levels. Due to the occurrence of these whales in the project area, often within the footprint of the proposed port expansion, and because of the sensitivity of beluga whales to received noise levels, this project has a significant probability of "taking" these marine mammals. Any such taking would violate the MMPA, unless specifically authorized. The MMPA provides for the authorization of unintentional and incidental takes of small numbers of marine mammals. NMFS and the applicant are currently discussing MMPA authorization for this work. Therefore, the recommendations regarding beluga whales in this letter are premised on the assumption that the project will be operating under an MMPA Small Take Authorization.

Alternatives Analysis

In previous letters to MARAD and the Corps of Engineers dated September 17, 2004, December 9, 2004, April 7, 2005, and June 1, 2005, NMFS has consistently recommended pursuing an alternative design for the project that would reduce impacts to living marine resources. An objective, rigorous analysis of alternatives and their associated impacts is necessary for the Corps to identify the least environmentally damaging practicable alternative, which is the only option the Corps can permit under the Clean Water Act section 404(b)(1) guidelines. The applicant's preferred alternative would eliminate and degrade a very large area of habitat used by beluga whales, salmon, and forage fish. Alternative designs that incorporate a partially pile-supported wharf would reduce the amount of fill needed for the project and maintain shallow water habitat near shore. NMFS has reviewed the Environmental Assessment, Public Notice, and other project related information provided by the Corps and MARAD. The analysis to date does not demonstrate that a partially pile-supported alternative is not practicable.

NMFS has repeatedly recommended the use of a partially pile-supported design such as Alternative B in the Environmental Assessment or the Pile-Supported Dock with Slope (see Environmental Assessment page 2-30). Such a design would minimize the loss of nearshore habitat and provide shallow water refuge for out-migrating juvenile salmon and adults. MARAD and the Port of Anchorage have contended that pile-supported options are not viable, based in part on issues of seismic stability. However, NMFS understands that there is considerable disagreement within the engineering community regarding the seismic stability of the applicant's preferred alternative, as well as MARAD's conclusions regarding a pile-supported design (Chapman and Fernandez 2002, Moffatt and Nichol Engineers 2002, Geotechnical Advisory Commission 2005).

A March 2006 overview of the geotechnical design process, compiled by MARAD, summarizes discussions and analyses related to the design from 2003 through June 2005 (MARAD 2006). The overview notes that a number of parties have been involved in discussions related to the design, and a final project design has not been completed. It also states that both a solid fill

design and a pile-supported design would be stable under probable seismic events. Additionally, the document notes that MARAD is preparing a formal response to an August 15, 2005, letter from the Anchorage Geotechnical Advisory Commission (GAC) that reiterated concerns about the project design and called for an independent third party review.

NMFS has no expertise in geotechnical matters related to the port's design, but we are interested in clarifying the project design issues insofar as that helps inform the identification of the least environmentally damaging practicable alternative for the project. The August 15, 2005, letter from the GAC suggests that engineering professionals still have many questions about the project design. NMFS therefore supports an independent third party review to assist the Corps in evaluating the practicability of less damaging designs for the project. NMFS recommends that the Corps and MARAD jointly select the review panel in concert with the GAC, thereby removing the Port of Anchorage and its consultants from that role. NMFS understands the GAC (comprised of volunteers from various engineering firms in Anchorage) is interested in being involved in some capacity and would lend valuable local expertise for any review panel, such as one developed via the American Society of Civil Engineers committee on seismic design standards for container ports. Resolving questions about the design alternatives via a clearly independent review would greatly benefit the public review process for this important project.

Compensatory Mitigation

The proposed project would eliminate a very large area of intertidal and subtidal habitat, regardless of what design alternative is selected. The Public Notice states that the applicant proposes to compensate for unavoidable impacts by establishing a mitigation account to support and enhance salmon restoration programs under the Pacific Salmon Recovery Fund. As discussed during a February 9, 2006, interagency meeting regarding the project, decisions regarding the specific mitigation projects to be undertaken should be made by the Corps using an interagency committee to ensure that funds are directed to suitable projects to benefit the resources affected by the port expansion. NMFS recommends that the mitigation projects prioritize restoration or protection of estuarine habitat, and that some of the selected projects be designed to benefit beluga whales, in addition to salmon.

