



U.S. Army Corps
of Engineers
Alaska District

Department of the Army

Permit Evaluation and Decision Document

APPLICANT: Port of Anchorage

APPLICATION NO.: POA-2003-502-N

WATERWAY: Ship Creek

This document constitutes the Environmental Assessment, Public Interest Review, Section 404(b) (1) Guidelines Review and Compliance Determination, and Statement of Findings for the proposed work.

1.0 Authority

This permit action is being taken under authority delegated to the District Engineer by 33 CFR 325.8, pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act.

2.0 Proposed Project

2.1 Project Description and History:

The U.S. Department of Transportation, Maritime Administration (MARAD) in cooperation with the Municipality of Anchorage, Port of Anchorage, proposes to expand, reorganize, and improve the Port of Anchorage (POA). The Marine Terminal Redevelopment (MTR), Port Intermodal Expansion Project, involves the construction of an open cell sheet pile dock in the tidelands west, northwest, and southwest of the existing dock, which would almost double the size of the existing port and provide approximately 8,800 linear feet of waterfront structures. The proposed MTR Project would involve a discharge of fill material over approximately 138 acres of intertidal and subtidal waters of Knik Arm, a navigable water of the U.S. The Corps of Engineers, Alaska District is congressionally mandated to perform transitional dredging to maintain navigation to the Port during construction activities (transitional dredging) and to deepen the operational depth of the harbor subsequent to the construction of the expanded port facilities to -45 feet MLLW, compared to the existing -35 feet depth that the Corps has historically and currently maintains.

As the lead federal agency under the requirements of the National Environmental Policy Act (NEPA), the MARAD prepared an Environmental Assessment (EA) and finding of no significant impacts (FONSI) to the affected human environment, dated March 2005, for the MTR project. The MARAD subsequently prepared EAs and FONSI for the Cherry Hill and North End Runway Material Extraction and Transport Projects, dated January 2006 and May 2006 respectively. The Cherry Hill and North End Runway borrow pits (CHBP and NEBP) would provide the bulk of the fill material requirements of the preferred alternative identified in the MTR EA and described above.

The Corps of Engineers, Alaska District, Regulatory Branch issued a DA permit in August 2005 for the development of the "backlands" project, which involved

a discharge of fill material over 27 acres (of the total 135 acres associated with the MTR Project) of intertidal mudflats north of existing port facilities for military operations (previously referred to as Phase 1 for regulatory purposes only). Although associated with the proposed Marine Terminal Redevelopment project, Phase 1 was determined to have independent utility and was evaluated separately from the remainder of the overall port expansion project. The Corps verified the use of nationwide permit number 3 for the Port of Anchorage (POA) Haul Road maintenance project in June of 2007. The POA Haul Road maintenance activities involved minor widening and resurfacing of 4 miles of existing serviceable roads between the CHBP and the NEBP, which involved cumulative discharges of fill material over 0.21 acre of wetlands. The POA Haul Road project was determined to have an independent utility from the MTR project, as it would provide for development of areas outside of DA regulatory jurisdiction and it was not interdependent with the MTR project.

The Phase II DA permit application, which is the subject of this decision document, refers to the remainder of the tideland developments of the MTR Project and the Cherry Hill and North End Runway Borrow Pit developments (CHBP & NEBP respectively). The Phase II DA permit application included the following work subject to DA regulatory jurisdiction: the discharge of approximately 9.4 million cubic yards of fill material over 108 acres of intertidal and subtidal navigable waters of the U.S.; the dredging of approximately 633,000 cubic yards of marine sediment, over approximately 47 acres, necessary for the construction of the proposed sheet pile dock; and the development of the Cherry Hill and North End Borrow pits and their respective haul roads, which would cumulatively remove approximately 34.5 acres of wetlands.

2.2 Location:

The Port of Anchorage is located in the Knik Arm of Upper Cook Inlet, within section 31, T. 14 N., R. 3 W.; and sections 6 & 7, T. 13 N., R. 3 W.; Latitude 61° 15' N., Longitude 149° 52' W.; Seward Meridian; in Anchorage, Alaska. The CHBP and NEBP gravel extraction sites are located respectively within sections 5 & 6, T. 13 N., R. 3 W.; and within sections 27, 28, 33, and 34, T. 14 N., R. 3 W.; Seward Meridian; on Elmendorf Air Force Base, northeast of the Port of Anchorage.

2.3 Scope of Analysis:

As the permitting agency, the Alaska District, Regulatory Division's scope of analysis for the evaluation of the permit application and consequently, the scope of this decision document, includes the following aspects of the proposed project: the discharges of fill material below the high tide line of Knik Arm, a navigable water of the U.S., associated with the construction of the proposed open cell sheet pile dock; the dredging and open water disposal of marine sediments necessary for the construction of the proposed dock; and the developments of the gravel extraction areas on Elmendorf Air Force Base, which would include discharges of fill material in wetlands. The environmental assessments prepared by the U.S. Department of Transportation, Maritime Administration, the lead federal agency under the requirements of the NEPA, are partially incorporated by reference into this decision document. This decision document specifically evaluates information required for determinations of compliance with the EPA's 404 (b) (1) guidelines, as well as other regulatory considerations and findings mandated by our program, that are not fully addressed in the EAs prepared by the MARAD.

2.4 Purpose and need:

Applicant's stated purpose and need:

"The POA presently is operating nearly at or above sustainable practicable capacity for the various types of cargo handled at the facility. In addition, the existing aged facilities are substantially past their design life, have degraded to levels of marginal safety and are, in many cases, functionally obsolete. The Project will expand and upgrade the current POA facility to address existing needs and projected future needs to allow the POA to adequately support the needs of Anchorage and Alaska through 2025. Operations at the Port would improve and increase with the expansion, construction, and reorganization. The Project will influence the physical and economic aspects of the Municipality of Anchorage (MOA) and the State of Alaska. In addition, the Project is critical to national defense by providing the additional land and facilities necessary to support military deployments at this strategic site. Specific Project needs include:

- **Necessary replacement of obsolete infrastructure** - certain elements of the Port's existing infrastructure are functionally obsolete and near or below design safety standards for seismic events. These infrastructure elements will be replaced, warehouse storage developed, and code-compliant support structures relocated.
- **Ability to withstand harsh environmental conditions** - the Upper Cook Inlet provides challenges in the form of strong currents, the second most widely fluctuating tides in the world, ice buildup, scour from ice and silt, and earthquakes that any Port expansion proposal must consider.
- **Ability to withstand design seismic events** - the Project is located in an area of high seismic activity. The critical role of the facility in commerce for the State of Alaska mandates that the Port survive a major seismic event with the ability to continue operations. The MOA, through both the Geotechnical Advisory Commission and a mayoral-appointed Blue Ribbon Committee have imposed stringent seismic design standards for the Port with the intention of providing appropriate stability during major seismic events.
- **Additional capacity to accommodate growth in current customers** - current and near-future cargo-handling capacity will continue to exceed maintainable, safe, and efficient levels. Operational analysis and projected growth for the MOA and the State of Alaska have identified a need for approximately 135 additional acres of land and additional berth space to support existing and future Port operations.
- **Additional berths to provide service to new and existing customers** - expected growth of operations coupled with existing customer demand will result in at least 40 percent growth in ship calls, causing berthing conflicts, increased waiting times for berths, and increased transportation costs to the public. The expanded and upgraded Port will be capable of safely and efficiently handling commerce and military needs until 2025 and possibly beyond.

- **Deeper drafts, longer berths, larger cranes for offloading and more streamlined intermodal transportation to efficiently handle new ships with the ability to move the increasing amount of cargo out to the public** - current trends in maritime transportation have produced larger, longer ships that cannot be supported by the current Port facilities. With deeper drafts and wider beams, these large ships require longer berths and cranes with a wider capacity for unloading. Failure to expand would result in increasing inefficiencies and costs for shipping goods to Alaska's customers. Operational limitations of the existing Port infrastructure require that loading procedures at ports of origin be restricted to accommodate the limited crane reach at the Port of Anchorage.
- **Lighting, gates, and other features to meet new security requirements under the new Maritime Security mandates** - the Port of Anchorage, like all U.S. ports, must construct facilities and implement measures to comply with the Maritime Transportation Security Act of 2002 and associated U.S. Coast Guard maritime security regulations designed to protect the nation's ports and waterways from terrorist attack.
- **Additional space and an improved berth to support military rapid deployments without conflicting with commercial customers** - as a critical conduit for military deployment, the POA will need to maintain a sustained commitment that embodies a long-term plan, integrating intermodal efficiency with that of heightened security and positive cargo control. Current berthing facilities at the POA are insufficient to accommodate both military and commercial ships supporting the U.S. Army's Alaska-based Stryker Brigade Combat Team. The expansion in facilities and increase in efficiencies are also critical to the Port of Anchorage to maintain its designation as the 15th Strategic Commercial Seaport in the nation."

In summary, "the purpose of the Port Expansion Project is to replace functionally obsolete structures; increase POA capacity, efficiency, and security; and accommodate the needs of the U.S. military for rapid deployment".

Basic project purpose and water dependency [40 CFR 230.10(a)(3)]:

Regulatory Division has defined the basic project purpose as upgrading the existing port to accommodate immediate and forecasted cargo handling requirements. Any project alternative that would fulfill the basic project purpose would require work, including a discharge of dredged and/or fill material, in navigable waters of the U.S. Therefore, the basic project purpose of upgrading the existing port is considered to be a water dependent activity and it is not presumed that alternatives are available to the applicant that would not involve work in waters of the U.S. However, not all aspects of the proposed project are water dependent (e.g., the proposed wetland fills associated with the borrow pit developments).

Overall project purpose:

Regulatory Division has defined the overall project purpose as upgrading existing port facilities to improve efficiency, security, safety, and to expand the operational capacity of the Port of Anchorage to accommodate existing and forecasted growth capacity requirements. This defined overall

project purpose will be the basis of regulatory division's analysis of the practicability of less damaging alternatives.

2.5 Site description:

The Port of Anchorage is located on the eastern shore of the lower reach of Knik Arm, just south of Cairn Point and north of Ship Creek, in the industrial waterfront of Anchorage, Alaska. The Knik Arm estuary is approximately 40 miles long with a width that varies between 1 and 5 miles. Knik Arm is the northernmost extension of Cook Inlet. Cook Inlet is a large tidal estuary that flows into the Gulf of Alaska and covers an area more than $26 \times 10^3 \text{ km}^2$, with an average depth of 100 m and large expanses of glacial flour deposits and extensive tidal mudflats. Northern Cook Inlet bifurcates into Knik Arm to the north and Turnagain Arm to the east. Knik Arm has deep narrow channels flanked by large tidal benches, with approximately 60% of its area exposed at MLLW. The Port of Anchorage boundaries currently occupy an area of approximately 129 acres. Other commercial/industrial activities related to Port operations are located on Alaska Railroad Corporation (ARRC) property immediately south of Port property covering approximately 111 acres. To the north and east, Elmendorf Air Force Base (EAFB) lies on a terrace roughly 100 feet above the POA.

3.0 Alternatives Considered [33 CFR 320.4(b)(4), 40 CFR 230.10]

3.1 No action:

The no action alternative would constitute a permit denial. The Port of Anchorage handles the majority of commercial commodities entering the state of Alaska, serving 80% of Alaskan communities and handling approximately 90% of the state commercial cargo imports. There are no other ports in the state capable of handling the commercial and military logistical requirements for cargo handling and transport. The existing wharf is beyond its structural life and, at minimum, would need to receive major repairs and replacements to maintain critical service to the City of Anchorage and the state of Alaska. Additionally, the Port of Anchorage is designated by the Department of Defense and the Maritime Administration as the fifteenth Strategic Commercial Port in the United States. The no-action alternative would result in major delays in the distribution of commercial goods throughout the state due to congestion and delay during major military deployments. Failure to expand the Port would result in increasing inefficiencies and costs for shipping goods to Alaska customers. Also, certain elements of the Port's existing infrastructure are severely degraded and functionally obsolete and near or below design safety standards for seismic events. The Port of Anchorage's existing operational demands along with the foreseen rate of growth would result in berthing conflicts, increased ship berth waiting periods, and increased transportation costs to the public. Additionally, the Port's current infrastructure (berth and crane size, staging areas) would not be able to accommodate the larger and longer ships being used in maritime transportation. Finally, the current berthing facilities at the Port are insufficient to efficiently accommodate the military and commercial ships supporting the U.S. Army Alaska's (USARAK) military deployments.

3.2 Other project designs:

The proposed open cell sheet pile dock design would result in the permanent loss of approximately 135 acres of intertidal and shallow subtidal aquatic habitat between Ship Creek and Cairn Point. The Corps, along with federal resource agencies, nonprofit organizations, and a local tribal government, have determined that project alternatives that minimize the permanent loss of marine waters of the U.S. by fill placement would result in less long term and permanent environmental impacts to the aquatic ecosystem. Project design alternatives that would minimize the permanent loss of habitat would include the following: **A)** a reduction in the overall proposed expansion area in waters of the U.S. and/or **B)** a project design that completely and/or partially replaces the overall footprint of the proposed Open Cell Sheetpile structure with pile-supported sections.

A. Minimization of the proposed expansion area in waters of the U.S.

There are two types of design alternatives that would accomplish a reduction of the overall expansion area in waters of the U.S.: **1)** a design alternative that minimizes/reduces the proposed operational expansion area and **2)** a design alternative that incorporates landward expansion, as opposed to seaward expansion, to accomplish the increased capacity needs of the Port.

The Corps requested specific information from the applicant to support the additional land area requirements of the proposed project.

1. Overall Expansion Requirements

The MARAD MTR EA concluded that future land requirements for the proposed expansion would total 135 acres, 66 acres of intertidal and 69 acres of subtidal lands. The MTR EA listed the following projections of additional land needs by 2025:

- 37.7 acres for increased container cargo and military deployments.
- 39 acres of additional dock front and marine terminal space.
- 27.1 acres for break-bulk barge shipments.
- 3 acres for passenger facilities.
- 11 acres for short-term permits/industrial use.
- 14.4 acres for administrative areas.
- 7.8 acres for future development.
- A reduction of 5 acres currently reserved for auto/vehicle throughput.

According to information provided by the applicant, initial estimates for additional expansion requirements were based on the 1999 Port of Anchorage Master Plan, traffic planning, and historic and projected population growth of the Municipality of Anchorage and State of Alaska. The 1999 Master Plan involved an evaluation of the existing Port's infrastructure and operations, market conditions; demographic and socioeconomic profile of the State of Alaska, historical and foreseeable future commodities of Alaska's natural resource industries for (including oil and natural gas, coal, minerals and aggregates, forest products, and agricultural products), Alaska's existing marine transport system and the Port's networking with other Pacific Northwest Ports, and an evaluation of past and foreseeable shipping volumes and users at the Port. The evaluation determined that historic cargo volume growth rates from 1980-1999 averaged 2.8% and estimated a median growth of 63.9 acres, split between container cargo handling and dock front space (waterfront access).

The information generated in the Master Plan was used as input for computer modeling to analyze the handling of containerized cargo, break-bulk/neo-bulk, automobiles, liquid bulk, dry bulk, and passenger traffic. The primary Port cargo handling components analyzed were vessel arrival and berth availability, cargo transfer at the wharf apron, apron-to-storage transfer, storage yard and dwell times, storage-to-land transfer, and gate processing. The models accounted for seasonal operational variations of monthly throughput and analyzed current Port capacity and foreseeable cargo volume growth and additional space and equipment requirements. The results of the analysis were compared to world port industry standards, which, according to the applicant, typically fall between 2,000 and 4,500 twenty foot equivalent units (TEUs) per acre per year. The Port of Anchorage is estimated to be at 4,300 to 4,700 TEUs per acre per year.

The initial operational area predictions of the 1999 Master Plan were updated based on actual increases in Port cargo handling volume since the plan, inquiries from industry regarding new use of space and facilities, and the 2003 Operational Analysis of the Port of Anchorage (TEC Infrastructure Consultants, LLC). The operational analysis revealed that the average annual growth of container traffic through the Port of Anchorage increased at a rate that was more than twice that of the population growth. In 2003 Port throughput exceeded the 1999 average growth prediction by approximately 42%. Additionally, according to the applicant, there is an emerging need for break-bulk and neo-bulk barge capacity that was not anticipated in the Master Plan. A recently completed feasibility study by the Port of Anchorage on the creation of consolidation and distribution operations at the Port, "Port of Anchorage Consolidation and Distribution Concept Feasibility Study" (Northern Economics, Inc., 2006) to support the needs of rural Alaska communities indicates the probability of increased barge traffic at the Port.

The additional dock front space is based on the median growth prediction for container cargo, the need for military support, the need to upgrade and expand POL and cement offloading capability, emerging break-bulk throughput, consolidation and distribution of break-bulk and neo-bulk cargo for rural communities, and forecasted industry needs for increased barge use at the Port. Additionally, new Port security requirements preclude dual use of port facilities to include passenger operations.

The existing Port has approximately 8.9 acres of land dedicated to administrative, transportation, and other common uses. The expanded Port would require more administrative area to support increased security needs and to improve the land side transfer of cargo into and out of the Port.

The designation of the Port of Anchorage as a National Strategic Commercial Seaport has resulted in additional space requirements by military forces for deployment staging areas. The Military Surface Deployment and Distribution Command (SDDC) requested that MARAD issue a new pre-emergency Port planning order for facilities at the Port, which requires that additional area be available for exclusive military use, including 1,200 feet of berthing space and 25 acres of open staging area. Consequently, the Port's estimates for military/container storage areas have increased from the 37.7 acres predicted in the MTR EA. Additionally, the U.S. Coast Guard has an increased Port presence and has requested additional space to support Sector Anchorage operations and the U.S. Coast Guard Maritime Safety and Security Team (MSST) have requested space and facilities at the Port since the MTR EA was completed.

The Port anticipates, based on expected high growth forecasted needs and the additional military, maritime security, and industrial requirements that operational area requirements for 2025 would be:

- 98.8 acres for container cargo handling, dock front, and marine terminal space;
- 25 acres for military staging areas as required by the National Strategic Commercial Seaport program;
- 27.1 acres for break-bulk cargo and barge servicing;
- 3 acres for passenger facilities;
- 11 acres for short-term permits/industrial use;
- 14.4 acres for administrative areas; and,
- 7 acres (minimum) for the U.S. Coast Guard.

This gives a total predicted area need for 2025 of 186.3 acres, excluding any area for future expansion (7.8 acres in the MTR EA).

According to the Port, various entities are inquiring about available space for new activities such as coal shipment, gravel shipment/storage, additional fuel storage/shipment, lumber storage/shipment, and modular construction activities. The total amount of land requested is over 40 additional acres.

Therefore, although high growth estimates indicate a larger surface area than the proposed expansion, the MARAD and the Port have minimized the overall expansion area in waters of the U.S. by acquiring additional properties for landward development and by improving operational efficiency. Based on available information, including information provided by the applicant, the proposed expansion area represents the minimum area of growth to reasonably accommodate the forecasted needs of the overall project purpose.

2. Practicability of Landward Expansion Alternatives:

The geographic positioning of the Port of Anchorage and adjacent property ownership constrains the practicability of landward expansion. Current Port infrastructure is bounded by military land (EAFB) on its east side, Alaska Railroad Corporation (ARRC) property to its south side, and the navigable waters of Knik Arm on its north and west sides. Therefore, without obtaining property rights from the military or the ARRC, expansion of the Port must be seaward of existing port infrastructures.

To reduce the amount of tideland fill required for the expansion, the Port has entered into long-term leases with the U.S. Air Force and the U.S. Army to develop approximately 18 acres of land on the east side of the existing Port facility. This development required excavation into the bluff. Additionally, the Port is coordinating with the Department of Defense to obtain rights to the Defense Fuels Property, located southeast of the existing Port. This area is approximately 48.2 acres, of which 7.3 acres are associated with the 18 acres of military lease lands discussed above. The remaining area includes steep slopes and areas of known contamination that will limit development opportunities. Further expansion of Port infrastructure onto adjacent military lands is not available to the applicant.

The proposed Port expansion would include the continued use of facilities and structures that are in a serviceable condition. Existing bulk liquid and bulk dry storage, transportation facilities, and infrastructure currently in use are owned by Port customers, located adjacent to the Port on lands leased from the Alaska Railroad Corporation. The relocation of these facilities to Port lands would increase the forecasted space requirements. The proposed expansion includes reorganization of facilities to maximize operational and space efficiency to minimize expansion requirements. The proposed MTR project would group similar operations into common areas to provide land use flexibility and layout modifications as operational demands change to meet future needs without creating a need for additional expansion.

Therefore, the 135 acres of proposed seaward expansion represents the minimum expansion area in waters of the U.S. needed to accomplish the overall purpose of the project.

Minimizations of Wetland fills and construction-related dredging and fill volumes

Wetland losses associated with the proposed material extraction and transportation projects on EAFB were identified in the Phase II permit application to total 34.5 acres. Through the geotechnical sub-surface investigations, to characterize and quantify materials available within the extraction areas, the applicant has refined the material extraction areas to avoid higher value wetland complexes and minimize the overall wetland losses of the project to 20.5 acres. According to the applicant, selective mining methods would be used to the extent practicable to further reduce impacts to existing wetland and upland habitats during the construction period.

Since the public notice, design refinements and subsurface material investigations have resulted in reductions in construction related dredging and fill placement. Construction related marine sediment dredging has been reduced from approximately 633,000 cubic yards of material, over approximately 47 acres to approximately 258,000 cubic yards over 21 acres. Current fill requirements for the proposed dock construction have been reduced from 12,389,000 cubic yards to approximately 9,663,420 cubic yards. The applicant has also modified the barge berth area on the north end of the proposed project to be faced with approximately 1,000 feet of armor rock or riprap slopes, which would reduce the length of the sheet pile dock face to approximately 7,900 linear feet, compared to 8,800 linear feet described in the public notice.

B. Structural Design Alternatives:

Project design alternatives that minimize fill placement in waters of the U.S. and the associated permanent loss of aquatic habitat are considering less damaging to the aquatic ecosystem. Pile-supported structures in marine waters, while resulting in greater temporary harmful affects to marine mammals and fish during construction from noise generation and greater potential for secondary water quality impacts associated with contaminant discharges from runoff and spills, result in less permanent impacts to the marine aquatic environment. Considering that the OCSP design alternative would result in the permanent and absolute removal of intertidal and nearshore subtidal habitat, design alternatives that incorporate pile-supported dock sections are considered to represent a less environmentally damaging alternative. Therefore, the Corps requested additional information from the applicant to substantiate their assertion that designs incorporating pile-supported dock sections are not practicable. The Corps and EPA define

the term practicable as "*available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose.*"

Costs

The Corps is required to consider information related to cost in our analysis of the practicability of design alternatives and determination of the least environmentally damaging practicable alternative. The design alternatives considered in this analysis relate to the practicability of the proposed Open Cell Sheetpile (OCSP) Dock design compared to a steel pipe pile-supported dock design.

Based on the applicant's feasibility cost estimates, the construction related costs for pile-supported dock sections are three to four times that of the proposed OCSP alternative. According to the applicant, this cost differential makes a pile-supported dock cost prohibitive for the area requirements of the proposed dock expansion. According to the applicant, the proposed OCSP alternative is the only economically viable alternative to accomplish the overall purpose and need of the project. The Corps agrees that a construction cost increase of 3-4 multiples would make the construction of a 135-acre completely pile-supported structure cost prohibitive. However, the Corps requested additional information from the applicant as to why a partially pile-supported, or hybrid, dock design alternative was not practicable.

Construction Costs

The upper concrete surface platform of the dock would be similar between both the OCSP and pile-supported dock designs. However, the supporting structure of the proposed OCSP alternative would include earthen and mineral common fill material, which would be obtained without a direct cost to the applicant through an agreement between the MARAD and the Air Force for the development of the Cherry Hill and North End Runway Borrow Pits located adjacent to the Port on EAFB. The inexpensive fill material would represent a substantial cost savings to the applicant, considering the cost differential between the design alternatives for construction material. A steel pipe pile supported design would result in major increases in construction material cost considering that the price of steel has substantially increased over the last several years and is expected to continue to rise through the construction life of the project.

According to the applicant, the construction of platform pile-supported docks capable of supporting the anticipated truck and top-loader forklift traffic loads at the Port of Anchorage would vary in cost between \$200/ft² for typical truck traffic and \$400/ft² for heavy lift traffic. However, the proposed OCSP design platform is estimated to cost approximately \$100/ft² with a longer design service life (40+ years). The applicant has generally concluded that cost/ft² construction costs for pile-supported sections supporting the proposed large crane cargo handling operations would exceed the construction costs of the proposed OCSP design by approximately 400% and sections supporting truck traffic would exceed the OCSP alternative by 300%. Additionally, future design modifications to accommodate heavier loads could be accomplished by upgrading areas of pavement on an OCSP design at a fraction of the cost of upgrading a pile supported dock.

According to the applicant, the proposed OCSP project would cost approximately \$375 million USD. The Corps requested cost estimates from the

applicant on hybrid (i.e., partially pile supported and partially OCSP) design alternatives that incorporated steel pipe pile supported dock sections in the outer/seaward 100-ft and 50-ft of the proposed expansion footprint. According to the applicant's design team calculations, if the outer 100-feet of the dock expansion were pile supported, the construction cost of the structure would increase nearly 50 percent and a hybrid structure with the outer 50-foot pile supported would increase construction cost by \$98.2 million dollars, or about 25 percent. According to the applicant, any major increase in construction cost for the project would exceed their current funding levels and would not be economically viable. Additionally, considering that the project would be constructed over many years, the current inflationary rates in material costs of steel, cement, and other construction materials would further exacerbate this cost differential.

Additionally, according to the applicant, designing a hybrid structure adds design and construction complexity considering that the two structural systems respond differently during seismic events and the long-term settlement of the two systems would be different. To prevent damages from the differential seismic and settling movements, a seismic joint that would allow independent movement between the structures and flexible utility line connections would be needed. These added design complexities would further increase construction costs.

A Corps Cost Engineer provided an independent review of the cost-related information provided by the applicant and determined that the relative cost estimates provided for the various design alternatives were reasonable. The Corps has further determined that a hybrid design would have substantially higher construction costs relative to the proposed OCSP design as well as a greater potential for design problems. The Corps has determined that the cost estimates provided by the applicant, which were based on feasibility level designs, are within 15% of actual costs. Based on this information, the Corps has determined that additional design detail (e.g., requiring a 35% engineering design of the various alternatives) is not required to adequately generate cost estimates for our regulatory analysis of the practicability of alternatives.

Operation and Maintenance Costs

Upper Cook Inlet is considered to be an extremely corrosive environment, which makes corrosion protection of steel surfaces a major factor in marine construction projects. Considering that OCSP structures have considerably less exposed steel surfaces than alternative pile supported structures, OCSP structures have reduced corrosion rates and require less costly cathodic protection measures. Additionally, according to the applicant, the petroleum, oil and lubricant (POL) lines and other utilities are less likely to be damaged by corrosion, temperature fluctuations, seismic events, or other causes because they are not exposed to corrosive elements in the proposed OCSP structure. A pile supported design would require utility lines to be suspended under the structure, subject to exposure and other hazards.

Ice scouring is also a major consideration in Upper Cook Inlet as it requires expensive maintenance measures for ice damaged piles, utilities, and cathodic protection systems. According to the applicant, the proposed OCSP design would require substantially less maintenance than pile-supported alternatives. The serviceable life expectancy of an OCSP structure is 40+ years compared to 20+ years of a pile supported structure.

Also, a pile supported dock at this location may cause sediment deposition under the pile supported deck, which may slough into the maintenance dredge footprint of the harbor.

According to the MARAD and the Port, the MTR project has finite funding available for the construction of a project that would meet their stated purpose and need. Based on the amount of area required for expansion in waters of the U.S., as previously considered, and the project's funding constraints, the OCSP design alternative represents the only economically practicable alternative to the applicant.

Funding Limitations:

The Corps requested additional information from the applicant on the funding limitations of the project to substantiate their assertion that the increased cost of a partially pile-supported design would be cost prohibitive and therefore impracticable.

According to the applicant, the proposed project cost is approximately \$375 million USD, which is cost shared between the federal government, the State of Alaska, and the Municipality of Anchorage, and allocated as follows:

- Federal \$200 million
- State \$61 million
- Municipality \$115 million

The cost allocation is approximately 52% Federal and 48% local (which includes both State and Municipal contributions).

According to the applicant, a pile-supported or hybrid design would be cost prohibitive considering that federal funding limitations are anticipated to preclude federal contributions beyond the 200 million that is allocated and that the required local match to the federal contribution is already over programmed. Marine terminal improvements do not have established funding programs comparable to highways and airport transit operations, and therefore require funds to be earmarked by Congress. To date, the State of Alaska has granted \$26.2 million towards the expansion, with additional State grants anticipated during the course of the project. However, with the currently proposed budget reductions of \$150 million for FY2008, it is questionable whether additional State funds would be appropriated to match major project cost increases. The Municipality has for the past five years and will continue to save essentially all retained annual earnings for their financial contribution to the project, which amounts to approximately \$4 million/yr. The Port of Anchorage anticipates issuing a \$75 million revenue bond, which would be programmed into the tariff base paid by tenants for infrastructure improvements. This bond amount is considered by the applicant to represent the maximum amount that can be paid from future operational revenues. Any additional required improvements beyond the basic dock infrastructure would be at tenant expense or through additional tariff or lease rates. All municipal fund transfers to the federal government and any revenue bond issuances must be approved by the Anchorage Municipal Assembly.

Although minor increases in cost for the proposed project would not render the project impracticable, the cost increases of 25% or more associated with hybrid pile supported design alternatives are clearly not feasible economic alternatives to the applicant.

Technology

The technology for both pile-supported and OCSP docks exist and are available to the applicant. However, according to the MARAD and the applicant, the proposed OCSP design offers technological advantages over a pile-supported design.

According to the applicant, pile supported dock designs have predetermined load limitations. To stay efficient and competitive in the market place, Ports need to upgrade container handling forklifts and cranes, which are becoming larger and heavier. Platform structures can become inadequate short of their intended design life due to their inability to handle the operational load requirements of the future. The load capacity of a pile supported dock section governs the maximum operational load abilities of the entire facility, whereas, OCSP bulkheads can support heavier loads, with little or no modification. Therefore, the inherent load supporting capacity of an OCSP structure provides greater flexibility in accommodating heavier equipment loads by upgrading the pavement, which is considerably less costly than upgrading/rebuilding a pile supported deck.

According to the applicant, OCSP structures have greater internal stability than pile supported structures during seismic events, decreasing the risk of damage and/or failure from a major seismic event. There seems to be considerable disagreement in the engineering community regarding the above generalization. Also, according to the applicant, the differential settlement between pile supported deck sections and OCSP sections could result in different elevations between these sections that could result in safety hazards and affect the operation of dock equipment and result in costly subsequent modifications.

While pile supported design alternatives are technologically practicable, the proposed OCSP design offers greater flexibility for future modifications to the applicant.

Logistics

There are no logistical limitations that would make the construction of a complete or partial pile-supported design impracticable to the applicant. However, the logistical advantages of the proposed OCSP design would be costly to overcome in a pile-supported or hybrid design. For example, OCSP construction is primarily land based (i.e., less in water work than a pile supported structure), which provides logistical advantages regarding equipment mobilization, operation, and maintenance. Additionally, the importation requirements for material associated with constructing a pile supported structure poses limitations and potential delays compared to the OCSP design, which requires less concrete and prefabricated structures. Also, the inherent load capacity limitations could impact operational logistics by limiting the type of equipment that could be used on pile supported sections of the dock.

General environmental impact comparison of OCSP vs. pipe pile design alternatives:

The Corps and natural resource agencies have determined that a complete or partially pipe pile-supported structure would result in less permanent environmental impacts than the proposed OCSP design. This is due to the permanent and complete loss of the intertidal and nearshore subtidal habitat associated with the proposed OCSP design. Although altered and diminished, a pipe pile-supported dock design alternative would provide habitat functions

under the deck and in between piles, to include tidal current and beluga whale predation refuge opportunities for salmonids.

To compare the environmental affects associated with the proposed OCSF design and pile-supported design alternatives, consideration must be given to the existing ecological functions of the aquatic habitat within the proposed project area. The project area is approximately evenly divided between intertidal unvegetated mudflats and subtidal marine waters. The mudflats and near-shore subtidal waters in the project area provide limited habitat functions for marine species, of which the primary species of concern identified in the public interest review process are salmon and beluga whales. The continuously altered substrate by seasonal scouring and sediment deposition coupled with the extremely turbid and turbulent waters results in severely limited colonization opportunities for benthic organisms and little to no primary productivity. Additionally, the majority of subtidal substrate of the proposed project area has been annually dredged to -35 ft MLLW for many years. The project area consequently provides minimal salmonid feeding opportunities and the lack of aquatic vegetation and other physical habitat strata minimizes juvenile salmonid rearing benefits. The project area between the existing port and Cairn Point forms a tidal current gyre that provides both current refuge opportunities for salmonids and consequently, feeding opportunities for beluga whales. More generally, the nearshore waters of Knik Arm are preferentially used by adultsalmon for migration and refuge from beluga whales.

Regardless of the design alternative (i.e., OCSF, pile supported, partially pile supported), the design would still require a concrete top deck that would further shade the extremely turbid waters, severely limiting visual feeding opportunities and removing terrestrially based food availability for salmonids. The density of the pile configuration necessary to support the heavy cargo handling equipment on the seaward side of the dock would also limit habitat function by increasing sedimentation. The under deck slope that would be provided by a hybrid design would be much deeper than the original near shore slope and the extent to which this area would provide any noticeable value to fish and smaller aquatic species is unknown and it would be unusable to belugas. However, it is understood that salmonids prefer habitat with structure over deep open water. Therefore, although diminished, the structured habitat that would be provided by a pile supported structure would be better than an OCSF design in the context of providing habitat for salmonids and would thus minimize the adverse impacts of the project on aquatic habitat.

A steel pipe-pile supported dock would require the use of large impact hammers that produces low frequency and high decibel sound with long transmission distances known to injure and/or kill fish and marine mammals. The OCSF structure would primarily require a high frequency low amplitude vibratory hammer believed to emit less sound transmission in the water column. Also, the impact hammers required to drive sheet piles sections to final depth are smaller and impart less energy into the water column, thereby minimizing the short term impacts of the project during construction. Pile supported docks require open water construction from barges with increased risk for spills into waters of the U.S. OCSF structures are primarily constructed with land based equipment that provide better management practices and opportunities to minimize the risk of spills during and after construction. According to the Port, utility lines are more prone to damage and spills from ice, corrosion, and shipping accidents with pile-supported designs.

