DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

DEC 1 1 2019

CECW-POD

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Barrow, Alaska Coastal Erosion Section 116 Feasibility Report and Environmental Assessment

1. Purpose. I request budgeting support and assistance for the construction of the Barrow, Alaska Coastal Erosion Project. The purpose of the subject study was to evaluate federal interest in and the feasibility of constructing coastal storm risk management measures for addressing erosion and coastal flooding along the shoreline of Barrow, Alaska. Barrow experiences frequent and severe coastal storms, resulting in flooding and erosion that threaten public health and safety, the economy of the community, over $1 billion of critical infrastructure, access to subsistence areas, and cultural and historical resources. Based on the findings of the enclosed Final Feasibility Report and Environmental Assessment and in accordance with the 1 June 2010 Implementation Guidance (IG) for Section 116 of the Energy and Water Development and Related Agencies Appropriations Act (EWDRAAA) of 2010, Headquarters U.S. Army Corps of Engineers (Corps) has approved the decision document.

2. Non-Federal Sponsor. The North Slope Borough (NSB) is the non-federal sponsor for the study and has stated its intention to cost-share in federally-constructed coastal storm risk management measures.

3. Authorization. This study was conducted under authority granted by Section 116 of the EWDRAAA of 2010 which states:

> *"The Secretary of the Army is authorized to carry out structural and non-structural projects for storm damage prevention and reduction, coastal erosion, and ice and glacial damage in Alaska, including relocation of affected communities and construction of replacement facilities: Provided, that the non-Federal share of any project carried out pursuant to this section shall be no more than 35 percent of the total cost of the project and shall be subject to the ability of the non-Federal interest to pay, as determined in accordance with 33 U.S.C. 2213(m)."*

The IG for studies and projects under the Section 116 Authority notes that:

> *"Each decision document will present the National Economic Development (NED) analysis for all viable alternative and identify the NED Plan when alternatives exist with net positive NED benefits. If there is no NED Plan and/or the selection of a plan other than the NED Plan is based in part or whole on non-monetary units*

(Environmental Quality and/or Other Social Effects), then the selection will be supported by a cost effectiveness/incremental cost analysis consistent with established evaluation procedures." (Memorandum for Commander, Pacific Ocean Division, 10 May 2012)

4. Project Background and Discussion. The community of Barrow, currently recognized as the City of Utqiaġvik, is located on the Chukchi Sea, approximately 750 miles north of Anchorage, Alaska. Barrow is the northernmost community in the United States and the administrative, economic, social, and cultural center for the NSB. The coastline of Barrow, Alaska is approximately a five mile combination of bluff ranging from 14 to 35 feet high, low lying areas that mesh with the beach, and a coastal road that runs north past the Naval Arctic Research Laboratory (NARL). Barrow has had two emergency declarations since 2015. The NSB's emergency response costs are currently exceeding $8.5 million per year to build and maintain sacrificial berms and fill Super Sacks (a 25 to 30 cubic yard capacity sand bag) to reduce the rate of land lost to the Chukchi Sea during the open water period. These activities reduce risk of saltwater inundation to the Utilidor (an underground insulated network of pipes and cables used to convey water and electricity) and the freshwater lagoon. They also reduce the threat of erosion to public and private infrastructure and to cultural resources. The NSB is currently using all of the gravel sourced in the community for addressing coastal erosion and flooding while the community's still losing land and infrastructure by erosion. This is creating a shortage of gravel for developing capital improvement projects, constructing new homes and repairing roads. The objectives of the study were as follows:

1) Reduce risk to life, health, and safety for the Barrow community over the 50-year period of analysis.

2) Reduce damages in Barrow caused by flooding and shoreline erosion to residential and commercial structures and critical public infrastructure located within the five mile study area over the 50-year period of analysis.

3) Reduce or mitigate damage to tangible cultural heritage along the Barrow shoreline, specifically to reduce any further losses to the culturally significant Utqiaġvik Village Site over the 50-year period of analysis.

5. Study Alternatives and Recommended Plan. The study initially evaluated a number of structural and non-structural alternatives to address coastal storm erosion and flooding at Barrow based on economic, engineering, and environmental and cultural resource factors. The final array of alternatives consisted of eight structural plans labeled A through H, as well as a No Action alternative. The structural alternatives consisted of various combinations of three measures (rock revetment, revetted berm, and raising and

revetting the coastal road) at six different reaches. These reaches, and some of the key infrastructure and resources at each reach, are Reach 1 (Bluffs), which includes the culturally significant Utqiaġvik Village Site; Reach 2 (Barrow), which includes part of the Utilidor; Reach 3 (Lagoon), which includes part of the Utilidor, as well as the lagoon which is the community's only freshwater source, and several historic properties; Reach 4 (Browerville), which includes Stevenson Street which is the community's main access road north, and major utility infrastructure; Reach 5 (South and Middle Salt), which includes Stevenson Street, a landfill, and sewage lagoons; and Reach 6 (NARL) which includes significant subsistence use areas and the only Tribal College in Alaska. Three of these alternatives yielded positive net NED benefits.

a. The NED plan was identified as Alternative A (Reaches 2 and 3), which yields average annual net benefits of $587,000 based on the Fiscal Year (FY) 2020 discount rate of 2.75% and has a benefit to cost ratio (BCR) of 1.2. Alternatives B (Reaches 1, 2 and 3), and C (Reaches 1, 2, 3, and 4) were also economically justified. However, none of the economically justified plans reduced the flooding risk and associated environmental hazard risk at the landfill and sewage lagoon sites, or flooding risks to infrastructure at the NARL site.