Conservation Recommendations

NMFS offers the following recommendations for the project to minimize impacts to living marine resources. Recommendations #1-5 are EFH Conservation Recommendations pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act. Please note that under section 305(b)(4)(B) of the Magnuson-Stevens Act, the Corps is required to respond in writing within 30 days to NMFS EFH Conservation Recommendations. If the Corps does not make a decision within 30 days, you should provide NMFS with a letter to that effect, and indicate when a full response will be provided. Recommendations #6-7 are specific to beluga whales. In addition to the special conditions requested below, NMFS requests that all the recommendations regarding belugas in Enclosure B be included as special conditions to the Corps permit.

1. The Corps should deny a permit for the proposed project because the applicant has not demonstrated that its preferred alternative is the least environmentally damaging practicable

design. Alternatively, the Corps should defer its decision on the permit application pending the completion of a more comprehensive alternatives analysis to evaluate design options to reduce impacts to intertidal and subtidal habitats (see #2 below).

2. The Corps should require the applicant to provide an independent third party review of geotechnical considerations related to the project design. Such a review would assist the Corps in evaluating the practicability of partially pile-supported alternatives that involve less intertidal and subtidal fill than the applicant's preferred alternative. This additional information is necessary for the Corps to complete a thorough alternatives analysis to identify the least environmentally damaging practicable alternative for the project. The Environmental Assessment prepared by MARAD does not analyze alternative designs in sufficient detail to respond to the requirements of the 404(b)(1) Guidelines, and should be supplemented with a more comprehensive analysis as envisioned by 40 CFR 230.10(a)(4). The Corps should require Corps approval (in consultation with NMFS and other appropriate agencies) of the membership of the independent review panel and the process for conducting the review.

3. To minimize adverse effects of noise from construction and operation of the project, the Corps should require the applicant to develop an underwater noise reduction plan for approval by the Corps in consultation with NMFS and other appropriate agencies. The plan should incorporate measures such as timing windows, structural designs, operational procedures, and other methods to reduce adverse effects on fish and other living marine resources. For example, the plan should include a requirement for piles to be driven with a vibratory hammer to the maximum extent practicable, and if an impact hammer is required because of substrate type or the need for seismic stability, piles should be driven as deep as possible with a vibratory hammer before the impact hammer is used.

4. The final project design should incorporate state-of-the-art treatment for stormwater runoff from the expanded port facility to reduce degradation of upper Cook Inlet from hydrocarbons and other pollutants stemming from port operations.

5. No permit should be issued for Phase II until the Corps, NMFS, and other appropriate agencies have agreed upon a complete mitigation plan for the project. If the mitigation plan includes establishment of a fund to support future mitigation projects, the plan should specify the amount of funding, the types of projects to be funded, the resources that should benefit from selected projects, and the process for selecting and approving projects.

6. In-water pile driving (i.e., excluding work when the entire pile is out of the water due to shoreline elevation or tidal stage) should not occur within two hours on either side of each low tide to reduce impacts to beluga whales.

7. Belugas should not be exposed to sound levels in excess of 180 dB re: 1μPa. The radius surrounding such noise sources should be determined empirically and established based on propagation loss equations using data specific to this project. (If no Small Take Authorization under section 101(a)(5) of the MMPA is obtained, Cook Inlet beluga whales should not be exposed to noise in excess of 160 dB re: 1μPa.)

Conclusion

In summary, NMFS opposes issuance of a permit for the applicant's preferred alternative of a sheet pile dock with 135 acres of fill because the information we have reviewed does not demonstrate that this is the least damaging practicable alternative. The project as proposed will have substantial and unacceptable impacts to aquatic resources of national importance, as defined in Part IV paragraph 3(b) of the Clean Water Act section 404(q) Memorandum of Agreement between the Department of Commerce and the Department of the Army. Unless all of our recommended conservation recommendations for EFH and Cook Inlet beluga whales are followed, we recommend that you deny the requested permit. If you decide to issue the permit over our objections, we may seek higher level review of your decision pursuant to the 404(q) Memorandum of Agreement.

