Section 107 Navigation Improvement Project
Detailed Project Report and
Environmental Assessment

DRAFT

Blue Hill Harbor
Blue Hill, Maine

US Army Corps
of Engineers®
New England District

January 2020

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BLUE HILL HARBOR
BLUE HILL, MAINE

NAVIGATION IMPROVEMENT PROJECT

DETAILED PROJECT REPORT
AND
ENVIRONMENTAL ASSESSMENT

JANUARY 2020

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EXECUTIVE SUMMARY

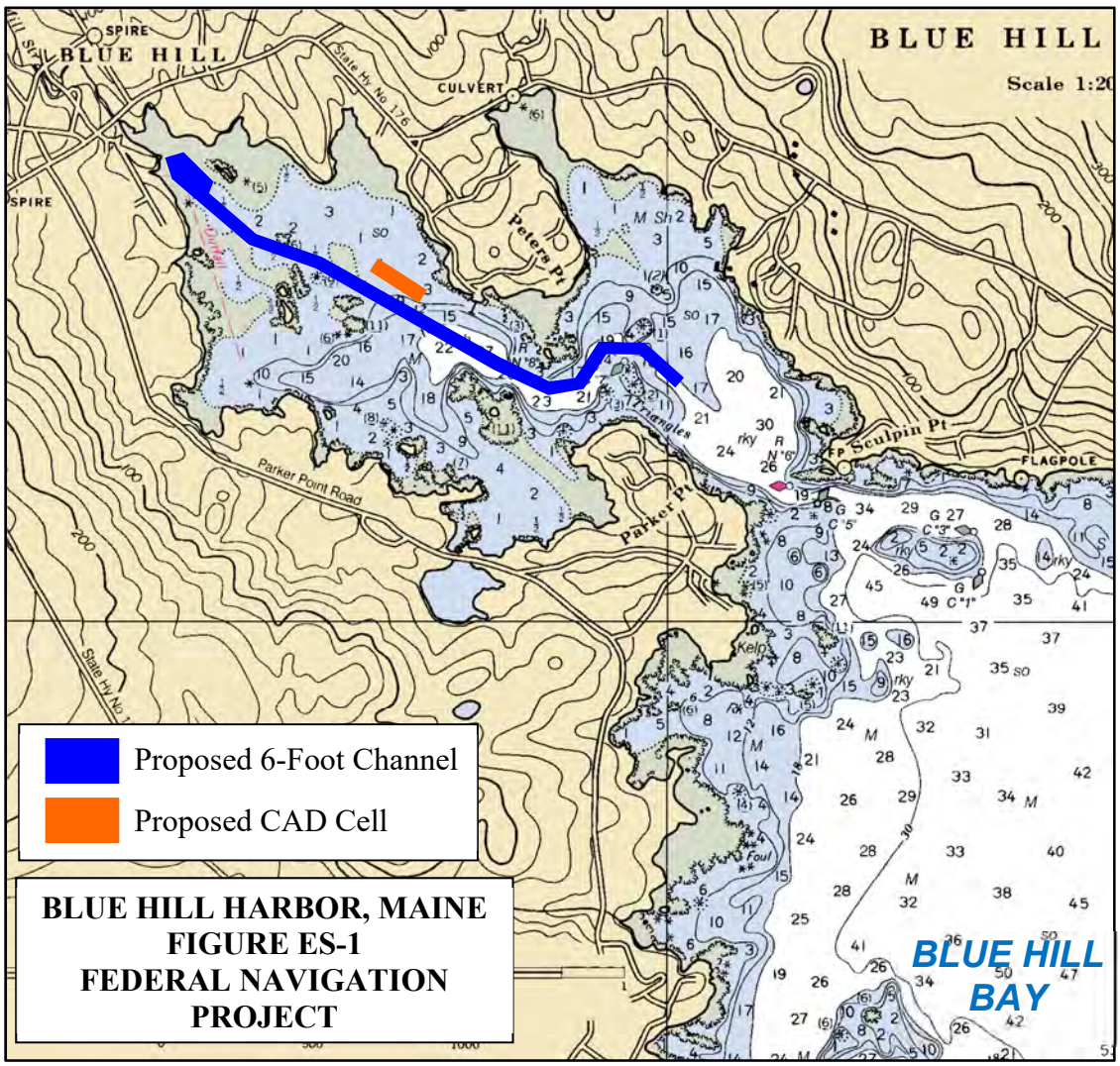
The U.S. Army Corps of Engineers (USACE), in partnership with the Town of Blue Hill, Maine initiated this feasibility study of establishing a Federal Navigation Project (FNP) in Blue Hill Harbor, Blue Hill, Maine. The study was conducted to determine if Federal participation in channel and related navigation improvements is warranted. The proposed channel improvements would increase the harbor's ability to accommodate safe and efficient commercial fishing vessel operations from the Town Landing. Establishing a FNP would also eliminate groundings of fishing boats transiting to and from the landing at lower tides.

This study developed and analyzed various alternatives for navigation channel improvements and the benefits that each alternative provides. The Recommended Plan, as shown in Figure ES-1, would establish a -6-foot mean lower low water (MLLW) by 80-foot wide Federal channel extending about 5,400 feet from deep water off Parker Point up-harbor to the Blue Hill town landing with a one-half acre turning basin at its head. Only the upper 2,600 feet of the channel would require dredging. The project would involve the dredging of about 92,500 cubic yards of material, of which 73,000 cubic yards would be from the channel and an estimated 19,500 cubic yards from the CAD cell construction. The dredging would be by mechanical dredge and scow that will be able to operate in shallow draft areas in the channel.