The noise generation associated with the construction of pile-supported sections of the dock would result in substantially greater temporary impacts to both the human and natural environment. The residents of the Government Hill community just east of the project site would be subjected to much greater noise levels for longer durations over the construction phase of the project. Additionally, the noise emissions in the water column would result in a much more potentially harmful environment for marine fish and mammals. The harmful effects of pile driving to marine organisms are difficult to impossible to mitigate. The physical settings (both climatic and current energy) of the project area make many noise attenuation measures, including seasonal timing restrictions, bubble curtains, etc., impracticable. Adverse impacts to beluga whales by pile driving activities can be mitigated with the inclusion of soft start, monitoring, and shut down procedures; however, the construction of a partially to fully pipe pile supported dock would increase the probability of the taking of beluga whales. Incorporating monitoring and shut down procedures to prevent harmful effects to salmonids during pile driving are impracticable and soft start procedures would likely only benefit salmonids of sufficient size and strength to relocate. Juvenile salmonids may be unable to resist strong tidal current currents to avoid the project area during pile driving. The adverse temporary impacts to fish and marine mammals associated with the construction of a pipe pile supported design are relative to the construction period. Considering that the increased temporary impacts of dock construction would occur over a minimum of 5 consecutive years, the increased temporary impacts from pipe pile driving would be far greater than the proposed OCSP design.

Modifications to the proposed design to improve habitat functions:

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. The extent of the mitigating effect of the construction joints to salmonids is unknown.

Security

The Port of Anchorage is designated as one of the fifteen U.S Strategic Commercial Ports. This designation is related to the value of the Port in supporting the deployment of the Stryker Combat Team and other military forces stationed in Alaska. As a Strategic Port, the ability of the Port to support the mission of the military is a vital part of the nation's defense. According to the applicant and an under water demolishing expert, the proposed OCSP design is less prone to damage from attacks aimed at disrupting vital interstate commerce and cargo supplies.

3.3 Other sites:

The MTR EA analyzed several other locations in their alternative analysis; no other sites were determined to meet the project's purpose and need. Additionally, the Corps has conducted several feasibility studies in the past, which analyzed alternative locations. No other locations have been determined to represent a less damaging practicable alternative. Commercial and military ports have been at this location since 1918. Considering the

existing infrastructure already in place (road and rail lines, military access, and POL lines) other locations would not to represent a reasonable alternative.

The Port of Anchorage (POA) is the main port facility in the state of Alaska, serving 80% of the geographic area handling approximately 90% of the state's commercial imports. There are no other ports capable of handling the commercial and military logistical requirements for cargo handling and transport in the state. The POA has a strategic location for supporting the rapid deployment of the Stryker Brigade Combat Team and other U.S. Army Alaska combat forces due to its proximity to Elmendorf Air Force Base and Fort Richardson and the POA handles cargo for all of the major military installations in Alaska. The POA is a critical national port that has been designated as the 15th Strategic Commercial Seaport in the nation by the Department of Defense and is considered to be a critical link in the rapid deployment of U.S. troops throughout the world.

4.0 Mitigation [33 CFR 320.4(r); 40 CFR 230.70-77]

The direct unavoidable impacts of the project would involve the permanent loss of 138 acres of intertidal mudflats and subtidal marine waters of Knik Arm and 20.5 acres of ponded wetlands on Elmendorf Air Force Base. While it has been determined that the unavoidable impacts of the proposed project would not result in significant impacts to the human and/or natural environment, compensatory mitigation requirements to offset the unavoidable losses of aquatic habitat is both appropriate and practicable. In-kind mitigation opportunities (i.e., the replacement and restoration of identical and/or similar habitats) to directly compensate for the intertidal and subtidal habitat loss associated with the project have not been identified. Additionally, in-kind aquatic habitat replacement and/or restoration does not necessarily represent the most beneficial form of compensatory mitigation to contribute towards offsetting the impacts of the proposed action. The primary aquatic species of concern, identified in the public interest review process, which would be adversely impacted by the aquatic habitat losses associated with the proposed project, are salmonids and beluga whales. The primary project related impacts identified that would adversely affect beluga whales would occur from potentially harmful noise levels introduced by project construction and subsequent operations. The primary project related impacts to salmonids would be the permanent loss of nearshore subtidal and intertidal habitat and temporary impacts that would occur during construction, including potentially harmful noise levels and entrapment from fill placement. As a primary food source of beluga whales, project related impacts that would potentially decrease salmon population numbers would secondarily affect beluga whales. Practicable measures to mitigate the temporary and secondary impacts of the project, including harmful noise levels, would be included as special conditions. This section of the decision document is related to compensatory mitigation for the unavoidable permanent impacts of the project, which includes the permanent loss of marine and wetland habitat. The cumulative impacts associated with overall losses to intertidal and subtidal habitat in Knik Arm are minimal, considering that the majority of this habitat type would remain intact and functioning. The only losses of this habitat type are attributed to the industrial waterfront developments of the Port of Anchorage area, and Port Mackenzie, located on the opposite side of Knik Arm. The vast majority of the intertidal and subtidal areas of Knik Arm are undisturbed. However, riparian and associated estuarine habitats near the project area have been cumulatively degraded by historical human development activities and thus provide both more

compensatory mitigation opportunities (i.e., are available) and more desirable effects to offset the unavoidable impacts. Therefore, it has been determined that mitigation projects involving the restoration and/or enhancement of riparian and associated estuarine aquatic habitats of Knik Arm tributaries located near the project area represent the most appropriate and practicable form of compensatory mitigation.

The watersheds in closest proximity to the proposed tideland developments are Ship Creek, which is located just over 2,000 feet south of the proposed expansion, and Chester Creek, which is located approximately 1+ miles south of the proposed expansion. The closest watershed to the wetland developments on EAFB is Six-Mile Creek. The Corps coordinated with the EAFB biologists to determine available projects that would provide the greatest ecological benefits to the watershed.

To develop an appropriate plan to offset the unavoidable impacts associated with the project, the Corps has coordinated extensively with applicant and the lead federal agency and consulted with the resource agencies. During the previous permit evaluation process of Phase I, the MARAD and the Port commenced a conceptual Mitigation Plan to establish a committee of various stakeholders to develop and analyze the feasibility of practicable mitigation projects to include in their overall project plan. In response to recommendations from resource agencies, the previous plan was canceled by the applicant in lieu of establishing a mitigation account to fund previously identified and evaluated projects of the Pacific Salmon Recovery Program. Based on these recommendations, the Corps and the Municipality of Anchorage will finalize a Memorandum of Agreement for the management and administration of mitigation funds. The Port would be required to manage the design, construction, and monitoring of mitigation projects selected and approved by the Mitigation Advisory Committee and the Corps. Mitigation projects would include (but are not limited to) projects previously identified under the Pacific Salmon Recovery Program, projects identified during the public interest review process, and projects identified from a Ship Creek Feasibility Study, which would be a requirement of the DA permit, if issued. The Memorandum of Agreement specifies the amount of the mitigation funds and the process for selecting appropriate projects and allocating funds, through consultation with the Mitigation Advisory Committee and final approval by the Corps. The amount of mitigation funds required for the proposed project is directly proportionate to the debits of the proposed project, calculated in accordance to the Anchorage Debit-Credit Methodology.

The POA will establish an escrow account into which mitigation funds would be deposited each year over a period of five years (i.e., 20% increments). Funds will be disbursed from the account for specified projects upon written approval of the Corps in consultation with the Mitigation Advisory Team. In the event that any of the initially proposed projects are determined to be infeasible, remaining funds would be directed towards other restoration, enhancement, and/or preservation projects selected by the Mitigation Advisory Committee and approved by the Corps. The Corps, in consultation with the Mitigation Advisory Committee, will approve any modifications to the Mitigation Plan. The preliminary mitigation projects identified during the public interest review process would include projects in the estuarine and lower riparian reaches of Six-Mile Creek, Ship Creek, and Chester Creek. The preliminary mitigation projects and the administration and management of the compensatory mitigation fund account are further described in Attachment A: Preliminary Mitigation Projects and Attachment B: Memorandum of Agreement

between the U.S. Army Corps of Engineers and the Municipality of Anchorage respectively.

5.0 Public Involvement

We received a complete application on January 18, 2006. A public notice describing the project was issued and posted on our website on January 19, 2006. A revised public notice extended the public comment period until March 22, 2006.

5.1 Comments received:

Comments were received from the EPA, NMFS, USFWS, Department of the Air Force, Cook Inlet Keeper, Native Village of Eklutna, the Mayor of Anchorage, North Star Terminal, and one private citizen during the public notice comment period. Aside from the Mayor of Anchorage, all comments received were opposed to the project, as proposed. The Port of Anchorage has provided several letters in support of the proposed project recently; however, considering that the letters were received outside of the comment period and not addressed to the Corps, these letters are not included in the consideration of comments.

5.1.1 Federal Agencies:

U.S. Environmental Protection Agency- letter dated March 22, 2006.

The EPA stated that the proposed project did not appear to represent the least damaging, practicable alternative to fulfill the project purpose and therefore not in compliance with the CWA's Section 404 (b) (1) Guidelines, and recommended that the Corps not approve the project. The EPA discussed the potential impacts of the projects and referenced several sections of the 404(b) (1) guidelines, which they believe the proposed project fails to meet.

The EPA made the following recommendations, based on the potential impacts of the proposed project and their opinion that the proposed project doesn't represent the least damaging practicable alternative:

1. "That the Corps further analyze the practicability of less damaging alternative waterfront development configurations." The EPA also recommended that the Corps analysis address the likelihood of structural failure, which may lead to reintroduction of contaminated dredged materials.
2. "That the Corps further analyze whether there is a less damaging practicable alternative to the proposed timeframe and project sequencing." (that is, a shorter construction window)
3. "That the Corps require avoidance and buffering of the Triangle/Fish Lakes wetland complex in the North End extraction site."
4. "That the Corps require sampling and analysis of material in the proposed dredging areas prior to issuing any permit for dredging." The EPA requested that their office review the proposed sampling plan and also recommended the following:
 - a. "The plan a figure specifying planned sampling locations and depths, as well as GPS surveying of the sample locations, and

Quality Assurance/Quality Control measures for the ROST and analytical lab;

- b. The lab analysis be used to verify both negative and positive ROST results, not just negative results; and,
- c. That the lab analysis also include other potential contaminants of concern, such as Persistent Organic Pollutants and heavy metals."

The EPA also recommended that the Corps not issue any permit for dredging until their office had the opportunity to review sampling results;

5. "That any permit involving pile driving require state-of-the-art measures to minimize noise impacts to fish and beluga whales," and that the Corps incorporate permit conditions in accordance to NMFS recommendations to monitor and minimize potential impacts associated with increases in operational noise levels;
6. "That any permit authorizing fill in intertidal and marine waters include seasonal and/or tide stage timing limitations to minimize impacts to aquatic organisms and waterbirds." (e.g., limiting fill placement to low tide and in the winter months)
7. "That any permit authorizing work at the extraction sites incorporate a seasonal timing window to minimize impacts to migratory birds. Specifically, we recommend that any permit prohibit clearing, grubbing, excavation, stockpiling, grading and/or filling at the extraction sites between 1 May and 15 July."

Regarding compensatory mitigation to offset the unavoidable impacts of the project, the EPA stated their support of the establishment of an interagency advisory committee and generally supported the concept of establishing an in-lieu fee account to fund compensatory mitigation projects. The EPA made the following recommendations regarding compensatory mitigation:

1. "The role of the advisory committee be formalized in the same Memorandum of Understanding (MOU) that the PN indicates the Corps and the Port would finalize prior to permit issuance, and, that the advisory committee members have the opportunity to be MOU signatories, as well;
2. That the MOU specify the method(s) by which the in-lieu fee amount will be determined, including, primarily the Anchorage Debit-Credit Methodology;
3. That the MOU specify that the expenditure of the in-lieu fee funds would be limited to projects that would offset adverse project impacts by restoring, enhancing and/or preserving salmonid, beluga, water/wetland bird habitat in relative proportion to the debits associated with those impacts. We continue to believe that restoration of the estuary at the mouth of Ship Creek would provide the most appropriate offset of the unavoidable impacts of Port expansion, and recommend that such a project be investigated further by the advisory committee; and,

4. That your office not issue any permit until the MOU has been signed by all participating agencies and the in-lieu fee funds have been provided by the Port."

U.S. Fish and Wildlife Service- letter dated March 17, 2006.

The USFWS objected to the proposed project due to the perceived availability of less damaging alternatives and the direct and indirect impacts of the proposed project on aquatic resources. The USFWS expressed their concern over the proposed project conflicting with restoration efforts on Ship Creek and referenced their working efforts with the Municipality of Anchorage, National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADF&G), Anchorage Waterways Council, and National Fish and Wildlife Foundation towards restoring salmon and their habitat in Ship Creek, which include, "replacement of three failing culverts with a bridge at the mouth of Ship Creek, and implementation of streambank restoration and angler access in partnership with the Municipality's "Sustainable Salmon initiative", and their current efforts with ADF&G to "develop and implement alternatives to existing dams that interfere with fish passage in Ship Creek."

The USFWS discussed their concerns regarding foreseeable adverse impacts to juvenile salmon from both the Anchorage and Matanuska-Susitna (Mat-Su) area streams that drain into Knik Arm. The USFWS stated that "Ship Creek contributes a large number of wild salmon and the vast majority of hatchery produced salmon in Knik Arm". The USFWS stated that "nearshore habitat at the project site is critical to rearing salmon from all Knik Arm tributaries, especially Ship Creek". The USFWS also commented on the economical importance of the Ship Creek recreational fishery.

According to the USFWS, "the best available scientific literature indicates that juvenile and adult salmonids inhabit and move along nearshore, shallow water areas because these habitats provide food and refuge from predators. Scientific studies in the Pacific Northwest provide information which we believe is relevant to an understanding of potential project effects on anadromous fish...There is relatively little definitive information presently available about juvenile and adult anadromous fish use of specific habitats in Knik Arm, making it difficult to predict with certainty potential project impacts...Based on the best available information, the proposed project has the potential to result in significant direct impacts to anadromous fish in Knik Arm..."

The USFWS stated that their office believes that the permanent loss of littoral habitat and the effects on fish movement and migration in Knik Arm would, "result in significant adverse impacts to aquatic resources of national concern." The USFWS also stated their concern over the unavoidable noise impacts to fish associated with the proposed pile driving and noted that the high turbidity and currents in the area would make monitoring and documentation impossible. The USFWS recommended measures to avoid and minimize noise effects during project construction.

The USFWS recommended that an evaluation of the practicability of alternatives that minimize fill in the littoral zone and expressed their preference for pile supported designs. The USFWS also stated that a catastrophic failure of the proposed structure would result in, "additional direct and indirect effects on anadromous fish, both as a result of the failure itself and as a result of reconstruction."

The USFWS, in accordance with procedural requirements of the 1992, 404(q) Memorandum of Agreement between the Department of the Interior and the Department of the Army, Part IV 3(a), advised the Corps that the proposed work, "may result in a substantial and unacceptable impact to aquatic resources of national importance, unless a less damaging alternative is proposed." The USFWS recommended that the Corps not issue a permit for the proposed project.

The USFWS also recommended that the Corps require an independent third party technical review of the project's technical and seismic design.

The USFWS provided the following permit special condition recommendations should the Corps determine that there are no less damaging practicable alternatives to the proposed project:

1. "During the period from April 15 through August 15, all pile driving associated with the project must use sound attenuation measures approved by the Corps of Engineers, in consultation with the USFWS and NMFS, to reduce noise levels below the threshold for causing injury to juvenile anadromous fish.

Rationale: This condition is intended to prevent damage to anadromous fish populations using the Port of Anchorage area. Juvenile anadromous fish are thought to be particularly susceptible to adverse effects of noise generated by impact pile driving because they are present in the Port area for much of the summer. Adult anadromous fish are thought to move through the area very rapidly. Adverse effects on fish can include death or injury. Vibratory pile driving is thought to result in relatively little injury to fish, and is one method available to reduce sound effects. Other available methods include bubble curtains or driving piling when areas are dewatered as a result of low tides. Based on limited studies conducted by the POA and KABATA, the majority of juvenile anadromous fish migrating through Knik Arm are found in the project area in mid-April, May, June, July, and early August.

2. A Department of the Army permit should be not issued for phase II of the project until: a) a complete mitigation plan is agreed upon by the Corps, MARAD, POA, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, State of Alaska, Municipality of Anchorage, and the Matanuska-Susitna Borough, and b) compensatory mitigation funding has been provided by the applicant.

Rationale: A mitigation fund is needed to provide for compensation related to unavoidable impacts to anadromous fish habitat resulting from the proposed project. It is impossible to provide on-site mitigation for adverse project impacts related to loss of anadromous fish habitat or for adverse effects on anadromous fish movements and migration due to the extensive area to be impacted and the absence of comparable on-site restoration or enhancement options. Therefore, off-site compensatory, mitigation opportunities are required. Since an unknown percentage of the anadromous fish using the project site originate in Matanuska-Susitna Borough steams and an unknown percentage originate in the Municipality of Anchorage it is appropriate to designate that a share of mitigation funds be used in each jurisdiction.

The Service believes there should be compensation for all unavoidable losses of intertidal, subtidal and wetland habitats because these habitats are aquatic resources of national importance. Additionally, there should be

compensation for unavoidable project effects on movements and migration of anadromous fish. The mitigation plan should include the following provisions:

(a) Approximately fifty percent of compensatory mitigation funds will be available for mitigation projects in the Matanuska-Susitna Borough and fifty percent for projects in the Municipality of Anchorage.

(b) Language governing administration of the escrow account shall be approved by the Corps, after consultation with resource agencies.

(c) No funds should be disbursed from the compensatory mitigation fund without written authorization from the Corps, after consultation with resource agencies.

(d) The Corps, in consultation with resource agencies, shall approve mitigation projects designed and properly implemented to protect, conserve, and restore habitat for anadromous fish within the boundaries of the Matanuska-Susitna Borough, and the Municipality of Anchorage.

3. The Service recommends that to prevent impacts to nesting migratory birds, no vegetation clearing, fill placement, excavation, or other construction activities at the material sites shall be conducted between May 1 and July 15, except at sites which have been sufficiently disturbed or altered (e.g., with fill, plastic, or other materials that will cover nesting habitat) before May 1 to eliminate suitable nesting habitat.

Rationale: Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to "take" migratory birds, their eggs, feathers or nests, as previously discussed."

National Marine Fisheries Service (NMFS):

Letter dated March 22, 2006: In summary, the NMFS opposes issuance of a permit for the applicant's preferred alternative because their office does not believe that the applicant has demonstrated that it is the least damaging practicable alternative. The NMFS believes the project would have 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. The NMFS recommends that the Corps deny the requested permit unless all of their recommended conservation recommendations for EFH and Cook Inlet beluga whales are followed.

The following NMFS Recommendations are related to EFH Conservation pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act:

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.

The NMFS provided the following recommendations to reduce project related impacts to beluga whales.

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: 1 μ Pa. 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: 1 μ Pa.)

8. 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.

10. 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).

Letter of 31 January 2007:

The NMFS provided a follow up letter to their previously submitted comments on March 22, 2006.

The NMFS requested information on how the ERDC review of the proposed project would be used in the regulatory review of the project. The NMFS also expressed their concern over the number of projects that are moving forward in Knik Arm and the Ship Creek estuary and the cumulative impacts of these projects on their trust resources and which may ultimately preclude opportunities to enhance the ecological function, accessibility, and attractiveness of the Ship Creek estuary to the public.

The NMFS recommended that in adherence to planning documents, such as the 1988 POA and Municipality of Anchorage Ship Creek Concept Plan and the Recommendations of the 1998 Ship Creek Enhancement Citizens Advisory Task Force, the Corps should promote the opportunities to enhance the maritime and recreational role of Ship Creek and increase its accessibility and attractiveness, to include relocating existing activities along north Ship Creek (North Star Terminal and Swan Bay) to the POA expansion site. This would allow most industrial marine operations to be located in one area, at the POA, while allowing for restoration opportunities to rehabilitate and enhance the Ship Creek estuary that can be better used by salmon (juvenile and adult), other marine fish, and belugas.

NMFS provided the following recommendations to capture their concerns specific to Cook Inlet belugas:

Recommendation 1. Acoustics Characterization and Mitigation

The POA should fund and conduct an evaluation of noise levels in lower Knik Arm waters associated with their expansion construction and operations. This analysis should include development of an industrial 'sound index' that represents the POA expansion construction and operational noises. The POA Sound Index should accurately represent construction and operational sounds including, but not limited to: pile driving, dockside activities, vessel traffic in the channel, dredging, and docking activities. Under this recommendation, the POA should acquire in-water noise measurements to: 1) establish a time series characterizing the POA operational noise levels (pre-expansion), 2) develop an engineering report with recommendations for noise reduction through structural or operational means, and 3) implement any such recommendations that are within the authority of the POA and/or Municipality of Anchorage. The overall goal is to have a noise signature from the expanded POA that is less than that of the existing facility. This noise reduction plan should be finalized and available for NMFS review with two years left for construction.

This evaluation of noise levels in lower Knik Arm waters will provide noise exposure data collected concurrent with beluga monitoring. Both efforts will verify whether the expansion construction and operational work will present a negligible effect to the Cook Inlet beluga population. The POA Sound Index will provide noise exposure data to interpret the effect of POA noise on beluga whale presence or absence, and any altered behavior observed during construction and operations (i.e., a dose-response analysis). An annual review of beluga observations and noise exposure data should be provided to NMFS no later than February 1 of the following year. This annual review would provide an effective mechanism to minimize noise levels by modifying construction plans, based on the best available information collected by both NMFS and non-NMFS researchers. NMFS encourages the other users on lower Knik Arm, in addition to the POA, to reduce underwater anthropogenic noise sources in Cook Inlet to promote the beluga recovery. Therefore, results from this annual review effort will be shared with the Matanuska-Susitna Borough, Knik Arm Bridge and Toll Authority, Alaska Railroad, oil and gas industry, and other Cook Inlet users.

Recommendation 2. Beluga Whale Monitoring

The POA currently has contracted for beluga whale monitoring near the POA. This study has three primary objectives, as stated in the POA reports: 1) Estimate the frequency at which beluga whales are present in the project footprint; 2) Characterize habitat use and behavior of belugas near the POA during ice free months; and 3) Map sound levels and attenuation with distance related to POA background noise and expansion activity.

In collaboration with NMFS, the POA beluga monitoring program currently has observers at one of two sites (Cairn Point and POA) for six hours a day, twice weekly. This meets Objective 1 and Objective 2 (as stated above). One interesting disparity in the monthly reports from April through September 2006 is the modification of the third objective: from mapping sound levels and attenuation to "provide information to the POA on beluga whale sightings and locations relative to construction". This modification was not previously discussed with our agency, nor is it acceptable to us for two reasons: First, an essential element of this monitoring is to characterize the effect of received noise on belugas. Secondly, this revision duplicates the first objective: "estimate the frequency at which beluga whales are present in the project footprint." We recommend the modification be retracted, re-instating the original language for objective number 3, and inserting a new objective Number 4 to read as follows: "4) Characterize and assess the impacts of received noise from the POA on beluga whale behavior and movements within lower Knik Arm." Therefore, the beluga monitoring program should be expanded beyond current effort to address new objective Number 4. The POA should develop and present to NMFS for approval a study which includes the proposed research design. Any study proposal should be coordinated with NMFS and should include:

- 1) Shore-based Observations:** Shore-based observations will monitor beluga frequency and behavioral changes in lower Knik Arm, especially around the POA and the expansion footprint. These observations will need to detect a 50 percent change in passage rate into and out of lower Knik Arm. NMFS is very concerned about interference with beluga passage rate and use of Knik Arm. More shore-based observations may be required to achieve the desired power.
- 2) Passive Acoustics:** The POA should fund and conduct a passive acoustics plan to validate visual observations. A hydrophone(s) should be placed near the POA expansion to detect passing whales. The POA should determine the proportion of belugas missed from shore-based surveys. An evaluation of detection bias is critical to assess the power of survey techniques.

Recommendation 3. Safety Zones

The POA should establish and enforce safety radii and shut down standards around the in-water pile driving areas. Initially, safety radii will be based on conservative estimates from Blackwell's (2005) study at the Port MacKenzie dock. That will require shut down for any whale observed within 200 feet of a vibratory driver or 6,000 feet for an impact hammer. The POA will conduct on-site underwater noise surveys to verify the 190, 180 and 160 dB re 1 μ Pa rms isopleths from in-water pile driving activities for the POA expansion. Safety zones appropriate to the POA site conditions and equipment will then be empirically determined and implemented. The 160 dB re 1 μ Pa rms safety

zone should be in force unless the POA obtains authorization under the section 101 (a) of the Marine Mammal Protection Act for the incidental and unintentional taking of marine mammals; in which case the safety zones should be 180 dB re 1 μ Pa rms for whales and 190 dB re 1 μ Pa rms for seals.

Safety zones around pile driving areas should be monitored for marine mammal presence before, during, and after any pile driving activity. If the safety radius is obscured by fog or poor lighting conditions, pile driving should cease until the entire safety radius is visible.

Recommendation 4. Construction

Prior to the start of pile driving activity, the POA should require a briefing between the construction supervisors and crews, the marine mammal monitoring team, acoustical monitoring team, and POA expansion team. The purpose of this briefing will be to establish party responsibilities, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures. The Project Engineer will have the authority to stop or delay any construction activity in order to ensure any sighted marine mammal is no longer within the zone of impact.

Recommendation 5. Pile Driving

The POA should officially notify NMFS of the date each year's pile driving activities are to commence.

The POA should establish "soft start" or "ramp up" procedures for pile driving activities. The soft start technique will be used at the beginning of each piling installation. This allows any marine mammal that may be in the area to leave before pile driving activities reach full energy. The soft start will require contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy, followed by a one minute waiting period. If marine mammals are sighted within the safety zone prior to pile-driving, or during the soft start, the Resident Engineer (or authorized individual) will delay pile-driving continuation until the mammal has moved outside the safety zone. Pile driving will start or resume only after the marine mammal is identified to have moved outside the safety zone by a qualified observer or after 15 minutes have elapsed after the sighting.

To the maximum extent practicable, pile-driving should be completed in dry conditions. Steel pile driving required for the barge terminal above elevation +10 should occur at low tides in dry conditions whenever feasible. Sheet pile for tail walls should be embedded in dry fill whenever feasible, recognizing that water depths and tides at the POA expansion site prohibit pile driving in dry conditions entirely.

Recommendation 6. Beluga Whale Outreach and Education

The POA should erect beluga notification signage in waterfront viewing areas near the Ship Creek public boat launch area. This signage will provide education awareness on the Cook Inlet beluga status and will provide the public with directions to report beluga sightings to NOAA/NMFS. POA will consult with NOAA/NMFS to establish sign criteria.

The POA should erect similar signage within the secured POA area and entrance, visible to all port users, to improve their established long-term formalized marine mammal sighting and notification procedure.

This will be expanded for any port user, visitor, tenant, or contractor, not related to the POA expansion. These procedures clearly identify roles and responsibilities for reporting requirements. All reports should be disseminated to the NOAA/NMFS by the POA within 24 hours.

Recommendation 7. Marine Mammal Observers

The POA should require pile driving contractors to have two full-time shore-based marine mammal observers under contractual obligation during in-water construction. The shore-based marine mammal observers should complete a daily field observation log during construction.

Recommendation 8. Marine Mammal Protection Act, Small Take Authorization

The POA should coordinate with NOAA/NMFS to receive Small Take Authorization, under the Marine Mammal Protection Act. An Incidental Harassment Authorization (IHA) petition has been submitted by POA for the 2007 season and a Letter of Authorization (LOA) petition has been submitted for years 2008-2012. If an IHA and/or LOA is issued by NMFS, all terms and conditions of this IHA and/or LOA supersede Recommendations 3, 4, 5, 6, and 7."

Letter of March 5, 2007:

The NMFS provided comments on the Port of Anchorage's responses to comment received in response to the public notice, dated September 25, 2006. The NMFS letter specifically provided comments on their perception of the practicability of a less environmentally damaging partially pile supported design alternative.

The NMFS recommended that the Corps: "1) clarify and substantiate the project purpose and need...2) expand and clarify the alternatives analysis by directing a detailed independent review of the practicability of a partially pile supported design (based on technology, seismic stability, cost, and environmental impacts) by someone not currently involved in the project; and 3) engage in an open, collaborative process involving NMFS and other resource agencies to identify suitable mitigation to offset the unavoidable impacts of this project."

The NMFS stated that their concerns related to the minimization of fill and evaluation of partially pile-supported alternatives are related to conserving nearshore fish habitat for coho and Chinook salmon. The NMFS concerns related to impacts to beluga whales are focused on the construction and operation of the expanded port, rather than specific design alternatives, and requested that any permit issued include mitigation and monitoring to promote the conservation of beluga whales.

The NMFS expressed their view that the applicant has not demonstrated that the proposed project represents the least damaging practicable alternative (LEDPA), including substantiating the purpose and need and the impracticability of a less damaging partially pile supported alternative.

The NMFS recommended that the Corps require a detailed independent 3rd party review of the project, based on 35% design plans, of both the OCSP and partially pile supported designs. The NMFS stated that the third party review should assess the practicability of less damaging design

alternatives by comparing technology, seismic safety and stability, and cost.

U.S. Coast Guard: No comments received.

Department of the Air Force, Pacific Air Forces: Memorandum dated February 17, 2006.

The Air force commented on the proposed gravel extraction projects on EAFB, which would include a cumulative loss of up to 347 acres of terrestrial habitat over a six year period and a decline of viable gravel resources. They stated that their office should be listed as a participating agency for permit related agency coordination. The Air Force stated that mitigation should be required for the wetland impacts associated with the gravel extraction area and recommended mitigation measures to maintain or enhance migratory bird habitat that would draw migratory species away from the EAFB airfield, a study of non-game wildlife and indicator species to determine the health of the ecosystem, and salmon enhancement on Elmendorf AFB.

5.1.2 State Agencies:

Alaska Department of Natural Resources (ADNR), Office of Habitat Management and Permitting: No comments received

Alaska Department of Environmental Conservation (ADEC): No comments received

ADNR, Office of Project Management and Permitting: No comments received

ADNR, Office of History and Archaeology: No comments received

5.1.3 Federally Recognized Tribes:

Native Village of Eklutna (NVE): letter dated March 22, 2006.

The NVE expressed their belief that the proposed project requires an EIS to satisfy NEPA requirements considering the perceived significant impacts to fish and fish habitat, Cook Inlet Beluga Whales, the practicability of less damaging alternatives, avoidance, minimization, and mitigation hierarchy, and cumulative effects. The NVE also expressed their perception that the proposed project is not in compliance with the CWA and the 404(b)(1) Guidelines and that a DA permit should not be issued without additional safeguards. The NVE requested that a comprehensive and accurate aquatic habitat loss assessment be made and that full mitigation be forthcoming

5.1.4 Local Agencies:

Municipality of Anchorage, Office of the Mayor:

Letter of November 1, 2005 (from the Mayor of Anchorage, Mark Begich and Port Director, Governor Bill Sheffield):

The letter discussed the proposed facilities for berthing barges and providing freight staging areas for consolidation and shipping of rural-bound freight to coastal Alaska communities, which currently rely

on tug and barge operations out of Puget sound that are infrequent and slow. By shipping most freight directly to the Port of Anchorage for consolidation and reshipping, cost savings and frequency of service would be improved for rural Alaska. Improved freight mobility in rural Alaska would also improve local economic conditions and provide business opportunities for rural Alaska.

At this time, the only freight barge docks currently in operation are the private facilities of North Star and Swan Bay Holdings/Lynden on the north side of Ship Creek. The proposed project would provide a viable alternative location for these services.

Long term interests of the POA and MOA involve promoting the redevelopment of the lower Ship Creek area in order to improve economic use, aesthetic quality and environmental conditions of the area. To that end both the MOA and the POA intend to continue to examine the long term opportunities of relocating these land lease tenants to the facilities that would be provided by the proposed Port expansion. As the barge berth facilities of the proposed expansion become operational, the MOA and POA intend to work with the Alaska Railroad Corporation and all potentially effected private business to identify issues related to the relocation and to determine the economic and environmental impacts.

Letter of April 16, 2006:

The Mayor of Anchorage wrote a letter expressing his and the Municipality of Anchorage's support for the proposed modernization and expansion of the Port of Anchorage (POA). The mayor stated the importance of the Port of Anchorage to supplying the product shipment needs of the State.

The Mayor stated that the POA serves 80% of the state geographically and provides 90% of Alaska consumer goods, handles 5 million tons of cargo annually, including 37,000 vehicles and 6 million barrels of oil. Increased Port efficiency would reduce transportation costs throughout AK. "The demands on Port infrastructure continues to outgrow port facilities, with annual increases in tonnage averaging a rate of 5%/yr. 2004 POA reached usage level not predicted until 2014. The current Port can't handle the current usage and future needs.

The mayor stated that the municipality recognizes the degraded state of the existing Port, which is already 25 years past its design life. He also stated that, through the planning process, they have discovered that the existing pile-supported design is flawed in that it promotes ice scouring and corrosion, undermining structural integrity and that earthquake survivability is a concern. The mayor pointed out that he appointed a committee of professional engineers, seismologists and Municipal officials to determine the seismic standards of the Port Expansion Design.

The mayor pointed out that the proposed municipal expansion is a federal project where the U.S. Department of Transportation, Maritime Administration is the lead federal agency and that the MARAD and the Municipality have entered into an agreement, approved by the Anchorage

Assembly to accomplish the task and expressed there confidence in MARAD to successfully manage the project.

Port of Anchorage, Governor Bill Sheffield:

Letter of November 3, 2006:

Governor Sheffield wrote the District Engineer in reference to the practicability of other designs to the proposed Open Cell Sheet Pile (i.e., a partially pile-supported design). Mr. Sheffield stated that there is substantial cost difference between pile supported construction and maintenance costs to that of the open cell sheet pile, with unit construction cost approximately 3 times higher. Additionally, a pile supported design would require substantially more dredging in advance of construction, which would delay the project by several years. He also stated the OCSP design allows for economical upgrades/improvements that a pile-supported structure does not. He also went on to stated the following perceived advantages of the OCSP sheet pile design compared to that of a pile supported design: a partially pile supported structure is more prone to damage in a seismic event and that the Port is a critical facility for post earthquake relief and recovery; that there are not tangible environmental benefits; and that the Port of Anchorage has been designated the nations 15th Strategic Seaport, a pile supported structure is more prone to damage and destruction by enemy forces of the U.S. He pointed out that Alaska District has issued 76 permits for OCSP structures, where they were determined to represent the least damaging practicable alternative by the AK.

Letter of November 7, 2006: (from Governor Bill Sheffield, Port Director, to District Engineer, Colonel Kevin Wilson regarding the relocation of North Star and Swan Bay Holdings/Lynden). To follow up on the November 1, 2005 letter from the Mayor and Governor Sheffield, they informed us of recently meeting with Mr. Pat Gamble, President of the Alaska Railroad Corporation, regarding the relocation. The ARRC has agreed to work with the MOA and POA on the effort to examine the economic, environmental, and social impacts of relocating the tenants, provided that the affected leaseholders are fully involved in any discussions. They also invited an Alaska District representative to participate in their working group.

5.1.5 Organizations:

NorthStar Terminal and Stevedore Company:

Letter dated January 30, 2006:

North Star Terminal & Stevedore Co. LLC (NSTS) is an adjacent tug and barge lease holder located to the south of the proposed project. NSTS expressed concern over the public notice depicted future dredging requirements at the south end of the port expansion, as it appears too close to their docks; NSTS expressed concern over the potential for increased shoaling or scouring in front of the barge berths, which require set elevations. They also stated that their barge berths more than adequately meet the demand for barge operations and expressed

concern over market socialization. NSTS also questioned the Port's assertion that the POA is at or near critical capacity.