If you have questions regarding EFH or fish resources, please contact Brian Lance at (907) 271-1301 or Larry Peltz at (907) 271-1332. If you have questions regarding beluga issues, please contact Barbara Mahoney at (907) 271-3448.

Sincerely,

Robert D. Mecum
Acting Administrator, Alaska Region

Enclosures (2)

cc:
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NATIONAL MARINE FISHERIES SERVICE
ENCLOSURE A

Impacts to Fish and EFH from the Port of Anchorage Expansion Project

Background

The project area provides rearing and migratory habitat for several streams that drain into Knik Arm, in upper Cook Inlet. The nearshore habitat at the project site is important to all these streams, especially Ship Creek. Historically Ship Creek was one of the top two salmon-producing waterways in the Anchorage Bowl. Currently it contributes a large number of wild salmon and much of the hatchery produced salmon in Knik Arm. Ship Creek is one of the few urban salmon fisheries in the nation. The number of angler days of effort spent on Ship Creek (average of 50,000 from 1998 to 2002) is exceeded in Alaska only by the Kenai River. The average economic effect for the Ship Creek fishery is estimated at $7.3 million annually (Northern Economics 2004).

Assessment of Impacts

The Port of Anchorage expansion project will impact fish in Cook Inlet. While there may be few definitive studies on the use of the nearshore shallow coastal areas in the upper Inlet, use of this type of habitat elsewhere by salmon and other species is well supported by the literature (Groot and Margolis 1991). The Pentec studies conducted for this project suggest "juvenile salmonids in Knik Arm are not as dependent on littoral habitats as are the same species elsewhere." NMFS interprets the available data differently. NMFS review of historical documents related to fish studies in upper Cook Inlet (including Dames and Moore 1983 and Moulton 1996) and more recent studies (Pentec 2005a and Pentec 2005b) leads us to conclude that a wide variety of fish species are present in the vicinity of the Port of Anchorage and use the habitat in the near shore zone.

Based on our review of the available data, NMFS is particularly concerned about potential effects of the project on juvenile Chinook and coho salmon, which appear to prefer the intertidal habitat. Juvenile Chinook salmon otoliths sampled between Cairn Point and Point Woronzof showed that 80 to 85 percent of the fish were of hatchery origin (Table 12 Pentec 2005a). The large component of hatchery fish indicates to NMFS this area is important to the hatchery produced Chinook salmon smolt released from Ship Creek. In other areas, juvenile Chinook salmon stay in their natal estuary for varying periods of time (Healey 1991). It is reasonable to assume the intertidal area east and west of the mouth of Ship Creek is part of the functional Ship Creek estuary, and thus serves as a transitional habitat for salmon migrating from fresh to salt water. Loss of 9,000 linear feet of intertidal area to the east and directly adjacent to Ship Creek would mean that a Chinook salmon smolt exiting Ship Creek during an incoming tide would be forced east and not have any intertidal area in which to adjust and seek refuge while it acclimates to saltwater and begins to feed on marine organisms. If the port expansion proceeds as proposed, NMFS anticipates that survival rates will decrease for these smolts.

NMFS disagrees in part with the assertion from the Pentec studies that the tow net sampling suggests that fish utilize all of Knik Arm and are not necessarily oriented to the shoreline. A direct comparison of the Port of Anchorage tow netting and beach seining data and the beach seining data collected for the proposed Knik Arm bridge suggests a shoreline preference for some species (Table 1 below). Based on the catch data from near shore and off shore sampling, chum, pink, and sockeye salmon do appear randomly distributed across Knik Arm. However, Chinook and coho salmon are much more abundant in the shoreline sampling, suggesting that those species use the intertidal area preferentially. This comparison suggests Chinook and coho salmon may rely upon the intertidal area as they make the transition from freshwater to saltwater.

The Pentec studies observe that after July, the large numbers of juvenile salmon collected appeared to be mostly young of the year coho and sockeye salmon. NMFS is concerned that this information may be misleading. Coho salmon fry that enter the sea in the first spring or summer of life are generally not thought to survive to the adult stage (Groot and Margolis 1991). This may be true for sockeye salmon too. Consequently, although abundant, these fish may not be nearly as important as the smolt present earlier in the year. If protecting juvenile fish during construction becomes an issue, priority should be given to the juveniles present from April 15 to July 15. After July 15, it is questionable whether the large numbers of juveniles present result in many returning adult salmon.

