KNIK ARM CROSSING
SECTION 905(B) (WRDA 86) ANALYSIS

1.0 STUDY AUTHORITY

a. This Section 905(b) Analysis was prepared in response to the House Public Works Committee Resolution for Rivers and Harbors in Alaska, adopted 2 December 1970. The resolution states:

Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Rivers and Harbors in Alaska, published as House Document Numbered 414, 83rd Congress, 2nd Session, . . . and other pertinent reports, with a view to determining whether any modifications contained herein are advisable at the present time.

b. Funds in the amount of $100,000 were appropriated in fiscal year 2003 to conduct the reconnaissance phase of the study.

2.0 STUDY PURPOSE

The purpose of the reconnaissance phase study is to determine if there is a Federal (Corps) interest in participating in a cost-shared feasibility phase study to determine feasibility of providing transportation improvements to the City of Anchorage and the Matanuska-Susitna (Mat-Su) Borough. In response to the study authority, the reconnaissance study was initiated in September of 2003. The reconnaissance study has resulted in the finding that there is no Federal interest in continuing the study into the feasibility phase. The purpose of this Section 905(b) Analysis is to document the basis for this finding.

3.0 LOCATION OF STUDY, NON-FEDERAL SPONSOR AND CONGRESSIONAL DISTRICTS

a. The study area is located in the City of Anchorage and the Mat-Su Borough in the vicinity of Knik Arm.

b. The non-Federal sponsor is the Knik Arm Bridge And Toll Authority (KABATA).

c. The study area lies within the jurisdiction of:

1. Senator Ted Stevens (AK-R)
2. Senator Lisa Murkowski (AK-R)
3. Representative Don Young (At Large)

4.0 PRIOR REPORTS AND EXISTING PROJECTS

a. The basic purpose of the Knik Arm Crossing is to build capacity to provide a multi-modal transportation system between the Port of Anchorage and Port Mackenzie in the Knik Arm of the Upper Cook Inlet in south-central Alaska that will:

   1. Provide a safe, reliable, and operable system on a year round, 24 hour, 7 day a week basis;
   2. Provide a connection to establish a convenient, efficient surface transportation between the two ports and to permit efficient management, freight growth, and improved mobility between the two ports;
   3. Provide safe, reliable, and efficient connectivity, capacity, and mobility between the two ports to permit maximum service to each community through the ports;
   4. Provide needed homeland security and national security needs for the ports and the supporting communities.
   5. Maintain or improve vessel traffic with no increase in channel maintenance activities.
   6. Maintain habitat for marine mammals and other species of concern.

b. The following reports were reviewed as a part of this 905(b) analysis:

   1. Preliminary Appraisal of Proposed Knik Arm Causeway, Ivan Block and Associates, 1955. This report investigated the effects of a proposed causeway, potential benefits, and construction considerations.
   2. Knik Arm Highway Crossing, Howard Needles Tammen and Bergendoff Consulting Engineers, 1972. This study was initiated by the Alaska Department of Highways, now the Alaska Department of Transportation and Public Facilities (ADOT&PF), for the purpose of exploring technical problems associated with an engineering structure across Knik Arm. The study encompassed various structure types including bridges, tunnels, and dams.
   3. Knik Arm Crossing Economic Feasibility, ADOT&PF, 1983. This report evaluates the economic feasibility of a highway crossing of Knik Arm, including connections to the Parks Highway on the north and the Anchorage road system to the south. This report includes costs, benefits, and environmental impacts based upon a conceptual design of a representative alignment of the highway.
   4. Knik Arm Crossing Engineering Feasibility and Cost Estimate Update Project (Update Project), ADOT&PF, 2003. This study provided a preliminary examination of historical and current planning, engineering, and cost factors for the purpose of updating the engineering feasibility and

cost estimate components of the project. This report was based upon an update of information from the 1983 ADOT&PF analysis.

5. Knik Arm Ferry Environmental Assessment, prepared by HDR, Inc. for the Matanuska-Susitna Borough, 2003. The purpose of the project is to provide ferry transportation for people and goods between the south side and north side of Knik Arm in a timely and practical manner. Ferry service would include a ferry vessel capable of accommodating projected traffic. It would also include docks and ferry terminal infrastructure to connect the ferry to existing road systems.

c. This study is investigating potential impacts to the following Corps project(s):

1. PORT OF ANCHORAGE - The Federal project accommodates three dry cargo berths and an oil handling facility. It is the main supply and distribution center for the south central and interior areas and the two large military bases that lie within the Municipality of Anchorage. The Port of Anchorage is the largest cargo port in Alaska; 2,661,000 tons of cargo (all commodities) passed through the port in 2001.