Letter received on January 30, 2007 (incorrectly dated January 30, 2006): The NSTS reiterated concerns expressed in their January 30, 2006, letter including: 1) Corps maintenance dredging proposed at the south end of the expanded dock and affects to their dock, 2) adverse affects at their existing dock due to scouring and/or increased sedimentation, 3) the proposed POA barge berths would socialize the market, and 4) additional taxes associated with maintaining an expanded port. The NSTS also asked about the status of the Corps sedimentation transport study.

Letter dated May 24, 2007:

NSTS reiterated their concerns over potential changes in sediment transport patterns (shoaling or scouring) that the proposed POA expansion project may have on their business activities. The NSTS expressed discontent over the recent offerings of the Port of Anchorage to mitigate adverse affects to NSTS operations by increased sediment deposition during construction, which included monetary reimbursements, assistance with increased dredging, POA barge dedication, etc. The NSTS stated that the POA offerings are inadequate considering that the majority of NSTS revenues at Anderson Dock come from facility charges.

Cook Inlet Keeper:

Letter dated March 22, 2006:

The Cook Inlet Keeper association strongly opposes to the issuance of a DA permit for the proposed action. Based on the CIK's interpretations of the legal requirements of the National Environmental Policy Act and the Clean Water Act, including the Section 404 (b) (1) guidelines, and the perceived significance of the project on special aquatic sites and marine habitat loss, including cumulative impacts, and impacts to Beluga whales, dredging, engineering of the proposed design, dredging, and socioeconomic issues. The CIK reference several sections from NEPA, the CWA, and the 404(b) (1) Guidelines and several lawsuits to support their arguments. The CIK believes that the proposed action does not represent the least damaging practicable alternative. The CIK also opposes the issuance of the Phase 1 permit and believes that the Corps should be required to publish its decision documents and draft permits of public review.

Letter dated March 23, 2007:

The CIK reiterated their belief that the proposed project does not represent the least damaging practicable alternative and that the NEPA requires the Corps to public notice its environmental document, and that an EIS is required.

Letter dated June 5, 2007:

The CIK reiterated their belief that an EIS is required for the proposed project under the NEPA and that the Corps would be in violation of the NEPA if we do not make an EA or EIS publicly available for notice and comment prior to issuance of a permit. The CIK also expressed their belief that less environmentally damaging alternatives are feasible.

5.1.6 Individuals:

Joel Blatchford (undated letter, received February 17, 2006):

Mr. Blatchford wrote a letter in opposition to the proposed project. Mr. Blatchford believes that the proposed project would erode and cause an increase in sediment deposition that wouldn't be dredged and would cause belugas to abandon the area.

John Daley, letter dated February 6, 2007:

Mr. Daley expressed concern over the overall extent of the expansion and the proposed open cell sheet pile design. He suggested that the area requirements of the proposed project are unsubstantiated and unnecessary. He also suggested that the proposed sheetpile design does not have the necessary seismic stability compared to a pile supported design and that a pile supported design is the best design alternative for the proposed project.

5.2 Evaluation and Consideration of Comments:

The Corps received a total of nine comment letters in response to the public notice for the Phase II permit application. Eight comment letters opposed the issuance of a DA permit, including one comment letter received from a private citizen. Additional letters were received from the NMFS, Cook Inlet Keeper, and Mr. John Daley, an engineer from Trick Nyman and Hayes who commented as a private citizen, following the expiration of the public notice comment period.

Environmental Protection Agency (EPA):

Consideration of EPA Recommendations:

1. *"That the Corps further analyze the practicability of less damaging alternative waterfront development configurations." The EPA also recommended that the Corps analysis address the likelihood of structural failure, which may lead to reintroduction of contaminated dredged materials.*

Response: Through the public review process, the Corps has considered all information available regarding the practicability of less damaging project alternatives.

With regard to the structural stability of an applicant's proposed design of a project, it is not typically within the Regulatory's jurisdictional authority or expertise to question or otherwise approve the engineering aspects of the design. However, due to the relation of the potential effect of the proposed design on other federal projects and the human and natural environment, the Corps contracted a design review by the ERDC. The ERDC has prepared an initial review of the global and internal stability of the proposed Open Cell Sheet Pile design under both seismic and static conditions. Their initial design review did not indicate that the proposed structure had a likelihood of failure and was generally accepting of the geotechnical investigations, studies, and engineering development to date. However, the review pointed out several items requiring additional analysis and documentation necessary in the finalization of the design to accomplish acceptable safety standards. These design requirements would be requirements of the DA permit.

2. *"That the Corps further analyze whether there is a less damaging practicable alternative to the proposed timeframe and project sequencing." (that is, a shorter construction window)*

Response: The Corps has coordinated closely with the applicant to minimize adverse impacts associated with construction sequencing and overall timeframe. The Corps had concerns over the initially proposed construction sequencing and anticipated increases in sedimentation in the project area during the overall construction period. The applicant has modified their construction sequencing to minimize increases in sediment deposition in the project area during construction. With regard to a shorter construction window, the proposed construction period represents the minimum amount of time required to construct the proposed project, which will require an extensive amount of coordination of construction type windows while maintaining an operable port.

3. *"That the Corps require avoidance and buffering of the Triangle/Fish Lakes wetland complex in the North End extraction site."*

Response: The Corps agrees with the EPA that the Triangle/Fish Lake and adjoining wetland complex represents the highest aquatic habitat and recreation value within the proposed gravel extraction sites. The applicant has, since the public notice, modified the development area near the Triangle/Fish Lake area to provide this buffer. A special condition would be added to the DA permit to maintain this buffer.

4. *"That the Corps require sampling and analysis of material in the proposed dredging areas prior to issuing any permit for dredging." The EPA requested that their office review the proposed sampling plan and also recommended the following:*

a. *"The plan a figure specifying planned sampling locations and depths, as well as GPS surveying of the sample locations, and Quality Assurance/Quality Control measures for the ROST and analytical lab;*

b. *The lab analysis be used to verify both negative and positive ROST results, not just negative results; and,*

c. *That the lab analysis also include other potential contaminants of concern, such as Persistent Organic Pollutants and heavy metals."*

The EPA also recommended that the Corps not issue any permit for dredging until we have had the opportunity to review sampling results;

Response: The Corps agrees with the EPA that chemical characterization of the proposed dredge material is necessary, considering that the proposed project would involve dredging of virgin material outside or at greater depths than the existing maintenance dredge footprint. The Corps performed chemical screening, sampling, and analysis of the sediments within the project area in accordance to a plan coordinated with the EPA. The Corps prepared a formal report of the results of the screening and laboratory analysis, which concluded that the proposed dredge area did not contain contaminant levels exceeding water quality standards. This report was also coordinated with the EPA.

5. *"That any permit involving pile driving require state-of-the-art measures to minimize noise impacts to fish and beluga whales," and that the*

Corps incorporate permit conditions in accordance to NMFS recommendations to monitor and minimize potential impacts associated with increases in operational noise levels;

Response: The Corps agrees with the EPA that pile driving activities should involve noise attenuation measures to prevent unnecessary impacts to fish and beluga whales. The Corps will require special conditions requiring the implementation of NMFS recommendations to monitor and minimize noise associated impacts.

6. *"That any permit authorizing fill in intertidal and marine waters include seasonal and/or tide stage timing limitations to minimize impacts to aquatic organisms and waterbirds." (e.g., limiting fill placement to low tide and in the winter months)*

Response: Absolute seasonal and low tide work limitations is not practicable for a major Port expansion such as the proposed action. The expansion of the Port is entirely within intertidal and subtidal areas, thus there is not upland work that could be conducted during seasonal and high tide work restriction periods. This recommendation also appears to directly conflict with recommendation #2, which recommends a shorter construction period. The applicant's construction phasing was designed to expedite the project construction to the maximum extent practicable. Seasonal and tidal construction restrictions would lengthen the construction period considerably and consequently increase the temporary impacts of the project. Pile driving during the winter months is not practicable due to ice movement and fill compaction, which is critical to the internal stability of an OCSP design and problematic under freezing conditions. Subsequent to the outer dike construction, landward construction activities would be relatively separated from the marine environment.

The Corps proposes to impose the following timing restrictions on the project:

Fill placement: the outer dike construction shall be constructed during low tides to the maximum extent practicable to expeditiously isolate the work area from tidal flood water.

Pile driving: The applicant shall coordinate with Elmendorf hatchery on smolt release dates and in water work shall be prohibited for a 1 week period following release.

7. *"That any permit authorizing work at the extraction sites incorporate a seasonal timing window to minimize impacts to migratory birds. Specifically, we recommend that any permit prohibit clearing, grubbing, excavation, stockpiling, grading and/or filling at the extraction sites prohibit between 1 May and 15 July."*

Response: The Corps agrees and a special condition to accomplish the object would be included in the DA permit.

Compensatory Mitigation Recommendations:

1. *"The role of the advisory committee be formalized in the same Memorandum of Understanding (MOU) that the PN indicates the Corps and the Port would finalize prior to permit issuance, and, that the advisory committee members have the opportunity to be MOU signatories, as well;*

2. That the MOU specify the method(s) by which the in-lieu fee amount will be determined, including, primarily the Anchorage Debit-Credit Methodology;

3. That the MOU specify that the expenditure of the in-lieu fee funds would be limited to projects that would offset adverse project impacts by restoring, enhancing and/or preserving salmonid, beluga, water/wetland bird habitat in relative proportion to the debits associated with those impacts. We continue to believe that restoration of the estuary at the mouth of Ship Creek would provide the most appropriate offset of the unavoidable impacts of Port expansion, and recommend that such a project be investigated further by the advisory committee; and,

4. That your office not issue any permit until the MOU has been signed by all participating agencies and the in-lieu fee funds have been provided by the Port."

Response: The Corps has coordinated closely with the applicant to develop an appropriate and practicable compensatory mitigation plan for the proposed project. All of EPA's recommendations regarding compensatory mitigation would become requirements prior to DA permit issuance, with the exception of all participating agencies being signatories to the MOA, which is a specific agreement between the Corps and the Municipality of Anchorage to fulfill the obligations of the federal permit.

United States Fish and Wildlife Service (USFWS):

With regard to the current restoration efforts on Ship Creek that the USFWS referenced, the proposed project would not directly affect these projects and the mitigation requirements of the DA permit, if issued, would require a feasibility study and subsequent projects complementary to the existing restoration efforts, including modification of the KAPP Dam.

With regard to the USFWS statement that, "Ship Creek contributes a large number of wild salmon and the vast majority of hatchery produced salmon in Knik Arm", the Corps is unaware of any information supporting the claim that Ship Creek contributes a 'large number of wild salmon in Knik Arm', in fact current knowledge of the system indicates the contrary. With regard to the USFWS statement that, "nearshore habitat at the project site is critical to rearing salmon from all Knik Arm tributaries, especially Ship Creek", the Corps is unaware of any information that would indicate that the project area is "critical" salmon rearing habitat for all or any of Knik Arm's tributaries, especially Ship Creek. Juvenile salmonids from the Ship Creek hatchery are reared at the hatchery for up to 2 years, at which point they are released as smolts, ready for out-migration. There is no information available that indicates that the project site is critical rearing habitat for Ship Creek hatchery smolts or juveniles salmonids from other Knik Arm tributaries. Aside from the fact that juvenile salmonids are present within the project site, whether washed into the area by flood currents or actively seeking refuge from the currents, there is no information indicating that the juvenile salmonids are actively feeding, using the area for osmoregulation, or at the location for a duration of time that would suggest that the area is critical for rearing compared to other areas within the vast shoreline of Knik Arm. The project area does not provide feeding opportunities or salinity levels noticeably different than other areas within Knik Arm/Upper Cook Inlet. The Corps considers the scientific studies in the Pacific

Northwest referenced by the USFWS to not be directly applicable to the conditions of the project site, which are quite different. The Corps disagrees with the USFWS's determination that the proposed project would result in significant impacts to fisheries or that the project area represents an aquatic resource of national importance (see discussions under Section 6).

The Corps concurs with the USFWS that impacts to fish from pile driving activities would be unavoidable and would be difficult to impossible to monitor and document. Considering that juvenile salmonids may potentially be unable to resist tidal currents to avoid the project area during pile driving activities, the injurious and/or fatal effects on juvenile salmonids should be minimized to the maximum extent practicable. The proposed OCSP design is expected to result in considerably less noise related impacts to marine organisms compared to the construction of a pipe pile supported structure. Appropriate and practicable measures would be incorporated into the DA permit, if issued, to avoid and minimize noise related impacts to fish during construction.

The Corps agrees with the USFWS that pile-supported designs minimize the permanent loss of aquatic habitat and should be fully evaluated. The Corps also agrees with the USFWS that the failure of the proposed structure would result in additional affects to anadromous fish.

Consideration of USFWS Recommendations:

1. *"During the period from April 15 through August 15, all pile driving associated with the project must use sound attenuation measures approved by the Corps of Engineers, in consultation with the USFWS and NMFS, to reduce noise levels below the threshold for causing injury to juvenile anadromous fish.*

Response: The Corps agrees that pile driving activities must incorporate practicable noise attenuation to minimize impacts to juvenile anadromous fish and marine mammals. The DA permit would require that the applicant use vibratory hammers to the maximum extent practicable (i.e., until failure) and that all pile driving activities would be prohibited for a one week period following smolt release from the Ship Creek hatchery. Additionally, any impact hammer pile driving would be limited to within 2 hours of low tide. The applicant would also be required to measure and monitor sound levels and conduct live cages testing during pile driving to develop site specific information that would later be used to modify practices if necessary.

2. *A Department of the Army permit should be not issued for phase II of the project until: a) a complete mitigation plan is agreed upon by the Corps, MARAD, POA, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, State of Alaska, Municipality of Anchorage, and the Matanuska-Susitna Borough, and b) compensatory mitigation funding has been provided by the applicant.*

Rationale: A mitigation fund is needed to provide for compensation related to unavoidable impacts to anadromous fish habitat resulting from the proposed project. It is impossible to provide on-site mitigation for adverse project impacts related to loss of anadromous fish habitat or for adverse effects on anadromous fish movements and migration due to the extensive area to be impacted and the absence of comparable on-site restoration or enhancement options. Therefore, off-site compensatory, mitigation opportunities are

required. Since an unknown percentage of the anadromous fish using the project site originate in Matanuska-Susitna Borough steams and an unknown percentage originate in the Municipality of Anchorage it is appropriate to designate that a share of mitigation funds be used in each jurisdiction.

The Service believes there should be compensation for all unavoidable losses of intertidal, subtidal and wetland habitats because these habitats are aquatic resources of national importance. Additionally, there should be compensation for unavoidable project effects on movements and migration of anadromous fish. The mitigation plan should include the following provisions:

(a) Approximately fifty percent of compensatory mitigation funds will be available for mitigation projects in the Matanuska-Susitna Borough and fifty percent for projects in the Municipality of Anchorage.

(b) Language governing administration of the escrow account shall be approved by the Corps, after consultation with resource agencies.

(c) No funds should be disbursed from the compensatory mitigation fund without written authorization from the Corps, after consultation with resource agencies.

(d) The Corps, in consultation with resource agencies, shall approve mitigation projects designed and properly implemented to protect, conserve, and restore habitat for anadromous fish within the boundaries of the Matanuska-Susitna Borough, and the Municipality of Anchorage.

Response: The Corps agrees that compensatory mitigation is necessary to offset the unavoidable impacts of the project. The compensatory mitigation plan would be coordinated with the mitigation advisory members and consistent with most of the recommendations of the USFWS. However, the Corps disagrees that fifty percent of mitigation funds should be allocated to the Matanuska-Susitna Borough. Corps' mitigation policy requires a tiering approach to the development of appropriate mitigation, with the primary goal of achieving onsite and in-kind mitigation to offset the unavoidable impacts of a project on aquatic resources. Considering that practicable mitigation opportunities that would provide "in-kind" mitigation are not available (i.e., projects that would replace the marine and wetland habitat loss), the next step is to provide on-site mitigation to the maximum extent practicable. Therefore, the Corps believes that mitigation projects in watersheds closest to the project area would represent the most appropriate locations for mitigation. These watersheds provide the greatest opportunity to contribute towards offsetting the direct impacts of the project. However, any mitigation projects that are identified as providing ecological benefit to Knik Arm that would contribute towards offsetting the impacts of coastal development would be fully considered by the Corps in consultation with the mitigation advisory committee.

3. *The Service recommends that to prevent impacts to nesting migratory birds, no vegetation clearing, fill placement, excavation, or other construction activities at the material sites shall be conducted between May 1 and July 15, except at sites which have been sufficiently disturbed or altered (e.g., with fill, plastic, or other materials that will cover nesting habitat) before May 1 to eliminate suitable nesting habitat.*

Response: The Corps agrees and a special condition prohibiting impacts to migratory bird nesting habitat would be included in the DA permit, if issued.

National Marine Fisheries Service (NMFS):

Pursuant to the Magnuson-Stevens Fishery Conservation Management Act (MSFCMA), the Corps of Engineers is required to formally respond to the NMFS EFH conservation recommendations at least 10 days prior to issuing a DA permit. The NMFS submitted Essential Fish Habitat (EFH) conservation recommendations in response to the public notice. The Corps has fully considered the EFH recommendations in our evaluation of the permit application, which are described below.

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)."*

Response: The Corps has determined that the proposed project represents the least damaging practicable alternative. The Corps has worked with the applicant and the lead federal agency extensively to avoid, minimize, and compensate for the unavoidable impacts of the proposed project. The Port of Anchorage and the Maritime Administration have completed comprehensive alternative analyses in the preliminary planning stages of the project and the NEPA process. Additionally, the Corps has required additional information from the applicant during the public interest review process to demonstrate that less damaging alternatives are not practicable, as required by the 404 (b) (1) Guidelines.

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."*

Response: The Port of Anchorage (POA) and the Maritime Administration (MARAD) have conducted extensive feasibility studies of the global and internal stability of several project designs, including the proposed, under static and seismic loadings. Additionally, the POA and the MARAD continue to analyze structural stability considerations in their design process. The feasibility and design studies have incorporated several layers of independent review. These studies, coupled with independent reviews by the Corps Engineering Research and Design Center (ERDC), provide more than sufficient analysis necessary for the assessment of geotechnical considerations. The Corps regulatory program has determined that it would be inappropriate and unnecessary to require an additional independent review panel and process selected and approved by the Corps in consultation with the NMFS and other agencies. Furthermore, the Corps has determined that an additional independent geotechnical review as suggested by the NMFS would not assist, and is certainly not necessary, for our analysis of the

practicability of less damaging alternatives (i.e., partially pile supported designs) under the 404 (b)(1) guidelines. The feasibility studies conducted by the POA and MARAD determined that a partially pile-supported structure is feasible at this location. Therefore, an additional geotechnical review would not provide any information necessary for our analysis of less damaging practicable alternatives. However, considering that the proposed federal project directly affects the Corps maintenance dredging federal project, the Corps Operations and Maintenance Section required an independent review of the geotechnical studies conducted for the project by the Corps ERDC. The ERDC analysis made several recommendations for the final design of the proposed structure. These recommendations have become requirements for the Corps dredging project and will be carried as special conditions to the DA permit.

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."*

Response: The Corps concurs with this recommendation and has worked extensively with the applicant to develop practicable measures to minimize impacts from the introduction of noise in the water column during construction. Please review the enclosed list of draft special conditions related to minimize noise related impacts.

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."*

Response: The Corps agrees with this recommendation. The Port of Anchorage is required to comply with the requirements of Section 402 of the Clean Water Act for any discharges of stormwater or other effluents from the proposed facility into waters of the U.S. The Port shall continue to work with the EPA to ensure that proper authorization is in place and appropriate measures to avoid and minimize adverse impacts are implemented.

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."*

Response: The mitigation requirements of the DA permit would involve the establishment of a mitigation account to fund aquatic ecosystem restoration, enhancement, creation, and/or preservation projects. A Memorandum of Agreement between the Corps and the Municipality of Anchorage specifies the

amount of funding, the types of projects to be funded, the aquatic resources that should benefit, and the process for selecting and approving projects. The Corps recognizes the vital role of the NMFS and other appropriate resource agencies involvement and expertise in the process for selecting and managing appropriate and practicable mitigation projects.

Beluga Whales: The National Marine Fisheries Service has provided two formal letters with recommendations for avoiding and minimizing adverse impacts to beluga whales (see letters dated 22 March 2006 and 31 January 2007). Additionally, the Corps met with the NMFS on several occasions to discuss mitigation measures in the public interest review process. The objectives of the NMFS recommendations would be incorporated as special conditions of the DA permit, if issued (see special conditions section of this document). The Port of Anchorage has submitted petitions for an Incidental Harassment Authorization (IHA) for the 2007 construction season and a Letter of Authorization (LOA) for construction seasons 2008-2012 (Anchorage Port Expansion Team, Final Petition; January 2007) for Small Take Authorizations from the NOAA/NMFS under the Marine Mammal Protection Act (MMPA) for the incidental and unintentional taking of marine mammals. Upon receipt of the IHA and/or LOA authorizations, the Corps may reevaluate and modify the terms or conditions of the DA permit to ensure consistency with the terms and conditions of the MMPA authorizations.

NORTH STAR: The Corps has met and teleconferenced with the NSTS on numerous occasions in an attempt to fully understand their concerns and the availability of practicable mitigation measures. The Port of Anchorage has also coordinated with both NSTS and Swan Bay in an attempt to develop agreeable compensation measures for their identified concerns, which include the following:

Proposed Barge Operations: The Port of Anchorage provides the majority of the shipment needs of the state. There is an apparent public need in rural Alaska for improved marine freight shipment service, including cost, reliability, and frequency of deliveries. With regard to the NSTS concern that the proposed barge berths at the POA would socialize the barge market, it is not within the Corps regulatory purview to regulate or otherwise influence market competition or to prevent the development of public facilities by a local government to ensure that a private enterprise has a market niche.

Corps Dredging Operations near the Anderson Dock

The proposed project design has been modified to shorten the proposed waterfront structure on the south-end of the project and to tie into existing sheet pile structures located to the south. The modified south-end design will increase the distance between future Port facilities and the existing barge facilities located to the south of the Port. This modification distances USACE maintenance dredging activities from these barge facilities to prevent adverse affects associated with scouring/sedimentation.

Sedimentation/Scouring of Adjacent Properties:

Based on previous modeling efforts by the Corps, as well as observations of the affects of the groin constructed just south of the port, major changes in sediment shoaling or scouring patterns are not expected to occur from the proposed expansion. The Port has met with the adjacent railroad property lease holders and has agreed to monitor

and mitigate adverse affects associated with increased sedimentation and/or scouring during the construction phase of the project to the maximum extent practicable. The Port's proposed mitigation measures include monetary, equipment, manpower, and other construction assistance to maintain their operations. Additionally, the Port has offered to dedicate barge terminal space for their use should their docks become temporarily unusable. The Port intends to install monitoring instruments at the waterfront of NSTS to measure changes in sedimentation during construction. No historical records have been kept by NSTS or Swan Bay regarding specific volumes of annual maintenance dredging, thus it would be impossible to specifically quantify changes in sedimentation rates at these facilities. The Port has however vowed to work cooperatively with the adjacent barge facilities to minimize adverse impacts to their operations during construction to the maximum extent practicable.

Department of the Air Force, Pacific Air Forces:

The Corps met with Elmendorf environmental staff during the public review process to discuss their concerns. Elmendorf expressed their understanding of the purpose and need for the project and the benefits that the gravel extraction project would have regarding the BASH program of the adjacent airfields. However, Elmendorf expressed concern over the loss of mineral and wetland habitat resources and believed that compensatory mitigation for the wetland losses on EAFB should be required to improve existing aquatic resources on EAFB. The Corps requested information from Elmendorf staff on mitigation opportunities available in nearby aquatic environments. Elmendorf provided information for several projects that would improve salmon passage and habitat on six mile creek, located to the north of the gravel extraction areas. All projects involving enhancement/restoration of aquatic resources have been included in the Draft mitigation plan for the project. The MARAD established a MOA with EAFB for the proposed mineral extraction and reclamation activities.

Cook Inlet Keeper:

The Port of Anchorage Expansion project is comprised of the Marine Terminal Redevelopment (MTR) project and the associated Cherry Hill and North End Runway Material Extraction projects, which are proposed federal actions by the U.S. Department of Transportation, Maritime Administration (MARAD). The MARAD is the lead federal agency under the National Environmental Policy Act (NEPA), which requires the preparation of an Environmental Impact Statement (EIS) for proposed federal actions that significantly affect the quality of the human environment. The MARAD prepared an Environmental Assessment (EA) to determine the level of analysis and documentation required under the NEPA for the proposed federal action of expanding the Port of Anchorage (MTR Project) and subsequently for the material extraction projects. The U.S. MARAD determined through an extensive EA process that the proposed federal action would not have significant impacts to the human environment and subsequently prepared a Finding of No Significant Impact (FONSI), which was signed by the MARAD in March of 2005 for the MTR project. The MARAD subsequently prepared FONSI's for the material extraction projects in January and June of 2006.

Port activities have occurred in the project area since 1915 and the Corps of Engineers has performed harbor maintenance dredging activities since 1958 and navigational channel dredging since 1997. FONSI's were prepared in several previous Corps environmental documents under the NEPA for the federal harbor

and navigational channel projects, which are within the same affected environment as the federal action currently proposed.

The expansion of the Port of Anchorage is a federal project proposed by the MARAD. The MARAD is the lead federal agency under the requirements of the NEPA. The MARAD prepared the required EAs and subsequent FONSI's for the proposed actions in compliance with the NEPA. The Corps, as a federal permitting agency, has developed implementation procedures for the NEPA in its evaluations of DA permit applications and decision documents, which includes an assessment of environmental impacts and a statement of findings of compliance with other applicable laws including the NEPA. The Corps has evaluated the permit application through an extensive public interest review process that has included requiring supplemental information from the applicant necessary for a comprehensive assessment of the anticipated impacts of the proposed federal action on the human environment. Our public interest review included considerations of impacts to the aquatic environments as well as conservation, economics, aesthetics, general environmental effects, cultural values, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, mineral needs, property ownership, endangered species, historic properties, and the general needs and welfare of the people. This decision document constitutes our public interest determination and findings of compliance with applicable laws and regulations, including the NEPA.

As required by 40 CFR 1508.27 of the NEPA regulations, this decision document evaluates all of the factors related to the assessment of significance of the anticipated affects of the proposed action on the human environment by considering the intensities of the relevant impacts in the context of the affected environment(s).

Having reviewed the environmental NEPA documents prepared by the MARAD, information provided by the applicant, all interested parties and the assessment of environmental impacts, the Corps has found that this permit action would not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

With regard to the CIK's comments that the Corps is required by the NEPA to publish a draft EA for public comment prior to reaching a permit decision, the Corps has developed NEPA implementation procedures that are consistent with the Act. The requirements of the NEPA for the proposed action have been met by the NEPA processes conducted by the MARAD, the lead federal agency, and subsequently through the permit application evaluation process (including the NEPA) of the Corps, which included a public notice process and a comprehensive decision document.

Joel Blatchford:

The Corps teleconferenced with Mr. Blatchford to discuss his concerns. Mr. Blatchford believes that the proposed project would result in increased sedimentation that would render the Port of Anchorage unusable and close off the entrance into Knik Arm for beluga whales. Based on available information on water circulation and sediment deposition patterns, the Corps does not believe that the proposed project would result in substantial increases in sediment deposition at the mouth of Knik Arm or in the navigational approach and docking area of the Port of Anchorage.

John Daley:

The Corps has evaluated the practicability of less damaging alternatives and has determined that the proposed project represents the least damaging practicable alternative. Our analysis included both area requirements and design alternatives, to include pile supported designs. The geotechnical and seismic studies and independent reviews conducted on behalf of the proposed project, including the independent reviews of the ERDC, represent a sufficient level of analysis necessary for Regulatory Division's assessment of the project. A Department of the Army permit does not approve an applicant's engineering design.

6.0 Analysis of Beneficial and Detrimental Impacts to the Environment and the Public Interest, and Factual Determinations for Discharges of Dredged or Fill Material [33 CFR 320.4(a-r), 33 CFR 325 App B, and 40 CFR 230.11 and 230.20 - 230.77]

6.1 Factors

Physical substrate determinations 230.11(a) and Substrate 230.20:

The proposed port expansion area contains intertidal unvegetated mudflats and marine bottom sediments consisting of fine silts and clays, less than 0.1 mm in diameter. The disposal site for construction related dredged material contains gravel and silt. Sediment entering Knik Arm is primarily from suspended glacial sediment from the fresh water discharges of the Matanuska and Knik Rivers. The rivers that enter Knik Arm discharge approximately 20 million tons of sediment annually. Tidal currents, periodic high water levels and wave action have resulted in erosion of the bluffs along Knik Arm, which also contribute sediments into Knik Arm. Seasonal ice formation and movement occurs on the upper benches that gouge and scour intertidal and shallow subtidal areas. The high sediment loads carried to the shorelines from glacial streams and eroding bluffs results in relatively unstable sediment substrates which are continually altered by waves, currents, ice movements, and dredging. Dredged sediments discharged at the disposal area are redistributed by the strong currents and tides and do not tend to accumulate, based on regular bathymetric surveys.

The proposed action also involves the development of gravel extraction sites over approximately 350 acres on EAFB, immediately west of the Port. Extensive geotechnical borings and analyses have been performed to delineate contaminated soil areas, and useable earthen and gravel for fill material. No more than minor impacts to substrates are anticipated.

Water circulation, fluctuation and salinity determinations 230.11(b), Current patterns and water circulation 230.23, and Salinity gradients 230.25:

Knik Arm has deep channels that are flanked by shallow intertidal and shallow subtidal benches composed of sand, mud, or gravel depending on location. It has extreme tidally-generated currents that routinely exceed 4-5 knots and occasionally exceed 7 knots. The lower intertidal and subtidal benches are subjected to high rates of scour in some locations and shoaling in others.

Knik Arm has strong tidal currents and turbulence, resulting in thorough vertical mixing and relatively uniform water properties from top to bottom.

Temperature, salinity, and density are relatively uniform from the water surface to bottom in Knik Arm, aside from a minimal stratification of salinity during the month of May, where salinities have been measured to be between 6 to 11 ppt at the surface and 12 ppt near the bottom. Otherwise salinities have been uniform from surface to bottom with 9 ppt in July, 8 ppt in October, and 9 ppt in November. The lower surface salinities measured in May are expected to be caused by snowmelt in river discharges. Seasonal salinity variations are inversely proportional to temperature variations, with 1 ppt in the upper Arm in the summer and 20 ppt in the lower Arm in the winter.

Knik Arm tidal ranges average 25.9 feet and extreme tide ranges of approximately 38 feet, which is the highest in the U.S. and second highest in all of the Americas. Knik Arm has an average depth of 15 m in its lower half that quickly shallows to tidal flat at its head. The high tide ranges result in extremely strong currents that exceed 4 knots. Knik Arm has reversing currents which flow north (up the arm) on the flood tide and south (down the arm) on the ebb tide.

The depths of Cook Inlet decrease in its upper reaches, which limit wave heights to less than 3 meters; Knik Arm waves are further reduced in height.

Tidal currents and circulation affect the distribution of nutrients and consequently, productivity, in Knik Arm. Knik arm has extreme tide fluctuations in a shallow and narrow basin, producing a thorough mixing laterally, longitudinally, and vertically over tidal cycle.

The Corps of Engineers has been studying the tidal circulation of Upper Cook Inlet for many years and proposes future 3-D and sediment modeling.

Recent modeling efforts have been completing for information concerning the proposed Port of Anchorage Expansion, which include the ***Two-Dimensional Tidal Circulation Modeling - Port of Anchorage Expansion*** and a 3-D Flow Table Model, both of which characterized tidal circulation patterns of the Port vicinity under existing conditions and under a condition representing the proposed expansion. The primary concerns which necessitated the need for these analyses were changes to tidal hydrodynamic circulation patterns that could affect shoaling/scouring patterns in the vicinity, which would affect the federal dredging project at the Port and adjacent properties (barge terminals) and watercourses (Ship Creek).

Ship Creek is an adjacent watercourse located south of the Port. The hydrodynamic studies by the Corps has revealed that the proposed expansion would have a negligible effect on existing current speeds at Ship Creek and would have no effect on the directional pattern.

EAFB is an adjacent property located to the north and east of the Port. The proposed project would eliminate tidal erosion of the bluff at the base of LF04 (a regulated historic landfill), which should reduce ongoing erosion and release of potential contaminants into Knik Arm.

Flint Hills operates a lease on an adjacent property located directly south of the proposed expansion. The OCSP structure for the Port expansion will meet the existing OCSP structure at the Flint Hills property. The MTR design team was also involved with the design and construction of the Flint Hills structure and measures will be taken to avoid impact to their structure and/or operations.

NorthStar operates a lease on a property located south of the Flint Hills lease with barge terminal operations. The proposed expansion will not extend out further than the existing jetty (on the south) which has not shown significant sedimentation on either the flood or ebb side in the six years since the jetty was constructed. The hydrodynamic study by the USACE showed that changes are greatly reduced just a short distance to the south of the Port. The Corps does not anticipate more than minimal impacts to the NorthStar property due to the expansion. The Port will work with the USACE to minimize dredging in proximity to the NorthStar property.

The Corps hydrology and O&M section have concerns over increased sedimentation that is expected to occur at the existing Port from the proposed construction phasing. This sedimentation could adversely affect the federal maintenance dredging project at the port. To mitigate these adverse impacts the applicant and the lead federal agency have modified their design slightly and their construction phasing. The MARAD and Port would continue to coordinate closely with the Corps as needed to minimize adverse hydrodynamic changes during construction to the maximum extent practicable.

Coordination between MARAD, the Port, and the Corps during the public review process has resulted in a modification of the proposed design on the north-end to provide a smooth flow transition from the expanded Port to Cairn Point.

The modeling results indicated that the overall expansion would slightly modify current conditions at the Port, and those small modifications, while not significant to the overall environment, may actually be beneficial in terms of reducing long-term dredging activities. As the USACE study did not specifically address the interim conditions that could exist during construction, they have expressed concern that there will be increased sedimentation within the shipping lanes that would exceed the current dredging capacity.

The original construction phasing plan called for initial construction north of the existing dock, then construction south of the dock. Dock operations would then be relocated from existing dock to the new dock sections. The existing dock would then be demolished and replaced. As the new dock section would extend approximately 400 feet further into Cook Inlet than the existing dock, there is concern that this construction phasing would result in eddies, reduced current velocities, or areas of stagnate water in front of the existing dock, resulting in increased sedimentation and accumulation of ice that would impact ship operations.

The USACE requested that the phasing plan be re-evaluated to minimize impact on maintenance dredging during construction, and ice formation during winter months. Specifically, the Port re-evaluated the phasing to examine beginning construction at one end and proceeding to the other to maintain steady current velocities near the existing dock to minimize sedimentation and ice build up. This reevaluation found that this phasing approach was not conducive to maintaining commerce through the Port. In order to maintain the necessary port function, the areas north and south of the existing dock must be constructed first to allow shipping operations to move off of the existing dock. Consequently, the Port and the waterfront design team completed another analysis of the phasing plan with the goal of balancing the needs of commerce with the potential impact to maintenance dredging and construction

limitations [dock construction can only be carried out during the periods of time when there is no ice present (approximately April through October)].