Potential Impacts to Fish Resources

Overview

The impact area from the proposed Port of Anchorage expansion constitutes a component of what remains of the Ship Creek estuary. The Ship Creek estuary has largely been filled in and channelized to accommodate growth of an industrial district. The relative productivity of the estuary has most likely been severely reduced from its original state. The small part of the original estuary and its surrounding area that still exists in a functional state has high ecological value. The 9,000 linear feet of shoreline included in the proposed port expansion is a functional component of the remaining estuary. The loss of the functions served by this area cannot be replaced.

Project impacts can be divided into short-term impacts resulting from construction and long-term impacts from the dock expansion. Short-term impacts are habitat destruction and damage to fish primarily related to filling intertidal and subtidal areas, as well as noise associated with pile driving. It is debatable whether the seven-year construction period for the port expansion can be considered short-term. Continuous damage over a seven-year period could result in a long-term impact to species with shorter life cycles. Long-term impacts are permanent habitat alteration and destruction and the resulting negative impact on fish. The cumulative effects of this project on both juvenile and adult anadromous fish, when combined with other projects proposed in upper Cook Inlet as well as rapid development in the Mat-Su Borough, can be expected to result in significant declines in anadromous fish populations over time. This could have serious ecological and economic consequences. In short, the Port of Anchorage expansion project together with other proposed and potential development in upper Cook Inlet could result in significant cumulative impacts to anadromous fish.

Fill

The Port of Anchorage expansion project would fill approximately 135 acres and eliminate approximately 9,000 linear feet of intertidal habitat. Dumping fill into waters where fish are present can kill, injure and isolate fish in the discharge area. Injured and isolated fish are subject to increased predation (birds), disease, decreased feeding efficiency and/or death from subsequent fills.

Pile Driving

Numerous studies have shown that pile driving can kill and injure fish (Hastings and Popper 2005). The proposed port construction would require driving sheet pilings across the face of the 9,000-foot dock expansion. The pile driving would occur over an extended period of time. Since fish were found in the project area during the entire period sampled, the potential for significant impact to fish from noise is unavoidable. High turbidity and currents make the impact nearly impossible to monitor and/or document. This is a short-term impact. However, due to the seven year projected construction window, uncontrolled and unmonitored pile driving could have a long-term negative impact on juvenile salmon survival.

Habitat Alteration

The elimination of 135 acres of intertidal and subtidal habitat for the port expansion, spanning 9,000 linear feet of shoreline, would likely cause substantial habitat changes in this portion of Knik Arm. A 9,000 foot long dock face would replace existing areas of shallow slow moving water with deep fast moving water across a sheer sheet pile face. The sheltered areas of slower moving water where juvenile fish tend to be more abundant would be eliminated. The clearer water microhabitats in the intertidal area that allow for visual feeding also would be eliminated. This habitat alteration would negatively impact Chinook and coho salmon juveniles that now use the intertidal area by displacing the fish from a preferred habitat and eliminating a feeding area. The degree of the impact to fish populations is difficult to quantify. The impact would be long-term (once the habitat is stabilized a net negative impact persists) and would most likely decrease survival of juvenile fish emanating from Ship Creek. This, in turn, would reduce the number of adult salmon returning to Ship Creek and available to sport fisheries. Ship Creek supported an average of over 50,000 days of angler effort per year from 1998 to 2002 (Alaska Department of Fish and Game). The Ship Creek fishery average yearly economic effect was estimated at $7.3 million (Northern Economics Inc.), meaning Ship Creek anglers pumped over $36 million into the Alaska economy during this five-year period. Any negative impacts to the Ship Creek fishery would have negative economic implications to the Alaska economy.

Table 1: Knik Arm Fish Sampling Comparisons. CPUE Data Comparison, Juvenile Salmon, Beach Seines versus Tow Nets. Data from Pentec 2005a Report - Table 4 and Table 6, Pentec 2005b Table 7 and Table 9.