Dredged material from the upper channel reaches includes about 10,600 cubic yards from the upper two feet of material that has been determined unsuitable for unconfined open water placement. To dispose of the unsuitable portion of the dredged material a CAD cell would be constructed north of the channel. A small amount of the suitable dredged material from the lower channel reaches would be used to cap the CAD cell. All remaining suitable material, including material dredged to create the CAD cell, would be placed at the previously used Eastern Passage Disposal Site. Various other channel depths and upland disposal options for the unsuitable material were also evaluated. The Recommended Plan, with a 6-foot channel and CAD cell would result in the greatest economic net benefits derived for providing the commercial fishermen with reliable and improved access to the facilities in Blue Hill Harbor.

The US Army Corps of Engineers (USACE) has concluded the proposed navigation improvements would cause a temporary disruption of the environmental resources present in the construction work area and immediately adjacent during dredging operations and no significant long term effects are anticipated. Due to the benefits attributable to the commercial fishing industry, any effects are considered to be offset by the improvement and the resulting overall economic growth of the region.

The total estimated cost of design and construction for the recommended plan, based on price levels as updated in October 2019 for Fiscal Year 2020 price levels, would be $2,916,000. Annual benefits would be $153,100 as compared to annual costs of $122,700 resulting in a benefit to cost ratio of 1.25, and net annual benefits of $30,400. Federal participation in providing commercial navigation improvements at Blue Hill Harbor, Maine is warranted.



Escalating the design and implementation cost to FY2021 price levels gives a fully funded cost of $3,122,000. The non-Federal Sponsor would be required to provide ten percent of the cost of design and construction ($312,200) up-front upon execution of a Project Partnership Agreement before project design can be completed, and a second ten percent ($312,200) upon completion of construction. The total non-Federal share of project implementation is $624,400. The total Federal share, 90 percent up-front, is $2,809,800.

The District Engineer finds the proposed action would result in positive economic benefits to the commercial fishing fleet and the local economy, exceeding annualized costs. Based on the review and evaluation of the environmental effects of the proposed action as presented in the accompanying USACE 2020 Environmental Assessment, the adoption of a Federal Navigation Project at Blue Hill Harbor is not a major Federal action significantly affecting the quality of the human environment. In making this determination the District Engineer has considered public and other comments on the Federal Action.

The USACE recommends that a Federal navigation project be adopted at Blue Hill Harbor, Maine, under the authority of Section 107 of the River and Harbor Act of 1960, as amended,

in accordance with the Recommended Plan identified in the Detailed Project Report, with such further modifications thereto as in the discretion of the Chief of Engineers may be advisable.

The recommendations contained in this report reflect the information available at this time and current USACE Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are authorized for implementation funding.

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1 INTRODUCTION

This study evaluates the feasibility of establishing a Federal Navigation Project (FNP) in Blue Hill Harbor, Blue Hill, Maine. The improvements would increase the harbor's ability to accommodate safe and efficient vessel operations from the Town Landing. Navigation improvements would alleviate delays for the commercial fishing vessels using the landing for offloading catch, fueling, and provisioning. They would also eliminate groundings of fishing boats transiting to and from the landing at lower tides.

The commercial fleet at Blue Hill has increased over the years, with boats being based out of several small coves and harbors along the Town's shores on Blue Hill Bay. Improving the town landing at Blue Hill Harbor would provide a central location for the fleet to work from. This would assist in attracting a stable group of buyers for the catch landed by the fleet, place the fleet closer to services, supplies and fuel providers, and enable near year-round operations from a protected harbor area.

Lack of adequate channel depth and turning area at the Town Wharf have limited its use to higher tide stages. Part of the Town's fleet chooses to operate out of more distant small coves and harbor areas, which are in more exposed locations that limit their months of operation and safety of access. Reduced operating costs could be realized with a central and more accessible landing. These tidal delays and damages increase the operating costs of Blue Hill fishermen, reducing net incomes and reducing overall economic efficiency.
This Detailed Project Report (DPR) is the result of an engineering, economic and environmental feasibility study of navigation improvements in Blue Hill Harbor, Maine (Figure 1). The town is home to a large commercial fishing fleet and a number of seasonal recreational boats and facilities.

A 1972 U.S. Army Corps of Engineers (USACE) DPR concluded that establishing a Federal navigation channel in Blue Hill Harbor was in the Federal interest, but lack of local financing prevented implementation at that time. By letter of September 9, 2009 the Town of Blue Hill requested that the USACE revisit the feasibility and Federal interest in the improvements proposed in 1972 for the navigation conditions in Blue Hill Harbor. An initial appraisal and determination of Federal Interest was completed August 13, 2013, and approved by the North Atlantic Division on October 24, 2013. The Section 107 Fact Sheet was approved by the Assistant Secretary of the Army for Civil Works (ASA-CW) on November 21, 2014. A Feasibility Cost-Sharing Agreement was executed between the Town of Blue Hill and the USACE on June 29, 2015. The principal Federal interests at Blue Hill are improving the safety and efficiency of commercial navigation for vessels accessing the Town Wharf where grounding damages and tidal and congestion delays hinder vessel operations.