The result of the latest evaluation indicates that a balanced approach to phasing involves construction of the southern most section and barge docks at the northern end of the project first, followed by approximately 2,000 feet of new dock construction south of the barge docks the following season. This approach provides the minimum amount of new dock space necessary to maintain commerce. To further reduce the potential for increasing sedimentation in front of the existing dock for the two seasons between the start of dock construction and the final abandonment of the existing dock, temporary dikes at the ends of the construction phases will be constructed at a shallow angle to the existing shore line. These angles will be determined in collaboration with the USACE to minimize interim sedimentation. The shallow angles will reduce the potential for eddies and areas of slack flow adjacent to the new construction.

The waterfront design team reviewed the previous studies and made their own observations. The Preliminary Analysis of Currents, Ice, and Dredging (PND, 2006) included the observation that the jetty constructed approximately six years ago (at the southern end of the expansion) shows no evidence of significant sedimentation, nor alongshore sediment transport accumulation. The waterfront design team anticipates that because of the lack of the sedimentation around the jetty, the South Extension can be part of the initial construction without major impacts to maintenance dredging in front of the existing dock during construction.

Regular bathymetric surveys will be ongoing during construction, and the Port and MARAD will continue to work with the USACE as new information becomes available. The design and construction phasing will be re-evaluated in coordination with USACE throughout construction, as needed, to optimize the phasing and to reduce potential sedimentation impacts.

Tidal currents are greatest in the main channel in front of Cairn Point, with natural eddy formation in the lee of Cairn Point. Turbulent flow separation at Cairn Point during ebb tide was shown to be instrumental in causing shoaling at the POA. The proposed project is expected to decrease sedimentation at the POA. Adverse impacts to tides, currents, ice movement, and sedimentation are not anticipated.

Suspended particulate/turbidity determinations 230.11(c) and 230.21:

Eroding bluffs and glacial rivers carrying high suspended sediment loads (e.g., Matanuska River carries loads at 2,000 mg/L during the summer) discharge extremely high levels of particulates into Knik Arm. The tributaries entering Knik Arm discharge up to 20 million tons of sediment annually (primarily from Matanuska and Knik Rivers). Consequently, the waters of upper Cook Inlet and Knik Arm have high suspended sediment loads with mean turbidity levels over 400 NTUs. The proposed tideland development and dredging would increase turbidity levels during discharges of fill material, dredging, and open water dredge sediment disposal. Increases in turbidity would be short lived, as strong tidal currents thoroughly flush the area, and would not result in more than minimal impacts to the marine environment. Additionally, the dredge sediment material is known to be cohesive and drops to the floor of the disposal site as a large mass, where it is redistributed by the high energy environment.

Water 230.22 (nutrients, chemical content, dissolved gas, pH, temperature), water quality 320.4(a), and 320.4(d):

Winter temperatures in Knik Arm are slightly below freezing. Primary sources of organic carbon include the tributary streams and tidal marshes, especially the stream estuaries of Goose Bay and Eagle Bay and the Woronzoff tidal flats. The extreme tidal fluctuations in Knik Arm produces rapid currents, high suspended sediment transport, and abundant dissolved oxygen. Chemical sampling in 1994 detected very low concentrations of arsenic, barium, chromium, and lead.

The extreme tidal currents and circulations in Upper Cook Inlet directly affect distribution of nutrients and thus productivity. The extreme tidal range in the shallow and narrow basins thoroughly mixes the water laterally, longitudinally, and vertically in every tidal cycle. The large fresh water inputs to Upper Cook Inlet in the summer reduce salinity and phosphate concentrations near the river mouths and deliver large quantities of silicate, nitrate, nitrite, and suspended particulates of organic carbon

Extreme tidal currents and turbulence thoroughly mixes the water column to the extent that salinity, temperature, and turbidity are uniform from top to bottom throughout the year, with the exception of temporary stratification that appears immediately following snowmelt in May. Oceanographic measurements in Knik Arm in 1992 revealed water temperatures were between 4 and 5 C in May, 11 to 12 C in July, and 6 to 7 C in October. As the ambient air temperatures drop and ice thickening increases in late November, water temperatures drop to a uniform -1 C. Knik Arm salinity and temperature measurements in 2005 revealed that salinity and temperature tend to be inversely proportional, with salinity levels reaching maximum low levels in mid summer, during periods of maximum freshwater input to the system.

The proposed dredging and fill material discharges would temporary decrease dissolved oxygen levels and overall water quality. The proposed expansion of the dock and operational footprint of the Port would further limit the availability of terrestrially based sources of nutrients from plant life and insects. Additionally, in water construction equipment may introduce petroleum based contamination. The applicant would employ a stormwater pollution prevention plan (SWPPP) to avoid contamination from site runoff. The POA currently operates under an NPDES permit developed for the municipality of Anchorage and complies with specific pollution prevention measures during construction and operation and includes stormwater management and monitoring. The POA coordinates with the EPA and Municipality of Anchorage for their NPDES permit. Implementation of BMPs and permit conditions would minimize erosion and sedimentation to mitigate adjacent properties and waters from effects related to erosion, sedimentation, and flooding; to control spills; and to handle potentially hazardous materials and waste in accordance with federal, state, and local requirements.

Current Port operations include operational and regulatory controls for storm water. Individual port tenants are required to maintain current National Pollution Discharge Elimination System (NPDES) permits and the port carefully monitors tenant and port activities to maintain a pollution free operation. Port and tenant NPDES activities are reported annually. The intent of the project is to design and construct a modern stormwater collection and discharge system that will make monitoring and control of the system efficient and effective.

Final designs will incorporate appropriate state-of-the-art treatment measures for stormwater run-off as required by regulations. Should more rigorous treatment measures be necessary in the future, the OCSP allows for oil-water separators or grit chambers to be easily installed.

EAFB is an adjacent property located upgradient of the Port to the north and east. The project will take drainage from EAFB into consideration with the design intent to segregate EAFB drainage from Port drainage. In addition, construction of the MTR project will eliminate tidal erosion from the base of LF04 (a regulated historic landfill) which should reduce ongoing erosion and release of potential contaminants into the inlet.

The following BMPs that the MARAD proposes to employ during construction to prevent the release of contaminants into the water column will minimize potential adverse impacts to water quality:

- The Port would continue to follow the guidelines for establishing operations in the event of a major response effort to an oil spill or hazardous material release as defined in the Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases (AURT, 1999).
- Construction contractors would be required to prepare a plan detailing methods to control spills and for handling hazardous materials and wastes in accordance with federal, state, and local regulations.
- Construction contractors will be required to perform maintenance of on-site capabilities to respond to spills of oils, fuels, or other similar materials.
- Marine spill response equipment, including absorbent pads and containment booms will be stored on site in case of accidental spills.
- The Port will require on-going training of personnel involved with construction and operations to ensure awareness of BMPs with a proactive spill prevention and reporting program.
- Construction debris and dredged fill material would be recycled when feasible or disposed of off-site at an approval landfill.
- The Port will require that all construction adheres to the *Anchorage Erosion and Sediment Control and Materials Containment Guidance Manual* (MOA, 1991a) and the *Stormwater Treatment Plan Review Guidance Manual* (MOA, 1999b).
- The Port will provide a general construction SWPPP to be used by contractors to avoid contamination from site run-off. Further, the Port will require all construction contractors to strictly adhere to their own site-specific SWPPPs. Regular inspections of SWPPP requirements and implementation of BMPs will occur during expansion activities.
- Sediment traps, fencing, and other measures would be employed during construction to minimize the potential for erosion and sedimentation during construction and to protect adjacent properties and waterways from effects related to erosion, sedimentation, and flooding.
- On-going construction dredging will be monitored by bathymetric surveys to identify changes in the surface area to ensure minimal disturbance.

- Prior to construction and earth movement, the Port would be responsible for preparing a Soils Management Plan in the event that contaminated soils are encountered at the pre-existing Port during fill activities.
- Stockpiled material will be covered, enclosed, watered twice daily, or stabilized with nontoxic binders to prevent migration of sediments.
- Materials within the Cherry Hill and North End Borrow pits are characterized in place prior to removal to identify any areas of potential contamination. Materials found to contain unacceptable levels of contamination are left in place and contractually removed from the borrow area. Known materials with known contamination will be transported off of EAFB for use in construction.
- Borrow source operations on EAFB are required to conduct concurrent reclamation and leave the borrow sources at the end of each construction season in a condition that promotes drainage while limiting the potential for off-site migration of sediments and potential contaminants from the site. Borrow source development is regulated by a Development, Operation, and Reclamation plan that has been prepared in conjunction with and received approval from the USAF. These plans will be revised, updated, reviewed and approved by the USAF on an annual basis.
- Areas of fill material that will not be surfaced until the following construction season will be covered with gravel and graded to drain to temporary sediment control structures placed to prevent migration of sediments

The proposed action is not expected to result in more than minor impacts to water quality.

Flood hazards 320.4(a)(1), floodplain values 320.4(a)(1), Normal water fluctuations 230.24, wetlands as storage for storm and flood waters 320.4(b)(2)(v):

The proposed project would permanently remove 138 acres of intertidal and nearshore subtidal waters of Knik Arm, located approximately 2,000 feet north of Ship Creek. Based on 2-D numerical modeling of the vicinity, the proposed project is not expected to have any affect on Knik Arm water levels. Although identified as within the floodplain of Ship Creek, the proposed action is not expected to affect floodplain functions or values due its location in Knik Arm, which has ample floodwater capacity. No appreciable impacts to flood control functions are anticipated.

The proposed gravel extraction areas are not within a riparian floodplain and are not expected to impact flood water storage, affect water levels or increase flood hazards.

Floodplain management (functions, degradation of floodplain values and functions Executive Order (EO) 11988, practicable alternatives) 320.4(1):

The port expansion area in Knik Arm is not expected to affect floodplain functions, values or the management of Ship Creek's floodplain. The gravel extraction areas on EAFB are outside of the floodplain of the nearby Six mile Creek. The proposed project areas do not provide any known floodplain functions or values and no more than minimal impacts are anticipated.

**Wetlands shielding other areas from wave action, erosion, or storm damage
320.4(b)(2)(iv):**

There are no wetlands that would be impacted that function as storm wave retardants. The proposed structure would buffer the landward bluffs from wave action, thus preventing tidally induced storm damage and erosion. Due to the geographic positioning and proposed design configuration relative to Cairn Point to the north and adjacent properties to the south, no increases in wave action is expected on adjacent properties. The overall port expansion project would remove 138 acres of intertidal and subtidal benches. The intertidal mudflats of the area provide a transitional buffer between Knik Arm and the bluffs of Government Hill and Elmendorf, which are in a perpetual state of erosion. The proposed project would prevent the erosion of the Elmendorf bluff to the north of the existing Port from tidal forces, which introduce historic landfill debris (LF04) into Knik Arm.

Shore erosion and accretion 320.4(a)(1):

The Corps of Engineers has been performing annual maintenance dredging of the deep draft Anchorage Harbor since 1965. Knik Arm carries an extremely high suspended sediment load, contributed from glacially fed streams that annually discharge up to 20 million tons and eroding bluffs. Sediment transport patterns at the Anchorage Harbor Dock vary seasonally, with scouring occurring in the winter and deposition in the summer. Sediment shoaling patterns at the Anchorage harbor have increased since 1994, which have increased maintenance dredging volumes from approximately 250,000 cubic yards to over 2 million cubic yards. Anchorage Harbor is situated south of Cairn Point, where the formation of a natural gyre occurs that opposes the strong currents and deposits sediment loads.

The Corps has analyzed two-dimensional numeric tidal circulation and three dimensional flow table models for the preexisting and post construction states of the proposed project. Both models indicate that the proposed project would result in no more than minor changes in tidal circulation patterns to adjacent properties. Minor hydrodynamic changes in front of the proposed dock face are expected to result in a decrease in sedimentation. It should be noted that the existing models are more qualitative in nature and do not predict precise hydrodynamic conditions and that the qualitative hydrodynamic assessments only provide indications to affects on sediment deposition rates, which is dependent on sediment concentration, particle size, and current velocity. That is, with increased currents and the reduction of the gyre leeward of Cairn Point, it is presumed that sediment settling out of suspension would decrease. However, it is also presumed that sedimentation and maintenance dredge quantities would temporarily increase during the phased construction of the proposed action. The MARAD and the Port have modified their design and construction phasing to minimize this adverse affect to the federal maintenance dredging project to the maximum extent practicable and no more than minor impacts are anticipated.

The Corps is Coastal Hydraulics Lab is currently undertaking a sedimentation study to complement existing and proposed upgrades to the 2-D and 3-D tidal circulation models to provide quantitative, more informative projections of dredge quantities at the Port.

As stated above, the Corps applied an existing hydrodynamic circulation model of upper Cook Inlet and the Port of Anchorage vicinity to compare tidal circulation patterns at and near the Port under existing and the proposed

expansion conditions of the Port. The majority of water volume that moves through Knik Arm flows within the deep tidal gorge and does not flow across the tidal flats at the Port. The proposed Port expansion would have little affect on the overall flow through the deep gorge and the numerical model depicted that increases in current speeds were relatively minor, although flood tide flows were shown to increase along most of the proposed dock face (except on the south end, where current speeds decreased). The depicted increase in flood current speed from south to north along the dock face generally suggests that sediment deposition in the harbor basin would decrease during flood flows.

Under ebb tide conditions, the model showed that the proposed expansion greatly suppressed the gyre formation south of Cairn Point. The proposed expansion resulted in ebb flows to be directed to the south for longer periods and at higher speeds. This indicates that the proposed expansion would result in a hydrodynamic regime that would be less conducive to settling suspended sediments out of the water column at the dock face.

The 2-D model analysis also included adjacent properties south of the Port and at Port McKenzie. Current speeds and direction at Port McKenzie were shown to be unaffected by the proposed expansion. Also, the proposed expansion had a minimal effect on current speeds and no affect on directional patterns at Ship Creek and negligible to no affects on circulation patterns in the area of the Woronzoff Flats.

Wetlands as ground water recharge areas 320.4(b)(2)(vi):

There are no wetlands within the proposed port expansion development footprint. The water received by some of the wetlands that would be lost due to the proposed gravel extraction developments may infiltrate into to the groundwater. Available information does not indicate that the proposed wetlands areas provide important recharge functions.

Wetlands as maintaining baseflows for aquatic resources 320.4(b)(2)(vi):

There are no wetlands within the proposed tideland development footprint. The proposed borrow pit development and haul roads would remove approximately 20.5 acres of emergent freshwater and scrub shrub wetlands. The emergent wetlands are topographical depressions that become impounded by historical developments (construction and gravel extraction) and receive their hydrologic input from precipitation and runoff. The closest flowing waters are Ship Creek to the south and Six mile Creek to the north. The wetland areas that would be impacted do not function to maintain the baseflows of either creek.

Proposed disposal site determinations 230.11(f)(2) (Mixing zone, in light of the depth of water at the disposal site; current velocity, direction, and variability at the disposal site; degree of turbulence; water column stratification; discharge vessel speed and direction; rate of discharge; dredged material characteristics; number of discharges per unit of time; and any other relevant factors affecting rates and patterns of mixing):

Construction related dredge material would occur at the existing Corps maintenance dredging open water disposal site, which is located approximately 3,000 seaward from and parallel to the main dock face. The Corps has been disposing maintenance dredge material at this location since 1980. Construction related dredge volumes, which would occur over approximately 5

years, would be a total less than the annual Corps maintenance dredge volumes, which have exceeded 2 million cubic yards annually since 2001. Dredged material is transported to the disposal site by tug and barge and discharged in increments of approximately 1,500 cubic yards. The water depth at the disposal site is between 50-80 feet and is annually surveyed by the Corps to ensure a maintained depth of -44 feet MLLW. Dredge Sediment mounding at the disposal site is not expected considering the high energy tidal currents in the area, which are uniformly oriented southwest along the natural channel of Knik Arm and is known to redistribute the dredged sediment. Current speed increases with depth and results in a bottom friction up to 4 feet/second. The substrate of the disposal site is classified as gravel with some silt. The turbulence in the dredging and disposal areas from the extreme tidal currents results in well mixed waters. Mixing zones are not necessary due to the high suspended sediment load of the natural marine environment, which consists of the same particulate type (primarily glacial till) as the dredge material. The water column at the disposal site is uniform (i.e., not stratified). The dredging and disposal activities would result in only minor temporary effects in the water column.

Special aquatic sites (Sanctuaries and refuges 230.40, Wetlands 230.41, Mudflats 230.42, Vegetated shallows 230.43, Coral reefs 230.44, Riffle and pool complexes 230.45), wetlands 320.4(a)(1), and 320.4(b)(1) and (2):

MUDFLATS

The proposed tideland development area contains unvegetated mudflats. Mudflats are special aquatic sites that are generally considered to have high ecological value. The mudflats of Knik arm are broad intertidal flats and marshes that flank the coastline and estuarine mouths of its tributaries. The mudflats within the project footprint would be permanently removed by the proposed port expansion design. However, the proposed project is not expected to alter water circulation patterns that would affect the inundation patterns of other, more productive mudflats of the region, which contain more extensive and diverse biota, and foraging and nursery areas.

Mudflats generally provide important habitat for numerous species of waterfowl, shorebirds, seabirds, fish, and benthic organisms. The mudflats within the immediate project area are considerably disturbed from historic development of the shoreline, which have either permanently removed or produce shading (existing port dock). The mudflats in the area are also subjected to high current scouring in the winter, high sediment deposition in the summer, and seasonal ice scour. The mudflats are unvegetated with very low benthic primary productivity (nominal to low amounts of macroalgae and microalgal activity), which is contributed to the high turbidity of the waters (lack of sunlight penetration) and sediment deposition and scouring patterns. Therefore, considering both the abundance of undisturbed mudflats within Knik Arm that would remain and the relatively low ecological value of the mudflats in the project area, the loss of an additional 51 acres is not expected to have a more than minor affects to the aquatic environment.

WETLANDS

The proposed action would result in a cumulative loss of 20.5 acres of scrub shrub and seasonally ponded wetlands on EAFB from the development of the gravel extraction areas at the North End Runway and Cherry Hill

borrow pits, with 8.5 acres occurring at the Cherry Hill Borrow Pit and 12 acres at the North End Borrow Pit. The wetlands within the project area have been disturbed by historical and existing adjacent developments and activities. Nonetheless, the wetland areas provide valuable habitat for aquatic organisms, including the wood frog, Alaska's only amphibian, which is known to be an indicator species for habitat value. The wetland areas that would be impacted on EAFB have been cumulatively assigned a relative ecological value of 2, in accordance to the Anchorage Debit/Credit Methodology. The wetland losses associated with the proposed action are not expected to result in more than minor individual or cumulative affects to aquatic resources. The following characterizes the wetland disturbances that would occur within the gravel extraction development areas and mitigation measures:

Cherry Hill Borrow Site:

The 97-acre Cherry Hill Borrow Site contains an existing gravel pit, portions of which has been used in the past as material sources for EAFB and POA construction projects, and has received extensive ground disturbance. 21 acres are currently used as a borrow source and another 20 acres have been reclaimed/revegetated from previous gravel extraction activities. The remaining 56 acres have been disturbed by past military activities. Additionally, a portion of the borrow pit is used as a snow dump for EAFB road maintenance.

North End Borrow Site:

Portions of the North End Borrow Site have been mined for gravel for EAFB construction project, which have resulted in extensive ground disturbance. The southeast section of the Borrow Site is currently an active gravel extraction area.

BASH:

The borrow pits and their respective wetlands are immediately adjacent to the north end of the North-South Runway and the west end of the East-West Runway on EAFB, which contributes to the risk of bird aircraft strikes. EAFB is in support of the removal of these wetlands as they attract birds that present bird aircraft strike hazards (BASH).

Mitigation Measures:

The applicant has minimized the total wetland impact from the originally proposed 34.5 acres of wetland losses identified in the permit application to the currently proposed cumulative loss of 20.5 acres. The applicant modified the footprint of the North End Borrow Pit and re-aligned the haul road from this pit to avoid wetland areas to the maximum extent practicable. The wetlands losses would occur within the watershed of the nearby anadromous Sixmile creek. Elmendorf wildlife biologists and the Corps have determined that the best available and practicable compensatory mitigation measures to contribute towards offsetting the unavoidable wetland losses of the proposed action would be three fishery enhancement mitigation projects on Sixmile Creek previously described in the document. These mitigation projects would be requirements of the DA permit, if issued. The applicant has entered into agreements with both EAFB and the Alaska Department of Natural Resources (ADNR) to reclaim the borrow pits

with native plant species to provide shrub wildlife habitat following their development.

A special condition would be added to the DA permit, if issued, to preclude vegetation clearing and extraction and fill operation within vegetated areas during bird nesting periods, to comply with the Migratory Bird Treaty Act.

Wetlands would be avoided during the period of April 1 to July 15 to enable Wood Frogs the opportunity to breed and the tadpoles to develop into froglets, which would hopefully relocate to wetlands adjacent to the project area.

The Triangle and Fish Lakes wetland complex is an area of high habitat and recreational value. The North End Borrow Pit boundary was reconfigured to exclude this area from development plans. A 300 foot buffer would be maintained between the wetland complex and the limit of borrow activities by special condition to the DA permit, if issued. The applicant would be required to install and monitor a series of wells in the western portion of the North End Borrow Pit to assure that gravel mining activities do not undermine adjacent wetland hydrology. Recreational access would be maintained to the lakes by modifying traffic patterns and constructing an access trail to Triangle Lake from the north.

Fish, crustaceans, mollusks, and other aquatic organisms in the food web 230.31 and aquatic ecosystem and organism determinations 230.11(e):

The proposed action would remove approximately 135 acres of intertidal and nearshore subtidal waters of Knik Arm. It is estimated that approximately 60% of Knik Arm is intertidal, providing extensive tidal flats along the shoreline and marshes at riparian confluences. Knik Arm estuary supports numerous anadromous streams and provides habitat for waterfowl, shorebirds, seabirds, fish, marine mammals, and benthic organisms. The primary aquatic organisms of concern identified in the public interest review process are salmonids and beluga whales. The proposed action, which would occur near the opening of Knik Arm, would directly affect salmonids and beluga whale habitat within the immediate project area and secondarily affect salmonids and belugas whales migrating northeast up Knik Arm to the several freshwater confluences.

Due to extreme tidal currents, turbulence, turbidity, and seasonal variations in substrate scouring and sedimentation patterns, the intertidal and nearshore subtidal waters of the project area provides minimal primary productivity and supports relatively limited habitat for benthic organisms. The physical conditions of Knik Arm are extreme: Deep channels flanked by shallow tidal benches, extreme tides, winter water temperatures slightly below freezing, low and seasonally variable salinities, high suspended sediment load with (high turbidity), high rates of sediment delivery to the shorelines from eroding bluffs, and seasonal ice formations that scour intertidal and shallow subtidal substrates. These physical conditions create unique ecological challenges, which influence on the nature of the habitats and trophic processes.

The MARAD and the Port of Anchorage conducted fish and benthos sampling and analysis in the vicinity of the Project to provide additional information on

the unique ecological conditions in Knik Arm. The Pentec sampling report determined that many of the generalizations common to littoral habitat functions in other parts of Southcentral Alaska are partially to completely inapplicable in Knik Arm. Pentec concluded many functions generally associated with littoral habitats are not provided by Knik Arm shorelines; i.e., shallow water and/or structures are not necessarily a refuge for juvenile salmonids and there are few, if any, predators present. While Pentec captured large numbers of amphipods and crangonid shrimp in their beach seining, tow-net data indicated these prey types and juvenile salmonids are as abundant in offshore waters. Pentec determined that it is likely that juvenile salmonids in Knik Arm are not dependent on littoral habitats. Impacts to fish habitat from the proposed project is discussed under the Essential Fish Habitat Section below.

Marine Mammals:

Upper Cook Inlet in the region of Knik Arm has little documented use by Killer whales, steller sea lions, minke whales, and harbor porpoises. Harbor seals are known to inhabit Augustine and Shaw Islands and on the entire west side of Cook Inlet, with high concentrations at the mouth of the Susitna River. According to the NMFS, the project area provides high value beluga whale habitat, including summer feeding areas. The Cook Inlet beluga population is a small geographically isolated and genetically distinct stock with a range that is to be largely confined to Cook Inlet. The Cook Inlet beluga population has declined since 1994. The NMFS designated the Cook Inlet beluga population as depleted under the MMPA in 2000. The NMFS performs annual flight sighting surveys and mathematical analysis to predict actual populations of adults and juvenile beluga whales. The latest survey at the time of the public notice suggested a population of approximately 278; since then the population is estimated to have increased slightly. The NMFS undertook a status review of the Cook Inlet beluga stock to determine whether the population should be listed under the Endangered Species Act and has locally proposed listing.

The following information on the depleted Cook Inlet beluga whales was provided by the NOAA Office of Protected Resources:

"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, 2005). The only stock likely to be affected by the proposed construction activities at the Port of Anchorage is the Cook Inlet stock. The Cook Inlet stock is the most isolated of the five stocks, based on the degree of genetic differentiation between this stock and the four others (O'Corry-Crowe *et al.*, 1997).

The Cook Inlet beluga whale population has declined significantly over the years (NMFS, 2005). 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). The annual abundance surveys conducted each June or July from 1999 to 2006 have resulted in abundance estimates of 367, 435, 386, 313, 357, 366, 278, and 302 whales for each year, respectively (Rugh *et al.*, 2006, NMFS unpublished data). The Cook Inlet beluga whale stock is considered below its Optimum Sustainable Population and there is considerable concern regarding its small population size. In response

to this significant decline, NMFS designated the Cook Inlet stock of beluga as depleted under the MMPA on May 31, 2000 (65 FR 34590). In March 2006, NMFS formally initiated a Status Review of the Cook Inlet beluga whale to determine if this stock should be listed under the ESA. On April 20, 2006, NMFS received a petition from Trustees for Alaska to list Cook Inlet belugas as endangered under the ESA. After reviewing the information contained in the petition, as well as other scientific information readily available, NMFS determined the petitioned action may be warranted (Rugh *et al.*, 2006).

In November, 2006, NMFS published the Status Review and Assessment of Cook Inlet Belugas. This assessment reported the results of a detailed population viability analysis developed specifically for the Cook Inlet beluga population. The analysis explicitly modeled small population effects, demographic stochasticity, allee effects, predation mortality, and unusual mortality events. Following are the conclusions of the status review:

- The contraction of the range of this population northward into the upper Inlet makes it far more vulnerable to catastrophic events with the potential to kill a significant fraction of the population.
- The population is not growing at 2% to 6% per year as had been anticipated since the cessation of unregulated hunting.
- The population is discrete and unique with respect to the species, and if it should fail to survive, it is highly unlikely that Cook Inlet would be repopulated with belugas. This would result in a permanent loss of a significant portion of the range for the beluga species.
- The importance of anadromous fish runs in Cook Inlet to belugas is evident. The bulk of their annual nutrition is acquired during the summer months.
- The PVA shows a 26% probability of extinction in 100 years and 68% probability of extinction in 300 years (for the model assuming one predation mortality per year and a 5% annual probability of an unusual mortality event killing 20% of the population). It is likely that the Cook Inlet beluga population will continue to decline or go extinct over the next 300 years unless factors determining its growth and survival are altered in its favor.

Since the preparation of this Status Report, NMFS has concluded that the Cook Inlet beluga whale qualifies as a "distinct population segment" (DPS) under the ESA and has proposed to list it as endangered. The public comment period on the proposed listing of this DPS has been extended to July 19, 2007.

Primary Threats to Cook Inlet Belugas

The Conservation Plan has identified factors that determine the growth and stability of this stock. The plan identifies 4 natural factors include stranding events, predation by killer whales, parasitism and disease, and habitat capacity and environmental change. The plan identifies 9 human induced factors include 1) subsistence harvest, 2) commercial fishing, 3) pollution, 4) vessel traffic, 5) tourism and whale-watching, 6) coastal development, 7) noise, 8) oil and gas, and 9) research. The conservation plan specifically cites concerns

regarding the effects that the Port of Anchorage expansion will have on the belugas, including effects from encroachment into lower Knik Arm from the expansion, increased ship traffic, increased noise levels due to port construction (pile-driving) and operation, and physical loss of habitat due to landfill.

Distribution

Cook Inlet beluga 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, CI 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. They 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. They often retreat to the lower portion of Knik Arm during low tides.

Satellite transmitters attached to 14 beluga whales in upper Cook Inlet in the summers of 2000-2002 (Hobbs *et al.* In review) provided location and movement data through the fall and winter and into May. These data found that in August, beluga whales were concentrated in Knik Arm, along the Little Susitna River delta, or in the area of Fire Island, Point Possession, and Turnagain Arm. 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. In January, February, and March, beluga whales used the central offshore waters moving as far south as Kalgin Island and slightly beyond. Beluga whales also ranged widely during February and March with excursions to Knik and Turnagain Arms, in spite of greater than 90 percent ice coverage (Hobbs *et al.* In review).

The traditional wisdom and knowledge (TWK) of Alaska Natives (Huntington 2000) and systematic aerial survey data (Rugh *et al.* 2000) indicate the summer range of CI beluga whales has contracted (not as many animals seen as far south anymore), especially since the mid 1990s. This shrinking distribution is probably a function of a reduced population with the remaining whales using the best habitat that offers abundant food, the best calving areas and the best escape from predation. An expanding population will refill the previously utilized areas in the lower Inlet. Therefore, maintaining quality habitats in these areas is essential to recovery of the population.

Habitat

Within this distribution, NMFS has characterized the relative value of four habitats as part of the management and recovery strategy in its "Draft Conservation Plan for the Cook Inlet Beluga Whale (*Delphinapterus leucas*)" (NMFS, 2005). 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 north of Anchorage in Cook Inlet is classified as Type 1 on the east side and type 2 on the west side. The objective is to preserve Type 1 habitat.

Reproduction

Beluga whales typically give birth to a single calf every two to three years, after a gestation period of approximately 14 months. Most of the calving in Cook Inlet is assumed to occur from mid-May to mid-July (Calkins 1983), although Native hunters have observed calving from April through August (Huntington 2000). Alaska Natives described calving areas within Cook Inlet as the northern side of Kachemak Bay in April and May, off the mouths of the Beluga and Susitna Rivers in May, and in Chickaloon Bay and Turnagain Arm during the summer. The warmer waters from these freshwater sources may be important to newborn calves during their first few days of life (Katona et al. 1983; Calkins 1989). Mating follows the calving period. Reports on the age of sexual maturity vary from 10 years for females to 15 for males (Suydam et al. 1999), to 4 to 7 years for females and 8 to 9 years for males (Nowak 1991). Beluga whales may live more than 30 years (Burns and Seaman 1986).

Social

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 Cook Inlet (Figure 1). It is not known whether these represent distinct social divisions. Native hunters have stated that beluga whale form family groups and suggest that there are four types of beluga whales in Cook Inlet, distinguished by their size and habits (Huntington 2000).

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).

Beluga whales in Cook Inlet often aggregate near the mouths of rivers and streams where salmon runs occur. 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. 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 Cook Inlet 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 lb.).

The smelt-like eulachon (also named hooligan and candlefish) is a very important food source for beluga whales in Cook Inlet. Eulachon may contain as much as 21 percent oil (total lipids) (Payne et al. 1999). These fish enter the upper Inlet in May. Two major spawning migrations of eulachon occur in the Susitna River, in May and July. The early run is estimated at several hundred thousand fish and the later run at several million (Calkins 1989). Stomachs of beluga whales harvested from the Susitna area in spring have been filled with eulachon (NMFS unpublished data. 2000

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 of Anchorage, 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 whale⁷. 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. Fried et al. (1979) noted that beluga whales in Bristol Bay feed at the mouth of the Snake River, where salmon runs are smaller than in other rivers in Bristol Bay. However, the mouth of the Snake River is shallower, and hence may concentrate prey.

Beluga Hearing Sensitivity

One of the most important aspects to assess the effects of high intensive sounds on marine mammals is to understand their hearing sensitivity. The hearing threshold of marine mammals varies greatly from species to species, and often depending on the species sensitivity to a particular frequency range (Richardson *et al.*, 1995; Nachtigall *et al.*, 2000). Judging by the sounds they produce, cetacean hearing varies by species from extreme low frequency capability in larger whales (Thompson *et al.*, 1979; Clark, 1989; Nishimura and Conion, 1994) to very high frequency sensitivity in small odontocetes (Schevill and Lawrence, 1953; Møhl and Andersen, 1973). Studies of audiograms of

several cetacean species confirm that most odontocete species have sensitive hearing between 1 - 120 kHz (see review by Richardson *et al.*, 1995; Nachtigall *et al.*, 2000).

Beluga whale peak hearing sensitivity is between 10 and 100 kHz (Richardson *et al.*, 1995), and within that range their best hearing threshold approaches 42 dB re 1 μ Pa. Above 100 kHz their sensitivity drops off very fast but the bandwidth of their hearing extends as high as 150 kHz (Au, 1993); below 8 kHz the decrease in sensitivity is more gradual, approximately 11 dB per octave (Awbrey *et al.*, 1988). Beluga whales are able to hear frequencies as low as 40 - 75 Hz (Johnson *et al.*, 1989), but at these frequencies their sensitivity is quite poor (the threshold level at 40 Hz is on the order of 140 dB re: 1 μ Pa).

Studies on small to moderate-sized odontocetes, such as harbor porpoises and killer whales, all showed similar hearing frequency sensitivities to those of beluga whales, i.e., they all have poor hearing sensitivity at frequencies below 1 kHz, but extremely good sensitivity at, and above, several kilohertz (Andersen, 1970; Szymanski *et al.* 1999; Kastelein *et al.*, 2002).

Noise Levels Produced by the Port

Marine mammals rely on underwater sound for communication, foraging, navigation, and predator avoidance; therefore, acoustic cues are vital to their survival and reproductive success. However, the amount of anthropogenic sound introduced into the sea by human activities has substantially increased the ambient sound level in the ocean during the last 100 years. Much of this increase is due to the increased size of ships and shipping fleets. In addition, coastal industrial activities and active sonars, such as fishfinders and echosounders, used by both fishing and recreational vessels also introduce certain amounts of anthropogenic sound into the marine environment (Hildebrand, 2005).

The impacts of these anthropogenic sounds on marine mammal populations are not fully understood at this time. However, pervasive underwater sound from commercial shipping increases levels of background noise, which may mask acoustic signals that are important for marine mammal communication, foraging, predator avoidance, and navigation (Kruse, 1991; Miller *et al.*, 2000; Croll *et al.*, 2001; Foote *et al.*, 2004). Noise may affect developmental, reproductive, or immune functions, and cause more generalized stress. Some studies show that long-term exposure to anthropogenic noise may cause marine mammals to abandon their essential habitat (e.g., Bryant *et al.*, 1984; Morton and Symonds, 2002).

Upper Cook Inlet is one of the most industrialized and urbanized regions of Alaska. As such, ambient noise levels are high (Blackwell and Greene, Jr., 2002). The common types of noises in upper Cook Inlet include sounds from vessels, aircraft, dredging, construction equipment such as diesel generators, bulldozers, and compressors, and from construction activities such as pile-driving.