	Littoral / Nearshore Habitat		**Offshore Habitat**	
CPUE	**POA 2004/2005 Beach Seines**	**KABATA 2005 120-foot Beach Seines**	**POA 2005 Tow Net Transects**	**KABATA 2005 Tow Net Transects**
Juvenile Chinook	0.84	1.3	0	0.2
Juvenile Chum	0.33	1.0	0	2.5
Juvenile Coho	1.86	1.6	0.1	0.3
Juvenile Pink	0.06	0.2	0	1.3
Juvenile Sockeye	0.42	1.1	0	2.4

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NATIONAL MARINE FISHERIES SERVICE
ENCLOSURE B

Cook Inlet Beluga Whales and the Port of Anchorage Expansion Project

The Port of Anchorage construction and operation will result in the direct elimination of beluga habitat through filling, and diminishment of habitat value through physical and acoustic alteration. The expanded port would entail the discharge of fill materials into approximately 135 acres of intertidal and subtidal waters. Construction and operational dredging would impact an additional 235 acres of Knik Arm, for a total of 370 affected acres within important habitat for the Cook Inlet beluga. It is possible that belugas may abandon important nearshore habitat south of Cairn Point due to the alteration and reduction of available habitat by the port expansion project. The port expansion project may also restrict or discourage transit of whales through Cairn Point narrows to important feeding areas in upper Knik Arm.

NMFS evaluated beluga habitat in Cook Inlet within the 2005 draft "Conservation Plan for the Cook Inlet Beluga Whale (Delphinapterus leucas)." The draft Conservation Plan established four beluga whale habitat classifications within Cook Inlet:

1. Type 1 Habitat is defined as "High Value/High Sensitivity" and includes what NMFS believes to be the most important and sensitive areas of the Inlet relative to beluga habitat requirements. Type 1 Habitat includes feeding areas throughout the upper Inlet, principally near several important anadromous fish streams. Belugas tend to concentrate in dense groups in the shallow waters of Type 1 Habitat (Rugh et al. 2005), making them vulnerable to disturbance.
2. Type 2 Habitat is defined as "High Value" and includes summer feeding areas and winter habitats in waters where belugas typically occur in lower concentrations or less frequently than in Type 1 Habitat. Type 2 Habitat generally contains areas with deeper waters, where belugas may be less prone to harassment and disturbance. Type 2 Habitat is comprised of seasonally important foraging sites and transitional corridors for access to Type 1 Habitats. The proposed 370 total acres to be filled or altered by the Port of Anchorage expansion project is located within Type 2 Habitat.
3. Type 3 Habitat occurs in offshore areas of the mid and upper Inlet and also includes wintering habitat as described by the results of satellite tagging research (Hobbs et al. 2005). Belugas are less commonly seen in Type 3 Habitat, but the areas are still used enough to be considered a relatively important resource for the whales.
4. Type 4 Habitat describes the remaining portions of the range of belugas within Cook Inlet. In Type 4 Habitat, belugas are seen occasionally or have been reported in the past, but they are not seen as often as in the other habitat types.

The draft Conservation Plan establishes two planning objectives for beluga habitat: 1) preservation of Type 1 Habitat, and 2) conservation of all beluga habitat types. Accordingly, the Type 2 Habitat planning objective is no net loss of habitat function or value. Noise associated with construction and operation of the expanded port is the aspect of the project that poses the greatest threat to the Cook Inlet beluga stock. Thus, minimization of construction and operation noise would accrue the most benefit to the conservation of belugas and their habitat.

Various sources provide information and environmental data concerning beluga use of the project area (lower Knik Arm), the remainder of Knik Arm, and the rest of upper Cook Inlet (Goetz 2005; Rugh et al. 2000, 2005; POA unpublished data; LGL unpublished data). These data demonstrate that Knik Arm waters are used intensively by belugas and verify feeding and travel behavior within the project area for the port expansion. Studies conducted for the Port of Anchorage (Markowitz, memos to W.E. Humphries, August, September, October and November 2005) reported that 79% of the total number of belugas observed in study area were observed in the immediate footprint of the port expansion project. These belugas exhibited various behaviors such as traveling, feeding, suspected feeding, and diving. A group of 23 whales was observed feeding or suspected feeding 89% of the time (Markowitz, memos to W.E. Humphries, August, September, October and November 2005).

