July 2016
Pacific Ocean Division
Alaska District

PETERSBURG NAVIGATION IMPROVEMENTS
SECTION 107 PROJECT FACT SHEET

1. Project Name: Petersburg Navigation Improvements.

2. Army Corps of Engineers District and Participating Sponsor:
- **a. Corps District and POC:** Alaska District, George Kalli.
- **b. Sponsor and POC:** Petersburg Borough, Alaska.

3. Congressional Delegation:
- a. House – Don Young (R-AK)
- b. Senate – Lisa Murkowski (R-AK), Dan Sullivan (R-AK)

4. Location:

The City of Petersburg is located on the northwest end of Mitkof Island, where the Wrangell River Narrows meets Frederick Sound. It lies midway between Juneau and Ketchikan, about 120 miles from either community (Figure 1).

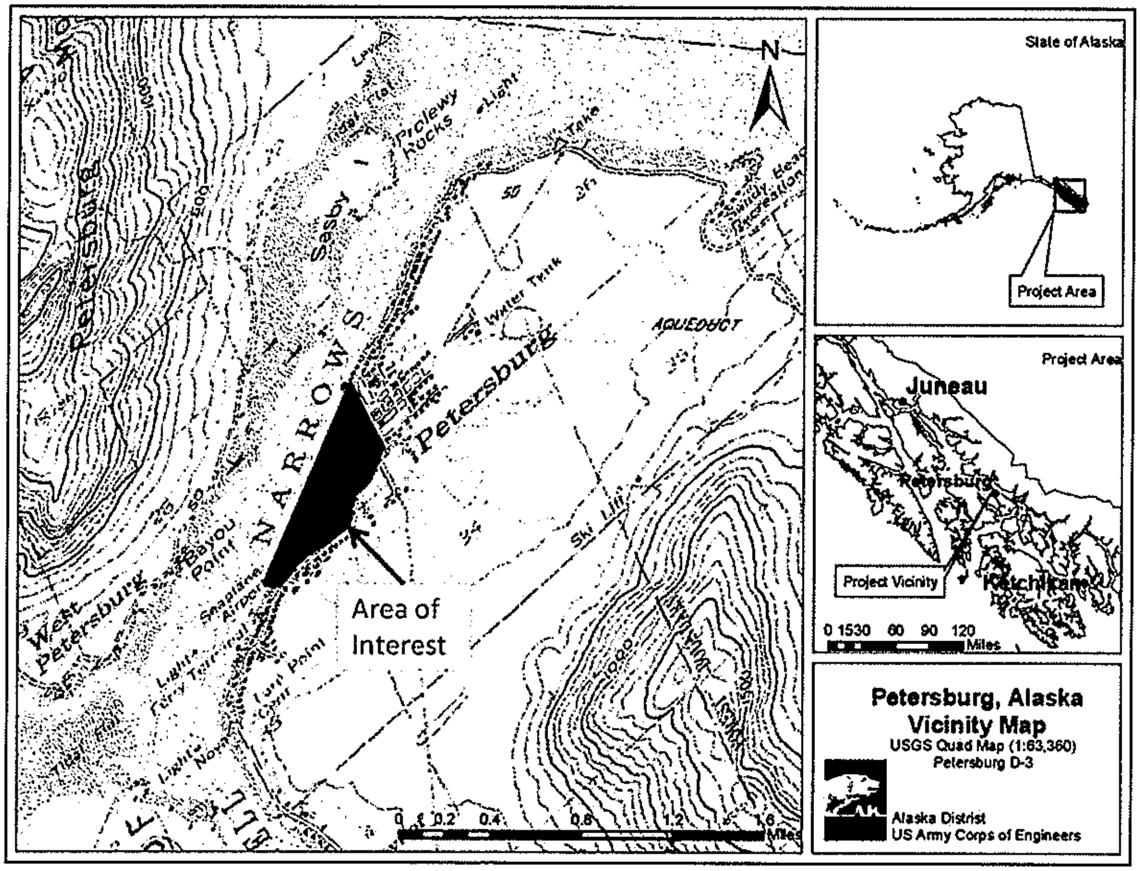
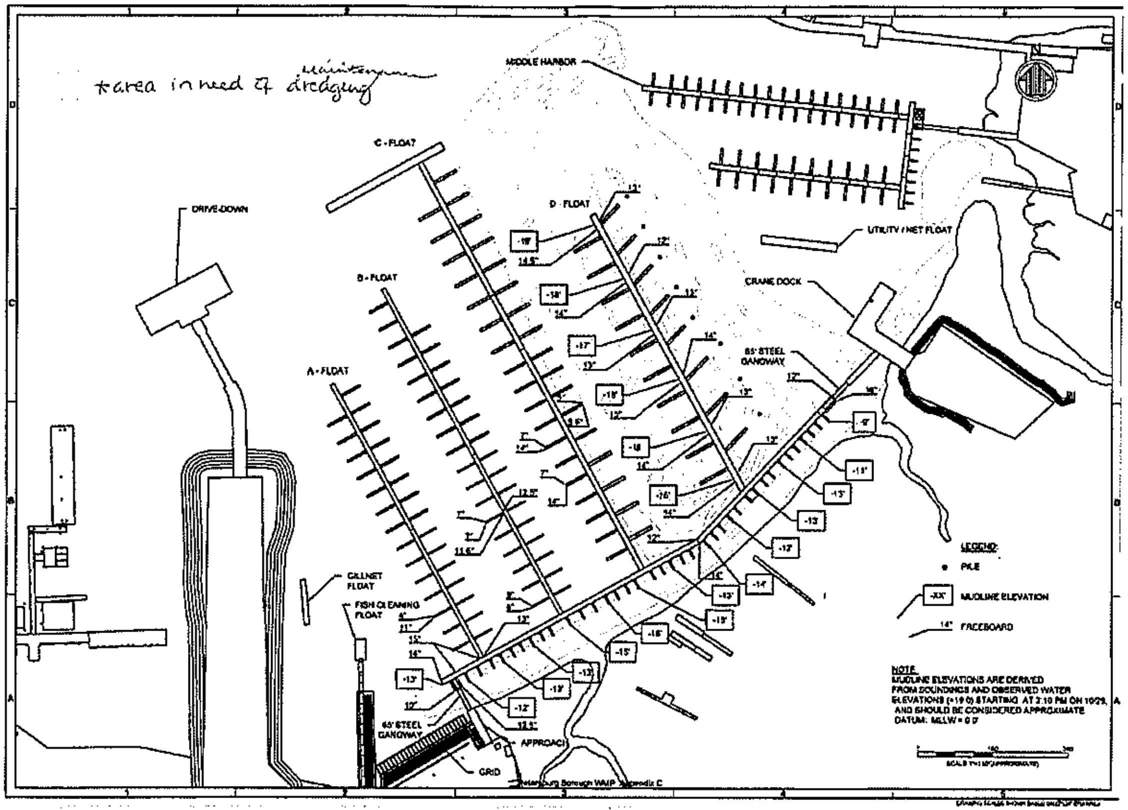