As mentioned above, several of the components of the Port of Anchorage expansion have the potential to disturb individuals, alter habitat, or affect the growth or stability of the population, including high levels of in-water sound generated during port construction (pile-driving),

physical loss of habitat due to landfill, and increased vessel noise following the port expansion. Upon review, we have determined that some of the Port's activities, specifically construction activities (including pile-driving) during the redevelopment may harass marine mammals pursuant to the Marine Mammal Protection Act and thereby require an Incidental Take Authorization."

The direct impacts of the proposed project would permanently remove marine habitat used by beluga whales. The potential adverse secondary impacts include diminishment of habitat value through physical and acoustic alteration and increased operational noise levels at the expanded port. Potential temporary impacts include pile driving noise generation, which could cause injury or disrupt feeding activity. The NMFS believes that the proposed project would contribute to cumulative adverse impacts on Cook Inlet belugas and their habitat.

Beluga whales that are observed in the vicinity of the Port are most likely using the area around the mouth of Ship Creek to feed on salmon, eulachon, and other fish. Beluga Whales are known to feed on fish that take refuge in the gyre that forms south of Cairn Point. Beluga whales have been observed within the project area and it is believed that feeding may occur in the Port vicinity, including in the tidal current gyre created south of Cairn Point. Construction activities could result in excessive noise levels in the water column to an extent that beluga whales could be harassed or injured, which would constitute a "taking" that would violate the MMPA, unless specifically authorized.

The NMFS expressed concern that the expansion project may also restrict or discourage transit of whales through Cairn Point narrows to important feeding areas in upper Knik Arm. According to the NMFS, "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."

NMFS evaluated beluga habitat in Cook Inlet within the 2005 draft "Conservation Plan for the Cook Inlet Beluga Whale. The NMFS considers the area in the Port vicinity to be "Type 2 Habitat", which is high value habitat that includes "summer feeding areas and winter habitats in waters where belugas typically occur in lower concentrations..." It is believed that historical industrial activities in the Port vicinity have lowered the habitat type from the highest value.

Best available information obtained from previous studies, NMFS aerial survey data, and recent monitoring and studies associated with the Port of Anchorage and Knik Arm Crossing Projects, document that Knik Arm is used extensively by belugas for feeding and travel patterns, including the proposed project area. Knik Arm is used by belugas throughout most of the year, with higher concentrations in the project area (lower Knik Arm) in the spring and summer and upper Knik Arm August through November. Observational data (Rugh et al. 2000, 2005; LGL unpublished data) document decreased sighting rates in the waters of the project area at the Port of Anchorage compared to waters to the south and west of the project (e.g. Chickaloon River, Susitna River, and Little Susitna River) and upper Knik Arm, suggesting that industrial activity effects from vessel use and noise levels may alter beluga behavior and habitat use.

Sound perception is believed to be necessary for Beluga whales to efficiently navigate and communicate and excessive ambient noise levels are known to result in behavioral altering reactions ranging from tolerance or habituation to altered calling behavior, reduced habitat use, and flighting behavior. Based on observational data, the NMFS, believes that Cook Inlet beluga whales are especially intolerant of high frequency noise levels (such as that produced by small boats) that are within the most sensitive hearing range of beluga whales. The Port of Anchorage is primarily used by large commercial and military vessels that produce lower frequency noise, less detectable by beluga whales. The secondary impacts of the proposed project on noise levels, while not known to be acutely harassing to beluga whales, would include increased rates of vessel traffic and cargo handling activity, and increased maintenance dredging. Noise levels introduced in the water column during construction activities and subsequent increased vessel use and size and cargo handling operations at the expanded port should be minimized to the maximum extent practicable.

According to the NMFS, information that is needed to analyze the extent and duration of the effects of the proposed project and to appropriately mitigate construction and operational impacts includes beluga response observations to particular industrial noise introductions.

The loss of approximately 60 acres of nearshore subtidal marine habitat associated with the proposed action is expected to result in a relatively minor loss of beluga habitat, considering that over 20,000 acres of available mid channel subtidal habitat would remain in Knik Arm following the proposed action. Additionally, the National Marine Fisheries Services' Draft Conservation Plan for the Cook Inlet Beluga Whale (March 16, 2005), suggests that coastal development isn't a limiting factor to beluga populations.

The Port commenced a beluga whale monitoring program, in consultation with the NMFS, in August of 2005 to estimate the frequency of presence, to characterize habitat use and behavior, map in-water sound levels and distance attenuation of Port background noise and pile driving activities. The program included shut down procedures of in-water construction activities when beluga whales enter a designated radius. The sighting information included date, time, number of whales sighted by age class (adult, sub-adult, calf, estimated by color), heading, primary and secondary activity, location, and group swimming formation; and data collection on locations, movements, and behavior of beluga whales near the Port. Based on the monitoring observations, the primary activity of beluga whales in and around the proposed project area most often involved traveling in a linear formation and feeding in areas south of the project near the mouth of Ship Creek and the deep water narrows off of Cairn Point.

The applicant proposes to conduct an underwater noise study to verify the 180 and 160 decibel isopleths from in-water work associated with the proposed vibratory hammer pile driving activities. All existing data in Upper Cook Inlet is related to impact hammer pile driving on pipe piles, which is believed to produce greater noise levels than the proposed action. The impact hammers used to drive pipe piles generate a low frequency, high decibel sound known to transmit long distances in the water column. The proposed installation of sheet piles would use a vibratory hammer that generates a high frequency, low amplitude, believed to transmit lower sound levels.

Port expansion activities have the potential to "take" marine mammals by harassment, primarily involving in-water work. Takes by harassment will potentially result when marine mammals near the activities are exposed to the sounds generated by proposed construction activities and the operations of vessels and other equipment associated with construction. No take by serious injury is expected, given the nature of the planned activities and the mitigation measures that are planned. No lethal takes are expected. The LOA application is currently being reviewed by NOAA/NMFS.

In May 2006, the Port submitted to NOAA/NMFS an application for issuance of a Letter of Authorization (LOA) and an Incidental Harassment Authorization for the Taking of Marine Mammals (belugas) during Phase II Construction Activities associated with the Port expansion project. This request is for the incidental, unintentional, taking of small numbers of marine mammals during Phase II activities for the period of April 2007 to April 2012. This LOA application is pursuant to Section 101(a) (5) of the Marine Mammal Protect Act (MMPA), 16 U.S.C. § 1371.101 (a) (5); 50 CFR § 216, Subpart I. With the proposed "soft start" ramp up procedures and the required monitoring and operation shut down procedures, it is not anticipated that the proposed project would result in a mortality, injury or Level A harassment taking of a beluga or other marine mammal.

The LOAs that would be issued would include mitigation measures, a plan of cooperation; and a monitoring, reporting, and research coordinating plan to reduce and evaluate the incidental taking before, during and after construction. The DA permit, if issued, would include MMPA taking authorization conditions by reference and specific conditions to minimize the temporary and secondary noise levels associated with construction and subsequent operational activities to the maximum extent practicable.

It is not anticipated that any federally protected marine mammal takes would result in the form of mortality or injury (Level A harassment). However, based on introduction of construction noise; i.e., pile driving, and increased vessel traffic, Level B harassment may occur and is defined as "the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild". Takes by harassment will potentially result when marine mammals near the activities are exposed to the sounds generated by proposed construction activities and the operations of vessels and other equipment associated with construction. A threshold value of 180 decibels related to 1 micro Pascal (dB re 1 μ Pa) sound pressure levels (SPLs) as criteria for marine mammal harassment is generally accepted based on published threshold values for temporary threshold shift in marine mammals and criteria used by NMFS when issuing small take authorizations.

During the LOA approval process, mitigation measures will be identified, including contractual requirements of construction contractors, to implement approved plans for marine mammal monitoring, enforcement of non-pursuit, and shut-down of in-water work when marine mammals are seen within defined ranges to further reduce short-term reactions, and minimize any effects on behavior. In all cases, the effects are expected to be short-term, with no lasting biological consequence. No "take" by serious injury or death is expected, given the nature of the planned activities and the mitigation measures that are planned.

The potential taking of belugas by "level B" harassment is expected to result in minor impacts to the population vitality. These impacts are likely to occur even if the no-action alternative was selected; the purpose of the proposed action is to efficiently accommodate the projected increase in ship operations, which would likely occur whether or not the project is completed. The more efficient operations from the re-developed and expanded marine terminal would likely result in less long-term noise impacts as ship operations would be improved and wait times for berth space would be reduced and/or eliminated. No more than minor long-term noise impacts associated with the anticipated increases in ship traffic are expected.

BIRDS

Coastal marshes in Upper Cook Inlet provide important resting and staging areas for migrating waterfowl and breeding habitat. The marshes provide recreational opportunities to south central Alaska, which is the most heavily populated area of the state. Common waterfowl observed in the salt marshes and wetlands of upper Cook Inlet include pintails, mallards, green-winged teal, lesser Canada geese, cranes, and swans. The Susitna Flats salt marsh reaches peak waterfowl density in May for feeding, resting, and mating by up to 100,000 waterfowl and several thousand lesser sandhill cranes. Between 8,000-10,000 ducks are believed to nest in the flats.

Common shorebirds include plover, sandpipers, yellowlegs, dowitchers, and phalaropes. Shorebird distribution is related to food availability, primarily clams, gammarid amphipods and algal cover. Vegetated flats and marshes provide important shelter food sources to shorebirds and waterfowl, including alkali-grass, insects, and algae. The primary shorebird concentration areas are along the western shores of Upper Cook Inlet in Redoubt Bay, Trading Bay, and the marsh flats of the Matanuska, Knik, Susitna, and little Susitna Rivers. The shoreline tidal flats and marshes south of Ship Creek to Potter Marsh and West Chester Lagoon have high concentrations of migrating waterfowl and shorebirds and is considered high value habitat.

There is limited use of the mudflats of the Ship Creek estuary by birds; however, shorebirds, gulls, and waterfowl are observed in the area. The area of designation for migrating birds terminates approximately one mile south of the project area, which strongly indicates that valuable habitat that supports bird species diversity does not extend northward into the proposed project area.

The proposed project area is an unvegetated mudflat with little macroscopic life presence and low bird use. The project involves subtidal and intertidal development, where nesting and rearing habitat is extremely limited due to the lack of food and shelter sources. Although there is limited information on bird use of the mudflats immediately north of the project area, USFWS surveys in 1991 found a total of 14 individuals comprising 2 species (spotted sandpiper and mew gull). The intertidal areas at the mouth of Ship Creek and south are considered to be high value waterfowl habitat and the area north of Ship Creek to Cairn Point (the project area) is considered to be relatively low value waterfowl habitat for breeding and migrating.

Areas within the Port boundaries are monitored by the U.S. Department of Agriculture (USDA) Wildlife Services for bird presence and removal to minimize potential safety hazards associated with EAFB flight activities. On an annual basis (May, June and July) the USDA is actively involved in gull

control on Port property. The program removes bird nests and eggs, as well as juvenile birds. Juvenile gulls removed are relocated to the Palmer Hay Flats State Game Refuge outside of the Anchorage area. The proposed action is expected to result in no more than minor direct, secondary, or cumulative impacts to bird habitat and resources.

ESSENTIAL FISH HABITAT:

The proposed work has been evaluated for possible effects to Essential Fish Habitat and coordinated with the National Marine Fisheries Service pursuant to the Magnuson Stevens Fishery Conservation and Management Act of 1996.

The POA and MARAD initiated consultation with the NMFS, as required under the MSFCMA. The Phase 1 project permitted in August of 2005 removed 27 acres of Essential Fish Habitat. Little is known about fish use in Knik Arm as it relates to distribution by habitat type, feeding behavior, migration, and availability to prey. However, recent fish sampling studies conducted by the MARAD and Port for the proposed project revealed the presence of numerous species of adult and juvenile fish in the Port vicinity. However, the study depicted the project area as having a relatively limited habitat value compared to other nearshore environments.

According to the NMFS, "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." The fish species in the project area include fish used in recreational and commercial fisheries and as prey for larger fish and marine mammals. Recent studies completed in Knik Arm include the 2005 Pentec studies for the Port of Anchorage and the Knik Arm Crossing Project and other studies of Dames and Moore 1983 and Moulton 1996. Best available information indicate that that shallow waters along the tidal flat benches of Knik Arm are used for adult salmon migration, 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. The NMFS and the North Pacific Fishery Management Council identified Essential Fish Habitat (EFH) in upper Cook Inlet for anadromous Pacific salmon.

The primary species of salmon that have been documented to be within the proposed project area and thus most directly affected by the proposed project are juvenile chinook and coho salmon. Juvenile Chinook salmon sampled between Cairn Point and Point Woronzof were primarily of Ship Creek hatchery origin. The project area is located approximately 2000 feet north of the mouth of Ship Creek and the proposed action would remove most of the remaining intertidal and shallow subtidal waters north of the mouth to Cairn Point. 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. It is inferred that salmon smolts are flushed to the north in the project area by flood tides. The primary adverse effects to salmon smolts would be the removal of shallow water habitat in the project area where they may seek refuge from strong tidal currents and predators.

Project alternatives that reduce the amount of fill and incorporate a relatively shallow margin along the shore would reduce impacts to fish habitat by retaining a sheltered migratory corridor for salmon and prey species.

According to the NMFS, "The project area provides rearing and migratory habitat for several streams that drain into Knik Arm, in upper Cook Inlet." Based on information reviewed in the public interest review process, the Corps agrees with the NMFS that the project area is used by several fish species, including juvenile and adult salmon. However, there is no available information that indicates that the proposed project area is critical rearing habitat for juvenile salmonids. The primary impacts of the proposed action on juvenile salmonids are of hatchery origin, which rear at the hatchery. The project area provides poor rearing habitat and juvenile smolts, which may be unable to resist the strong flood tide currents are probably forced into the project area and take refuge under the existing dock structure and in the gyre south of Cairn Point, where increased predation may occur. Adult salmon have shown a strong preference for the shallow waters along the coastline of Knik Arm, including the project area.

The NMFS disagrees with conclusions made in the Pentec studies conducted for the project, which infers that, " juvenile salmonids in Knik Arm are not as dependent on littoral habitats as are the same species elsewhere." According to the NMFS, it is reasonable to assume the intertidal area of the project area is part of the functional Ship Creek estuary and would therefore provide 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."

The Corps disagrees that the project area is associated with the functional estuary of Ship Creek. The historic marshes of the Ship Creek estuary, north of the mouth have long been removed from the functional Ship Creek estuary. The project area does not provide lower salinity levels or other physical or chemical strata characteristics unique to the Ship Creek estuary, compared to other shoreline areas of Knik Arm. Furthermore, Cook Inlet and more specifically, Knik Arm, are large estuaries with low salinity levels during the summer months when smolts are outmigrating. There is no information that indicates that the waters of the project area provide any unique benefit to osmoregulating salmonid smolts compared to waters elsewhere in Knik Arm. Additionally, pile supported alternatives preferred by the NMFS would provide relatively little feeding habitat under the dock platform considering the additive affect of extreme turbidity and shading.

The recent fish sampling studies associated with the Port of Anchorage expansion project and the Knik Arm Crossing project indicates that the habitat of the project area does not provide the traditional aquatic habitat generally associated with near-shore areas. Additionally, the project area has been previously impacted by past Port and other industrial activities. Compensatory mitigation project would contribute towards offsetting the impacts of the project by providing enhancement/restoration to higher value fish habitats.

Based on historic commercial fishing activities, adults are known to pass through Knik Arm from June into September on the way to spawning streams. Juvenile salmon are assumed to pass through Knik Arm in May and June during out-migration.

The Pentec fish studies in the project area identified fish species, relative abundance, seasonal presence, habitat preferences, food availability, and food use (stomach content analysis). The 2004/2005 Pentec studies complemented the previous 1983 Dames & Moore study. Pentec investigated fish activity throughout Knik Arm in the vicinity of the proposed Port expansion, as well as further up Knik Arm. Pentec summarized data from the recent investigation and previous work to provide insight into the rearing and growth of juvenile salmon as well as other species, such as Bering cisco and saffron cod in Knik Arm. The Pentec studies questioned the traditional knowledge of visual feeding behavior in the highly turbid waters of Knik Arm (where turbidities exceed 1,000 nephelometric turbidity units) and noted that juvenile salmonids in Knik Arm are "not as dependant on littoral habitats as are the same species elsewhere, and are swept back and forth in strong tidal currents through Knik Arm with only a small portion along the shorelines." Therefore, the generally accepted views describing fish reliance on littoral habitat do not necessarily apply in Knik Arm.

Littoral habitat, or intertidal areas, are typically well lighted when inundated by tide water and are traditionally believed to provide important juvenile salmonid habitat including: refuge from predators; habitat features such as large woody debris, eelgrass, and kelp beds that provide refuge from predators; productive shallow waters with abundant prey, including epibenthic zooplankters such as harpacticoid copepods, amphipods, and mysids; and reduced salinity levels at stream confluences and estuaries that provide relief from osmoregulatory stresses.

Knik Arm is an extreme physical environment that affects the quality of the habitat, mainly: deep channels flanked by shallow intertidal and shallow subtidal benches that may be sand, mud (hard or soft), or gravel/cobble; extreme tide ranges; extreme tidally generated currents (exceeding 5 knots); lower intertidal and subtidal bottoms subjected to high current scour and high sediment bed loads; winter water temperatures slightly below freezing; low and variable salinities ranging from about 1 part per thousand (ppt) in the upper Knik Arm in the summer to 20+ ppt in lower Knik Arm in the winter; high suspended sediment loads (turbidities between 400-1000 NTUs) and sunlight penetration depths of only a few centimeters; high rates of sediment delivery to the shorelines from eroding bluffs, resulting in continuous sediment deposition that is redistributed by wave, current, and ice action; and seasonal ice formation and substrate scouring.

The Pentec study concluded that many of the generalizations common to littoral habitat functions in other parts of Southcentral Alaska and the Pacific Northwest are partially to completely inapplicable in Knik Arm. For example:

- *"Low benthic primary productivity* (Dames & Moore, 1983); small patches of macroalgae (rockweed and annual green algae are present on occasional boulders and riprap as far north as Cairn Point and the Port; Pentec, 2005a, b). Microalgal activity is low except in tidal marshes and in localized tufts or carpets of blue-green algae on some mud or clay beaches.
- *Minimal, if any, pelagic primary productivity* (Larrance et al., 1977); high suspended sediment load likely reduces the compensation depth to a few centimeters.

- *Significant contributions of organic carbon from streams*, especially during spring breakup (seen in beach seine and tow net hauls; Dames & Moore, 1983; Pentec, 2005a, b).
- *Second primary organic carbon source from high salt and/or brackish marshes*, especially in the major stream estuaries (Goose Bay, Eagle Bay) and high marsh benches in embayments (e.g., from Ship Creek to Point Woronzof).
- *Low to moderate density and diversity of invertebrates* (Pentec, 2005a) and potential prey for higher consumers such as fish and birds.
- *Majority of invertebrates are generally larger sizes* than can be consumed by smaller juvenile salmon (e.g., young of the year of all species).
- *Low abundances of invertebrates during the winter* (November through April; in Pentec, 2005a, b).
- *Limited densities of zooplankton* including smaller primary consumers such as copepods; importance as prey for fish under the conditions of Knik Arm is uncertain. Larval herring was the most abundant taxon in zooplankton in Knik Arm; larval herring were common in the diet of juvenile salmonids in northern Cook Inlet (Moulton, 1987) but were not significant in the diets of juvenile salmonids in Knik Arm; low incidence of fish in fish stomachs analyzed (Dames & Moore, 1983; Moulton, 1987; Pentec, 2005a).
- *Refuge from Predators* shallow water and natural and man-made features are not necessary as refuge for juvenile salmonids in Knik Arm because there are few, if any, predators. Predation by birds and fish that may be present in low numbers is typically visual and not very successful in this high turbidity environment. (Mean turbidity in Knik Arm during the 2004-2005 surveys were over 400 NTU). The study did find that juvenile salmonids to some degree are more abundant in areas sheltered from the strongest currents such as behind the existing Port wharf, and in a small cove just south of the Port MacKenzie fill (Pentec, 2005a, b)."

The Pentec study indicates that intertidal and shallow subtidal waters of the project area are not essential for successful juvenile salmonid rearing or migration in the study area. Tow net sampling showed a considerable presence of salmonids in the open waters of Knik Arm during the spring (May through July). The Moulton studies in 1997, which were collected in offshore surface waters of Upper Cook Inlet south of Fire Island, also showed offshore deep water use by juveniles. While the absolute densities, in terms of catch per set were higher along the shoreline (beach seine catches) than in offshore areas (tow net samples), the total numbers of juvenile salmonids present at any one time in the offshore versus shoreline areas could be considered greater by the total area of open water compared to the shoreline sample area, during the juvenile outmigration period or May through July. Pentec data from August and September 2005 showed that tow net catch of juvenile salmonids dropped while numbers of fish (primarily juvenile coho) remained present in beach seine catches. The study indicates that overall numbers of juvenile salmonids are likely greater at any given time during May through July in the offshore waters than in near-shore waters of Knik Arm or may reflect the inability of juvenile salmonids to control their movements given the extreme tidal currents turbidity. Thus, it cannot be said that juvenile salmonids favor, or show a "strong preference" for shoreline or offshore

habitats in Knik Arm, but that they are found in both habitat types. The higher catch per unit of coho and Chinook juveniles in beach seine versus tow nets is most likely contributed by their larger size (greater swimming ability) compared to pinks and chum and their ability to maintain position along shorelines.

Juvenile pink and chum salmon have a relatively brief residency in Knik Arm from late April through mid May and fish studies conducted in 2005 and 1983 suggests that there is no defined preference of migration patterns or abundance of the east side versus west side of Knik Arm for juvenile salmonids, adult salmonids, saffron cod, or all species combined.

The primary prey source of juvenile salmonids from stomach content analysis of the 1983 and 2005 Pentec studies were insects of terrestrial origin. Terrestrial insects are delivered to Knik Arm by wind, flight, and stream confluences. The aspect of the proposed action that would have the greatest affect on juvenile salmonid feeding opportunities would be the increase in separation between marine waters and adjacent terrestrial vegetation and insect sources. The density of available surface prey would likely be less than would be available to fish closer to shore. This impact is constant regardless of the design configuration (i.e., pile-supported deck vs. fill). The incremental effect would be impossible accurately measure in the field and is unlikely to measurably impact fish runs, or have more than minor impacts to fish populations. The Pentec studies indicate that the most probable mode of feeding by fish in Knik Arm is by silhouetting prey at the surface against a light sky. Assuming this is true, feeding is severely limited if not impossible under the existing pile-supported dock or a pile supported design alternative for the proposed project, compared to open water. Additionally, fish and invertebrates are largely excluded from pile supported structures in this region by ice buildup on the pilings from November through March. This same condition would exist under any pile-supported sections of dock included in the expansion, which limits the value of these areas as fish habitat. Also, there was a high degree of digestion of prey in many juvenile salmonids stomachs, which suggests that feeding may have occurred at some distance from the point of capture.

Feeding efficiency of juvenile salmonids has been shown to be impaired by turbidities in excess of 70 NTU (Bisson and Bilby, 1982), well below typical and persistent levels in Knik Arm (Pentec, 2005a). Based on 2004-2005 observations, visual feeding may be possible in microhabitats within the surface water in Knik Arm where short periods (minutes) of relative quiescence in the generally turbulent water allow partial clearing . Pentec observed feeding by phalaropes in surface waters in association with rafts of floating vegetative debris where short-term clearing allowed the phalaropes to find the amphipods present in those surface waters. Pentec also observed surface feeding by saffron cod where they were feeding on crustaceans in the clearer surface microhabitats. Pentec hypothesized that juvenile salmonids can also feed in these small ephemeral lenses of clearer waters where prey can be seen or silhouetted against the sky. From the observations, it appears that these areas occur in the middle of Knik Arm., as well as along shorelines.

The Pentec studies also determined that the high turbidity levels in Knik Arm result in a lack of schooling by juvenile salmonids and by other normally schooling fish such as herring and smelt, the turbid environment results in a lack the visual cues necessary for schooling, lack of visual predators (e.g., few if any avian predators or piscivorous fish). The lack of schooling

determinations is supported by the lack of large numbers of any species of salmon in any one beach seine or tow net set compared to lower Cook Inlet where large catches (often 100s) of juvenile salmonids in many sets are common. The high turbidity levels results in a limited abundance of smaller epibenthic and pelagic zooplankton, decreased primary productivity and a resulting reliance on food found near the surface, and a strong orientation of adult salmon to shallow near-shore areas (where they may gain some refuge from beluga whale predation).

A gradual increase in salinity in lower Ship Creek allows fish to easily acclimate to Knik Arm salinities (>15 ppt in May; >10 ppt in June). Salinity within Knik Arm is lower than generally found in open ocean environments, further reducing osmotic stress and easing acclimation of salmonids. Salinity will be the same in front of the new dock face as it now is along the present shoreline.

Temporary impacts of the proposed project include injury or death of fish from filling activities and noise associated with pile driving. Filling in areas where fish are present can injure, kill, and isolate fish. Injured and isolated fish are subject to increased predation (birds), disease, decreased feeding efficiency and/or death from subsequent fills. Impacts to fish associated with the proposed pile driving are unavoidable and the high turbidity and currents make monitoring difficult to impossible to 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. Permanent impacts involve the removal of intertidal and shallow subtidal habitats in the project area. The shallow water that provide sheltering areas of decreased currents, where juvenile fish tend to be more abundant, would be eliminated in the project area.

The high underwater Sound Pressure Levels (SPLs) generated by impact hammer driving of hollow steel piles are known to adversely effect fish and marine mammals. The proposed OCSP structure would primarily involve vibratory driving of relatively planar sheet piles (flat sheets approximately 20 inches wide and less than 1 inch thick). It is generally believed that use of vibratory hammers to minimize the introduction of harmful noise levels or SPLs, resulting in less adverse to the aquatic environment than impact hammers. The DA permit, if issued, will require use of vibratory hammers to the maximum extent practicable. That is, until engineered depth is achieved or until failure, at which point impact methods would be required to complete the driving to final depths. The impact pile driving hammers used for sheet pile are smaller and impart less energy into the surrounding water column than those used for large diameter pipe pile. According to the MARAD and the applicant, the sound for the two types of pile hammers differs not only in intensity but also in frequency and impulse energy. Impact hammers primarily emit sounds within a 100 to 800 hertz (Hz), the frequency range thought to be most harmful to aquatic species, while vibratory hammers, emit sounds is in the 20 to 30 Hz, below the range believed to be harmful.

SPLs in the water column are usually reported in units of decibels related to 1 micro Pascal (dB re 1 μ Pa), reported as either an instantaneous peak or root mean square (RMS). The NMFS has identified a threshold peak SPL of 180 dB at a 10 meter distance for minimizing harmful effects to and beluga whales. Impact pile driving typically produces SPLs in the range of 195 to 209 dB, while vibratory pile drivers produce SPLs in the range of 160 to 192 dB. Documentation of pile driving activities resulting in injury or death to fish

are associated with impact driving of hollow steel piles, larger diameter pile believed to result in the greatest impact. No studies have documented damage to fish from impact driving of steel sheet piles, although sound pressures generated may exceed the 180 dB threshold.

Attenuation of SPLs in the water column occurs with increased distance from the source. The Blackwell studies of 2005 measured sound pressure reduction over distance from impact steel pile driving in Knik Arm. The study determined that SPLs decreased approximately 20 dB with a multiple of 10 increase in distance. The Anderson and Reyff study of 2006, which is not specific to Knik Arm indicates a 4 dB decrease in SPLs as distance is doubled for impact hammer driving of sheet piles. Under the preferred alternative, sheet piles would primarily be driven with a vibratory hammer, which may generate peak SPLs up to 180 dB at an 80 m radius. Assuming that adult fish and marine mammals have adequate swimming ability to resist currents, there would be ample area in Knik Arm to avoid the potentially harmful radius.

The proposed action of the Phase II permit application would result in the loss of 51 additional acres of existing intertidal habitat. The intertidal area consists of an upper shoreline of rip rap, mud middle and lower shoreline behind and south of the existing Port wharf. These 51 acres are in addition to the 27 acres of intertidal development previously authorized for Phase I. Approximately 9 acres of the proposed development is currently under the existing wharf surface. While the habitat to be lost does comprise existing littoral habitat between Ship Creek and Cairn Point, existing habitat is of lesser value compared to other intertidal mudflat habitats in Knik Arm. The proposed action would result in the permanent loss of 60 acres of subtidal habitat, which constitutes a very small percentage of the acreage of water present in the central part of Knik Arm (e.g., about 0.5 percent of the approximately 20,000 acres of subtidal water area between Point Woronzof and the south entrance to Goose Bay). The primary relevance of the proposed action to biota is associated with the resulting affect on shoreline morphology and the potentially related affects on fish and/or marine mammal migrations, refuge from predation, and feeding opportunities. The three major studies of the ecology of Knik Arm (Dames & Moore, 1983; Pentec, 2005a, b), indicate that the lower intertidal and subtidal habitats of the project area are of minimal biological activity with a high rate of current and ice scour and high suspended sediment loads. The trawling efforts of the fish studies in and near the project area revealed very few benthic invertebrates (crangonid shrimp and gammarid amphipods) and demersal fish, (Dames & Moore, 1983; Pentec, 2005b). Additionally, the majority of subtidal habitat that would be filled by the proposed Phase II construction is largely an area that has been historically dredged for many years and is consequently devoid of a stable substrate and the primary biota of the food web. The proposed action area does not provide critical or unique habitat necessary to maintain biota vitality in Knik Arm.

Construction minimization measures

The in-water construction activities of the proposed action have the potential to entrap fish as fill and structures are placed. To reduce the potential impact from construction operations a fish rescue and release program will be developed for review and approval by the Alaska Office of Habitat Management and Permitting (OHMP), the Alaska Department of Natural Resources (ADNR). Construction contractors would be required to prevent the creation of pools that may trap fish between tide cycles during construction activities. A Fish Rescue and Release Plan would be implemented to capture and release inadvertently trapped fish. The plan includes dike closures

during low tides, employment of beach seines to collect and release fish observed behind the dike, and grading embankments to drain ebb tide flows. The ADNR, OHMP has agreed to assist in the collection and release of inadvertently trapped fish. The plan would at minimum include the following measures:

- Final closure of dikes will occur during a low tide to minimize the volume of water isolated from Knik Arm to the extent practical. This would also minimize the numbers of fish that could be trapped.
- A beach seine (or other nets) will be used behind the dike to collect fish (nets should be able to capture adults and juveniles). Captured fish would be immediately released to open water.
- All embankments shall be graded to drain so fish do not become trapped during the ebb tide.

To reduce in water noise, which can result in the injury or death of fish and marine mammals, the applicant shall use vibratory pile driving methods to failure, using impact hammers only to achieve final depth after vibratory methods have reached refusal. Additionally, the impact hammers used to drive sheet pile are apparently much smaller and generate considerably less energy and noise in the water column than those used to drive steel pipe pile.

Measures that would minimize adverse impacts to marine fish and mammals from SPL generated from pile driving activities has been evaluated by the MARAD and the POA, including use of equipment that produces lower SPLs, restricting of in-water work when mammals are observed within a specified radius, seasonal and tidal cycle restrictions, and employment of bubble curtains. The use of "bubble curtains" to reduce in-water noise from pile driving is not practicable considering water depths, high tidal current velocities, and configuration of the structure at the construction site, which would most likely render bubble curtains ineffective.

Minimization measures that would become conditions of the DA permit, if issued, would include requiring vibratory hammers to the maximum extent practicable (i.e., until refusal, whale monitoring and shut down procedures, soft start ramp up procedures, and prohibited pile driving periods following hatchery smolt release. Additionally, sound level measurements and monitoring during pile driving would be required to develop site specific empirical data to determine if additional sound minimization measures are necessary.

Wildlife 230.32, fish and wildlife values 320.4(a)(1), also fish and wildlife at 320.4(c):

The proposed tideland development would occur within an area that has historically been developed for port functions for almost a hundred years. The project footprint is not within an area with directly established fish and wildlife values. The sport fisheries of Ship Creek and other anadromous tributaries of Knik Arm have established community social and economic values. The proposed project would result in permanent and temporary impacts to marine fish and beluga whales, including their habitat. With the inclusion of permit conditions to minimize project related impacts, fish and wildlife losses are expected to be minor.

The proposed gravel extraction activities would alter 350 acres of wildlife habitat, and remove 20 acres of emergent and scrub shrub wetland habitat. The proposed borrow pit development boundaries are not considered to be areas of high value fish and wildlife habitat and are adjacent to existing borrow pits, Air Force runways, roads and other human developments. The proposed project would include borrow pit wildlife habitat reclamation, avoidance of the high value Triangle/Fish Lake and wetland complex, and the inclusion of conditions to minimize wildlife impacts. No more than minor impacts to fish and wildlife are anticipated.

Threatened and endangered species 230.30:

This application was coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. According to the USFWS: "Based upon the project description, the Service concurs that the proposed project is not likely to adversely affect any species under Service jurisdiction listed as threatened or endangered under the Endangered Species Act, as amended. Further consultation regarding this project is not necessary at this time. If project plans change, new information becomes available that would indicate listed or proposed species may be affected by the project, new species are listed that may be affected by the project, or listed species are observed on the project site, consultation should be reinitiated by your agency."

While the proposed project would not affect any threatened or endangered species at this time, it should be noted that the National Marine Fisheries Service proposes to list the depleted Cook Inlet Beluga Whale as threatened. Should the Beluga whale be listed, Section 7 consultation would be required.

Contaminant determinations 230.11(d) and 230.60:

Anchorage Harbor:

The Corps of Engineers has performed annual maintenance dredging activities at the Port of Anchorage since 1965. The dredge spoils are disposed in open water, approximately 3,000 feet seaward of the dock face. The Corps has historically performed chemical sampling within the authorized maintenance dredge footprint, which found the dredge spoils to be free of contamination at acceptable levels for open water disposal. The last Corps chemical sampling activities occurred in 1994. The DA permit application would only authorize the applicant to perform dock construction related dredging. Subsequent to the construction of the proposed dock, the Corps Civil Works program would deepen and maintain the harbor to -45 feet MLLW.

Considering that construction, transitional, and operational dredging would involve the dredging of virgin sediments, located outside the existing Corps maintained dredge footprint and at greater depths, the Corps and the MARAD cooperated to perform screening and sampling of sediments for the proposed expansion and operating depth. The Alaska District, Materials Section, Engineering Services Branch performed Geoprobe Rapid Optical Screening Tool (ROST) petroleum contamination screening of 26 sites in the project area in October of 2006. In addition to the ROST screening, fourteen of the twenty six sites were pre-identified for traditional chemical sampling to correlate ROST results with laboratory identified sediment chemical concentrations. Based on an anomalous positive ROST response, additional samples were taken for traditional chemical analysis, which confirmed the absence of contamination. All laboratory results were below the Puget Sound Dredging

Disposal Analysis (PSDDA) screening levels. Therefore, based on the screening and sampling results, all sediments proposed to be dredged are suitable for open water disposal without additional testing. The Chemical Data Report, Anchorage Harbor ROST Study was finalized in January 2007 and coordinated with the EPA. All field screening and sampling was performed in compliance with the Work Plan that was coordinated and approved by the EPA. With the exception of the one anomalous ROST response, all ROST data indicated that contaminated substrate is not present. Very low levels of several organic contaminants were reported in laboratory samples collected at several locations throughout the project; however, all concentrations were well below screening levels and below concentrations that the ROST equipment would even be expected to detect.