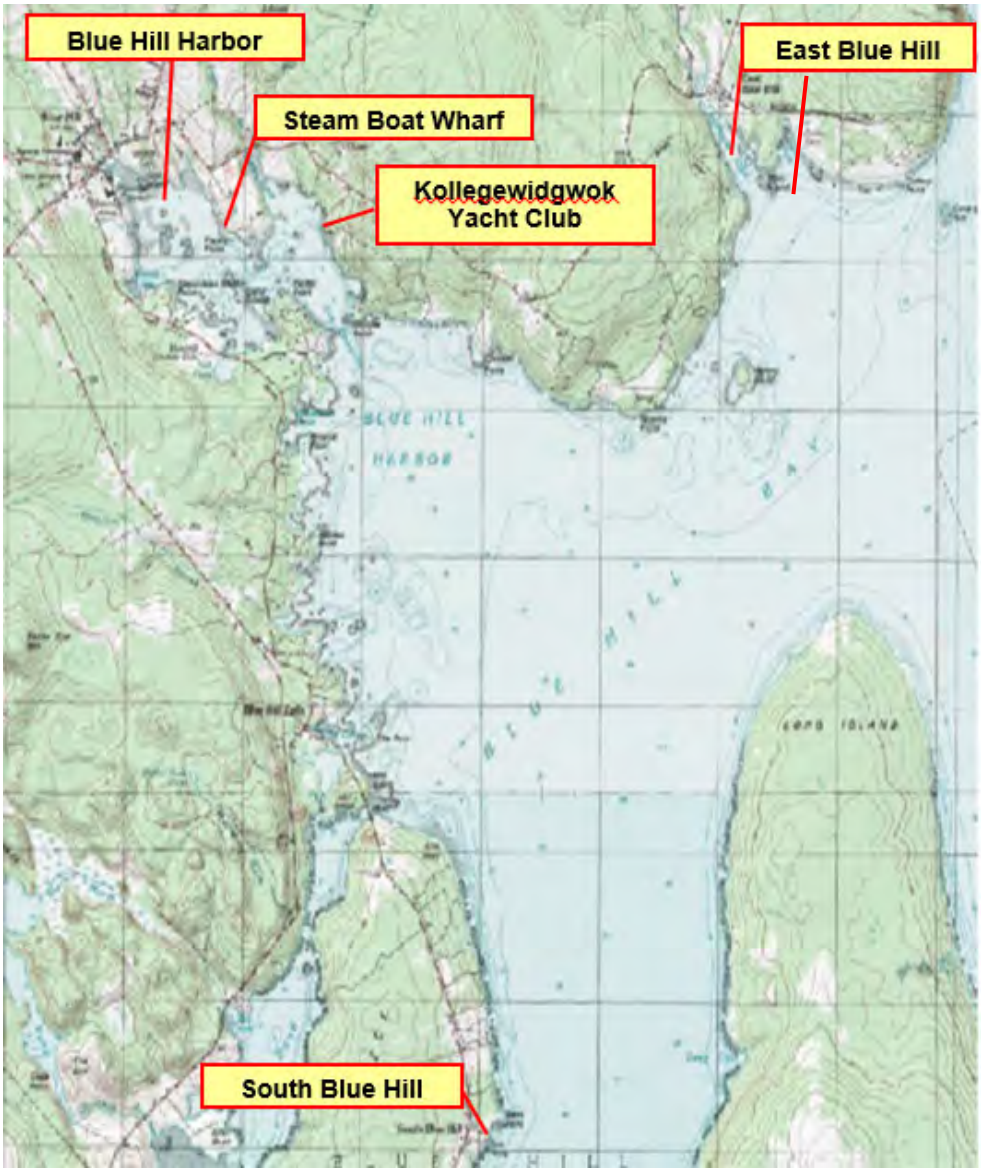

Figure 1: Project Location Blue Hill Harbor, ME Navigation Improvement Project

1.1 Study Authority

This report is prepared and submitted under the authority and provisions of Section 107 of the River and Harbor Act of 1960, as amended. Section 107 provides authority for the USACE to improve navigation including dredging of channels, anchorage areas, and turning basins and construction of breakwaters, jetties and groins, and other general navigation features in partnership with non-Federal government sponsors such as municipalities, counties, special chartered authorities, or units of state government.

1.2 Project Study Costs

The feasibility study is cost-shared 50/50 between the Sponsor and the U.S. Army Corps of Engineers, except for the first $100,000 in study costs which is funded 100 percent by the Federal government. The feasibility study examines reasonable alternatives for the problems and needs and determines the best solution consistent with Federal policy. The solution must

pass three criteria: economic feasibility, environmental impacts, and it must have a local partnership. The steps in the process are:

1. Feasibility Study - The Corps will conduct a Feasibility Study that is 100 percent federally funded up to $100,000. Costs over the $100,000 are cost shared with the non-federal sponsor on a 50/50 basis (up to one-half of the non-federal share can be in the form of in-kind services).
2. Final Project Design and Preparation of Plans and Specifications - Detailed design and preparation of plans and specifications are treated as part of total project costs for purposes of cost sharing and the non-federal cost share for these activities is collected with the construction cost share.
3. Construction - The non-federal share for design and construction of navigation projects with a design depth of 20 feet or less is 10 percent. The Sponsor is also responsible for an additional 10 percent contribution after construction, payable over a period of up to 30-years. Non-Federal cost-sharing of projects for recreational navigation is 50 percent. Cost-sharing for projects justified on the basis of both commercial and recreational navigation is apportioned according to the economic benefit produced for each purpose.
4. Future Project Maintenance - The U.S. Army Corps of Engineers is responsible for future maintenance of projects for commercial navigation for project depths of 50 feet or less, subject to available funding. Funding for shallow draft project maintenance has been constrained in recent years. Maintenance of projects constructed for recreational navigation purposes is a 100 percent non-Federal responsibility. Cost-sharing for maintenance of projects justified on the basis of both commercial and recreational navigation is apportioned according to the economic benefit produced for each purpose.

1.3 Study Location

Blue Hill Harbor is the principal commercial fishing harbor of the Town of Blue Hill, located in Hancock County, Maine. The harbor is located 160 miles by highway northeast of Portland, Maine, 16 miles west of Bar Harbor, and 13 miles southwest of Ellsworth, Maine. Blue Hill Harbor is located on the northwest side of Blue Hill Bay, northwest of Long and Mount Desert Islands. Small boat harbors in the area are Union River 11 miles to the northeast, Bass Harbor about 19 miles to the southeast, and Northeast Harbor about 24 miles to the southeast. Blue Hill Harbor and the surrounding location can be found on the National Ocean Survey Chart #13316 entitled "Blue Hill Bay."