Figure 1: Petersburg Navigation Improvements Location & Vicinity

5. Problem: Shallow depths are impacting the efficient use of portions of South Harbor. Vessels often run aground and portions of the harbor are inaccessible at lower tidal stages. The shallow depths are perceived to be due to a combination of sedimentation and isostatic rebound. Areas in need of dredging as indicated by the Borough of Petersburg are indicated in Figure 2.



*area in need of maintenance dredging

NOTE: MUDLINE ELEVATIONS ARE DERIVED FROM SOUNDINGS AND OBSERVED WATER ELEVATIONS (+19.0) STARTING AT 2:10 PM ON 10/29, AND SHOULD BE CONSIDERED APPROXIMATE DATUM: MLLW = 0.0'

Petersburg Borough WAIP Appendix C

Figure 2: Petersburg South Harbor with Shallow Areas of Concern Highlighted Yellow

6. Alternative Plans Considered:

A number of initial alternatives were considered, including dredging, advanced dredging to account for isostatic rebound, reconfiguration of the harbor floats, sediment traps to reduce sediment transport into the harbor, and combinations of these alternatives. Alternatives will be investigated in more detail during the Feasibility Phase to determine if a Federal interest exists to develop navigation improvements at Petersburg.

- **Dredging:**

Dredging of South Harbor is the likely recommended plan; this alternative will be further evaluated during Feasibility Phase. General Navigation Features, Local Service Facilities, and Project Depths will be designated during the Feasibility Phase.

- **Advanced Dredging:**

Conducting advanced dredging deeper than designated project depths may be warranted due to isostatic rebound occurring in the region. This concept will be investigated during the Feasibility Phase.

- **Reconfiguration of Harbor Floats:**

Reconfiguration of harbor floats in South Harbor would involve implementing a new configuration based upon existing harbor depths and boat drafts.

This plan does not appear to warrant further consideration for a number of reasons:

- Based on conversations with the harbormaster and vessel owners, the community likes the current configuration of the harbor floats.
- The floats do not need to be replaced. In order to reconfigure the harbor a staging area would need to be designated to store the existing floats.
- Active fishing occurs throughout the year. There is no period of time that the existing floats could be relocated without having economic impacts upon the harbor users.