Elmendorf Air Force Base:

Defense Fuels Property: The 48-acre Whittier-Anchorage Pipeline Tank Farm property (Defense Fuels Property) is adjacent to the Port of Anchorage property on the southeast. The Defense Fuels Property is a known contaminated area from historic military fuel storage activities. The Alaska Department of Environmental Conservation signed a Record of Decision in April of 2003, and institutional controls have been established to prevent the migration of contamination into Knik Arm.

North End Runway and Cherry Hill Borrow Pits: Several areas of potential soil contamination exist within the proposed borrow pit and haul road areas for past military activities. The MARAD, in cooperation with EAFB and ADEC have developed Soils and Groundwater Contamination Management Plans, which include soil sampling and screening programs. Annual development operation and reclamation plans are coordinated with EAFB and ADNR. The proposed project does not involve excavated or discharging contaminated soils.

LF04: Knik Bluff Landfill (LF04) is a historic military land fill along the bluff located to the north of the existing Port infrastructure. LF04 was used between 1945 and 1957 for the disposal of construction rubble, debris, and other solid waste. The steep bluff drops 200 feet to the shoreline and is a site of active tidal erosion, which exposes solid wastes to waters of Knik Arm. Contamination includes benzene. The Air Force, in accordance to their ROD under compliance a compliance agreement with the ADEC and EPA have imposed groundwater restrictions and annual ground water monitoring to determine migration of contaminants, degradation and dispersion. The military performs annual beach sweeps to locate and remove wastes exposed from the bluff. The proposed project would provide the benefit of protecting the bluff from tidal action and erosion, thus preventing the potential for introduction of contaminants into Knik Arm.

Ship Creek Area

Ship Creek flows through an industrial area of Anchorage, including the Anchorage Terminal Reserve (ATR). The Alaska Railroad Corporation (ARRC) and the United States Environmental Protection Agency signed an Administrative Order of Consent on June 29, 2004 to implement an environmental remedial investigation and feasibility study (RI/FS), within a 600-acre project area of the ATR. Various federal entities, including the Federal Railroad Administration (FRA), owned and operated within the area since 1915. The federal government transferred the Alaska Railroad to the state-owned Alaska

Railroad Corporation in 1985. The ATR includes the rail yard and other properties leased to tenants. The rail yard includes a track system, repair buildings, a fueling area, a steaming rack, warehouses, and offices. The leased properties of the ATR including power plants, trucking and transit operations, fuel storage, auto salvage, etc Activities within the ATR have included fueling, painting, steam cleaning, freight loading, and maintenance work on locomotives and rail cars, solid waste handling, hazardous waste storage, seeps to Ship Creek, spills, and elevated contaminant levels in soils, groundwater, and sediments.. The releases of industrial wastes and petroleum products have resulted in soil and groundwater contamination. The ARRC will sample the soil, groundwater, and surface water at several locations throughout the Anchorage Terminal Reserve during the RI/FS process to determine the nature and extent of contamination to assess the risk to human health and the environment and evaluate measures for remediation. A Ship Creek Surface Water and Sediment Assessment was completed by the ARRC in 2004, which resulted in the following general conclusions: 1) *"the environmental quality of surface waters and surface sediments in the areas included in this study to not indicate widespread or significant contamination with the constituents that were analyzed for in these samples"*, and 2) *"the metals concentrations in sediment samples appear to represent naturally occurring background or upgradient conditions. The metals concentrations are generally higher in sediments near the lower extent of Ship Creek, below the lower dam ... affected by saltwater..."*. The ARRC has installed a series of groundwater monitoring locations that will provide better information about the where some of the pollutants may have originated and where they may be moving in the groundwater. The proposed action would not affect contaminants in this area.

Water supply and conservation 320.4(a)(1) and 320.4(m), Municipal and private water supplies 230.50:

The proposed project is not expected to impact existing and potential water supplies.

Recreational and commercial fisheries 230.51:

There are no existing commercial or recreational fisheries in Knik Arm itself. Historically there was a terminal fishery located on the western shore of Knik Arm at the mouth of Fish Creek and south to Goose Bay. This fishery has been closed for some time and is not expected to be reopened in the foreseeable future according to the Cook Inlet Set Netters Association. Although Knik Arm itself isn't used for recreational or commercial fishing, the loss of fish habitat from the proposed action would affect the fisheries of its fresh water tributaries. The Ship Creek hatchery would potentially receive the most direct adverse effects from the proposed loss of intertidal and shallow subtidal habitat between the mouth of the creek and Cairn Point. The Ship Creek sport fishery provides an extremely popular recreational fishery, which, according the ADF&G, is the second highest angular-use fishery in the State of Alaska.

The proposed project area is within the Northern District of Cook Inlet commercial fisheries management, which includes the Upper Cook Inlet marine waters north of Boulder Point. Set gill-nets are the only permitted commercial fishing within the Northern District. There are beach set netters west of Point Mackenzie in Upper Cook Inlet.

The proposed action is not expected to result in more than minor impacts to recreational or commercial fisheries and the proposed compensatory mitigation would fund fishery restoration and/or enhancement projects.

Subsistence:

The proposed project involves the loss of approximately 135 acres of intertidal and subtidal marine habitat in the Knik Arm estuary, approximately 2200 feet north of the mouth of Ship Creek at the closest point. The primary anadromous fresh water stream inflows of Knik Arm that provide salmon resources used for subsistence are the Susitna, Knik, and Matanuska Rivers, which would indirectly impacted by the proposed project. The loss of intertidal and shallow subtidal waters of Knik Arm as whole by the proposed project is not expected to have an appreciable impact to subsistence resources. The Ship Creek estuary would experience the greatest direct impact from the proposed project. Ship Creek provides an important hatchery supplied urban recreational sport fishery; however, it does not provide recognized subsistence fishery resources.

Subsistence fishery use of Knik Arm includes saltwater set gill nets on the west side of the Arm. There are no subsistence fisheries in close proximity to the project area and the proposed project is not expected to have more than minimal impacts to subsistence fisheries.

Water-related recreation 230.52, recreation 320.4(a)(1):

The proposed project involves the expansion of existing Port infrastructure. The immediate vicinity of the Port of Anchorage is used for industrial purposes and does not provide any recognized recreational uses. Aside from the sport fishery of Ship Creek, located to the south of the proposed project, the area surrounding the Port of Anchorage provides nominal water related recreation. The development of the North End Borrow Pit and the POA Haul Road would temporarily preclude access to the existing Triangle Lake recreational area on Elmendorf Air Force Base (EAFB). The MARAD, in cooperation with EAFB, would mitigate this minor temporary impact by providing a new access trail and boat launch.

Aesthetics 320.4(a)(1) and 230.53:

The proposed project involves upgrading and expanding the existing Port infrastructure. The proposed expansion would affect the viewshed of the Government Hill community. While the project would involve a modification to the aesthetics of the existing coastline, it would be consistent with the existing adjacent industrial developments. No more than minor impacts are anticipated.

Wild and Scenic Rivers, National Wilderness Areas, National Seashores, National Parks, estuarine and marine sanctuaries 320.4(e), and for marine sanctuaries also 320.4(i), Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves 230.54:

The proposed project would not affect any known national preserves.

Energy needs 320.4(a)(1) and energy conservation and development 320.4(n):

The construction of the proposed project would have considerable energy

requirements; however, the energy demands of the proposed action is not expected to adversely affect energy conservation or development.

Navigation 320.4(a)(1) and 320.4(o):

Aside from a minimal amount of small boat use, the majority of navigation in Upper Cook Inlet involves the commercial vessel traffic at the Port of Anchorage. The Alaska District Corps of Engineers maintains the navigational channel and the harbor at the Port. The Corps is also mandated to lengthen the navigational channel and deepen the harbor at the Port of Anchorage to - 45 feet MLLW, which would allow larger class vessels to berth at the Port of Anchorage. Aside from temporary impacts to vessel berthing at the Port of Anchorage during the construction phases of the project, no impacts to navigation are anticipated. The proposed project would result in minor improvements to commercial navigation from the anticipated improvements to operational efficiencies. No more than minimal impacts to recreational navigation is expected.

Effects on limits of the territorial sea 320.4(f):

The proposed project would not effect the limits of the territorial sea.

Activities affecting coastal zones 320.4(h):

According to the Coastal Zone Boundaries Atlas, the Port of Anchorage is located within the Municipality of Anchorage Coastal District, Port of Anchorage Special Management Plan. The Alaska Department of Natural Resources, Office of Project Management and Permitting found the proposed project consistent with the Alaska Coastal Management Program.

Safety 320.4(a)(1), also safety of impoundment structures at 320.4(k):

The proposed project does not involve construction of an impoundment structure. The purpose and need of the project involves upgrading the existing dock structure to improve safety, as the existing dock structure is long past its original design life and is in a degraded state. According to the applicant, all construction activities would be conducted in accordance with all applicable safety requirements, rules, and regulations.

Historic properties (Section 301(5) National Historic Preservation Act) 320.4(a)(1) and 320.4(e):

The National Historic Preservation Act, Title 36 Part (36 CFR 800). Section 110(a)(2)(E) Part 800 requires the lead federal agency, to identify and evaluate cultural resources (historic properties). Section 106 Part 800 requires the lead federal agency to "take into account the effect of the proposed undertaking on any district, site, building, structure, or object that is included or eligible for the Nation Register." Section 106 also requires consultation with the SHPO for any federal project.

Section 101(d)(6)(A), requires consultation with "any Indian tribe...that attaches religious or cultural significance to historic properties that may be effected by the undertaking." It requires that the consultation, "provide the Indian tribe...a reasonable opportunity to identify its concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance,

articulate its views on the undertakings effects on such properties, and participate in the resolution of adverse effects.”

Archaeological sites, which may be inadvertently discovered during the proposed action, are protected by the Archaeological Resources Protection Act of 1979. Alaska Native remains (including grave goods), if inadvertently discovered during the proposed action, are protected by the Native American Graves and Repatriation Act of 1990 (43 CFR 10). Alaska Statute AS 12.65.5 applies to the discovery of all human remains. The MARAD and the POA would implement the established “EAFB Procedure and Point of Contact Sheet for the inadvertent Discovery of Human Remains” to comply with applicable laws.

The MARAD, as the lead federal agency, has considered the effect of the proposed action on historic properties within the areas of potential effect, which include the gravel extraction and haul road areas on EAFB. The MARAD has coordinated with the SHPO, the EAFB Cultural Resource and Environmental Office, and with native and tribal communities (including the Native Village of Eklutna, Native Village of Tyonek, Knik Tribal Council, Ninilchik Village Traditional Council, Seldovia Village Tribe, Native Village of Chickaloon, and the Kenaitze Indian Tribe). The MARAD completed research (records search and literature reviews) and cultural resource field surveys to identify, evaluate, and document cultural resources within the areas of potential effect and made determinations of eligibility (in accordance to NHPA criteria) for the National Register of Historic Places (NRHP), for the developments of the Cherry Hill and North End Borrow Pits and haul Roads.

Areas of Potential Effect (APE) of the borrow pit sites, for the purposes of the cultural resource monitoring plan, includes all areas which may be subject to ground disturbing activities, defined as the proposed borrow sites and the POA Haul Road transportation corridor (using a 100-foot wide investigative buffer corridor).

The following investigative reports were prepared by Stephen R. Braund & Associates under contract with ICRC (consultant for the Port of Anchorage Expansion Team) and submitted by the MARAD to the Corps and the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, Office of History and Archaeology for review:

Cultural Resources Monitoring Plan for Cherry Hill & North End Material Extraction, Revision 3, April 24, 2006:

Summary: This plan identifies how cultural resource monitoring will be conducted during road construction and material extraction activities at the North End and Cherry Hill Borrow Pits. This plan identified the activities that would occur from the proposed pit developments, research conducted to identify known cultural resources within the area of potential effect, the cultural resource surveys to be conducted, the responsibilities of the Cultural Resource Monitor (Stephen R. Braund & Associates) before and during project activities; consultation with Alaska Native Tribes and the State Historic Preservation Officer (SHPO); and the protocol that will be followed if human remains or cultural resources are inadvertently discovered/unearthed during the project activities.

Cultural Resources Survey, Port of Anchorage Haul Road, July 13, 2006:

This initial report was later revised in the *October 9, 2006, Volume 1 Report* described below.

Cultural Resources Initial Site Reconnaissance Cherry Hill Borrow Site, August 4, 2006

This report was revised in the *October 9, 2006, Volume 2* report described below.

Volume 1, Cultural Resources Survey: Port of Anchorage Haul Road July 13, 2006, Revised October 9, 2006

Summary: SRB&A conducted literature and archival reviews, cultural resource field surveys, and a workshop and field survey with the Native Village of Eklutna (NVE) to identify Trees of Interest (TOIs) or culturally modified trees (CMTs) for the proposed Haul Road project on EAFB. SRB&A and NVE identified 8 or more TOIs within the project vicinity and SRB&A identified 37 historic features. The TOIs/CMTs have branch shapes and trunk or limb twisting that some NVE members attribute to human causation. SRB&A determined that all of the observed tree shapes were characteristic of natural growth variations of birch and cottonwood trees in southcentral AK; the NVE believed the variations to be representative of TOIs/CMTs. The historic features identified in the survey were square or rectangular depressions in the ground; some of which contained milled wood, metal nails and hardware, communication wire, and sections of burlap bags. Based on the materials documented in, the shape, and the location of the depression, SRB&A interpreted the depressions to be associated with military defense positions at the Fort Richardson-Elmendorf Air Field during World War II (WWII) or military training activities following the war. The NVE believes the features may be affiliated with the Dena'ina culture.

The report determined that the 37 historic features and trees identified lacked the significance and integrity necessary for eligibility for the National Register of Historic Places (NRHP). Consequently, the report concluded that the proposed Haul Road project would not affect any historic properties. The NVE's Historic Preservation Officer believed that the project would affect historic and cultural properties from their tribal view due to their potential association with tribal history and spiritual connections associated with the landscape.

Volume 2, Cultural Resources Survey: Cherry Hill Borrow Pit, August 4, 2006, Revised October 9, 2006

Summary: Nearly 80 features were identified in the Area of Potential Effect (APE), including: ground depressions, two log-lined, cribbed wall depressions; barbed wire fence wire and pickets; a white picket fence feature that may be associated with a gravesite; concrete foundations and slabs; 55-gallon drums; two fuel supply and transportation tanks; abandoned utility poles; abandoned "Fun 'N' Fitness" physical training apparatus. Most of the features were determined to be associated with military defense positions at Fort Richardson-Elmendorf Air Field (as previously named) or as associated with post WWII military training activities. The report determined that none of the features identified contained the required integrity and significance for eligibility for the National Register of Historic Places. Therefore, the report concluded

that there would be no historic properties affected by the proposed action of gravel extraction at the CHBS. The white picket fence area, as it may represent a Dena'ina gravesite, was recommended for being flagged and avoided.

Cultural Resources-Initial Site Reconnaissance of the NEBS and Fish Lake Recreational Access Trail and Determinations of National Register Eligibility for the NEBP, December 2006 (received by the AK District on 23 January 2007)

Summary: Reconnaissance survey of the North End Borrow Pit documented more than 200 features or isolated artifacts, including ground depressions, concrete slabs and foundations, 55-gallon drums, abandoned utility poles, and a complex of ammunition storage bunkers/igloos with a defensive perimeter of structures, trenches, holes, and other infrastructure. Most of the features documented were interpreted as being associated with defensive positions built during World War II at the Fort Richardson-Elmendorf Army Air Field (as previously named) or associated with military training activities following WWII. Most of the features were included as clusters of associated features as follows: 1) bunker/igloo complex (ANC-02577), 2) anti-aircraft battery (ANC-02579, and 3) winter training area (ANC-02580). The report determined that the individual features of the three clusters and that the two of the three clusters (ANC-02579 and ANC-ANC-02580) lacked the required integrity and significance for eligibility for the NRHP. However, the report determined that the bunker igloo complex (ANC-02577) would be eligible as a historic district. The report also made determinations of eligibility of four previously documented features including a corrugated metal shelter (ANC-02005), a rock chimney/fireplace (ANC-02006), a gun emplacement and pillbox (ANC-02008), and the remains of a log cabin (ANC-02362). The report determined that the individual features were not eligible for the NRHP; however, the ANC-02005 feature contributes to the historic district of the bunker/igloo complex (ANC-02577).

Fish Lake Recreational Access Trail: Cultural Resources Initial Site Reconnaissance, December 2006 (received by the AK District on 23 January 2007)

The report recommended a finding of "No historic properties affected" (36 CFR Part 800.4(d)(1)) for the proposed work associated with the Fish Lake recreational access trail, as no historic properties were located in the project APE (36 CFR 800.16(d)).

On 1 November 2004 the ADNOR-OHA (SHPO) reviewed the Marine Terminal Redevelopment Project for conflicts with cultural resources under Section 106 of the NHPA. The SHPO concurred with the MARAD's determination that the following sites, located within the vicinity of the project area, are not eligible for the National Register of Historic Places (NRHP):

- ANC-760 (G.W. Palmer Warehouse)
- ANC-1302 (terminal end of Whittier to Anchorage military pipeline)
- ANC-1337 (Tak'at fish camp)

The SHPO also concurred with the MARAD that the potential increases in traffic and noise associated with the proposed project would not affect the

historic or potentially historic homes on Government Hill, located near the Port. The SHPO concurred with the MARAD that no historic properties would be affected by the project.

On 14 July 2005 the ADNR-OHA (SHPO) reviewed the Cherry Hill Gravel Extraction Project for potential impacts to historic and archaeological resources under Section 106 of the NHPA. The SHPO determined that the project area had medium to high archaeological potential for early homesteading sites associated with the early "Tent City" settlements and determined that archaeological monitoring should occur during the extraction process.

On 22 September 2006 the SHPO acknowledged receipt of the *Cultural Resource Survey of the Port of Anchorage Haul Road* and the *Cultural Resources Initial Site Reconnaissance Cherry Hill Borrow Site*. SHPO assigned the following Alaska Heritage Resources Survey (AHRS) numbers to the cultural resources that were identified in the surveys:

- ANC-2567: Military features along the Haul Road and Cherry Hill Borrow Pit
- ANC-2568: "Trees of Interest" along the Haul Road
-

The SHPO concurred with the report determination that the ten "trees of interest" (ANC-2568), which are within the Haul Road corridor, are not eligible for the National Register of Historic Places. The SHPO requested additional information on the 58 cultural features (Anc-2567) identified within the Haul Road Corridor and the 80 cultural features (ANC-2567) identified within the Cherry Hill Borrow Pit surveys are not eligible for the National Register of Historic Places. The additional information requirements of the reports are providing a historic context of World War II military defense and training activities on Fort Richardson-Elmendorf Air Field. The SHPO also recommended that the pillbox (ANC-1071) within the Cherry Hill Borrow Pit be flagged and avoided.

On 20 October 2006 the MARAD submitted revisions to the cultural resource survey reports for the Cherry Hill Borrow Pit and the POA Haul Road DOEs, in accordance to the SHPO recommendations of 22 September 2006. The pillbox (ANC-1071) was correctly identified as being outside of the Cherry Hill Borrow Pit project area. However, due to its close proximity to the project area, was flagged with instruction to field personnel for avoidance.

On 14 November 2006 the SHPO by letter acknowledge receipt of the Cultural Resource surveys for the Haul Road and the Cherry Hill Borrow Pit, dated October 9, 2006. SHPO reviewed the two undertakings under Section 106 of the National Historic Preservation Act. The SHPO concurred with the reports finding that ANC-2567 is not eligible for the National Register of Historic Places. The SHPO also concurred with the reports findings that no historic properties would be affected by construction of the Haul Road or the development of Cherry Hill Borrow Pit provided that the pill box (ANC-1071) and the potential gravesite (ANC-2587 are flagged off and avoided. The SHPO stated that the potential gravesite should have a minimum buffer of 75 feet because of the possibility of additional graves in the area.

On 17 January 2007 the MARAD provided a Determination of Eligibility, Determination of Effect, and a *Cultural Resources Survey Report* to the SHPO for the cultural resource features located within the NEBP and the Fish Lake/Triangle Lake Trail Corridor.

Fish Lake/Triangle Lake Project Area:

The MARAD determined that no historic properties would be affected during the proposed construction of the Fish Lake/Triangle Lake pedestrian trail as no cultural resource features eligible for the National Register were identified during the cultural resource survey of September 21, 2006, conducted by Stephen R. Braund and associates.

North End Borrow Pit: Determination of Eligibility and Determination of Effect for the Anti-Aircraft Batter, Winter Training Area, and Bunkers/Igloo Complex:

No features or indications associated with the use of the area by Dena'ina were or with the Anchorage Homesteading Era were discovered during the survey, which included 82 different excavations within the 255 acre borrow pit area.

Approximately 200 cultural resource features and isolated artifacts were identified and documented during the Cultural Resource survey. The features and artifacts were associated with military defense and training programs during the WWII and Cold War Eras and included barbed wire and screw pickets; fuel tanks, drums, and barrels; earthwork features (pits and depressions); structures and structural elements; and infrastructures components (trails and utility poles and wires); and the remains of a WWII era aircraft. The discovered features were grouped based on associated features and assigned Alaska Heritage Resource Survey (AHRs) numbers by the ADNR-OHA as follows:

- Anit-Aircraft Battery (ANC-2579)
- Winter Training Area (ANC-2580)
- Bunkers/Igloo Complex (ANC-2577)

Based on established criteria for determinations of eligibility for the NRHP, the MARAD determined that ANC-2579 and ANC 2580 were not eligible for the NRHP individually or as a historic district. The MARAD determined that the 59 features of ANC-2577 were collectively eligible for the NRHP as a historic district.

On 16 February 2007 the SHPO concurred with the MARAD finding that the Bunker/Igloo Complex (ANC-2577) is eligible for the NRHP under criterion A and C as a historic district and that ANC-2005 is a contributing property. The SHPO concurred with the MARAD that the remaining historic properties (ANC-2006, ANC-2362, ANC-2578, ANC-2579, ANC-2003, ANC-2004, ANC-2008, and ANC-2580) are not eligible for the NRHP. The SHPO also determined that the proposed development of the North End Borrow Pit has the potential to adversely affect the historic district ANC-2577 and ANC-2005, both of which are located with the NEBP. The SHPO determined that no historic properties would be affected by the proposed development of the pedestrian access trail between Fish Lake and Triangle Lake.

On 12 March 2007 the MARAD provided a Determination of Effect on the Bunker/Igloo Historic District (ANC-2577), which is located within the proposed project area of the North End Runway Borrow Pit. The MARAD determined that the ground disturbing activities associated with the road and borrow pit developments may have an adverse effect on ANC-2577. The MARAD proposed the development of a public brochure as mitigation for the anticipated adverse impacts to ANC-2577. The brochure would provide a historical narrative of the Bunker/Igloo complex and include historical and contemporary photographs. The MARAD stated that further adverse effects to ANC-2577 would be avoided until the mitigation is complete. The ANC-2577 is located in the northwest corner of the NEBP. The MARAD doesn't propose to develop the northwest corner of the NEBP until 2011.

On 22 March 2007 the ADNR, OHA (SHPO) reviewed the proposed development of the North End Runway Borrow Pit and the POA Haul Road under Section 106 of the NHPA. The SHPO concurred with the MARAD that tree clearing would not impact historic properties but that the development of the borrow pit would adversely affect Bunker/Igloo Historic District (ANC-2577), including the Corrugated Shelter Site (ANC-2005) contributing property. The SHPO stated that the road widening and borrow pit development may not commence until mitigation consultation is completed. The SHPO agreed with the MARAD that the development of a public information brochure, that would include historic and present day photographs of the historic district and discuss its history in context of military training activities at EAFB during WWII and the Cold War, is appropriate mitigation. The SHPO stated that a MOA should be developed to between their office and the MARAD, prior to the commencement of ground disturbing activities, to stipulate the subject matter, number of copies, and completion dates. The SHPO stated that the mitigation products may be completed later, in accordance with deadlines stipulated in the MOA).

On 2 May 2007 the MARAD notified the Advisory Council on Historic Preservation (Advisory Council) of their determination of adverse effect of the proposed gravel extraction activities in the North End Runway Borrow Pit on the 60 historic properties eligible for listing on the NRHP collectively as the Bunker/Igloo Historic District.

The historic properties located within the historic district ANC-2577 are relevant to the World War II and Cold War Era and consist of several buried corrugated steel bunkers arranged in a circular layout, connected by a gravel road and wooden stairway, and protected with slit trenches, guard shacks, barbed wire fences and foxholes. The ammunition storage bunkers appear to be connected to an anti-aircraft artillery site with remnants of utility poles and wires. The MARAD, in consultation with the Alaska SHPO and EAFB, is developing a Memorandum of Agreement (MOA) to specify appropriate mitigation for the adverse effects to the historic district.

The Advisory Council provided a letter to the MARAD on May 22, 2007, which concluded that Advisory Council consultation is not required for the proposed undertaking per *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, 36 CFR Part 800, Appendix A. The Advisory Council also stated that the final MOA, which is being developed between the MARAD and the Alaska SHPO, would need to be filed with their office at the conclusion of the consultation process to complete the requirements of Section 106 of the NHPA.

The ADNR-OHA provided a letter to the MARAD on June 8, 2007, stating that their office has reviewed the draft MOA concerning mitigation of the proposed adverse affects to the Bunker Igloo Historic District. The ADNR-OHA concluded that due to the recent issuance of the Advisory Council's program comment for *World War II and Cold War Era Ammunition Storage Facilities*, that the outline mitigation is no longer necessary.

On June 26, 2007, the MARAD and the ANDR-OHA met to confirm the conclusion of Section 106 coordination between their offices for the proposed action.

On June 27, 2007, the Corps teleconferenced with the ADNR-OHA to confirm that the coordination requirements necessary for compliance with Section 106 for the proposed action has been completed. The ADNR-OHA informed the Corps that the Department of Defense has completed nationwide mitigation for *World War II and Cold War Era Ammunition Storage Facilities* historic properties, which was approved by the Advisory Council and finalized in the code of federal regulations on May 21, 2007, as an alternative to site specific Section 106 coordination procedures.

To mitigate impacts to cultural resources, the Corps would include special conditions on the DA permit, if issued, as follows:

If the permittee or its contractors locate any prehistoric or historic remains during construction, constructions activities shall immediately cease in that area until determinations of eligibility for the NRHP can be made and mitigation measures developed in consultation with the SHPO. Procedures for managing inadvertent discoveries of cultural resources or human remains shall be employed as described in the Cultural Resources Monitoring Plan for Cherry Hill and North End Material Extraction, April 2006.

The permittee shall avoid wherever practicable any trees that were identified during the field surveys with the Native Village of Eklutna on June 7th and 8th, 2006. Any unavoidable removal of identified trees shall be preceded with high quality photography and narrative descriptions (including the surrounding landscape), which will be provided to the Native Village of Eklutna for their records.

Land use 320.4(a)(1):

No conflicting public land uses that would be affected by this project were identified in the public interest review. The proposed project would occur on private and military lands. The gravel extraction developments, through the use of the POA Haul Road would temporarily preclude the existing military personnel trail access to Triangle Lake. As part of the MARAD/EAFB land use agreement, the MARAD would provide alternative trail access during their use of the POA Haul Road.

Conservation 320.4(a)(1):

The proposed project is not expected to result in more than minor losses to public natural resources. The proposed project is a combined federal and municipal project that would provide improvements to the shipment of public commodities. The primary resources that would be affected are gravel resources, fisheries, and beluga whales, which are addressed under separate sections of this document.

Economics 320.4(q) (employment, tax revenues, community cohesion, community services, property values):

The Port of Anchorage is the primary transportation hub for Alaskan commodities. The proposed project would provide economic improvements, business and employment opportunities, tax revenues, and services to the City of Anchorage and the State of Alaska. The proposed project would provide the anticipated needs for community services over the next 25 years. There is no indication of any potential conflicts with established community cohesive values. No more than minor impacts anticipated.

Prime and unique farmland (7 CFR Part 658):

The proposed project would not affect farmlands.

Food and fiber production 320.4(a)(1):

The proposed project would not affect food and fiber production.

Mineral needs 320.4(a)(1):

The proposed project involves filling approximately 138 acres of tidelands to expand the existing dock and operational area. This will require approximately 9,663,420 cubic yards of fill material, which would be provided by the development/expansion of two material extraction sites, the Cherry Hill Borrow Site and the North End Borrow Site, located to the east of the proposed project on EAFB. The total land area of the material extraction sites (borrow pits) is approximately 352 acres, of which approximately 20.5 acres of wetlands would be filled from the development activities. Transportation of fill material between the North End Borrow Pit and the Cherry Hill Borrow Pit would occur by upgrading existing roads and trails between the borrow pits (POA Haul Road). The fill material would be directly transported to the project area by dump truck using the Cherry Hill Haul Road, a direct road transportation link between the Cherry Hill borrow pit and the Port of Anchorage. The MARAD has an MOA agreement with EAFB and a free use authorization from BLM for the development of these gravel pits and would submit annual mining and reclamation plans for review and approval from EAFB and the ADNRR, Division of Mining. No more than minor impacts anticipated.

Considerations of property ownership 320.4(a)(1), also at 320.4(g):

The proposed project is a federal project of the U.S. Department of Transportation, Maritime Administration (MARAD), located on municipal (Port of Anchorage) property and navigable waters of the U.S. The proposed project is adjacent to Alaska Railroad Corporation (ARRC) property to the south, and Elmendorf Air Force Base (EAFB) property to the east. The MARAD has developed an MOA for use of EAFB property for gravel mining. The proposed project is not expected to adversely affect ARRC properties and the ARRC did not comment on the proposed project. The federal Port expansion project has an interdependent relationship with the Corps federal maintenance dredging project, which maintains navigation to the Port, and the federal harbor deepening project, which is proposed following the construction of the expanded Port. The Port of Anchorage and the MARAD have coordinated and modified the proposed construction sequencing with the Alaska District Corps of Engineers to minimize conflicts with the maintenance dredging program

during construction. Cooperation between the federal projects is expected considering their interdependence.

General environmental concerns 320.4(a)(1), also environmental benefits at 320.4(p):

Heavy silt loads, wide tidal range, accompanying strong currents, and limited available of hard substrates where algae and epifaunal invertebrates can anchor all limit marine diversity and biomass in the general project area. The primary biological resources of concern are beluga whales and juvenile and adult salmon. Cook Inlet belugas whales are members of a discrete Cook Inlet population that is listed by the National Oceanic and Atmospheric Administration as a depleted stock. Studies and other sources empirical data confirm a relatively high use of the project area by both belugas and juvenile and adult salmon.

The general environmental concerns of the proposed project primarily involve the direct and secondary impacts associated with the loss of intertidal and shallow subtidal habitat south of Cairn Point and increased temporal and long term noise levels from pile driving activities and increased port operations. The proposed project would include compensatory mitigation to fund estuarine and riparian restoration and/or enhancement projects that would provide environmental benefits.

Other federal, state, or local requirements 320.4(j):

The applicant has received a Section 401 water quality certification from the Alaska Department of Environmental Conservation and a Coastal Zone Management Consistency Finding from the Alaska Department of Natural Resources, Office of Project Management and Permitting. The Mayor of the Municipality of Anchorage provided written support for the proposed project. Building permits from the Municipality of Anchorage are not required for the construction of Ports. The Port/MARAD has received permits from EAFB, the BLM and the ADNR for the gravel mining activities on EAFB (federal resource extractions). The applicant has applied for Marine Mammal "Take" authorizations from NOAA, which is pending. The applicant also has an FAA permit for construction within a flight zone. Construction related permits such as traffic control, contractor SWPPS, electrical would need to be obtained during the final surface improvements and the Port would need to plat their new property boundaries with the MOA upon completion of the proposed project and proposed land transfers with Department of the Army. The Alaska District is unaware of any other federal, state, or local requirements for the project.

Secondary and Cumulative Impacts 230.11(g) and 230.11(h) (effects on the aquatic ecosystem, associated with discharge of fills), also 320.4(a)(1):

As defined in CEQ regulations, cumulative effects are, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions..." The assessment of secondary and cumulative effects includes the establishment of a geographic scope in which to consider past, ongoing, and reasonably foreseeable impacts. Considering the geographic position and the relative nature of potential affects attributed to the proposed action of expanding the Port on aquatic habitats and resources, the scope of analysis of this assessment primarily involves the intertidal and nearshore subtidal waters of Knik Arm, which extends northeast from Point Woronzoff and Point MacKenzie to

its terminus at the confluences of the Knik and Matanuska Rivers. However, considering the migrating nature of the Cook Inlet Beluga Whale population, the geographic scope of analysis for cumulative impacts to beluga whales includes the waters of Cook Inlet, a tidal estuary approximately 220 miles in length. The extent of consideration for the borrow pit developments are defined by the boundaries of the gravel extraction exploration areas and adjacent wetland complexes on Elmendorf Air Force Base.

The proposed project is located within the lower reach of the Knik Arm, the northernmost reach of upper Cook Inlet. Knik Arm is approximately 40 miles long and varies from 1 to 5 miles wide. It is estimated that approximately 60 percent of Knik Arm is exposed at mean lower low water (MLLW) (i.e., intertidal). The intertidal areas of Knik Arm are mudflats, both vegetated and unvegetated, that primarily consist of fine, silt-size glacial flour. The Matanuska and Knik Rivers contribute the majority of fresh water and suspended sediment into the arm during summer months. Smaller rivers and creeks enter along the sides of the arm. Ship Creek flows into Knik Arm through the City of Anchorage Industrial area just south of the Port. The proposed project would result in a loss of less than 2% of the available shoreline of Knik Arm and substantially less than 1% of its available intertidal and/or subtidal reaches. The only coastal developments that have removed intertidal habitat reaches within Knik Arm are the port industrial developments of Port Mackenzie on the west side of the arm and the Port of Anchorage industrial area on the south side of the arm.

The proposed gravel extraction development areas on Elmendorf Air Force Base (EAFB) comprise of approximately 350 acres, of which approximately 20 acres of wetlands would be removed. EAFB contains extensive undeveloped wildlife habitat, including wetlands, most which remain in a relatively pristine state. 1,101 acres of freshwater wetlands, including emergent, ponded, forested/shrub. The percentage of wetland areas lost on EAFB is unknown; however, the majority of the wetland areas remain. The 20 acres of wetlands that would be lost by the proposed gravel extraction activities are located within or near existing developments (including gravel pits, roads, and airfields) and isolated from anadromous tributaries of Knik Arm. The higher value wetland complex areas surrounding triangle and fish lakes have been removed from the proposed project plan to minimize impacts. No more than minimal cumulative effects from wetland losses or the overall gravel extraction projects on EAFB have been identified.