2. COOK INLET NAVIGATION CHANNEL: The channel provides additional time for the passage of deep draft vessels to and from the Port of Anchorage.

5.0 PLAN FORMULATION

In support of the 905(b) two separate studies were performed. The first was an analysis of economic benefits for the Knik Arm Crossing based upon several reports. The benefits were updated to reflect current conditions and prices. Information from this economic analysis is contained in later sections of this report. For the second study the Alaska District worked with the Engineering Research and Development Center (ERDC) to develop a scope of work for potentially needed physical and numeric models. These models would likely be necessary to determine impacts during the design phase of any such project. This too is detailed later on in this 905(b).

5.1 Problems and Potential Solutions

Review of reports on previous studies identified the lack of adequate highway connectivity between Anchorage and the Mat-Su Borough as the overriding problem with the transportation infrastructure. The existing condition consist of a system of roads and thoroughfares that extend around Knik Arm, with no ferry or other vessel service between the Ports of Anchorage and Port Mackenzie. A summary listing of the transportation infrastructure related problems and potential solutions that were identified through a review of reports on previous studies are presented below in Table 1.

Table 1. Summary Listing of Transportation Infrastructure Problems, Solutions and Benefits from Previous Reports

Infrastructure Type	Problems	Potential Solution
Preliminary Appraisal of Proposed Knik Arm Causeway, Anchorage Alaska, December 1955		
Navigation	Adverse currents Winter ice Sedimentation	Causeway dam
Knik Arm Highway Crossing, Anchorage, Alaska, January 1972		
Highway transportation	Travel distance to interior Alaska Defense operations Emergency Evacuation Lack of access to west side of Knik Arm reduces land use and value	Causeway dam
Rail transportation	Travel distance to interior Alaska	Causeway dam
Knik Arm Crossing, Economic Feasibility, April 1983		
Highway Transportation	Travel distance to interior Alaska Lack of access to west side of Knik Arm reduces land use and value	Bridge Bridge-Causeway Causeway Tunnel
Knik Arm Ferry Environmental Assessment, June 2003		
Highway transportation	Travel distance between Anchorage and Mat-Su Borough communities Travel time between Anchorage and Mat-Su Borough communities Economic development	Bridge
Highway transportation	Travel distance between Anchorage and Mat-Su Borough communities Travel time between Anchorage and Mat-Su Borough communities Economic development	Ferry

Each of these studies focused on a crossing over the Knik Arm as the only possible solution to the problem of inadequate transportation system connectivity between Anchorage, the Mat-Su Borough and interior Alaska (via the Parks Highway). The 2003 report (ADOT&PF, 2003) documents a review of design and related engineering issues and identifies changes in socio-economic conditions since completion of the 1972 design study and report and the1983 economic feasibility study and report. The report includes information on the existence of the ferry and states that the alignment and construction of the proposed bridge will need to avoid adverse impacts on the ferry.

5.2 Alternative Considered for Evaluation

The only alternative considered for this evaluation is a bridge crossing of Knik Arm as presented in the Knik Arm Crossing Engineering Feasibility and Cost Estimate Update Project (Update Project), ADOT&PF, 2003. Other alternatives, such as a ferry crossing and freeway enhancements are not being considered by KABATA at this time. KABATA sees a bridge as the only feasible solution. Therefore, this analysis will solely focus upon the bridge alternative.

5.3 Assessment of Alternatives

The primary basis for this assessment of a Knik Arm crossing is documented in the 1983 ADOT&PF report. In addition, the 2003 ADOT&PF report provided information on changes in key socio-economic parameters that underlie the analysis in this report. This assessment includes (1) comparison of the 1983 forecasts with actual conditions and the most recent forecasts, if available; (2) description of the transportation system that would exist in the absence of construction of the proposed bridge; and, (3) an assessment of the magnitude of potential economic benefits.