b. In accordance with the Section 116 IG, a Cost Effective/Incremental Cost Analysis (CE/ICA) was conducted and used as the basis for recommending a plan other than the NED plan. The CE/ICA was based on a "community resilience unit" (CRU) metric, which measured relative changes in various economic, social/cultural, and environmental metrics. Based on the CE/ICA, Alternative H, which was the largest alternative analyzed and produced the most CRUs, was identified as the recommended plan.

c. Alternative H is not economically justified, as it has negative net average annual benefits of -$5,973,000 (at the FY 2020 discount rate of 2.75%) and a BCR of 0.6. However, Alternative H would reduce flooding and erosion impacts across all six reaches in the entire five mile study area, and address not only potential economic impacts in the project area under a future without project condition, but address additional cultural and environmental impacts as well. Depending on the reach, Alternative H would reduce the Annual Exceedance Probability (AEP) for the elevation at which damages would be initiated anywhere from 3% to 21% down to around 1% or below.

d. Alternative H consists of a +19 foot mean lower low water (MLLW) rock revetment that would be constructed against the natural bluff in front of the airport and the Utqiaġvik Village archeological site; a +14.5 foot MLLW revetted berm in front of the freshwater lagoon; and a +14.5 foot raised and revetted coastal road (Stevenson Street) stretching from the end of the lagoon north to Dewline Road, encompassing Browerville, the landfill, sewage lagoons, and NARL.

6. National Flood Insurance Program (NFIP). The NSB is currently not part of the NFIP. However, as a requirement for federal participation in the project, prior to project construction the NSB will need to join the NFIP. The NSB is currently working with the Corps and the Federal Emergency Management Agency on the necessary steps in order for them to become eligible to participate in the NFIP.

7. Project Costs. The estimated project first cost of the recommended plan is $328,630,000 (October 2019 price level) which includes the cost of constructing the proposed features and the value of lands, easements, rights-of-way, relocations, and disposal areas (LERRDs). LERRDs are estimated to be $4,500,000. The estimated federal (65 percent) and non-federal (35 percent) shares of project cost are $213,610,000 and $115,020,000, respectively. Based on a 50-year period of analysis and the FY 2020 discount rate of 2.75%, the recommended plan provides average annual benefits of $8,261,000. The average annual cost is $14,234,000, which includes operation, maintenance, repair, replacement and rehabilitation (OMRR&R) estimated at $1,729,000 per year. The net average annual benefits are -$5,973,000 and the benefit-to-cost ratio is approximately 0.6.

8. Project Implementation. Although the recommended plan would ideally be implemented as a whole, the individual reaches (with the exception of Reaches 2 and 3) could be constructed sequentially as funding allows. The priority for construction sequencing would start with Reaches 2 and 3, which would be the minimum implementable plan for meeting the project objectives, followed by Reach 1, which faces the highest risk to private residences and cultural heritage sites due to erosion. Reach 1 would be followed sequentially by Reaches 4, 5, and 6, in that order to create a continuous structure along the coastline.

9. Stakeholder Input. The goals and objectives included in the Campaign Plan of the Corps have been fully integrated into the Barrow Alaska Coastal Erosion study process. The proposed plan has been designed to avoid or minimize environmental impacts while maximizing future safety and economic benefits to the community. The study team organized and participated in numerous stakeholder meetings and two public workshops resulting in five letters of support from stakeholders and 362 public comments. The major public comment themes included safety considerations for the road design, the need for public access points to the beach and boat ramps, property acquisition, local hires for construction, environmental concerns regarding the landfill, and concerns as to whether the height of the structure will adequately account for worsening storm events. The study report describes the erosion and flooding risk associated with the Barrow, Alaska Coastal Erosion project, but also addresses the residual risks that would remain with implementation of the recommended plan. These residual risks have been communicated to the NSB.

10. Environmental and Cultural Resources Considerations. The recommended plan would have insignificant effects to the human and natural environment. Therefore, a Finding of No Significant Impact (FONSI) has been prepared. The recommended plan would have an adverse effect on a single historic property, requiring mitigation. A Memorandum of Agreement to determine the mitigation for the historic property was signed among the Corps, the NSB, and the Alaska State Historic Preservation Office on 7 June 2019.

11. Public, Technical, and Policy and Legal Review. Agency Technical Review of the Final Feasibility Report was completed and certified on 29 May 2019. A waiver from Type 1 Independent External Peer Review was granted by the Pacific Ocean Division Commander on 6 November 2018. Headquarters conducted policy and legal review of the Draft and Final Feasibility Report and Environmental Assessment, and all comments have been resolved. A complete summary of these reviews are included in the enclosed Documentation of Review Findings.

12. Recommendation. I have reviewed the subject report and find that that the recommended plan for providing erosion and flood risk reduction along approximately five miles of the Alaska coastline by constructing a combination of a rock revetment and revetting and raising Stevenson Street is technically sound, environmentally acceptable, and is justified based on the authority contained in Section 116 of the EWDRAAA of 2010. Therefore, I approve the report and request that you support and assist in budgeting of the recommended plan.

Encl

JAMES C. DALTON, P.E.
Director of Civil Works