NMFS aerial survey data (Rugh et al. 2000, 2005) show high use of Knik Arm by belugas when surveys were flown, primarily in June of each year. The Knik Arm Crossing beluga studies (Funk et al. 2005) report that Knik Arm was used by belugas throughout the year (with the exception of February) with high concentrations during August through November. Funk et al. (2005) also reported that belugas were concentrated in lower Knik Arm during spring. Interestingly, some observational data (Rugh et al. 2000, 2005; LGL unpublished data) indicate decreased sighting rates for waters off the Port of Anchorage, as compared with upper Knik Arm and areas to the south and west along upper Cook Inlet (e.g. Chickaloon River, Susitna River, and Little Susitna River). This may imply that lower Knik Arm activities, including the Port of Anchorage, may already have an impact on beluga behavior and habitat use. In this area, lower sighting rates may be a result of beluga response to relatively high noise levels, vessel activity, or related anthropogenic factors. Satellite tracking data (Hobbs et al. 2005) provided evidence that these whales routinely transited between upper Knik Arm and elsewhere in Cook Inlet, moving through the project area. A multivariate habitat use model found the waters of lower Knik Arm, including the project site and adjacent waters, were high value and similar to habitat within upper Knik Arm and other Type 1 Habitat areas (Goetz 2005). This infers that the port expansion project area could be Type 1 Habitat but now is used less intensively by belugas (i.e., it is now Type 2 Habitat). These modeling results suggest that when combined with current observations, development and industrial activity have already resulted in a tangible loss of Type 1 Habitat to belugas. If this change was attributable to underwater noise and the high level of maritime activity within lower Knik Arm, it is also reasonable to predict that the proposed port expansion would result in further diminishment of habitat value and use by belugas.

In addition to physical alteration and destruction of beluga whale habitat, the expansion project and future operation of the port would, without specific mitigation, increase noise levels within lower Knik Arm. Extensive research information describes the importance of sound to beluga whales for navigation and communication, as well as their hearing thresholds and behavioral reactions to noise (reviewed in Blackwell and Greene 2002). These reactions range from tolerance or apparent habituation to altered calling behavior (Lesage et al. 1999), reduced habitat use (Caron and Sergeant 1988), and acute reactions such as panicked flight (Finley et al. 1990; Erbe and Farmer 2000). NMFS has often observed Cook Inlet beluga whales' aversion to approaching small watercraft (NMFS unpublished data). Small boats emit high frequency noise that falls within the most sensitive hearing range of beluga whales (Blackwell and Greene 2002).

While larger vessels and certain port operations produce lower frequency noise which is less detectable to beluga whales, any such noise can affect these whales at high-received levels. According to the MARAD Environmental Assessment, the expanded port would increase annual ship arrivals from 491 (2003) to 763 (2025), accommodating much larger container ships (to 1,100 feet). A significant factor of additive noise would be associated with the port expansion construction, increased vessel traffic, loading/unloading activity, increased tug support, and increased dredging. Furthermore, the Port McKenzie vessel operations and construction and the proposed Knik Arm Crossing would have significant cumulative effects. Underwater noise reduction must be a primary planning element with respect to issuance of the Corps of Engineers permit for this work. Without effective underwater noise reduction during the construction period and expanded operations, NMFS considers the current environmental analysis inadequate.

NMFS commends the Port of Anchorage for monitoring belugas related to the project. Such monitoring must now be expanded to quantify the impacts of the port expansion and to enable decision makers to respond reasonably to future habitat development proposals. The feasibility-level monitoring studies (Markowitz memos to W.E. Humphries, August, September, October and November 2005) documented occurrence and distribution of beluga whales and described some behavior during operations. Beluga response to particular received levels of industrial noise is a key aspect missing from these studies. This information is needed to understand the extent and duration of effects from the port expansion and to ensure that necessary habitat values remain intact to provide opportunity for the recovery of the Cook Inlet beluga stock.

Following please find our recommended permit conditions for monitoring (as needed to validate the effectiveness of mitigation) and reporting necessary to protect beluga whales.