1.4 Scope of Study

This DPR summarizes the investigation of alternatives for providing navigation improvements at Blue Hill Harbor, Maine, for the benefit of the area's commercial fishing fleet. The steps in the study included an inventory of applicable and available information, performance of topographic and hydrographic surveys, environmental sampling and testing, and preparation of base plans. Public officials and harbor users were contacted to provide information and seek input in the study process. Based on these efforts, planning objectives and constraints were developed and alternative plans formulated. These plans were developed and evaluated in coordination with state authorities and the final alternative plans were selected for detailed study.

This report provides for the following:

- Identifying existing conditions and historical trends within the study area;

- Determining the navigational problems and needs of the area;
- Determining the most probable future condition without Federal improvements;
- Developing alternative improvement plans;
- Evaluating and comparing the engineering, economic, environmental, and social impacts of the alternative plans, with respect to the future condition; and
- Recommending improvements that are implementable, economically feasible, environmentally and financially acceptable, and socially beneficial.

The geographic scope includes:

- The inner portion of Blue Hill Harbor which includes Town Wharf and the area known as Steamboat Wharf,
- The naturally deep channel area, connecting the inner, middle, and outer portions of Blue Hill Harbor,
- Alternative landing points for the commercial fishing fleet within the Town of Blue Hill, including South Blue Hill and East Blue Hill,
- Areas of possible impacts beyond the immediate vicinity of Blue Hill Harbor, including the dredged material disposal site and the areas from which resources are harvested by the commercial fleet.

1.5 Prior Studies and Improvements

Navigation improvement studies of the Blue Hill area have occurred since 1891 when the first survey of navigation conditions was conducted by USACE.
The River and Harbor Act of 1890 authorized a survey of Blue Hill Harbor for the purpose of securing a large entrance to the harbor. The survey report in 1891 found that Blue Hill Harbor was not worthy of improvement by removal of the ledges known as "Middle Ground, Eastern and Western", but aids to navigation were recommended.

The River and Harbor Act of 1911 authorized a preliminary examination of Blue Hill inner harbor for the purpose of providing a navigable channel to the Town Wharf, but the findings of the report were that Federal funding was not justified.

The River and Harbor Act of 1945 authorized a preliminary examination of Blue Hill inner harbor for the purpose of providing a navigable channel to the Town Wharf. The preliminary examination report in 1946 found that improvements were warranted pending study of cost and local cooperation. The 1951 survey report concluded that providing a channel to and a turning basin near the Town wharf was not economically justified at that time.

The River and Harbor Act of 1965 authorized a survey of Blue Hill Harbor to determine the advisability of providing improvements in the interest of navigation and allied purposes. A reconnaissance report in 1969 recommended further study of the feasibility of establishing a channel in Blue Hill Harbor. The 1972 Detailed Project Report recommended constructing a channel 100 feet wide, 6 feet deep, from deep water to the Town Wharf including a turning basin 300 feet by 300 feet, 6 feet deep, adjacent to the wharf. The planned improvement did not proceed due to project sponsor funding limitations.

Figure 2: West at the Town owned landing in Inner Blue Hill Harbor

1.6 Study Participants and Coordination

The preparation of this report required the cooperation of Federal agencies, state and local government agencies, elected officials of the state and local governments, local commercial fishermen, and interested individuals. Appendix A contains a record of public involvement, agency coordination, and project correspondence.

1.7 Project Sponsor

The project sponsor is Town of Blue Hill, Maine. The town first requested a study of Blue Hill Harbor in their letter of 4 September 2009. The study was initiated in 2012 and a Federal Interest Determination was approved by the North Atlantic Division 24 October 2013. A Feasibility Cost Sharing Agreement was executed with the Town on 29 June 2015.

1.8 Environmental Operating Principles

The USACE has reaffirmed its commitment to the environment in a set of "Environmental Operating Principles". These principles foster unity of purpose on environmental issues and reflect a positive tone and direction for dialogue on environmental matters. By implementing these principles within the framework of USACE regulations, the USACE continues its efforts to evaluate the effects of its projects on the environment and to seek better ways of achieving environmentally sustainable solutions in partnership with stakeholders. The seven "Environmental Operating Principles" are as follows:

1. Foster sustainability as a way of life throughout the organization.
2. Proactively consider environmental consequences of all USACE activities and act accordingly.
3. Create mutually supporting economic and environmentally sustainable solutions.
4. Continue to meet our corporate responsibility and accountability under the law for activities undertaken by the USACE, which may impact human and natural environments.
5. Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.

6. Leverage scientific, economic and social knowledge to understand the environmental context and effects of USACE actions in a collaborative manner.
7. Employ an open, transparent process that respects views of individuals and groups interested in USACE activities.

1.9 USACE Campaign Plan

The U.S. Army Corps of Engineers Campaign Plan guides USACE policy decisions on how we organize, train, and equip our personnel; how we plan, prioritize, and allocate resources; and how we respond to emerging requirements and challenges and meet national priorities. The Campaign Plan is regularly updated and the current version of the plan covers the period of FY2018 to FY2022.

The USACE strategic plan effort towards improvement began in August 2006 with the "12 Actions for Change" and has evolved to four goals and associated objectives. Although the effort originally developed with a focus on missions that seek to manage risk associated with flooding and storm damage, the Campaign Plan Goals and Objectives are applied to all aspects of the USACE service to the nation including its civil works mission. USACE Campaign Plan Goals and Objectives are derived, in part, from the Commander's Intent, the Army Campaign Plan, and Office of Management and Budget guidance. The four goals are (1) Support National Security, (2) Deliver Integrated Water Resource Solutions, (3) Reduce Disaster Risk, and (4) Prepare for Tomorrow.