Immediate Project Area (Ship Creek Industrial Area)

The Port of Anchorage is located in Knik Arm, south of Cairn Point and approximately 2,000 feet north of the mouth of Ship Creek. The Ship Creek waterfront area is the birthplace of the development of Anchorage, as the original establishment of "tent city", associated with the construction of the railroad and the establishment of a marine-rail commerce connection. Ship Creek has been continually developed by industrial entities since the early 1900's. The mouth of Ship Creek has been developed for docking facilities since 1915, with the construction of first wet/dry dock located on the north bank of the creek. The existing Port of Anchorage infrastructure started in 1918, when the Alaska Railroad constructed the Ocean Dock terminal and the City Dock in 1927. The Ocean Dock was later leased to the US War Department and it was expanded and upgraded for utilities, gas and oil pipelines, additional tracks, etc... and used heavily during World War II. The Anchorage Port Commission was established by the City of Anchorage in 1948. Congress authorized the deep water (-35 feet MLLW) harbor at the City Dock, located to the north of the Ocean Dock, in 1958. The Ocean Dock was

destroyed in the 1964 Good Friday earthquake. The rebuilding, expansion, and federal maintenance dredging of the present day Port of Anchorage commenced in 1965 and has been ongoing ever since to accommodate growing demands. To date, 156 acres have been filled at the Port of Anchorage. The Port has become the most economically important cargo handling facility in the State of Alaska. With its five berthing terminals, the Port accommodates over 5 million tons of various commodities across its docks annually, including containerized freight handling, iron and steel products, and bulk petroleum and cement.

Over the past 55 years, the Corps has issued over 50 permits for work affecting waters of the U.S., including wetlands within close proximity to the proposed project. Earlier developments affecting the proposed action include the establishment of the Alaska Engineering Commission Headquarters, the Alaska Railroad Corporation headquarters and operations, Anchorage's tent city within the Ship Creek estuary, and the construction of 4 dams over Ship Creek. Past Corps permits at the Port of Anchorage include 4 acres of tideland fill in 1956, dock extensions in the 1970's and numerous expansion activities in the 1980's (including the filling of more than 30 acres of wetlands and tidelands). Additionally, the Corps of Engineers has performed annual maintenance dredging in the Port of Anchorage harbor for over 40 years, and deep draft navigation channel dredging since 1996. Additional past and ongoing industrial coastal filling and dredging operations near the Port include those of North Star, Summit Dock and Barge, Williams/Flint Hills, Swan Bay/Douglas Management, ABI, Port Mackenzie Dock, the Alaska Railroad Corporation, etc.

The cumulative impacts of past developments within the lower Ship Creek watershed have removed the once vast tidal marsh complex at its confluence with Knik Arm. By 1999 more than 1 mile of stream length and 2 miles of shoreline habitat in lower Ship Creek was lost due to channel straightening. As a result of past developments, lower Ship Creek has lost sinuosity, natural island features, riparian wetlands and the majority of the functioning estuarine marsh complex. Primarily as a result of the dam constructions and the loss of a viable estuarine marsh, Ship Creek no longer supports substantial numbers of wild chum and pink salmon populations. Although Ship Creek only supports nominal numbers of wild salmon, it has been enhanced by upstream hatcheries for many years and has become a unique urban sport fishery that supports the 2nd highest angler use freshwater fishery in Alaska.

Historical waterfront development has eliminated in excess of 50 acres of the intertidal habitat located between the mouth of Ship Creek and Cairn Point. The proposed tideland developments of the proposed Port expansion would eliminate approximately eighty percent of the remaining intertidal area that exists in the industrial area between Ship Creek and Cairn Point with approximately 60 acres lost from fill and an additional 6.5 acres disturbed by expanded maintenance dredging. The existing 2,000 linear foot intertidal area between the mouth of Ship Creek and the existing Port is disturbed by industrial waterfront developments (Swan Bay, North Star, Flint Hills, ABI, etc...), that involve intertidal fill and maintenance dredging activities. Approximately 850 linear feet of steep riprapped shoreline and 1,050 linear feet of sheetpile bulkhead currently lines the shoreline between the mouth of Ship Creek and the proposed project area. The proposed Port expansion area would replace approximately one mile of riprapped fill intertidal shoreline with a sheetpile dock face that would subsequently dredged for navigation. In 2006 the Port constructed a 27-acre fill over unvegetated mudflats north

of their existing facilities in the remaining tidelands between the existing port infrastructure and Cairn Point.

The overall tideland expansion of the proposed action would replace approximately 1.7 miles of existing disturbed shoreline to a sheetpile bulkhead that would subsequently be dredged to a depth ranging from -29 to -49 feet MLLW.

The proposed action would remove the majority of the remaining intertidal mudflats between the mouth of Ship Creek and Cairn Point. The qualitative affect of this loss is not considered to be major considering that the remaining intertidal areas do not provide critical estuarine characteristics or functions unique to Ship Creek, other than its proximity, compared to the abundant pristine intertidal areas in Knik Arm that would remain. The juvenile salmonid rearing functions of the Ship Creek estuary have been degraded for many years. The salmonids of Ship Creek are hatchery reared and released as smolts for sea migration. There is no information to substantiate that the area between Ship Creek and Cairn point provides unique ecological functions or habitat that are critical to salmonids or other aquatic organisms of Ship Creek or Knik Arm. The area does however provide refuge opportunities from predators and tidal currents for both adult salmonids that show a strong preference for migrating along shallow shoreline waters and juvenile salmonids. There are few predators of adult salmonids in Knik Arm and juvenile salmonids are not believed to rely on shallow shoreline habitat in Knik Arm to the same extent as other areas due to the low salinity levels and turbidity. Ship Creek hatchery smolts are believed to be flushed into the project area during flood tides. The consequences of the proposed action would be an increase in the exposure of adult and juvenile salmonids to predators and strong tidal currents, which may decrease the return rates of adult salmon to the Ship Creek sport fish hatchery; however, the proposed action is not expected to result in major impacts to the fishery.

The ongoing and reasonably foreseeable developments include the proposed barge terminal developments, railroad upgrades parallel to the coastline, and the Knik Arm Ferry landing, located to the south of the proposed action. There are no existing major coastal developments to the north of the proposed action along the eastern shoreline of Knik Arm. Other reasonably foreseeable projects that could potentially interact with the proposed action include the expansion Port MacKenzie Deepwater Dock on the opposite side of the arm, annual and potential increases in federal maintenance dredging quantities and the proposed harbor deepening and navigational channel lengthening projects at the Port of Anchorage, and the possibility of the Knik Arm Crossing Bridge to the north of the Port.

The Knik Arm Crossing as proposed, would build a partially pile supported structure, that would span Knik Arm from Cairn Point to Point MacKenzie. The bridge would have a pile supported length of 8,200 feet, which is approximately equal to the narrowest natural constriction of the arm. However, because of hydraulic considerations it is believed that an opening of 8,200 feet will increase the velocity of the out going tidal current to the point that it would carry more sediment and may deposit those sediments in the federally authorized project at the Port of Anchorage. This would increase maintenance dredging costs, and may result in adverse navigational impacts. It is expected that the proposed crossing will change to a structure with an 11,000 foot opening, as opposed to 8,200 feet. This modification would allay many of the concerns about the project, including adverse impacts to currents and sediment transport as well as marine fish and

mammals. To date, the Corps has not received a DA permit application for the proposed project. However, provided that the project is constructed to minimize adverse impacts to sediment transport patterns, this project is not expected to result in more than minor cumulative impacts to the aquatic environment.

The primary aquatic species of concern identified in this analysis and under consideration for the cumulative impacts of the proposed action are salmonids, which are previously discussed, and beluga whales, a depleted species proposed for listing under the ESA. In the Final EIS on the Subsistence Harvest Management of Cook Inlet Beluga Whales, NOAA Fisheries evaluated the cumulative impacts on Cook Inlet Beluga Whales. The agency found that cumulative impacts are diverse and include subsistence harvest, stranding, direct and indirect interactions with commercial and recreational fisheries including impacts to beluga prey, oil spills, municipal wastes and other pollutants, oil and gas development, municipal activities, underwater noise, airborne noise, tourism, vessel disturbances, predation, and disease. The overall habitat quality of the Cook Inlet stock of beluga whales has not been destroyed, modified, or curtailed to a degree to cause the stock to be in danger of extinction in the foreseeable future. Subsistence over-harvest of Cook Inlet Beluga Whales is considered the primary activity that has caused serious population declines. The cumulative impacts of activities in Cook Inlet other than subsistence harvest are considered relatively minor in comparison.

The proposed action would likely contribute to the cumulative impacts of vessel disturbances, reduction in food sources, reduction in habitat, water quality/contamination, and anthropogenic noise. The cumulative affect of the proposed action on fish, primarily salmonids, which are a food source to belugas, are not considered to be more than minor, as discussed throughout this document. The cumulative impacts of the proposed action on beluga whales from vessel disturbance are also considered to be minor, considering that the current and foreseen vessel operations at the Port of Anchorage are not expected to substantially change and involve infrequent and slow moving vessels that are unlikely to strike belugas and generate sound frequencies that are not known to cause harassment. As previously discussed, the proposed action would not result in more than minor cumulative impacts to habitat loss considering the minimal amount of offshore development and abundant subtidal habitat available in Cook Inlet. Habitat quality degeneration is also not considered to be more than minor considering that the proposed action would involve expanding existing Port infrastructure that has been in operation for many years. With regard to water quality, the proposed action would incorporate a SWPPP, is expected to have better spill prevention and containment abilities compared to the existing facility, and would not involve any dredging of contaminated substrates. Water quality certifications and minimization measures would be incorporated in the DA permit, if issued. The primary cumulative impact of concern over the proposed project is the cumulative impact associated with anthropogenic noise. Noise sources in Cook Inlet include vessel and aircraft, dredging and construction activities, oil and gas production and exploration, sonar, and geophysical surveys. There are several offshore oil platforms in Cook Inlet; there were 16 platforms as of 2005, the oldest of which is the *XTO A* platform constructed in 1964 and the newest of which is the *Osprey* platform installed in 2000. The primary actions that would contribute to noise levels that may affect the proposed action in the foreseeable future include the construction of offshore marine terminals in Cook Inlet for coal deposit developments, ocean seismic surveys and oil developments, the Knik Arm Bridge, off shore expansions of Port Mackenzie and other industrial developments near the project site, and increased dredging at the Port of Anchorage. Annual

dredging has occurred at the project site for over 40 years and the proposed action is not expected to have more than minor changes in maintenance dredging. However, transitional dredging during construction and the subsequent harbor deepening would increase dredging operations in the project area for many years. The harassment of belugas associated with dredge noise production are not documented or otherwise known. Quantitative data on beluga whale reactions to anthropogenic noise is limited. However, the hearing detection of beluga whales is most acute in the 10-100 kHz range, which is above the frequency produced by most industrial noise. The proposed action is not expected to measurably contribute to adverse cumulative affects of noise on belugas whales from other sources in Cook Inlet or Knik Arm for several reasons. Studies on the effects of noise exposure on beluga whales suggest that adverse impacts are temporary. Additionally, the ambient background noise of the project area in Knik Arm from current and silt movements masks many noise sources and rapidly attenuates noise due to the shallow water depths and soft substrate. The rapid attenuation of noise in Cook Inlet and Knik Arm minimizes the cumulative affects of discrete and distant noise sources. Also, the operational noise profile of the proposed expanded Port facility is not expected to have more than minimal differences compared to the existing facility. The production of adverse noise levels from the proposed action is associated with the construction of the proposed project, which would be minimized by both the proposed construction method (i.e., very little impact hammer driving) and through extensive monitoring, soft start, and shut down procedures. The cumulative impacts of the proposed action on the Cook Inlet beluga whale population are expected to be no more than minor.

As previously discussed, the cumulative impacts of the proposed action on available aquatic habitat in Knik Arm would be minimal and the losses to intertidal habitat between the mouth of Ship Creek and Cairn Point, where past industrial developments have altered the shoreline, is not considered to provide critical life cycle habitat for the salmonids of the tributaries of Knik Arm or beluga whales. The industrial and military Port area of the proposed action provides vital social functions to the City of Anchorage, the state of Alaska, and the nation. Compensatory mitigation projects would provide benefits to aquatic habitats and resources near the proposed action area. Responsible industrial developments in this so designated area would not result in more than minor impacts to the human environment and would serve public interests locally, regionally, and nationally. Therefore, in light of the past, ongoing, and reasonably foreseeable impacts in the vicinity of the project, we have determined that the proposed project is not expected to result in more than minor cumulative impacts to the Knik Arm estuary, or its aquatic resources.

The primary secondary impacts of the proposed action during construction and subsequent operations include increased ambient noise levels, decreased air quality, water quality impacts (from potential fuel discharges and contaminated material handling), erosion and sedimentation from wetland fill discharges, changes to sedimentation patterns, and trapped fish during filling. Adverse water quality impacts could occur from the re-suspension of sediments during dredging and in-water construction activities, which would cause localized and temporary increases in turbidity; potential contaminant discharges from accidental spills; increased stormwater runoff. Short-term increases in turbidity associated with the construction phases of the project would be temporary and would not generate chronic adverse effects on water quality. Potential impacts from accidental spills would be minimized through compliance with established contingency plans and conditions of the DA

permit, if issued. The cumulative increases in stormwater run-off in the region would increase in the concentrations and volumes of pollutants carried by the stormwater into receiving waters. The point and non-point sources of stormwater would be mitigated through stormwater permits; i.e., NPDES permits. These permits would include water quality monitoring and would be further reduced via implementation of standard site-specific Best Management Practices (BMPs), with the goal to ensure that stormwater run-off quality would not exceed applicable water quality standards. The implementation of BMPs and permit conditions would minimize secondary impacts. For these reasons, the potential adverse water quality impacts associated with the proposed action are not expected to result in more than minor impacts.

6.2 Public Interest Review General Criteria (33 CFR 320.4(a)(2):

The relative extent of the public and private need for the proposed work:

The proposed action is a federal and local government project that would serve the marine cargo shipping needs of the State of Alaska, as the Port of Anchorage handles over 90% of Alaska's cargo volume and serves 80% of the Alaska's communities. Additionally, the Port of Anchorage is designated as the 15th Strategic Commercial Seaport in the nation, supporting rapid military deployments and the military's cargo shipping needs. There is a substantial need for the city of Anchorage, the State of Alaska, and the U.S. military to upgrade the Port of Anchorage. The Port continues to operate over or near the sustainable practical capacity for most cargo types and the proposed expansion is necessary to accommodate existing and foreseeable cargo handling demands. There is no identified private need for the project.

The practicability of using reasonable alternative locations and/or methods to accomplish the objective of the proposed structure or work: No other practicable locations or methods were identified that would result in less environmental impacts to the aquatic ecosystem. The use of a partially pile supported dock design is considered by the Corps to represent a less damaging environmental alternative; however, it was determined to be impracticable primarily due to considerations of cost. The Corps has determined that the proposed action represents the least environmentally damaging practicable alternative.

The extent and permanence of the beneficial and/or detrimental effects that the proposed structures or work may have on the public and private uses which the area is suited:

The Port of Anchorage has been operating and expanding in the area since 1965. The project area has been used for commercial and military seaport operations since the conception of the City of Anchorage. The proposed project would provide substantial public benefits to the city of Anchorage, the State of Alaska, and the U.S. military by providing a modern economical intermodal facility to accommodate the immediate and forecasted needs. The proposed gravel extraction areas on EAFB have no known public uses that would be substantially affected and the areas would be graded and revegetated to enhance natural conditions and provide wildlife habitat upon completion. The Triangle/Fish Lake recreational area near the gravel extraction sites would be buffered and alternative public access would be provided during their development. The gravel extraction activities would involve the removal

earthen visual obstructions and waterfowl habitat near the Air Force runways, both of which create safety hazards to military planes.

6.3 Special Conditions and Rationale for Inclusion

The following conditions were included in the ADEC Certificate of Reasonable Assurance:

1. Petrochemical and other hazardous substance spill cleanup equipment shall be available on site. Material such as sorbent pads and booms shall be available and used immediately to contain and cleanup oil, fuel, hydraulic fluid, antifreeze or other pollutant spills as a result of construction and in water activities.
2. Reasonable precautions and controls must be used to prevent incidental and accidental discharge of petroleum products. Petroleum storage and handling activities must be sited, constructed and conducted so that there is no contamination of surface runoff by petroleum products.
3. Runoff discharged to surface water from a construction site disturbing 1 or more acres must be covered under EPA's NPDES General Permit for Storm Water Discharges from Large and Small Construction Activities in Alaska (AKR10-0000). This permit requires that a Storm Water Pollution Prevention Plan (SWPPP), describing construction runoff and erosion control, be prepared. For projects that disturb greater than 5 acres, this SWPPP must also be submitted to ADEC (Greg Drzewiecki phone 907-269-7692) prior to construction. Please contact EPA directly concerning the NPDES storm water permit
4. Design plans for the post-construction (permanent) collection and treatment of stormwater runoff must be submitted to and approved by the Alaska Department of Environmental Conservation (Greg Drzewiecki, 907-269-7692) prior to construction (18 Alaska Administrative Code 72.600). The plans must demonstrate that the storm water management system has the ability to remove total suspended solids particles greater than 20 microns in size from storm water runoff during storms equal to or less than the 2-year 6-hour rainfall event.
5. Fill material must be free from petroleum products and toxic contaminants in toxic amounts.
6. If contaminated soils or dredge spoils are encountered or petroleum sheen appears during excavation, dredging or fill activities, all work within the suspected contaminated area shall immediately cease. Linda Nuechterlein, ph. 907-269-7530 at the Department of Environmental Conservation (DEC) Contaminated Sites Section Anchorage Office shall be contacted and approval given before work resumes in that area. DEC Contaminated Sites Program Department approval is necessary to insure contaminated soils are not carried to other locations and appropriate monitoring of the site for contamination movement is not hindered.

7. Along the POA haul road and at any upland site prior to fill placement, a silt fence or similar structure shall be installed on a line parallel to and within 5' of the proposed fill toe of slope within all wetland areas containing standing water that are connected to any natural body of water or where the fill toe is within 25' of such a water body. This structure shall remain in place until the fill has been stabilized or contained in another manner and shall be removed when permanent site stabilization has been achieved.
8. Silt and sediment from the site excavation and fill materials may not enter wetlands or waters outside the necessary working area. Site preparation, excavation, fill placement, and construction activities must be conducted to prevent, minimize and contain the generation of silt and sediment that could be carried off-site by surface runoff. If silt and sediment are evident in standing or flowing water outside the excavation and fill area, the Port of Anchorage, or its contractors, shall apply appropriate control and containment measures. These measures may include fabric fences, straw bales, other effective filters, matting, settling ponds, or avoiding work during heavy precipitation.
9. Natural drainage patterns must be maintained, to the extent practicable, without introducing ponding or drying. Control of drainage must be provided by appropriate ditching, culverts, and other measures. Drainage ways must be vegetated to help control the transport of fine sediments.
10. During fill placement, the applicant shall limit the introduction of silts and organics into Knik Arm. To the extent practicable the creation of a turbidity plume during construction shall be minimized. Techniques to minimize the formation of a plume include, but are not limited to, use of silt curtains, use of fill clean of silts and organics, use of a fill dike to enclose the area to be filled, or construction during low water.
11. Portions of the material site that will not remain in operation after construction shall be re-contoured, stabilized, and revegetated as soon as practicable. During reclamation stockpiled organic material shall be spread over the contoured mine workings to promote natural plant growth. The goal of this condition is to promote the natural succession of vegetation that is representative of the area. Acceptable indicators that this process is occurring would be a reasonable presence, density, and distribution of pioneer species of plants typical to the area. The goal is to achieve a 40% live plant cover of the reclaimed area within two complete growing seasons.

In accordance with 33 U.S.C. 1341(d), all conditions of ADEC's Certification are incorporated as part of the DA permit. Therefore, they are not listed as special conditions.

The following special conditions will also be included in the permit to ensure the project is not contrary to the public interest [33 CFR 320.4(r)], to ensure the project complies with the 404 (b)(1) Guidelines [40 CFR 230.10(d)], or at the permittee's request:

I. Navigation:

The following conditions are to preserve free navigation, prevent navigational hazards, and to protect the interests of the United States in existing and future federal projects [(33 CFR Part 320.4(o)(3)).

1. Your use of the permitted activity must not interfere with the public's right to free navigation on all navigable waters of the United States.
2. You must install and maintain, at your expense, any safety lights and signals prescribed by the United States Coast Guard (USCG), through regulations or otherwise, on your authorized facilities. The USCG may be reached at the following address and telephone number: Commander (DPW), 17th Coast Guard District, P.O. Box 25517, Juneau, Alaska 99802; (907) 463-2269.
3. The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.
4. Appropriate and practicable mitigation measures shall be employed as needed to minimize adverse affects to federal dredging operations, adjacent properties, and/or flow patterns of waters of the U.S. from temporary changes in sedimentation patterns during the construction phases of the project. The Port of Anchorage shall cooperate with adjacent industrial businesses (e.g., barge terminals) to ensure that all appropriate and practicable mitigation measures are implemented during construction to both minimize and compensate for adverse affects to their operations.

II. Cultural Resources

The following two conditions are to ensure compliance with Section 106 of the National Historic Preservation Act and at the request of the applicant.

1. Procedures for managing inadvertent discoveries of cultural resources or skeletal remains shall be employed as described in the Cultural Resources Monitoring Plan for Cherry Hill and North End Material Extraction report (Anchorage Port Expansion Team, April 2006, or approved revisions).
2. Prior to ground disturbing activities, POA shall photograph and document site conditions of and around the trees of interest identified by representatives of the Native Village of Eklutna (Anchorage Port Expansion Team, Cultural Resources Survey: Port of Anchorage Haul Road, Appendix D; October, 2006.).

III. Borrow Pits:

The following condition is to prevent and minimize impacts to nesting migratory birds. Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to "take" migratory birds, their eggs, feathers or nests.

1. To prevent impacts to nesting migratory birds, no vegetation clearing, fill placement, excavation, stockpiling, grading or other disturbing construction activities at the material extraction sites shall be conducted between 1 May and 15 July, except at sites that have been sufficiently disturbed or altered to the extent that suitable nesting

habitat has been eliminated (e.g., covered or otherwise removed) prior to 1 May. If disturbing construction activities in areas containing potential nesting habitat are proposed after 1 May, the Port of Anchorage shall submit a plan to the Corps that demonstrates how compliance with the MBTA will be ensured. This plan must be coordinated with the USFWS and approved by the Corps prior to commencement of work that would potentially affect nesting habitat between 1 May and 15 July.

The following two conditions are necessary to prevent and minimize impacts to wetlands and aquatic organisms

2. The POA will establish a buffer between ground disturbing activities at the gravel extraction sites and adjacent wetland areas as necessary to prevent hydrological disturbances from development activities. Additionally, a buffer area shall be established around the Triangle/Fish Lake wetland complex and delineated onsite with silt fencing and signage and verified as adequate by the Corps prior to commencing extraction activities within 600 feet of the wetland complex. The extent and/or distance of the buffer boundaries shall be determined onsite based on vegetation, topography and hydrology as necessary to prevent an adverse disturbance to the wetland complex. The POA shall install and monitor a series of groundwater wells or piezometers in the western portion of the North End Borrow Pit to assure that gravel mining activities do not adversely affect adjacent wetland hydrology.
3. POA shall, to the extent practicable, limit disturbances to wetlands and open water areas where wood frogs are present to periods of time other than those known for breeding and tadpole growth (1 April to 15 July).

IV. Beluga Whales:

The following conditions are to prevent and minimize adverse impacts to marine mammals and to ensure compliance with the Marine Mammal Protection Act.

1. The POA has submitted petitions for an Incidental Harassment Authorization (IHA) for the 2007 construction season and a Letter of Authorization (LOA) for construction seasons 2008-2012 (Anchorage Port Expansion Team, Final Petition; January 2007) for Small Take Authorizations from the NOAA/NMFS under the Marine Mammal Protection Act (MMPA) for the incidental and unintentional taking of marine mammals. The conditions of the IHA and LOA Small Take Authorizations under the MMPA will be carried as special conditions of this DA permit unless otherwise noted by the Corps. The POA shall comply with the interim mitigation measures listed below to minimize project related adverse impacts to beluga whales. Upon receipt of the IHA and/or LOA MMPA authorizations, the Corps will reevaluate the terms or conditions of this permit and modify any conflicting conditions, if necessary.
 - A. The POA shall measure and evaluate construction and operationally generated noise introduced in Knik Arm at the Port of Anchorage. The applicant shall develop a 'Sound Index' to accurately represent noise levels associated with Port of Anchorage 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 shall characterize current baseline operational noise levels at the Port of Anchorage 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 final report will be provided to the NMFS two years prior to construction completion.

The Port of Anchorage Sound Index will be collaborated with the concurrent 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). An annual review of beluga observations and noise exposure data shall be provided to NMFS no later than 1 Feb annually. The annual review shall also identify relevant technological advances in sound attenuation. The POA shall employ practicable noise minimization measures identified in the annual reports in subsequent POA construction activities.

- B. In collaboration with the NMFS, the Port of Anchorage shall continue to develop and maintain a beluga monitoring program to estimate the frequency at which beluga whales are present in the project footprint; characterize habitat use and behavior of belugas near the Port during ice free months; map sound levels and distance attenuation related to POA background noise and expansion activity; and to characterize and assess the impacts of received noise from the POA on beluga whale behavior and movements. POA shall consult with NMFS to develop the program and shall include the following:
 - a. Include visual observations (shore-based and opportunistic vessel observations) to monitor beluga movements, timing, group size, locations, identifiable behaviors and patterns, and use of the area in the vicinity of the Project during operations through the construction period. The POA will also provide one year of post-construction monitoring in continued consultation with NOAA/NMFS.
 - b. Include a passive acoustic monitoring plan to correlate with visual observations. The POA shall 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.
 - c. The POA will employ a marine mammal observation team, separate from the construction contractor observer activities, for the duration of all construction activities.
- C. The Port of Anchorage shall establish and enforce safety radii and shut down standards around the in-water pile driving areas. Initially, the safety radii requiring shut down shall be for any whale observed within 650 meters of pile driving. The Port of Anchorage shall conduct on-site underwater noise surveys to verify the 190, 180 and 160 dB re 1 μ Pa rms isopleths from in-water pile driving activities for the POA expansion. Safety zones appropriate to the POA site conditions and equipment will then be empirically determined and implemented. The 160 dB re 1 μ Pa rms safety zone should be in force unless the POA obtains authorization under the section 101 (a) of the Marine Mammal Protection Act for the incidental and unintentional taking of marine mammals; in which case the safety zones should be those provided within the authorization. The safety zone around pile driving areas shall be monitored for the presence of marine mammals before, during, and after

any pile driving activity. If the safety radius is obscured by fog or poor lighting conditions, pile driving will cease until the entire safety radius is visible.

- D. Prior to the start of seasonal pile driving activities, the POA will require construction supervisors and crews, the marine-mammal monitoring team, the acoustical monitoring team, and all project managers to attend a briefing. The purpose of the briefing will be to establish the responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures.
- E. The Port of Anchorage shall formally notify the NMFS prior to the seasonal commencement of pile driving and provide weekly monitoring reports. A summary monitoring report will be submitted at the end of annual construction activities and a final report will be submitted at the end of the one year post construction monitoring season.
- F. The POA will establish daily "soft start" or "ramp up" procedures for pile-driving activities. The soft start technique will be used at the beginning of each piling installation to allow any marine mammal that may be in the area to leave before pile driving activities reach full energy. The soft start procedure will require contractors to initiate noise from vibratory hammers for 15 seconds at reduced energy followed by a 1-minute waiting period. This procedure will be repeated two additional times. If an impact hammer is used, contractors will be required to provide an initial start of 3 strikes at 40-percent energy, followed by a 1-minute waiting period, then two subsequent 3-strike sets. If marine mammals are sighted within the safety zone prior to pile driving or during the soft start, the contractor will delay pile-driving continuation until the mammal has moved outside the safety zone. Pile installation will resume only after a qualified observer confirms that the marine mammal has moved outside the safety zone or after 15 minutes have elapsed since the marine mammal was last sighted.
- G. The POA will erect whale-notification signage in the waterfront viewing areas near the Ship Creek Public Boat Launch and within the secured Port entrance that is visible to all Port users. This signage will provide information on the beluga whale and notification procedures for reporting beluga whale sightings to the NMFS. The POA will consult with the NMFS to establish the signage criteria.
- H. During in-water construction activities, the POA shall ensure that construction contractors delegate supervisory responsibility to include on-site construction personnel to observe, record, and report marine mammal sightings and response actions taken, to include shut down or delay.
- I. The POA shall establish a long-term, formalized marine-mammal sighting and notification procedure for all Port users, visitors, tenants, or contractors prior to and after construction activities. The notification procedure shall clearly identify roles and responsibilities for reporting all marine mammal sightings. The POA will forward documentation of all reported marine mammal sightings to the NMFS.

2. In-water impact pile-driving, excluding work when the entire pile is out of the water due to shoreline elevation or tidal stage, shall not occur within two hours of either side of each low tide.

V. Fish

The following conditions are necessary to minimize impacts to anadromous fish populations.

1. The Port of Anchorage shall either avoid pile driving activities between 15 May and 15 August or conduct an on-site fish study to analyze the impacts of vibratory and impact hammer sheet pile driving activities on salmonids at various distances and measured sound pressure levels. The study plan shall be developed in consultation with local representatives of the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Environmental Protection Agency, and approved by the Corps. The study plan should include a live cage fish study and hydroacoustic monitoring to assess the impacts of pile driving on the health and behavior of fish groups and individuals. The study plan shall be completed by 1 January 2008 and initiated in the 2008 construction season. The results shall be analyzed following the completion of the 2008 construction season and coordinated with the Corps and the aforementioned resource agencies. Based on the results of the study, this condition may be modified and/or supplemented to minimize adverse impacts to salmonids (including timing restrictions).
2. No in water fill placement or pile driving activities shall occur within a one week period following smolt releases from the Ship Creek Hatchery. The Port shall coordinate with hatchery staff to ensure compliance with this condition.
3. In-water sheet piles shall 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).
4. The final design shall, wherever possible, incorporate end-of-phase construction joints that provide potential refuge habitat areas for salmonids in the non-structural voids. Although the spacing, size, and configuration of these structural joints will be dictated by stability and construction requirements, void spaces within these joints shall be developed to maximize the potential salmonid refuge value of the space. The design of the refuge area within the void space shall be approved by the Corps, in consultation with other federal resource agencies. The refuge area shall be monitored by the Port of Anchorage between 15 May and 15 August for a minimum of 2 years following construction to determine the extent and nature of use by salmonids. Based on the monitoring observations, this condition may be modified to improve the functional value of refuge areas if necessary.

VI. Design Coordination:

The following three conditions are to prevent and minimize adverse impacts to public safety and security and to protect the interests of the United States in existing and future federal projects:

1. A final analysis of the global and internal structural stability of the open cell sheet pile structure under static and seismic conditions shall be submitted to the Corps of Engineers a minimum of two months prior to sheetpile installation activities of 2008. The analysis shall state the

assumptions made, data used, computational analyses performed, modeling input criteria used and output results generated (where modeling is applicable) that led to the final analysis. Additionally, to the maximum extent practicable, the final analysis shall, at minimum, include the following:

- a. Test the borrow source(s) to confirm the stability model input and determine the densification requirements. Provide your Quality Assurance Plan and the acceptance criteria for validating the densification of the backfill.
 - b. For each soil profile, run static stability models with six feet of over dredge below the design project depth and at a water elevation of -5 ft. MLLW.
 - c. Submit a plan that describes the proposed piezometer placements and all other instrumentation to be used to confirm how consolidation (and associated strength gain) is expected to occur, and to what degree. Additionally, the POA will submit annual reports of actual findings.
 - d. Conduct a parametric sensitivity analysis, investigating strength, modulus, and geometry, with the model for seismic loading to determine if the model is sensitive to small changes in input parameters. The study shall further evaluate possible failure modes, to include toe heave.
 - e. Define the target Factor of Safety for internal stability and model each construction phase area. All engineering parameters and design calculations for internal stability evaluation shall be included in the design analysis.
 - f. Further evaluate earthquake loading by considering a minimum of five accelograms, with no more than two being synthetic, and refined target design response spectra criteria in the analysis. Specifically, develop design target spectra based on deterministic spectra for MCE scenario earthquakes from the Castle Mountain fault and Megathrust sources using M_{max} and closest distance parameters. Use a suite of ground motion attenuation models that are appropriate for the region and source. Combine this suite of models either by a weighting or enveloping procedure to develop final target spectra and match the selected accelograms to the target spectra. Review the latest information on USGS Alaska seismic hazard maps to assist in the selection of parameters and ground motion attenuation models. The development of the final suite of design ground motions shall be conducted by a professional engineering seismologist experienced with current practice for developing design ground motions for critical facilities.
 - g. In light of the large strains predicted during an MCE, include laboratory residual shear strength tests in your analysis to investigate potential material responses.
 - h. Develop compatible designs for adjacent cells with different seismic performance objectives.
2. The POA shall submit Open Cell Sheetpile design modifications to the Corps for review.

3. The POA shall submit as-built drawings of the OCSP structures, approved and stamped by the Engineer-of-Record, following completion of construction phases and the overall structure.

VII. Fill Material:

The following conditions are required to minimize adverse impacts of the discharge on special aquatic sites and other waters outside of the project area [33 CFR 320.4 (r), 40 CFR230.5 (j) and 40CFR 230 Subpart H, including parts 230.71, 230.72, 230.73, 230.75]]

1. Fill material shall consist of clean fill, free of unsuitable material (e.g., trash, debris, asphalt, etc.), and free of toxic pollutants.
2. All fill material shall be stabilized as necessary to prevent erosion and encroachment of fill material outside the authorized footprint before, during, and after construction. No fill or construction materials shall be stockpiled on adjacent mudflats outside of the authorized project boundary.

VIII. Compensatory Mitigation:

The following conditions are required to compensate for resource losses important to the human and aquatic environment. (33 CFR 320.4(r) and 40 CFR Parts 230.41 and 230.42)]

1. The Port of Anchorage shall provide funding equivalent to the monetary value of the debits of the authorized project impacts, as determined by the Anchorage Debit Credit Methodology, in accordance to the attached Memorandum of Agreement (MOA) concerning compensatory mitigation for the overall project. Compensatory mitigation funds from the account will be allocated primarily for construction related costs of selected mitigation projects, as specified in the MOA. In addition to the funding requirements, the Port of Anchorage shall provide for the project management actions necessary to obtain any applicable permits and/or authorizations, the preparation of necessary engineered designs, and monitoring of all selected mitigation projects as necessary.
2. In addition to the mitigation requirements specified above, the Port of Anchorage shall conduct a feasibility study to identify the most practicable and beneficial aquatic habitat restoration, enhancement, creation, and preservation projects available in the Lower Ship Creek watershed and estuary. The projects identified in this study will be used by the Corps, under consultation with a mitigation advisory committee (consisting of federal, state, and local resource agencies and other applicable stakeholders, as appropriate) to determine which project(s) shall be implemented and funded as part of the compensatory mitigation requirements of this permit. The content of the final feasibility study plan shall be approved by the Corps to ensure compliance with this requirement.

Special Information:

Any condition incorporated by reference into this permit by General Condition 5, remains a condition of this permit unless expressly modified or deleted, in writing, by the District Engineer or his authorized representative.