- **Sediment Traps:**

Installing sediment traps along Hammer Slough and the other two outfalls that flow into South Harbor would potentially decrease the amount of sediment deposited during high flow events. These are small scale projects that are more suitable to be implemented at the local level and do not warrant further consideration as part of this study.

7. Description of Likely Recommended Plan:

The likely recommended plan is dredging of shallow portions of South Harbor as indicated in Figure 2 to an optimal depth to be determined during the feasibility phase of this study. Establishment of General Navigation Features (GNFs) and Local Service Facilities (LSFs) will also be determined during the feasibility phase. The local sponsor will be responsible for the cost to dredge the portions designated LSF while the Federal government will be responsible for those designated GNF.

Potential benefits of dredging at Petersburg include reduced vessel delays, reduced damages to vessels and harbor facilities, improved access for commercial fishing and subsistence activities, and increased Unit Day Value for recreational boaters. Delays for commercial vessels due to depth constraints at lower tides are expected to be the primary National Economic Development (NED) benefits. Our initial benefit analysis sufficient to reach a Federal Interest Determination (FID) quantifies benefits associated with the opportunity cost of time (OCT) for fisherman experiencing such delays. Future analysis will consider additional benefits associated with OCT and vessel operating costs, as well as potential benefits from reduced damages to vessels and harbor facilities, improved access for commercial fishing and subsistence activities, and increased recreation opportunities.

Based upon preliminary information, dredging quantities are estimated to be approximately 26,000 cubic yards (CY) from each the GNF and LSF portions of the harbor for a total of 52,000 CY. A bathymetric survey will be performed during the study to provide a more accurate estimate of quantities. Placement of dredged materials in the Borough landfill was assumed for preliminary cost estimates. A sediment characterization will be conducted during the feasibility phase to confirm the most appropriate dredged material disposal method.

Project costs for this preliminary analysis are based on a cost estimate for the 2013 North Harbor dredging effort at Petersburg and the estimated volume of dredged material for South Harbor. It is important to note that costs from the 2013 bid are higher than the actual cost of the 2013 dredging effort even after adjusting for inflation. This analysis is conservative in that it uses the higher cost estimate, which may overestimate project cost, resulting in a more conservative benefit-to-cost ratio. Maintenance dredging is assumed to occur in year 30 of the 50 year period of analysis. Table 1 summarizes project cost estimates for the South Harbor dredging effort.

Table 1. Project Cost Estimate

Category	**Unit**	**# of Units**	**Cost per Unit**	**Total[2]**
Mobilization & Demobilization	LS	1	$525,000	$525,000
Dredging	CY	52,037	$85	$4,423,000
Hydrographic Survey	LS	2	$50,000	$100,000
Sub-Total				**$5,048,000**
Operations & Maintenance (O&M)[1]			$7,617,000	$7,617,000
Total Cost				**$12,666,000**
Present Value Cost				**$7,830,000**
Average Annual Cost				**$312,000**

Notes:

1. O&M costs are estimated as the initial cost of dredging adjusted to the price level of the year in which O&M is expected to occur, then discounted to current dollars using the Federal Fiscal Year 2016 discount rate of 3.125 percent.
2. Values are rounded to the nearest thousand so some rounding error may occur.

Table 2 summarizes the likely range of National Economic Development (NED) potential benefits for navigation improvements at Petersburg. Average annual benefits range from approximately $549,000 million to $2.2 million with total benefits ranging from $13.8 million to $55.2 million. Annual benefits exceed the annual costs for each scenario considered.

Table 2. Future With Project Benefits

Scenario[1]	**Total Net Present Value**	**Average Annual Benefits**	**Average Annual Costs[2]**	**Benefit-to-cost ratio**
High	$55,180,000	$2,196,000	$312,000	7.05
Mid	$27,590,000	$1,098,000	$312,000	3.52
Low	$13,795,000	$549,000	$312,000	1.76
Breakeven[3]	$7,841,000	$312,000	$312,000	1.00

Notes:

1. Range of scenarios based on percent of vessels affected during each low tide cycle (high = 100%, mid = 50%, low = 25%, breakeven = 7%).
2. Average annual costs based on project cost estimate including O&M over the period of analysis.
3. The breakeven analysis uses project cost estimates to estimate the level of benefits required to reach a benefit-to-cost ratio equal to 1.

Initial estimates of project benefits and costs indicate potential Benefit-to-Cost Ratio (BCR) ranging from 1.8 to 7.0, indicating that there is a Federal Interest is conducting more detailed analyses.