The goal and associated objectives most closely related to the study and recommendation of a navigation improvement project at Blue Hill Harbor is:

Goal 2: Deliver Integrated Water Resource Solutions

- Objective 2a – Deliver Quality Water Resources Solutions and Services
  The Recommended Plan for navigation improvements at Blue Hill Harbor meets this objective by delivering a project which, within the limits of Federal participation established by Congress, meets to the extent practicable the expectations of our partners and stakeholders in providing safe and efficient navigation for the commercial fleet operating from the Town Wharf in Blue Hill Harbor.
- Objective 2c – Develop the Civil Works Program to Meet the Future Needs of the Nation
  The Recommended Plan for navigation improvements at Blue Hill Harbor meets this objective by delivering a project which, within the limits of Federal participation established by Congress, provides sustainable system of channel improvements. The study and recommendation were conducted with stakeholder engagement and the public provided an opportunity to review and comment on the study and its recommendations through the NEPA process.
- Objective 2d – Manage the Life-Cycle of Water Resources Infrastructure Systems to Consistently Deliver Reliable and Sustainable Performance
  The project has been formulated with the complete life-cycle in mind, with a consideration of the costs and impacts of both initial construction and future operations and maintenance, to determine the most cost-effective alternative solution to address problems and opportunities with navigation at Blue Hill Harbor.

2 PROBLEM IDENTIFICATION

This section discusses the project area and the reasons requiring navigational improvements. It establishes the planning objectives and constraints that direct subsequent planning tasks.

2.1 Problems and Needs

The principal navigation issue at Blue Hill Harbor is that the existing conditions do not accommodate safe and efficient operations of commercial fishermen and other vessel operators in the Blue Hill area. Regional demands on the commercial fishing fleet, navigation delays, and inefficiencies have become problematic for the fleet. There is a lack of sufficient water depth in the inner harbor to the publicly-owned shorefront facilities in Blue Hill Harbor. Under present conditions, navigation is limited to the period of three hours before and three hours after high tide. At low tide a boat drawing two feet or more cannot approach closer than 2,000 feet seaward of the wharf. The only other landings in Blue Hill Harbor that have adequate water access are the Kollegewidgwok Yacht Club and the privately owned old Steamboat Wharf on Peter's Point. The yacht club is a private seasonal recreational facility. The owner of the old Steamboat Wharf site does allow several fishermen to launch across that shore but has limited parking and facilities available and would not support fleet operations. Currently, a majority of commercial vessels load and offload at town facilities at South Blue Hill Wharf, located outside the protected inner harbor and five miles by road from the town center. South Blue Hill Wharf contains a municipal ramp, docks and floats, as well as 23 moorings for commercial fishermen. South Blue Hill is at maximum capacity with no room for expansion. The heavy use of this area by many of the vessels and the narrow width of the ramp results in frequent and significant congestion delays. The lack of appropriate access to the unloading facilities has caused delays for some boats as they wait to unload their catch resulting in excess labor and fuel costs. The exposure of the site along the more open lower bay also presents challenges to expanded operations.

Other fishermen are based in East Blue Hill Harbor, located outside the protected inner harbor to the northeast, and at Steamboat Wharf, located on the harbor's eastern shore. In addition to the 23 fishing vessels which moor at South Blue Hill, 8 commercial vessels moor at East Blue Hill, 12 moor at the Steamboat Wharf area, and 7 moor elsewhere around the harbor. Currently, there is some use of the Town Wharf in the inner harbor, but its use is limited due to the shallow access. There are no slips or moorings in the Town Wharf area of inner Blue Hill Harbor.

The Blue Hill commercial fishing fleet has already maximized the available berthing and offloading space so providing a new channel will alleviate the commercial fleet's navigation problems. The vessels utilizing Blue Hill as a base of operations, must be better accommodated if the commercial operators at Blue Hill are to continue to be competitive in the New England region fish industry. If accommodations are not made, the existing commercial fleet will continue to experience delays, groundings and berthing difficulties reducing the efficiency of commercial fishing operations. For improving navigation conditions USACE has tentatively selected a plan that recommends dredging a new channel to enhance the navigation routes and allow vessels to safely reach berthing and offloading areas. This study analyzes the alternatives for channel improvement and the benefits that each alternative provides to the existing fleet.

2.2 Existing Conditions

2.2.1 General Description – Blue Hill Harbor, which is extensive in area, is divided into three parts known locally as the outer, middle, and inner harbors. The outer harbor, situated southeast of Parker and Sculpin Points, has an area of approximately 350 acres, with depths ranging from 24 to 48 feet. The outer harbor is exposed to easterly and southerly winds. The middle harbor has an area of 80 acres with depths from 6 to 30 feet. The outer and middle harbors are connected by a deep natural channel between Parker and Sculpin Points. This channel has a width of about 150 feet and a controlling depth of 20 feet. The middle harbor is well protected in all directions. It connects with the inner harbor through a natural channel passing between Parker and Peters Points. The channel has a minimum width of 150 feet and a controlling depth of about 19 feet. The inner harbor contains 57 acres in which shallow depths prevail, ranging from 6 feet at a point 2,200 feet south east of the town wharf to +3.5 feet at the head of the harbor. The mean lower low water line is about 500 feet seaward of the town wharf. The mean range of the tide is 10.3 feet and the spring range is 11.7 feet.