7.0 Compliance with Other Federal, State, or Local Laws

State 401 Water Quality Certification: Certification was issued on July 21, 2006.

Pursuant to 33 CFR PART 320.4(d), the certification of compliance with applicable effluent limitations and water quality standards required under the provisions of Section 401 of the Clean Water Act are considered conclusive with respect to water quality considerations unless the Regional Administrator, U.S. Environmental Protection Agency, advises of other water quality aspects to be taken into consideration.

Coastal Zone Management Consistency Determination:

Concurrence was provided on July 7, 2006.

State and/or local authorizations (if issued):

There are no other state and/or local authorizations known.

Environmental justice issues (EO 12898):

The proposed project is not in contrary to any known Environmental Justice Issues.

8.0 Statement of Findings

8.1 Public Interest Determination: I find that issuance of a Department of the Army permit, as prescribed by regulations published in 33 CFR 320 to 330:

Is not contrary to the public interest. Is contrary to the public interest.

8.2 Evaluation of Compliance with 404(b)(1) Guidelines:

8.2.1 Alternatives Test (40 CFR 230.10(a)):

Based on the discussion in 3.0 are there available, practicable alternatives having less adverse impact on the aquatic ecosystem and without other significant adverse environmental consequences that do not involve discharges into "waters of the U.S." or at other locations within these waters? **No**

Based on 3.0 if the project is in a special aquatic site and is not water dependent, has the applicant clearly demonstrated that there are no practicable alternative sites available? **Yes.**

8.2.2 Special Restrictions (40 CFR 230.10(b)). Will the discharge:

Violate state water quality standards? **No**

Violate toxic effluent standards [under Section 307] of the Clean Water Act? **No**

Jeopardize endangered or threatened species or their critical habitat? **No**

Violate standards set by the Department of Commerce to protect marine sanctuaries? **No**

8.2.3 Other restrictions (40 CFR 230.10(c)): Will the discharge contribute to significant degradation of "waters of the U.S." through adverse impacts to:

Human health or welfare, through pollution of municipal water supplies, fish, shellfish, wildlife and/or special aquatic sites? **No**

Life stages of aquatic life and/or wildlife? **No**

Diversity, productivity, and stability of the aquatic life and other wildlife? Or wildlife habitat or loss of the capacity of wetlands to assimilate nutrients, purify water or reduce wave energy? **No**

Recreational, aesthetic, and/or economic values? **No**

8.2.4 Actions to minimize potential adverse impacts [mitigation] (40 CFR 230.10(d)). Will all appropriate and practicable steps [40 CFR 230.70-77] be taken to minimize adverse impacts of the discharge on the aquatic ecosystem? **Yes**

8.3 Findings of Compliance or Non-compliance with the 404(b)(1) Guidelines (40 CFR 230.12):

The discharge complies with the guidelines, with the inclusion of the appropriate and practicable conditions listed above to minimize pollution or adverse effects to the affected ecosystem.

8.4 Request for public hearing:

There have been no substantial public controversy issues raised and there is otherwise no valid interest to be served by a hearing. Therefore, a public hearing is not needed for making a decision on the subject permit application.

8.5 Section 176(c) of the Clean Air Act General Conformity Rule Review:

The proposed project has been analyzed for conformity applicability pursuant to regulations implementing Section 176(c) of the Clean Air Act. It has been determined the activities proposed under this permit will not exceed *de minimis* levels of direct emissions of a criteria pollutant or its precursors and are exempted by 40 CFR PART 93.153. This no-effect determination has been coordinated with the U.S. Environmental Protection Agency and the Alaska Department of Environmental Conservation. Any later indirect emissions are generally not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps. For these reasons, a conformity determination is not required for this individual permit.

8.6 Finding of No Significant Impact (FONSI) (40 CFR 1508.13):

Having reviewed the information provided by the applicant, all interested parties and the assessment of environmental impacts, I find that this permit action will not have a significant impact on the quality of the human environment. Therefore, an Environmental Impact Statement will not be required.

8.7 Completion of State review:

The State has issued a conclusive Coastal Zone Consistency Determination and a Section 401 Water Quality Certification.

Approved by:



Kevin J. Wilson
Colonel, Corps of Engineers
District Commander

10 Aug 2007

Date

**Attachment A: Preliminary Mitigation Projects
POA-2003-502, Port of Anchorage**

Lower Ship Creek

Ship Creek, which is the closest and most directly impacted watershed by the Port expansion area, has been historically degraded from human development activities. The Ship Creek estuary has been historically diminished in both size and function and the lower reaches of Ship Creek have been channelized, dammed and developed. The industrial developments have diminished streamside riparian habitat and buffering, salmon spawning and rearing habitat, and several dams have created major obstructions to salmon passage, which have substantially reduced the creek's wild salmon population. Mitigation activities that would restore and/or enhance the ecological functions of the Ship Creek estuary would provide the greatest opportunities to offset the unavoidable direct and indirect impacts of the Project. Due to the private ownership of the creek bed and adjacent lands in lower reaches of the creek, coupled with conflicting stake holder interests in the lower and upper reaches of the creek, mitigation projects are very controversial in the area. The Corps, Municipality and the advisory committee will consider appropriate and practicable mitigation projects identified in a Ship Creek Mitigation Feasibility Study, which would be a requirement of the DA permit, if issued.

Feasibility Study of Mitigation Opportunities in Lower Ship Creek

A feasibility study to identify the most practicable and beneficial aquatic habitat function restoration/enhancements projects available in the Lower Ship Creek watershed is needed. The projects identified in this study will be considered by the Corps to determine, under consultation with the Mitigation Advisory Committee, which restoration and/or enhancement projects in the lower/tidal areas of the Ship Creek watershed shall be implemented as compensatory mitigation project requirements for the Port of Anchorage expansion. The members of the Mitigation Advisory Committee are identified in the Memorandum of Agreement between the Municipality of Anchorage and the Corps of Engineers for the Management and Administration of Port of Anchorage Mitigation Funds. The feasibility would need to be coordinated with Regulatory Division to ensure that it adequately addresses the objective.

Many entities, including the Port of Anchorage, the Municipality of Anchorage, the Anchorage Waterways Council, and the National Marine Fisheries Service have developed proposals for various restoration and mitigation activities in Ship Creek. The proposed feasibility study of mitigation opportunities would draw together these various plans and perform a comparative evaluation of costs, logistics, and expected aquatic habitat benefits in order to determine how well each may be utilized by the Port of Anchorage, or others, for future mitigation projects and needs.

The following process is a proposed outline for the feasibility study:

- Identify Problems and Opportunities
 1. Utilize the Municipality's Watershed Task Force to identify lists of issues.
 2. Condense issues into common themes of needs.
 3. Relate needs to resources that could be enhanced.

4. Develop concise problem statements, goals, and objectives.
- Inventory of Current and Future Conditions Related to the Problems
 1. Utilize existing information for as many physical parameters as possible, including biology, hydrology, hydraulics, topography, etc.
 2. Collect additional baseline information as necessary.
 3. Identify key assumptions and constraints.
 - Identification of Alternatives to Address Problems
 1. Collect lists of potential projects from the POA, MOA, State of Alaska, and watershed stakeholders.
 2. Screen alternatives to identify those that serve to address the defined problems and opportunities.
 - Evaluate and Compare Alternatives
 1. Develop conceptual designs and costs to a similar level of detail.
 2. Analyze alternatives for ability to provide improvement for identified parameters.
 3. Utilize an Incremental Cost Analysis/Cost Effectiveness procedure to determine a comparative cost/benefit analysis for the grouping of projects.
 4. Itemize analysis that should be done prior to implementation.

The USACE, in consultation with the Mitigation Advisory Team (consisting of federal, state, and local governments) would ultimately approve the execution of specific mitigation projects. Pre-identified projects to include in the feasibility study include:

Estuary Enhancement and Expansion: Currently Coho and Chinook smolt released from Ship Creek hatchery have limited estuarine habitat for refuge. Opportunities should be explored that would expand the estuary to the south to provide access to higher value mudflats, refuge from tidal currents, and potential juvenile rearing habitat for hatchery smolts and for restoring wild salmonid populations.

Dam Removal and/or Fish Passage Modifications: This action includes the planning, permitting, design, and construction associated with improving fish passage and/or removing the Knik Arm Power Plant (KAPP) dam (and potentially other dams located on Elmendorf and Fort Richardson) located on Ship Creek. This action is intended to restore historic salmon passage, restore and enhance riparian and estuarine habitat, increase downstream sediment transport, and improve public fish viewing opportunities.

Conservation Easements: This action would preserve critical areas within the remaining tidal estuary with the placement of easement

restrictions on those properties to preclude further losses by development.

Riparian Buffering: Ship Creek has been degraded by the absence of riparian buffering from industrial development located on the north side of the lower reach of the creek to its mouth. Projects shall be explored that would provide buffering, creek restoration and greater public access along Ship Creek from the North Ship Creek Point access bridge to the mouth of the creek.

Mitigation projects would be available for review and consideration by the Corps, the Municipality, and the advisory committee following the issuance of the DA permit and completion of the feasibility study, which would identify appropriate and practicable mitigation projects. Design drawings and environmental review and permitting would commence following the review and approval of the projects by the Corps under consultation with the advisory committee.

Six Mile Creek

To offset the unavoidable wetland losses associated with the borrow pit developments on EAFB, the following compensatory mitigation projects have been identified within the Six Mile creek watershed:

Lower Six Mile Lake: This project would replace fish ladders that are impeding fish migration in an effort to improve fish passage for adult and juvenile salmon. New design and construction would include a covered viewing platform with interpretive salmon displays.

Upper Six Mile Lake: This project is intended to stabilize the edge of Talley Avenue separating Upper and Lower Six Mile Lakes and enhance the existing gravel spawning beds. The project will also design and construct spawning channels along with check dams to coincide with freshwater flows.

Six Mile Creek: This project would design and construct four irregularly shaped over-wintering ponds at the location where Six Mile Creek meanders through the wetlands west of Fairchild Avenue.

The Six Mile Creek fisheries enhancement projects would be available for review and consideration by the Corps, Municipality, and the advisory committee following issuance of the DA permit. Design drawings and environmental review and permitting would commence following the review and approval of the projects by the Corps under consultation with the advisory committee.

Chester Creek

Chester Creek Aquatic Ecosystem Restoration, Westchester Lagoon to Cook Inlet, Phase II is an aquatic restoration project at the mouth of Chester Creek in Anchorage, Alaska. The proposed project is to improve anadromous fish passage by removing a major obstruction, constructed in 1971, to salmon at the mouth of Chester Creek. The mitigation project involves the construction/creation of a new intertidal channel to allow unobstructed fish migration in and out of Chester Creek from Knik Arm.

"Urbanization, loss of streamside habitat, modification of spawning substrates, and most importantly, major obstructions to in-migration and out-migration of salmon, have reduced the creek's salmon stocks almost to extinction. The current fish ladder at the lagoon severely hinders fish passage, allowing only a few fish to enter the creek each year." (*Summary, Page i, Chester Creek Aquatic Ecosystem Restoration, Final Integrated Report/Environmental Assessment and Finding of No Significant Impact, January 2005.*)

The Corps published the final environmental assessment in January 2005. Phase 1 of the Chester Creek Aquatic Ecosystem Restoration Project, which involves the relocation of utility lines (fuel and sewer) and partial channel construction, is currently underway. Phase 2 involves the installation of an 18-foot diameter culvert under the existing railroad embankment and the construction of a new all-tidal channel. This mitigation project involves the construction of a 1,550 feet long open intertidal naturalized channel at the mouth of Chester Creek and a monitoring plan to measure the effectiveness of the fish passage features, habitat changes, and revegetation activities. The proposed intertidal channel would provide access to spawning habitat and provide essential rearing habitat for salmonids.

An environmental assessment, finding of no significant impact, and preliminary engineer design drawings have been completed for this project. The final design for the project is anticipated by October 2007. The allocation of mitigation funds associated with DA permit POA-2003-502-2 for the construction of this project is available for the immediate review and consideration by the Corps, Municipality, and the advisory committee.

ATTACHMENT B:



**MEMORANDUM OF AGREEMENT
BETWEEN THE
U.S. ARMY CORPS OF ENGINEERS
&
THE MUNICIPALITY OF ANCHORAGE**

**Concerning the Administration and Management of
Compensatory Mitigation Funds for the
Port of Anchorage Expansion Project
Department of the Army Permit POA-2003-502**

SECTION 1. INTRODUCTION & BACKGROUND

- 1.1 This Memorandum of Agreement (MOA) establishes a formal agreement between the Regulatory Division of the Alaska District Corps of Engineers (hereinafter “Corps”) and the Municipality of Anchorage (hereinafter “Municipality”) for the administration of compensatory mitigation funds, as required by Department of the Army (DA) permit POA-2003-502-2 and subsequent modifications authorizing work in waters of the U.S. associated with the Port of Anchorage Expansion Project (Port Expansion). This MOA describes the objectives, process and the roles and responsibilities associated with the management and allocation of compensatory mitigation funds. Mitigation projects shall be reviewed and selected in the context of their comparative abilities to offset the direct losses of aquatic habitat and functions attributed to the Port Expansion project, as well as their overall ecological benefit relative to cost (cost/benefit analysis). Mitigation projects for consideration will include projects that restore, enhance, create, and/or preserve aquatic habitat and functions of Knik Arm and its tributaries, including projects that support and enhance the Municipality’s sustainable salmon and creek restoration programs. This MOA is effective as of the last date set forth on the signatory page hereto.
- 1.2 DA permit POA-2003-502-2 authorized the discharge of fill material over 27 acres of intertidal mudflats in Knik Arm north of the existing dock at the Port of Anchorage (Port). DA Permit POA-2003-502-N, if issued, would authorize discharges of fill material over the remainder of the proposed Port Expansion project area, which includes an additional 111 acres of intertidal mudflats and nearshore subtidal waters of Knik Arm

and gravel extraction activities that would result in the removal of 20.5 acres of wetlands on Elmendorf Air Force Base (EAFB).

SECTION 2. AUTHORITY

- 2.1 The Corps has regulatory jurisdiction over discharges of dredged and/or fill material in waters of the United States, including wetlands, under Section 404 of the Clean Water Act and work in or affecting navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899. The Corps Regulatory Program strives to avoid, minimize, and offset adverse impacts to aquatic resources, while allowing reasonable infrastructure development and economic growth through fair, flexible and balanced permit decisions. Authorized adverse impacts to the aquatic environment are offset by appropriate and practicable compensatory mitigation requirements, which may include restoring, enhancing, creating and/or preserving aquatic habitat and their functions and values.
- 2.2 The Municipality is recognized as a qualified entity for the administration and management of mitigation funds on behalf of the Port of Anchorage under the terms and conditions of this MOA. The Municipality has staff with expertise in land management, law, wetlands, hydrology, and planning. Additionally, the Municipality's Creeks Community Development Manager provides oversight and coordination of the Municipality's salmon habitat protection and restoration program, pursuant to the Southeast Sustainable Salmon Program and the Pacific Coast Salmon Recovery Fund. The Watershed Task Force, established by the Mayor of Anchorage, provides advice and guidance to the Municipality as it implements salmon restoration and watershed projects.

Section 3 PROGRAM ADMINISTRATION

- 3.1 The Municipality of Anchorage Office of Economic and Community Development shall oversee implementation of the MOA including organizing the Port of Anchorage Mitigation Advisory Committee (advisory committee) and related administrative support. The advisory committee shall include an initial permanent panel consisting of representatives of federal, state, and municipal resource agencies. Other public, private, nonprofit, and/or tribal entities will be invited for consultation on particular mitigation projects as appropriate and mutually agreed upon by the Corps and the Municipality. The Municipality and the Corps will consult with the advisory committee for advice and recommendations as to the overall ecological benefits and the appropriateness of proposed mitigation projects in meeting the purpose, objectives and outcomes of this MOA, which are described in Section 4. The initial permanent panel members shall consist of representatives from the following agencies:

1. Alaska Department of Natural Resources
Office of Habitat Management and Permitting
2. U.S. Fish and Wildlife Service
3. Environmental Protection Agency

- 3. National Marine Fisheries Service
- 4. Municipality of Anchorage, Planning Department
- 7. Department of the Air Force, 3 CES/CEVP
- 8. Municipality of Anchorage
Office of Economic and Community Development
- 9. U.S. Army Corps of Engineers, Regulatory Division

- 3.2 The Municipality of Anchorage Creeks Community Development Manager shall chair the advisory committee, which includes responsibilities to organize meeting dates, times, and place, in consultation with members of the advisory committee. The Municipality shall convene meetings with the Corps and the advisory committee as necessary to execute the terms and conditions of this MOA, at minimum once a quarter, and maintain a written record of meetings. Additionally, the Municipality will track and present the progress of projects funded pursuant to this MOA to the Corps and the advisory committee.
- 3.3 The Corps shall be the final approval for the allocation and distribution of mitigation funds after considering all comments and recommendations provided by the advisory committee.

SECTION 4 PURPOSE OBJECTIVES & OUTCOMES

- 4.1 Purpose: This MOA establishes the procedures and process for the management and administration of compensatory mitigation funds as required under DA permit POA-2003-502-2 and any applicable subsequent permit modifications, which authorize work in waters of the U.S associated with the Port of Anchorage Expansion. Mitigation funds shall be used for the restoration, enhancement, preservation, and/or creation of aquatic habitats and functions to offset, as practicable, respective losses associated with authorized activities. The establishment of a mitigation account to fund compensatory mitigation projects within adjacent and/or nearby tributary watersheds of Knik Arm (which may include tributaries within the Matanuska-Susitna Borough) has been determined to represent the most appropriate and practicable compensatory mitigation opportunity available to offset the unavoidable adverse impacts associated with DA authorized Port Expansion activities.
- 4.2 Objectives: Compensatory mitigation projects shall be selected based on the ecological benefits that would be provided and their respective contributions toward offsetting the losses of aquatic habitats and functions associated with DA authorized Port Expansion activities. Projects will be prioritized based on their availability, their respective locations and aquatic function gains relative to the authorized project impacts, and comparative cost to benefit ratios. When practicable, on-site compensatory mitigation (i.e., in areas adjacent or continuous to the impacted aquatic areas of the Port expansion) will be preferential over offsite mitigation projects. Off-site compensatory mitigation projects will be undertaken in the same geographic area and types of aquatic habitat impacted by the authorized work to the extent practicable. Additionally, in-kind compensatory mitigation projects that would offset the direct aquatic resource functional

losses associated with Port Expansion activities will be undertaken to the extent practicable.

- 4.3 DA permit POA-2003-502-2 authorized the discharge of fill material over 27 acres of intertidal mudflats adjacent to the existing Port in Knik Arm. DA permit POA-2003-502-D authorized the discharge of fill material over 0.21 acre of wetlands on Elmendorf Air Force Base for maintenance activities on the POA Haul Road. DA permit POA-2003-502-N, if issued, would authorize the discharge of fill material over an additional 111 acres of adjacent intertidal mudflats and nearshore subtidal waters at the existing Port location in Knik Arm and 20.5 acres of ponded wetlands on EAFB. Priority shall be given to projects in proximity and of similar habitat types as the impacted areas of the Port Expansion. The authorized impact areas of the Port Expansion involve the intertidal mudflats and nearshore waters of Knik Arm, located north of the mouth of Ship Creek and south of Cairn Point, and wetlands within the Cherry Hill and North End Runway Borrow Pits on EAFB, northeast of the Port (See Attachment A). Mitigation projects contiguous or adjacent to authorized impact areas have the highest priority, followed by projects which are in the same watershed, followed by projects in other watersheds nearby. Additionally, mitigation projects involving the same or similar aquatic habitat types as those impacted and lost by Port Expansion activities will be given priority over other habitat types. To contribute towards offsetting the intertidal mudflats and nearshore marine habitat losses associated with the expansion of the Port infrastructure, mitigation projects adjacent to the impact areas in Knik Arm will be given the highest priority, followed by projects in the intertidal and tidally influenced estuarine and riparian reaches of nearby freshwater tributaries of Knik Arm, mainly Ship Creek, just south of the Port expansion (See Attachment A). To offset the wetland losses associated with the gravel extraction developments on EAFB, located within the proximity of the Six Mile Creek watershed, priority will be given to wetland and riparian mitigation projects within the Six Mile Creek watershed.
- 4.4 The primary aquatic resource losses associated with the port expansion are the losses of intertidal and nearshore habitat used by salmon and beluga whales, species of high social and ecological value. The intertidal and nearshore subtidal waters of the Port Expansion area are used by juvenile and adult salmonids, originating from tributaries of Knik Arm, for refuge from the strong currents of Knik Arm and as a migration corridor for adult salmonids. The mouth of Ship Creek is located approximately 2000 feet from the southernmost limit of the Port expansion project. Ship Creek supports a hatchery enhanced urban sport fishery of high social and economic importance to the City of Anchorage and the State of Alaska. Ship Creek hatchery produced Chinook and Coho smolt represent the salmonid populations that would experience the greatest direct impact from the habitat losses associated with the Port Expansion. Cook Inlet Beluga whales, a depleted marine mammal, are known to frequent the Port area, especially the gyre formation south of Cairn Point, and are believed to use the area for the feeding opportunities provided by the salmonid use. In-kind mitigation options that involve the direct replacement of the intertidal and nearshore subtidal habitat losses associated with the Port Expansion are not currently available or practicable. Mitigation projects that would best offset Port Expansion impacts by restoring, enhancing, or preserving nearby intertidal and nearshore salmonid habitats will be given the highest priority, including

projects located in the estuarine and lower riparian reaches of nearby Knik Arm tributaries. It is anticipated that projects that improve salmon habitat to maintain and enhance Pacific salmon populations near the Port Expansion area would also provide a direct benefit to beluga whales by maintaining and/or enhancing a primary food source.

- 4.5 Compensatory mitigation projects that would contribute toward offsetting the functional losses attributed to the Port Expansion would support salmon populations through the restoration, enhancement, creation and/or preservation (listed in order of priority) of existing nearby estuarine and associated lower riparian habitats. Projects would include the removal and restoration of historical fills and developments, the removal of fish passage barriers, the restoration of natural hydrodynamics and sediment transport patterns, the enhancement and/or creation of estuarine juvenile salmonid refuge and rearing habitat, restoration and enhancement of riparian buffers and streambanks, the preservation of estuarine and riparian habitats, and projects that protect natural riparian buffers and streambanks by providing public access and improving overall social function (fishing, viewing, etc.) The allocation of mitigation funds for studies and evaluations will be approved sparingly only as absolutely necessary to implement high priority compensatory mitigation projects.
- 4.6 Prior to the allocation of mitigation funds, the Corps, Municipality, and the advisory committee will review available mitigation projects and prioritize them in accordance to their overall ability to offset the aquatic function losses of the Port expansion and their respective cost/benefit or cost/credit ratio. Applicable mitigation projects include projects identified in the Municipality of Anchorage's Sustainable Salmon initiative and/or other projects that may later be identified that would meet the purpose and objectives of this MOA. Nearby Knik Arm tributaries and the preliminary mitigation projects currently available for review and consideration by the Corps, Municipality and the advisory committee are summarized below (the following list is not absolute and does not limit other Knik Arm tributaries or projects which may be later identified).

Chester Creek

Chester Creek Aquatic Ecosystem Restoration, Westchester Lagoon to Cook Inlet, Phase II is an aquatic restoration project at the mouth of Chester Creek in Anchorage, Alaska. The proposed project is to improve anadromous fish passage by removing a major obstruction, constructed in 1971, to salmon at the mouth of Chester Creek. The mitigation project involves the construction/creation of a new intertidal channel to allow unobstructed fish migration in and out of Chester Creek from Knik Arm.

Status: An environmental assessment, finding of no significant impact, and preliminary engineer design drawings have been completed for this project. The final design for the project is anticipated by October 2007. The allocation of mitigation funds associated with DA permit POA-2003-502-2 for the construction of this project is available for the immediate review and consideration by the Corps, Municipality, and the advisory committee.

Six Mile Creek

To offset the unavoidable wetland losses associated with the borrow pit developments on EAFB, the following compensatory mitigation projects have been identified within the Six Mile creek watershed:

Lower Six Mile Lake: This project would replace fish ladders that are impeding fish migration in an effort to improve fish passage for adult and juvenile salmon.

Upper Six Mile Lake: This project is intended to stabilize the edge of Talley Avenue separating Upper and Lower Six Mile Lakes and enhance the existing gravel spawning beds. The project will also design and construct spawning channels along with check dams to coincide with freshwater flows.

Six Mile Creek: This project would design and construct four irregularly shaped over-wintering ponds at the location where Six Mile Creek meanders through the wetlands west of Fairchild Avenue.

Status: The Six Mile Creek fisheries enhancement projects would be available for review and consideration by the Corps, Municipality, and the advisory committee following issuance of DA permit POA-2003-502-N. Design drawings and environmental review and permitting would commence following the review and approval of the projects by the Corps under consultation with the advisory committee.

Lower Ship Creek

Ship Creek, which is the closest and most directly impacted watershed by the Port expansion area, has been historically degraded from human development activities. The Ship Creek estuary has been historically diminished in both size and function and the lower reaches of Ship Creek have been channelized, dammed and developed. The industrial developments have diminished streamside riparian habitat and buffering, salmon spawning and rearing habitat, and several dams have created major obstructions to salmon passage, which have substantially reduced the creek's wild salmon population. Mitigation activities that would restore and/or enhance the ecological functions of the Ship Creek estuary would provide the greatest opportunities to offset the unavoidable direct and indirect impacts of the Project. Due to the private ownership of the creek bed and adjacent lands in lower reaches of the creek, coupled with conflicting stake holder interests in the lower and upper reaches of the creek, mitigation projects are very controversial in the area. The Corps, Municipality and the advisory committee will consider appropriate and practicable mitigation projects identified in a Ship Creek Mitigation Feasibility Study, which would be sponsored by the Port of Anchorage following the issuance of DA permit POA-2003-502-N. Pre-identified projects to include in the feasibility study for consideration include:

Estuary Enhancement and Expansion: Currently Coho and Chinook smolt released from Ship Creek hatchery have limited estuarine habitat for refuge. Opportunities should be explored that would expand the estuary to the south to provide access to higher value mudflats, refuge from tidal currents, and potential juvenile rearing habitat for hatchery smolts and for restoring wild salmonid populations.

Dam Removal and/or Fish Passage Modifications: This action includes the planning, permitting, design, and construction associated with improving fish passage and/or removing the Knik Arm Power Plant (KAPP) dam (and potentially other dams located on Elmendorf and Fort Richardson) located on Ship Creek. This action is intended to restore historic salmon passage, restore and enhance riparian and estuarine habitat, increase downstream sediment transport, and improve public fish viewing opportunities.

Conservation Easements: This action would preserve critical areas within the remaining tidal estuary with the placement of easement restrictions on those properties to preclude further losses by development.

Riparian Buffering: Ship Creek has been degraded by the absence of riparian buffering from industrial development located on the north side of the lower reach of the creek to its mouth. Projects shall be explored that would provide buffering, creek restoration and greater public access along Ship Creek from the North Ship Creek Point access bridge to the mouth of the creek.

Status: Mitigation projects would be available for review and consideration by the Corps, Municipality, and the advisory committee following the issuance of DA permit POA-2003-502-N and completion of the feasibility study, which would identify appropriate and practicable mitigation projects. Design drawings and environmental review and permitting would commence following the review and approval of the projects by the Corps under consultation with the advisory committee.

4.7 In the event that any of the initially proposed projects identified above are determined to be infeasible, remaining funds will be directed towards other restoration, enhancement, and/or preservation projects approved by the Corps under consultation with the Mitigation Advisory Committee.

4.8 Outcomes: The monetary value of the Mitigation Fund is based on functional habitat losses attributed to DA authorized Port of Anchorage Expansion activities based on the calculation of debits in accordance to the Anchorage Debit-Credit Methodology (ADCM). Therefore, the purpose and outcomes of compensatory mitigation projects will be to appropriately offset functional losses through the generation of credits in accordance to the ADCM (i.e., credit-debit balancing). The overall measurement of success will consider the geographic area of successful restoration, enhancement,

creation, and/or preservation, and the resultant improvements to the relative ecological value and/or aquatic function in accordance to the ADCM. The Corps and the Municipality, under consultation with the advisory committee, will establish the specific objectives for which to guide, measure, and execute compensatory mitigation projects funded pursuant to this MOA. The debits and relative ecological values of Port Expansion activities authorized by DA permits POA-2003-502-2, POA-2003-502-D, and potentially POA-2003-502-N are as follows:

<u>Relative Ecological Values (REV) and Type</u>	<u>Debits</u>
<u>Phase I permit: POA-2003-502-2</u>	
REV 2 (intertidal, unvegetated mudflats)	17.45
<u>POA Haul Rd: POA-2003-502-D</u>	
REV 2 (EAFB wetlands)	0.11
<u>Phase II permit: POA-2003-502-N</u>	
REV 1 (intertidal, unvegetated mudflats)	11.04
REV 2 (nearshore subtidal and EAFB wetlands)	48.40
REV 3 (degraded subtidal)	20.07

Section 5: FINANCIAL ADMINISTRATION

- 5.1 The Municipality agrees to separately account for all mitigation funds received pursuant to this MOA in a “Port Compensatory Mitigation Account” (Account). Funds in this account will be managed and invested consistent with the provisions of Chapter 6.50 of the Anchorage Municipal Code. Interest earned on the account will be used to offset inflation rates of mitigation project costs as well other reasonable costs associated with establishing, maintaining and investing the funds contained within the subject account. Annual rates of inflation will be based on the Consumer Price Index of the Bureau of Labor Statistics. Interest earnings that exceed annual inflation rate percentages of the account balance, as well as the other reasonable account management costs described above, will be treated as unrestricted earnings of the Port of Anchorage.
- 5.2 The Municipality will assess the Account a one time fee of 5% for indirect administrative management and support provided pursuant to Sections 3, 5, and 6 of the MOA. Any allocation of Account funds to project management costs associated with the specific mitigation projects will be determined on a project-by-project basis based on advice from the advisory committee and approval by the Corps.
- 5.3 Disbursements from the account shall be made by the Municipality upon full consideration of recommendations received by the advisory committee and receipt of a written authorization from the Corps.
- 5.4 Disbursements for mitigation projects shall require written authorization and direction from the Corps for the distribution of specified amounts for specified purposes. Funds will be disbursed from the account for specified mitigation projects upon written approval

of the Corps in consultation with the advisory committee. In compliance with the written authorization, the Municipality of Anchorage’s Chief Fiscal Officer, or designee, shall direct issuance of funds in specified amounts for specified purposes as authorized by the Regulatory Division of the U.S. Army Corps of Engineers, Alaska District.

- 5.5 The Municipality will furnish an annual report by January 15th to the Corps and the advisory committee detailing all project activities and outcomes and financial information including: income, disbursements, and interest earned with respect to the Account.
- 5.6 The Municipality, on behalf of its department, the Port of Anchorage, shall establish the mitigation account with an initial balance of Nine Hundred Fifty-five Thousand Nine Hundred Ninety-eight Dollars (\$968,782.60), as required under DA permit POA-2003-502-2 and POA-2003-502-D. These funds may be allocated towards the implementation of eligible mitigation projects upon execution of this MOA. Subsequent funds associated with the mitigation requirements of DA permit POA 2003-502-N will, at minimum, be made by the Municipality over a period of five years (i.e., 20% increments) with annual deposits of \$1,407,849.73, with the first installment occurring within 30 days of permit issuance. The monetary mitigation amounts required by DA permits POA-2003-502-2, POA-2003-502-D (POA Haul Rd.) and POA-2003-502-N (if issued), are as follows:

Phase I permit: POA-2003-502-2:	\$ 955,998.00
POA Haul Rd: POA-2003-502-D:	\$ 12,784.60
<u>Phase II permit: POA-2003-502-N:</u>	<u>\$7,039,248.64</u>
Total	\$ 8,008,031.24

Section 6. TIME FOR PERFORMANCE

- 6.1 This MOA becomes effective when signed by the authorized parties to this MOA. The parties to this MOA shall commence performance of the work described herein immediately following signature. The selection and implementation of mitigation projects associated with the compensatory mitigation requirements of DA permit POA-2003-502-N, if issued, will be completed over a 5 year period, commensurate with the annual mitigation deposits by the Port and the construction phasing of the Port Expansion project, if practicable.
- 6.2 The administrative terms of this MOA shall remain effective for a period of five (5) years or until identified mitigation projects have been completed and available mitigation funds are depleted. If after five (5) years mitigation funds and appropriate and practicable mitigation projects remain, there will be an option to renew the agreement for an additional period up to five (5) years, as necessary to complete the administration of the funds. As mitigation projects may require post construction monitoring, monitoring requirements will remain in effect following construction of the last mitigation project approved under this MOA as necessary.

Section 7. GENERAL PROVISIONS

- 7.1. Amendments: This contract shall only be amended or modified by a written memorandum, executed by authorized representatives of the parties, with the same formality as this contract was executed. For the purposes of any amendment modification or change to the terms and conditions of this contract, the only authorized representatives of the parties are:

Chief, South Branch
Regulatory Division
U.S. Army Corps of Engineers, Alaska District

Municipal Manager
Municipality of Anchorage

Any attempt to amend, modify, or change this contract by either an unauthorized representative or unauthorized means shall be void.

- 7.2. Jurisdiction; Choice of Law: Any civil action rising from this contract shall be brought in the federal district court of the State of Alaska at Anchorage. Federal law shall govern the rights and obligations of the parties under this contract.
- 7.3. Severability: Any provision of this contract decreed invalid by a court of competent jurisdiction shall not invalidate the remaining provisions of the contract.
- 7.4. Termination: The duration of this MOA is in accordance with the terms specified in Section 6.0.

Section 8. NOTICES

- 8.1. Any notice required pertaining to the subject matter of this contract shall be either sent via facsimile (FAX) or mailed by prepaid first class registered or certified mail, return receipt requested to the following addresses:

Municipality of Anchorage
Dept. of Economic and Community Development
P.O. Box 196650
Anchorage, AK 99519-6650
FAX: (907) 343-4318

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
REGULATORY DIVISION
ATTN: POA-2003-502
P.O. BOX 6898
ELMENDORF AFB, ALASKA 99506-0898
FAX: (907) 753-5567

Notices are effective upon the earlier of receipt, proof of good transmission (facsimiles only), or five (5) days after proof of proper posting.

8.2 Staff support: Staff contacts to this MOA are:

Ryan Winn
Project Manager
Regulatory Division
US Army Corps of Engineers
Alaska District
Phone: 907.753.2712
Email: Ryan.H.Winn@poa02.usace.army.mil.

David Wigglesworth
Creeks Community Development Manager,
Municipality of Anchorage
Phone: 907.343.7116
Email: wigglesworthdt@muni.org.

Section 9. SIGNATORIES

IN WITNESS WHEREOF, the parties have executed this contract on the date and at the place shown below.

MUNICIPALITY OF ANCHORAGE

US ARMY CORPS OF ENGINEERS

Denis Leblanc
Municipal Manager
Date: _____

William A. Keller
Chief, South Branch
Date: _____

ATTACHMENT - A, MITIGATION MOA
DA PERMIT POA-2003-502, PORT OF ANCHORAGE
DIRECT PROJECT IMPACT AND
COMPENSATORY MITIGATION AREAS