8. As of the date of this fact sheet are there any policy waivers required, including a waiver for deviation from the NED Plan? None at this time.

9. Key Milestones;
ASA(CW) concurrence: October 2016
Execute FCSA: December 2016
Complete Feasibility: June 2018
PPA Execution: November 2018
Contract Award: April 2019

10. Authorization, appropriations act, or report language: The investigations summarized in this report were undertaken through the authority of Section 107 of the River and Harbor Act of 1960 (Public Law [P.L.] 86-645), as amended (33 U.S.C. 577). The requirements for review and funding are less stringent than for projects specifically authorized by Congress. Other legal requirements still apply, such as those in the National Environmental Policy Act of 1969 (P.L. 91-190), as amended, and various other laws and associated Federal regulations concerning environmental quality.

11. Financial Information:

a. Feasibility Study Cost: $750,000 (Federal share: $425,000) (Note: The initial $100,000 of the Feasibility Phase is federally funded with the remaining balance cost shared 50/50 with the non-Federal Sponsor. The remaining funds from the initial $100,000 will be utilized for scoping, FCSA negotiations, POD comments, ASA(CW) comments, and contingency.)

b. Construction Costs:

Item	Federal Cost	Local Cost	Total
Mobilzation/Demob.	$420,00	$105,000	$525,000
Dredging GNF	$1,769,200	$442,300	$2,211,500
Dredging LSF	$0	$2,211,500	$2,211,500
Surveys	$80,000	$20,000	$100,000
Total	**$2,269,200**	**$2,778,800**	**$5,048,000**

c. LERR Costs: $0
d. Local Service Facilities (LSF) costs: $2,211,500
e. Ultimate Federal Cost: $2,269,200
f. Benefit/Cost ratio: 1.8 to 7.0
g. Average Annual O&M Costs: $116,769

12. Complete Funding History by FY (Include one line for each additional FY):

	AMOUNTS SPECIFIED ("NAMED") BY CONGRESS	NET ALLOCATIONS FOR FISCAL YEAR
FY 2016	$0	$100,000

13. Supplemental Information:

a. **Establishment of General Navigation Features (GNFs) and Local Service Facilities (LSFs):** Since South Harbor is not a Federally maintained harbor, GNF (entrance channels and maneuvering/turning basins) and LSF (mooring areas, local access channels) areas have not been established. With the execution of this project, GNF and LSF areas will be established in accordance with EP 1165-2-1 and South Harbor will become a Federally maintained harbor. Federal maintenance is limited to those portions identified as GNF. Dredging of LSF portions of the harbor will be a local responsibility.

b. **Environmental Setting:** The environmental impact of the proposed project is expected to be minimal. An Environmental Assessment (EA) will be prepared to meet National Environmental Policy Act (NEPA) requirements.

c. **Economic Analyses:** Depth constraints are expected to affect all commercial fishing vessels moored on D Float (38 vessels) and the north half of C Float (36 vessels) (Figure 3). A tide of -1' MLLW was stated as the limit of safe navigation within these portions of South Harbor.[1] Tides lower than -1' MLLW are assumed to cause delays for vessels moored in these areas while entering and exiting South Harbor. While all 78 vessels would be affected if entering or exiting the harbor during low tide events, not all vessels use the harbor daily due to the different types of fisheries accessed from Petersburg. Delays are assumed to occur on half of the days during the low tide cycle for vessels entering and exiting the harbor during this time.

Our initial analysis to determine Federal Interest Determination examines a range of benefit scenarios based on the assumed percent of vessels affected during each low tide cycle. The most conservative scenario assumes 25 percent of vessels would be affected during each low tide event. This is considered to be a conservative assumption, as most vessels run multiple gear types and essentially fish year round, so it is likely that a larger portion of vessels would be affected during low tide events. Depth constraints are also expected to cause delays for vessels requiring access to the crane dock and inland mooring area (Figure 3), but benefits associated with reducing these delays are not quantified in this initial benefit analysis.

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[1] Based on discussions with Petersburg harbormaster and local fishermen.