5.3.1 NED Benefits

In general, NED benefits result from implementation of actions or measures that reduce the cost of producing goods and services from a national perspective. They also include (1) the net value (total value minus cost of production) of production of new goods and, (2) services, e.g., new recreation opportunities, neither of which would be produced without implementation of the action or measure. The conceptual basis for measurement of NED benefits is the "willingness to pay," which is typically represented by the market value of the good or service, net of production costs. In the case of non-market goods or services, e.g., recreation opportunities made possible at no cost to the user, values may be set by Federal policy or by a survey designed to determine "willingness-to-pay."

The actual computation of estimates of economic benefits is based on a comparison of expected future conditions without and with implementation of a proposed action, such as the Knik Arm crossing. Economic benefits of implementation of the action are the differences between the without- and with-project future conditions. In the case of the proposed bridge, this means that potential economic benefits must be computed on the basis that ferry service (passenger, car, and truck) exists prior to the bridge. Though actually figures are not computed, the following table shows a subjective valuation of potential benefits compared to the actual values represented in the 1983 report.

Table 2. Summary of Potential Magnitude of Economic Benefits

Benefit Category	Estimate of Benefits, ADOT&PF, 1983 ($ million) 1/	Findings of Review and Assessment of the Magnitude of Potential Benefits
National Economic Development (NED)		
Highway travel benefits		Highway travel benefits are largely realized without the proposed bridge by the ferry service.
Automobile		
Operating Costs	233.8	Incremental benefits to the bridge would be relatively insignificant.
Value of Passenger Time	1,161.1	Incremental benefits to the bridge would be relatively insignificant.
Total automobile benefits	1,394.9	Incremental benefits to the bridge would be relatively

Benefit Category	Estimate of Benefits, ADOT&PF, 1983 ($ million) 1/	Findings of Review and Assessment of the Magnitude of Potential Benefits
		insignificant.
Truck		
Operating Costs	(7.9)	Incremental benefits to the bridge would be relatively insignificant.
Value of Passenger Time	270.9	Incremental benefits to the bridge would be relatively insignificant.
Total truck benefits	263.0	Incremental benefits to the bridge would be relatively insignificant.
Induced Travel	32.8	Incremental benefits to the bridge would be relatively insignificant.
Highway Construction Costs	40.0	Improvements on which benefits were based have already been constructed. Because of the existence of ferry service there would be no additional savings in highway construction costs with the proposed bridge.
Ferry System Operating Costs	2/	Termination of ferry service with the proposed bridge is possible. Existing information sources do not contain data needed to develop a reconnaissance-level estimate of cost savings/benefits.
Recreation	50.0	Ferry service provides access to the Point MacKenzie area needed to realize these benefits without the proposed bridge
Agriculture	2.6	Ferry service provides access to the Point MacKenzie area needed to realize these benefits without the proposed bridge.
Military operations	2/	No military need for direct access to the Point MacKenzie area was identified in recent studies.
Homeland Security Costs	2/	Ferry service provides the connection between the Port of Anchorage and Port MacKenzie that is needed for optimal security operations.
Port Connectivity	2/	Ferry service provides the needed connection between the Port of Anchorage and Port MacKenzie.
Regional Economic Development (RED)		
Land Value Enhancement		Benefits will be realized without construction of the proposed bridge by the transportation access provided by the ferry service.
Residential	399.0	Incremental benefits to the bridge would be relatively insignificant
Commercial	179.1	Incremental benefits to the bridge would be relatively insignificant

Benefit Category	Estimate of Benefits, ADOT&PF, 1983 ($ million) 1/	Findings of Review and Assessment of the Magnitude of Potential Benefits
Industrial	206.0	Incremental benefits to the bridge would be relatively insignificant
Port Development	10.2	Incremental benefits to the bridge would be relatively insignificant
Total Benefits	**2,577.6**	Total incremental economic benefits to construction of the proposed bridge are expected to be relatively insignificant.
Notes: 1/ Benefits are total over a 40-year long period of analysis (1990-2030). 2/ This benefit category was not addressed in ADOT&PF, 1983.		

5.3.2 Summary of Economic Benefits

Because of the existence of ferry service between Anchorage and Point MacKenzie in the without-project condition, economic benefits to construction of a bridge crossing will be relatively insignificant. Minor benefits are expected from reduced travel costs; the possible reduction of ferry service and the resulting savings in operating costs; and further enhancement of land value. Analysis of the magnitude of these benefits would require detailed study that is beyond the scope of this reconnaissance study.