1. Monitoring

Monitoring the POA expansion project shall include A) beluga monitoring (to quantify the nature and extent of effects), B) noise monitoring (to quantify and predict the zones of beluga noise exposure for the major underwater noise sources associated with this project), and C) mitigation monitoring (to verify the shut-down of construction sources capable of injuring or reducing the hearing sensitivity of belugas). Integration of beluga, noise, and fish monitoring should be coordinated to the maximum extent practical. Integration will also be a key aspect to aid NMFS interpretation of the effects and determinations required under any Small Take Authorization under section 101(a)(5) of the MMPA. Annual draft reports shall be submitted in a timely manner to NMFS and key stakeholders for review.

A. Beluga monitoring:

As stated in the POA Marine Terminal Redevelopment EA, the applicant shall monitor beluga whales before, during, and one year after construction activities. Initial beluga observations were started in 2005. This monitoring effort requires: Shore-based observations by at least two teams to monitor the beluga whale movements, timing, group size, locations, and identifiable behaviors near the POA expansion area. The monitoring will be conducted from March through November (excluding the winter ice months). Beluga observation should be performed six hours per day, twice a week. The observers should attempt to monitor beluga whale presence or absence in addition to factors such as tide height, the relative location of

active industrial noise sources, and vessels. Detailed observations should include specific localization of each sighting, individual coloration, group size, directional movement, stage and tide direction, behavior notes (slow vs. fast travel, direction vs. non-directional movements, etc.), and human activity (location and direction of ships, ship sizes, etc.) associated with the POA or within lower Knik Arm.

B. Acoustic Monitoring

The applicant shall record underwater frequency composition and sound pressure levels within lower Knik Arm during each construction year and one year after construction completion, beginning in 2006. The acoustic sampling frequency and duration should be developed each year in consultation with NMFS to measure broadband noise levels over a reasonable range of distances. Sampling design should account for multiple sources and paths along with specific noise sources anticipated to contribute a majority of the acoustic energy related to the project. Pile driving is expected to be the major source of impulsive construction noise, and as such, must be measured over a variety of distances to mitigate harassment of belugas, and to understand and predict future noise exposure estimates. Measurements must occur over several tidal cycles (due to significant alteration of water depth) and include periods representative of high use at the POA. Other specific activities important to record include vessel docking activities, tugboat assists, cargo transfers, maintenance and construction dredging, and other anthropogenic activities that are likely to introduce noise into the water. This monitoring shall be accomplished by trained acousticians approved by NMFS.

C. Mitigation Monitoring

Observers shall be on-site and observe all construction activities capable of producing received underwater sound pressure levels in excess of 160 dB re: 1μPa between 15 April and 1 December of each year for the duration of the project, and they shall direct operations to be suspended whenever one or more beluga are observed within, or about to enter the 180 dB zone. (If no Small Take Authorization under section 101(a)(5) of the MMPA is obtained, Cook Inlet beluga shall not be exposed to noise in excess of 160 dB re: 1μPa).

D. Integration

a. In the project area beluga presence is going to be influenced by the availability of prey, availability of escape terrain from predators, pile driving, vessel presence, background noise, reproductive status, season, and ice cover. Assessing the importance of these factors to the presence or absence of belugas in the project area will be best achieved through integration and collaboration among monitoring projects and other studies. When practical, beluga monitoring should occur coincident with noise and fish monitoring projects.

b. A GIS database shall be established in partnership with NMFS to manage and analyze the whale observations and other sources of beluga data relative to variables such as season, bathymetry, tide, and distance from POA activities.

2. Reporting

The applicant shall prepare a draft annual report, subject to NMFS review, describing the results of the beluga, acoustic, mitigation and integration monitoring efforts. These annual reports shall evaluate the effect of the POA expansion project construction and operations on Cook Inlet belugas. Annual monitoring reports are to be provided to NMFS no later than 1 March of each year.

At the end of every five-year period, a comprehensive report shall be prepared integrating the results from annual reports to determine inter-annual variability and cumulative effects. Reporting requirements under the MMPA section 101(a)(5) authorizations can be coordinated to prevent duplicative reporting.

A final comprehensive report shall be prepared integrating the results from all monitoring years (before construction, during construction activities, and one year after construction completion).

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