Under existing conditions, about half the fishing vessels based in the various parts of Blue Hill load and offload their vessels primarily at South Blue Hill Wharf. Some also use the inner harbor wharf when it is accessible, at high tide. While South Blue Hill Wharf is the most used commercial fishing area, the Wharf has no power, water, or other services. Fuel trucks deliver fuel directly to vessels pulled up at the dock. Supplies and catch are loaded and off-loaded while vessels are pulled up at either the dock or at barges moored nearby. The landing at South Blue Hill is very exposed to winds and waves, particularly from the south and southeast. Loading and offloading delays occur frequently due to both congestion and the exposed conditions. As the only loading and offloading facility in the harbor, South Blue Hill facilities can be congested, requiring vessels to wait for a space to load or offload. Offloading delays of one to two hours are common, particularly in the summer months, with fishing vessels often lined up to offload. Offloading delays also occur during bad weather and the winter months, when high winds or waves make tying up to the exposed wharf too hazardous. Vessels which do tie up in bad weather are sometimes damaged from banging against the dock. The municipal wharf and floats at South Blue Hill are also regularly damaged, requiring repairs, as vessels knock against the wharf and floats during rough weather.

Some vessels use the inner harbor wharf periodically, depending on conditions and tides. When using the inner harbor wharf, tidal delays can be significant, with vessels lining up to wait for the tide. Another concern in the inner harbor is that vessels moored in the Steamboat Wharf area use private land to access their vessels and park vehicles. If this access is no longer allowed, an alternative location for access and parking will be required. Access and parking at South Blue Hill Harbor is already at capacity, particularly in the summer months. At East Blue Hill access is more limited, with a small boat ramp, limited parking, and no other public facilities. A large private marina occupies much of the harbor area at East Blue Hill. Fishermen and their floats are moored in the harbor's outer reaches. The harbor would have difficulty accommodating more than the 8 fishing boats that already work out of that location.

2.2.2 Recreation/Tourism - The town's economy is heavily dependent on the seasonal summer tourist business. The summer residents, most of whom come from other states, have built up the shore line of Blue Hill so that about 80 percent of its 15 miles of shoreline is now

occupied by estates and summer homes. In the summer months the population of Blue Hill swells to over 6,000 with the addition of tourists and seasonal residents attracted to the many recreation and tourism opportunities of the area, cultural amenities such as art galleries, a chamber music center, and nearby Acadia National Park.

Blue Hill Bay borders the west side of Mount Desert Island. During the summer months this reach of the Maine coast offers an unexcelled cruising ground for the boating enthusiast. Bar Harbor on Mount Desert Island is considered to be the largest yachting center east of Marblehead, Massachusetts. Although there are three other harbors along the east and south sides of the island which are used by boats on vacation cruises, there are no suitable harbors on the Blue Hill Bay side to attract these craft. An expansion of Bass Harbor on the island's southwest tip completed in 2011 is already fully used by the expanded fishing fleet of that island.

While the principal focus of improvement to Blue Hill Harbor is the commercial fishing fleet on the Bay's western shore, harbor improvements here may also incidentally benefit seasonal recreational boating. Improvements to Blue Hill Harbor would provide access to a population center which would attract many craft that presently by-pass the upper reach of Blue Hill Bay. Factors which deter visitors from using the Blue Hill Harbor under existing conditions include the congestion encountered at the yacht club landing and lack of public facilities. Without additional access, transients will continue to by-pass the harbor seeking other ports where suitable wharf facilities are available.

2.2.3 Economic Conditions – Appendix B contains the Economic Assessment of the proposed Federal Action. The town of Blue Hill is located in northeastern Maine in Hancock County. In 2010, Blue Hill had a population of 2,686 and contained 1,936 housing units (US Census Bureau, 2000). Summary socioeconomic statistics for the town, county and state are shown in the tables below. Between 2000 and 2010, the population and the number of housing units increased, with a population growth of 12.4% and a 30.3% increase in housing units (US Census Bureau, 2000). The median family income in Blue Hill in 2010 was $44,158 (US Census Bureau, 2010). This is slightly lower than the median family income in Maine of $46,933.

In 2016, Blue Hill had a labor force of 1,240 and an unemployment rate of 3.1%. The largest employment sectors in Blue Hill in 2016 were Health care and Social Assistance (27.5%), Retail Trade (18.8%), Accommodation and Food Services (9.1%), and Educational Services (9.0%). (Maine Department of Labor, Center for Workforce Research and Information) Commercial fishing is a major industry in Maine. It plays a significant role in the economy of Blue Hill and the wider regional area. The economic impact of the industry extends beyond the fishermen to include the many fish buyers, fish processors, and suppliers to Blue Hill fishing activity. Fishing also provides a more year-round income than the seasonal industries that cater to tourists and summer visitors.

In 2014, Blue Hill fishermen landed nearly 1.8 million pounds of catch, including 1,547,549 pounds of live lobster valued at nearly $5,600,000 (Blue Hill Harbormaster, 2015). Other major species landed include eel and scallops. In 2014, total landings were valued at $6,113,000 (Blue Hill Harbormaster, 2015). Blue Hill fishermen generally fish seven to eight months a year, six days a week, and typically fish full-time. Lobster boats predominate, with generally one or two crew per boat plus a captain.

2.2.4 Vessel and Fleet Presence – Currently, the Town of Blue Hill contains 428 vessels, of which 50 are commercial fishing vessels and 378 are recreational vessels. In comparison, in the early 1970's there were seven commercial vessels operating out of Blue Hill. Commercial vessels moor at several areas around the harbor, including South Blue Hill, Steamboat Wharf, and East Blue Hill. The geographical location of Blue Hill Harbor provides prime commercial fishing access to Blue Hill Bay. The fishing vessels range in draft from three to ten feet, with 96 percent of the vessels having drafts 4.5 feet or below.