5.3.3 Costs of Alternatives

Upon review of the reports and documents, the plan that KABATA is proceeding with will include a bridge and causeway combination at a cost of $1.16 billion. In addition, other projects that are needed to connect the bridge with existing infrastructure will add an additional $383 million, for a total project price of $1.54 billion (Knik Arm Crossing Engineering Feasibility and Cost Estimate Update, Volume 3 Schedule, Cost, Contracting, and Finance Report, 2003).

5.4 Policy Issues Related to Alternatives

Federal interest in water resources development is established by law. Within the larger Federal interest in water resource development, the Corps of Engineers is authorized to carry out projects in seven mission areas: navigation, flood damage reduction, ecosystem restoration, hurricane and storm damage reduction, water supply, hydroelectric power generation, and recreation. The role of the U.S. Army Corps of Engineers with respect to navigation is to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation. The Corps accomplishes this mission through a combination of capital improvements and the operation and maintenance of existing projects. Capital improvement activities include the planning, design, and construction of new navigation projects. Types of improvements typically include channels, jetties or breakwaters, locks

and dams, basins or water areas for vessel maneuvering, turning, passing, mooring, or anchoring incidental to transit of the channels and locks.

The statute that allows the Corps to participate in bridge construction pertains only to modification of bridges that obstruct navigation (Public Law 67-647, the Bridge Alteration Act). The Bridge Alteration Act (1941), commonly called the Truman-Hobbs Act, applies only to existing highway and rail bridges.

6.0 FEDERAL INTEREST

6.1 Federal Interest Associated With Alternatives

The test of Federal (Corps) Interest can be determined in the answer to the following questions.

1. Is there a problem the Corps can appropriately address through existing mission areas?

   It appears the problem is a land based transportation issue, with little potential need for alteration of traditional general navigation features.

2. Is there a solution that appears to be economically justifiable, reasonable in terms of engineering, and has environmental impacts that can be mitigated for?

   The bridge solution does not appear to be economically justified in terms of NED, RED, or OSE. There are engineering concerns because of the proposed alignment and its potential impacts to navigation. Environmental impacts have not been categorized.

3. Is there a willing and able non-Federal sponsor who will cost share in feasibility?

   The most likely non-Federal sponsor, KABATA, has not expressed interest in a cost shared study.

6.2 International and Interagency Support

The Corps has provided assistance to other jurisdictions for similar types of projects under what is now called the International and Interagency Support program (IIS). Through this program, the Corps can enter into agreements with other agencies to provide many types of technical, management, and construction oversight assistance. An example of this was the construction of the West Seattle Bridge in Seattle, Washington.

In 1979, the Seattle District US Army Corps of Engineers was approached by the City of Seattle to provide technical assistance and construction management for building of the West Seattle Bridge, spanning a 250-foot wide channel with a vertical clearance of 141 feet above MLLW. The main guideline for the Corps involvement was ER 1140-2-303, under the authority of Title II Intergovernmental Cooperation Act of 1968. The regulation spelled out criteria for the Corps to provide services, in particular that the services be a regular continuing function of the office which provides them, that such services not require staff additions which would exceed employment ceilings, that the recipient pay for the direct and indirect costs of providing such services and, finally the

services rendered must be unobtainable in a reasonable and expeditious fashion through ordinary business by the requestor.

Various provisions and policies have changed in the IIS program over the last 30 years, thus any utilization of the this Corps program for assistance with the Knik Arm Bridge would require significant coordination through all levels of the organization.

6.3 Federal Interest in Maintaining Navigation

The Corps has regulatory jurisdiction over a project such as the Knik Arm crossing and does have an interest on how the proposed crossing may impact the existing Federal navigation projects at the Port of Anchorage and Cook Inlet. It is in response to Corps' interest in maintaining the two navigation projects that the Alaska District went to the local sponsor with issues that will eventually come to light in the project's review and permitting process.