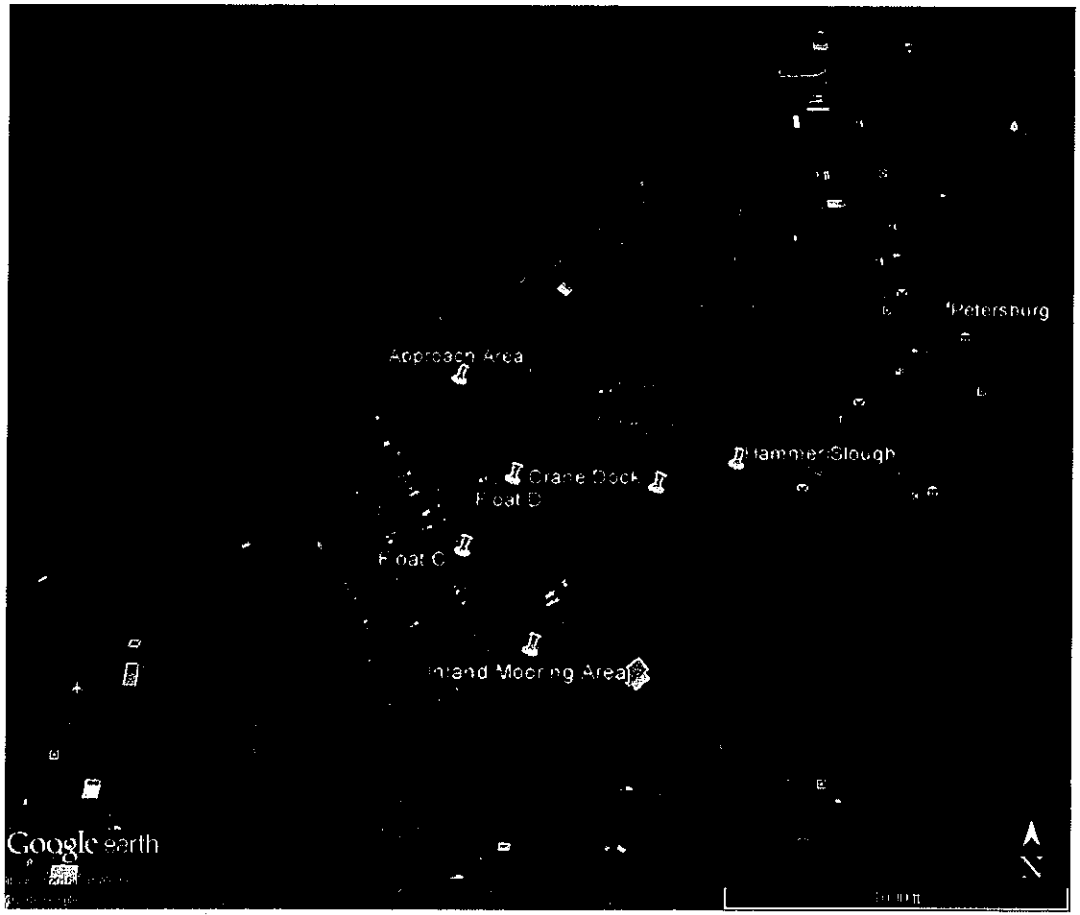

Figure 3. Petersburg South Harbor

Low tide cycles causing vessel delays occur approximately 5 times during the summer salmon fishing season, and impact access to South Harbor for an average of 4 days at a time. Average delay length per vessel is assumed to be 5 hours. As previously noted, this analysis assumes vessels would experience delays on half of the days during a low tide cycle, resulting in approximately 100 delay hours per vessel each summer in the future without project (FWOP) condition.

Captain and crew members incur an OCT during unplanned delay time. OCT is the value of time which could otherwise be spent pursuing additional work or leisure activities. For commercial fishing crew, OCT rates are calculated based on data from the report *Value of Time Commercial Fishermen in Alaska Could Save with Improved Harbor Facilities*, conducted by the Cornell University Human Dimensions Research Unit for USACE, Alaska District in September 2006. According to that report, 70 percent of Alaska salmon fishers would use that added time to conduct more fishing activity while 30 percent said they would use that time for leisure activity.

Considering that commercial fishing is the primary industry in Petersburg and local fishermen indicated they would rather spend time fishing if not delayed, this analysis assumes that captains and crews in Petersburg would elect to use these saved hours as work time. According to the Cornell report, the hourly wage rate for salmon fishermen is $87.06 for the captain and $69.89

for crew members, updated to current year dollars. Average crew size is assumed to be 4 members (including the captain) based on fleet composition and types of permits fished.[2] Assuming 4 crew members per vessel, the hourly OCT per vessel is estimated to be $296.72. Based on delay hours and OCT, the total annual OCT value per vessel is approximately $30,000. Damage estimates are reported in 2016 dollars and are based on a 50-year project period of analysis and Federal Fiscal Year 2016 discount rate of 3.125 percent.

d. **Real Estate:** There are no identified real estate issues that will prevent a project in this location at this time. A more in depth investigation will be conducted during Feasibility Phase.

14. Project Map: See Figure 1; found on page 1 of this document.

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[2] Based on Petersburg harbor office records of slip assignments and fishing permits by vessel.