2.2.5 Port Operations – Facilities to support the commercial fishing fleet are located at South Blue Hill and in the inner harbor. The inner harbor is located in the center of town within the main downtown retail district, in upper Blue Hill Bay. In 2012, the town completely rebuilt the inner harbor Town Wharf, a $300,000 to $400,000 investment, with the long-term goal of relocating commercial fishing loading and offloading operations to a protected location in the center of town. The new wharf has a crane as well as water service and electricity. Currently, the wharf in the inner harbor is used only minimally since it is accessible at only the highest tides, generally 3 hours per day. The upper end of the inner harbor is dry at mean low tide, with the mean low water line being about 500 feet from the Town Wharf.

At Peters Point, about 3,400 feet downstream of the town wharf, there are remains of an old steamship company wharf which is now privately owned as part of a large summer estate. There is a depth of about 13 feet of water near this wharf. Owners of the wharf allow transients and some locally-based boat-owners to use it but there are no supply facilities. The wharf is located about 1.5 miles from the center of town. Access by land is over a state highway and a dirt road leading to the summer estate which cannot be acquired by the town.

2.3 Without Project Condition

The *"Without Project Condition"* is the expected condition if the federal government takes no action to improve the navigation capabilities in the Blue Hill Harbor area. In this case, South Blue Hill will continue to be the only loading and offloading area with all-tide access for Blue Hill fishermen. The exposure of the South Blue Hill wharf to storms and bad weather conditions will continue to result in damages to vessels, damages to town infrastructure, seasonal restrictions on use, and delays. The lack of a second wharf with all-tide access will result in continued congestion delays at South Blue Hill facilities. For those vessels which use the Blue Hill Harbor inner harbor wharf, extensive tidal delays will continue. These delays and damages increase the operating costs of Blue Hill fishermen, reducing their net incomes and reducing overall economic efficiency.

The most likely future condition with navigation at Blue Hill Harbor is a continuation of the existing conditions which have constrained operations since its establishment.

2.4 Planning Objectives and Constraints

2.4.1 Planning Objectives are the desired results of the planning process that will solve the identified problems and typically result in the desired changes between the without- and with-project conditions. Planning objectives serve to eliminate from consideration alternatives and considerations that will not solve the identified problem.

State and local objectives for the project area include the continued development, management and success of the Blue Hill Harbor area as a base for commercial fishing. The Federal objective of water and related land resources project planning is to contribute to National Economic Development (NED) consistent with protecting the Nation's environment, pursuant to national environmental statutes (National Environmental Policy Act), applicable executive orders, and other Federal planning requirements. This requirement involves:

- Water and related land resources project plans shall be formulated to alleviate problems and take advantage of opportunities in ways that contribute to this objective.
- Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the Nation. Contributions to NED include increases in the net value of those goods and services that are marketed, and also of those that may not be marketed.

Planning objectives that have been identified to specifically address the navigation problems and needs of Blue Hill Harbor are:

- Reduce the cost of commercial fishing boat operations in Blue Hill Harbor during the 50 year period of analysis beginning in 2021.
- Contribute to safer conditions for the commercial fishing fleet in Blue Hill Harbor during the 50 year period of analysis beginning in 2021.
- Reduce projected without-project tidal delays and channel congestion for commercial navigation at the town wharf facilities at Blue Hill Harbor during the 50 year period of analysis beginning in 2021.

2.4.2 Planning Constraints are the parameters that limit the implementation of a proposed plan or plans to allow for improvement of the navigation conditions in support of the commercial and recreational industries at Blue Hill.

- The primary constraint at Blue Hill Harbor is the natural conditions. Blue Hill inner harbor is a tidal mudflat that is exposed across most of its area at low tide with several areas of rock ledge showing. Navigation improvements within the harbor should be aligned to avoid encountering ledge.
- Another constraint is the nature of the material to be dredged and the limitations that places on suitable disposal alternatives. The 65,000 CY material to be dredged for the proposal channel improvements contains approximately 10,600 CY of surficial sediment in the project area nearest to the town wharf that was found to contain polycyclic aromatic hydrocarbons (PAHs). This material was found to be unsuitable for unconfined open water placement and must be disposed of in a manner consistent with USACE, Environmental Protection Agency (EPA) and state policies.

3 FORMULATION OF PLANS

The formulation of alternatives for navigation improvement at Blue Hill considered the needs and problems of the study area. An alternative must be considered reasonable and designed to achieve the planning objectives, and are developed with regard to the planning constraints previously identified. State and local sponsor objectives are essential considerations in the evaluation of alternative plans.

3.1 Plan Formulation Rationale

The formulation of alternative plans is based on a standard set of criteria. Each of the alternative plans must:

- be complete so that it provides and accounts for necessary investments or other actions to ensure the realization of the planned effects;
- be effective to alleviate the specified problems and achieve the specified opportunities;
- be efficient, demonstrating a cost effective means of alleviating the specified problems and realizing the specified opportunities;
- be acceptable by state and local entities and the public, and;
- be compatible with existing laws, regulations, and public policies.

Each alternative is considered on the basis of its effective contribution to the planning objectives, and the selection of a specific plan is based on technical, economic, and environmental criteria that allows for a fair and objective appraisal of the impacts and feasibility of alternative solutions.

Technical criteria require that the plan have the dimensions necessary to accommodate the expected vessel use, sufficient navigation area to provide for maneuvering of boats, and allow for development or continued use of shore facilities. All plans must contribute to navigational efficiency and be complete within themselves.

Economic criteria require that the benefits of the navigation improvement exceed the economic costs and that the scope of the project is such to provide maximum net benefits. Environmental criteria require that the tentatively selected plan preserve and protect the environmental quality of the project area. This includes the identification of impacts to the natural and social resources of the area and the minimization of expected impacts that adversely affect the surrounding environment. It also includes the assessment of impacts that are incurred during the construction of the proposed navigation improvements and those activities attracted to the area after plan implementation.

3.2 Management Measures

Management measures can be identified and evaluated as the basis for formulating alternative plans to solve the navigation problems in Blue Hill Harbor. These management measures are categorized as either structural or non-structural.