In 2003, under an O&M study, the Corps of Engineers built a physical model of the Port of Anchorage at the Engineering Research and Design Center (ERDC) in Vicksburg, Mississippi. This model was constructed with the intent of studying circulation patterns at the Port of Anchorage; however, it also served as a tool to do rough estimate on the impacts of the then proposed Knik Arm bridge crossing. The Corps took the opportunity to use this model to briefly investigate potential hydraulic interaction with the in water structure of the proposed bridge. Dramatic changes in the hydraulic conditions within Knik Arm were observed. It was however determined that the existing model was not sufficiently sophisticated to demonstrate all potential impacts; hence a recommendation was made to develop a new, specific model of the bridge crossing. With funds from this reconnaissance analysis, the Corps has worked with ERDC to develop a scope of work on both a numerical and physical model of the Knik Arm crossing to assess its impacts. The objective of the numerical and physical model studies, associated with the Cook Inlet and particularly the Knik Arm, segment is to assess the potential for environmental impacts and the Corps of Engineers' navigation and maintenance responsibilities

Potential impacts associated with bridge construction appear to be the most far reaching and should be investigated in depth. Partial blocking of the Knik Arm cross section by the causeways and bridge piers will increase velocities and turbulence in the near field of the bridge and velocities for an extensive distance in both the flood and ebb direction from the bridge. The impact in the near bridge vicinity will result in deepening of the channel and scour at the toes of the causeways and at the bridge piers.

Impacts that could be seen at further distances (far field) are more numerous and are listed for below.

1. *Area-wide changes to the ebb and flood tide flow patterns*. Construction of the proposed projects may significantly alter the pattern of eddies and gyres formed along the Knik Arm and farther seaward in Cook Inlet. Such changes would have long-term implications on shoreline morphology or cause unexpected environmental impacts.
2. *Navigation impacts due to flow strengthening or flow pattern modification*. Present navigation practices may need to be modified if the proposed projects are shown to modify the flow patterns or increase flow velocities in the vicinity of the Port of

Anchorage or in the approach and maneuvering lanes. Changes will need to be evaluated in the ERDC ship simulator utilizing currents developed through numerical models verified by physical models or extensive data collection.

3. *Modification of upstream tidal flats and the wetting/drying cycle due to the Knik Arm Causeway.* Reduction of the Knik Arm cross section at the crossing may reduce the volume of water moving farther upstream during the flood stage of the tide. As a consequence, mud flats will be flooded for a shorter duration, and some flats may become permanently exposed.
4. *Hydrodynamic environment during causeway construction and during port expansion phases.* Partially completed projects will influence the flow patterns, and there is the possibility that increases in flow velocity may impact the construction sequence and possibility even the design of the improvement
5. *Potential accretion and sedimentation at Port of Anchorage.* With shifting sedimentation patterns, additional accretion at Corps project may occur, including increased sedimentation at the port that would lead to expanded dredging requirements. The importance of three-dimensional current patterns of the suspended sediment transfer may be critical. The vertical variations in flow magnitude and direction are significant factor in the Knik Arm flow pathways and probably at the locations of deposition.. This comparison between physical and numerical model results will assess the need to represent the three-dimensionality of the flow.
6. *Knik Arm navigation channel sedimentation.* The proposed modifications may lead to increased deposition of sediment in the navigation channel that could require dredging to maintain the channel at the authorized depth.
7. *Impacts on dredging methods and optimal disposal locations.* Present practices related to dredging and disposal may be impacted if flow patterns are significantly altered by the proposed modifications.
8. *Ice impacts.* Ice formation and breakup could impact the integrity of the causeway and cause scouring of the mud flats. Due to the presence of pan ice in the Inlet, as well as tidal influences, ice jams could occur cyclically at the bridge. Combined with the hydrodynamic factors previously discussed, a bridge could feasibly induce icing or ice movement at the Port of Anchorage, thereby disrupting operations. The impact of ice movement on a berthed vessel at Port Mackenzie forced the vessel to withdraw to Homer in January 2005.

Other items proposed for investigation are:

1. *Provide current patterns and velocities for studies of fish migration.* Proposed construction may impact upstream and downstream fish migration. The CHL studies will provide information for use by experts in studies of possible impacts to fish migration.
2. *Wind wave effects on sediment resuspension on tidal mud flats.* Increased resuspension could lead to additional sedimentation with the Corps navigation project.

3. *Flow field modifications due to Port of Anchorage expansion.* Dredging at the Port of Anchorage is a major Corps maintenance expense. The proposed port expansion and the order of construction may alter the flow regime. The port expansion may actually increase flow velocities adjacent to the berthing areas, resulting in less silt deposition. Increased flow velocities will need to be addressed for mooring at the dock.
4. *Impacts to Proposed Projects.* The influence of north-shore constructions including Port MacKenzie expansion and Knik Arm causeway on conditions at the Port of Anchorage should be investigated. Structures placed where they can impede or deflect the ebb flow may alter conditions at the Port of Anchorage, and thus, impact navigation and/or dredging requirements.
5. *Improvements in Port Mackenzie dock use.* Measurements of currents and navigation conditions so ship simulation can be used to optimize moorings and tug assists.
6. *Proposed Ferry Crossing.* Examination of optimal ferry crossing and landing sites should occur.

A need has arisen to perform models of shoaling at the Port of Anchorage. Though mainly focusing upon sedimentation issues in the existing Federal navigation channel, this model could also be used to assess the impacts of the proposed bridge as well. The Fiscal Year 2005 Energy and Water Appropriations Act (P.L. 108-447), Section 118(c), provided the following authorizing language, however, no funding was provided for this effort.

> *"(c) HYDRODYNAMIC MODELING. -- The Secretary shall carry out hydrodynamic modeling of the Knik Arm to identify causes of, and measures to address, shoaling at the Port of Anchorage, at a total cost of $3,000,000."*

The authorization to conduct model studies is to address the shoaling problems at the Port of Anchorage. The impacts of any potential future bridge structures in the Knik Arm should be included in modeling efforts to determine the effects and impacts on shoaling at the Port of Anchorage.

6.4 Federal Interest for initiating a Feasibility Study

In summary, there is no Federal (Corps) interest in pursuing a feasibility study for the bridge. Because there is no interest in a Feasibility study, the Preliminary Financial Analysis, Feasibility Assumptions and Exceptions, Feasibility Phase Milestones, Feasibility Phase Cost Estimate, and Potential Issues section will not be included in this report.

As described in section 6.2, there is a Federal Interest in performing modeling of the proposed bridge to determine potential impacts or benefits to the existing Federal navigation channels.

7.0 VIEWS OF OTHER RESOURCE AGENCIES

Because of the funding and time constraints of the reconnaissance phase, only limited and informal coordination are typically conducted with other resource agencies.

a. The affected communities have mixed views regarding the construction of the bridge. Typical arguments for the construction cite the need for new developable land and improved transportation between Anchorage and the Mat-Su region. Arguments against include environmental concerns and the large cost of a project of this type.

b. The U.S. Fish and Wildlife Service (USFWS) and the NOAA Fisheries indicate that that there are no species on the federal list of threatened or endangered species in the Ship Creek/Port area, Point MacKenzie area, or Knik Arm

The Cook Inlet stock of beluga whales is designated as depleted under the Marine Mammal Protection Act. A circumpolar species, five distinct stocks of beluga whale are found in arctic and sub-arctic regions. Cook Inlet is one of eight recognized wintering areas for beluga whales, and the Cook Inlet stock is the most genetically isolated.

Because of the presence of the Beluga, any project being proposed for implementation within the Knik Arm will require close coordination with the pertinent resource agencies.

8.0 PROJECT AREA MAP

A map of the study area is provided as Enclosure A.

9.0 RECOMMENDATIONS

I recommend continued coordination between the Corps of Engineers and KABATA as KABATA pursues the Knik Arm Bridge project. There is a clear Federal (Corps) Interest in maintaining the Federal navigation projects in Cook Inlet; therefore there is a Federal interest in continuing this coordination. There is, however, no Federal (Corps) Interest in entering into a cost shared feasibility study. Federal involvement in construction or funding assistance for this project does not fit with current Corps authorities or policies, but rather under the jurisdiction of other Federal agencies.

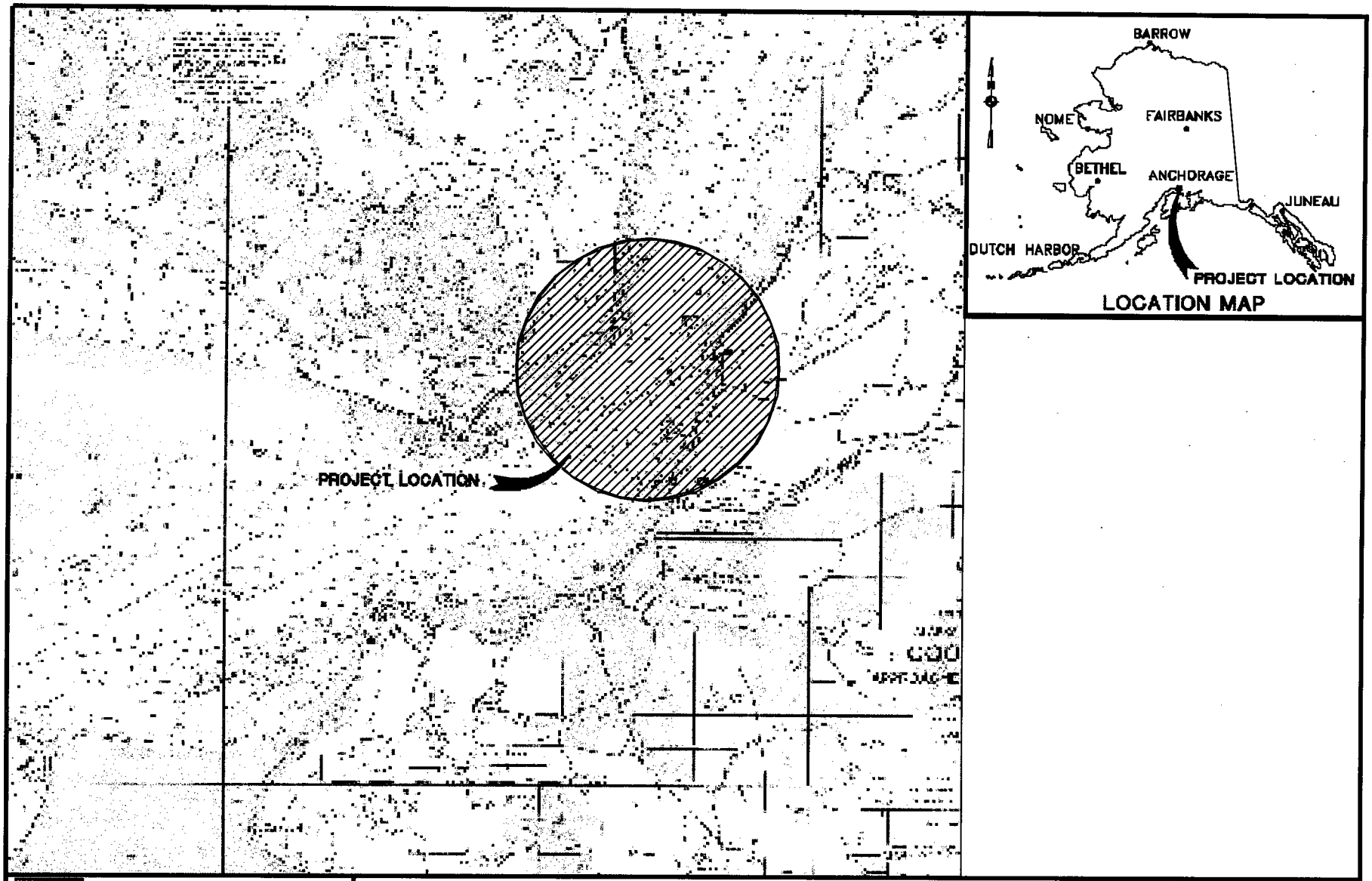
I recommend that KABATA continue to coordinate with the full breadth and depth of interest parties and agencies regarding the benefits and impacts of such a project. Plans for future development, such as the proposed bridge, need to consider the impacts such a project would have on the surrounding systems. The Port of Anchorage, Port Mackenzie, the Knik Arm Bridge and the natural environmental are physically connected, and cannot be considered separately.

I recommend that the model studies authorized by Fiscal Year 2005 Energy and Water Appropriations Act (P.L. 108-447), Section 118(c) include an assessment of the impacts of proposed Knik Arm Bridge structures on shoaling at the Port of Anchorage. This modeling effort should be coordinated with KABATA to ensure that impacts to the operation and maintenance of the Port of Anchorage are minimized. KABATA may also wish to participate in the model studies on a reimbursable basis to assist with their bridge designs.

The recommendations for Knik Arm, Alaska reflect the policies governing formulation of individual projects and the information available at this time. They do not necessarily reflect the program and budgeting priorities inherent in the local and State programs or the formulation of a national civil works water resources program. Consequently, the recommendations may be changed at higher review levels of the executive branch outside Alaska before they are used to support funding.

Date 29 Apr 05

TIMOTHY J. GALLAGHER
Colonel, Corps of Engineers
District Engineer



ALASKA DISTRICT
CORPS OF ENGINEERS
CIVIL WORKS BRANCH

KINK ARM CROSSING

ANCHORAGE, ALASKA

FIG 1