Structural measures are those that involve the construction of features that would, to varying degrees, meet the planning objectives developed for Blue Hill Harbor. These include channel improvements such establishing a channel to access additional port areas. A channel would need to be deep enough to reduce or eliminate tidal delays and the risk of grounding. A channel of sufficient width would reduce or eliminate channel congestion and assist in maneuvering for facility access and egress.

Given the limited nature of the improvements under consideration for this Section 107 CAP small navigation project more costly structural solutions such as relocation of port facilities to areas with deeper navigation access were not considered. The Blue Hill Harbor town wharf in the inner harbor is already developed for navigation access. Acquisition of private lands for

public commercial port development in other areas of the harbor or town would be far more costly than constructing a channel to the existing inner harbor town wharf.

Nonstructural measures involve those that would achieve the same planning objectives, but without resorting to structural improvements. An example of a nonstructural measure applicable to small fishing harbors involves the transfer of commercial fishing vessels to neighboring ports having capacity to sufficiently accommodate additional vessels at existing facilities. Another example of a nonstructural measure for a small fishing harbor would be use of tidal navigation to avoid dredging. These are discussed in the general consideration of alternatives below.

3.3 Analysis of Alternatives Considered

3.3.1 General Considerations and Non-Structural Alternatives

Navigation improvement alternatives were developed and analyzed during the early stages of the planning study. These alternatives included both structural measure (various dredging options) and nonstructural measures, including the possibility of transferring commercial fishing vessels to neighboring ports (Table 1).

Fleet Transfer: The transfer of some of the fishing vessels to nearby harbors is contingent on the ability of these harbors to provide adequate protection, capacity, and efficiency of operation. It is not likely that any commercial operators would permanently transfer their vessels if another alternative site does not have the capacity to provide adequate access features and facilities.

USACE planning efforts determined that harbors in the vicinity of Blue Hill do not meet the necessary qualifications of an "adequate" fishing port. Nearby harbors, such as Bass Harbor in Tremont, Maine and Stonington Harbor in Stonington, Maine, are fully used and suffer from overcrowding. These ports cannot handle the potential influx of vessels due to their lack of adequate anchorage or berthing space.

The only other option in Blue Hill bay is the Union River Federal Navigation Project at Ellsworth, Maine. This harbor is a tidal river port, seasonally restricted by winter ice formation and does not have shore support facilities necessary for the fishing fleet and boats operating from Blue Hill. All three alternative harbors would increase the daily haul distance by 20 to 25 miles roundtrip.

Table 1: Distances to Alternative Ports

From Blue Hill Harbor	Bass Harbor	Union River	Stonington Harbor
Miles Overland by Road	37	14	24
Miles by Water	21	20	26

Within the town of Blue Hill the commercial fishing fleet has apportioned itself in the most efficient way possible given the existing conditions. Of the 50 fishing vessels that are based in Blue Hill 23 are moored at South Blue Hill, 12 moor at Steamboat Wharf in Blue Hill Harbor, 8 moor at East Blue Hill, and 7 moor elsewhere. South Blue hill is the most developed of the alternatives within the town, but only 23 moorings are available. The South Blue Hill landing is at maximum capacity and is abutted by privately owned residences, making expansion of the landing cost prohibitive. South Blue Hill is exposed to wind and

waves from all directions. Some fishermen not moored at South Blue Hill unload their catch there, contributing to the congestion related delays.

Steam Boat Wharf lacks facilities to load/unload provisions and catch on launch boats. The landing is completely on privately owned land and access could be rescinded at any time. East Blue Hill's shore facilities are not equipped for commercial use. The anchorage is full and primarily utilized by recreational vessels.

Tidal Navigation: Tidal navigation is presently practiced by the portion of the fleet that unload at the town wharf in Blue Hill Harbor. New England experiences a semidiurnal tide; in general there are two high tides and two low tides every 24 hours and 50 minutes. The highs and lows (and therefore range of the tide) can vary considerably from one tidal cycle to the next. Experienced fishermen understand the tides in the areas they operate and pay attention to the tide charts. Even so, the effects of storms, waves, swells, surges, currents, winds and other factors all contribute to uncertainties in navigating shallow coastal waters and harbors. Groundings can occur when deeper draft boats are operated without sufficient underkeel clearance to account for these conditions and the effect on a boat's hull in the water and sail area (cross section exposed to the wind) above the water.

Fishing boats leave the harbor loaded down with provisions, ice, fuel, and bait, and return to the harbor loaded down with catch on ice. When loaded draft, plus a reasonable underkeel clearance for sea and channel conditions, exceeds the available controlling depth in the channel, then groundings can occur. The only solution short of dredging is to delay the channel transit, which costs the boat time, and if inbound fuel and labor. Significant delays inbound can result in spoilage of catch and reduction in the ex-vessel value of the catch. At Blue Hill the non-Federal Sponsor and the commercial fleet have requested the USACE to examine channel improvement to alleviate tidal delays and groundings. Further reliance by the fleet on tidal navigation would fail to address the problems experienced by the fleet.

3.3.2 Structural Alternatives

The Town of Blue Hill has made improvements to benefit commercial interests to the town wharf, located in the inner harbor which is completely protected. The town wharf has water, electricity, and a crane for loading/unloading. The wharf also has a heavy duty concrete boat ramp for launching vessels. The town wharf is directly adjacent to a hospital and a fire department. It also serves as the base of operation for the Harbormaster. The town wharf is in the town center, which provides ease of access to fuel, ice, and other necessary provisions. The town center is accessed by state highways. A channel into the town wharf would provide necessary access to facilities and would provide relief to overcrowding at other landings. All tide access to the town wharf in the inner Blue Hill Harbor is the only reasonable alternative to relieve the delays and groundings experienced by the existing fleet. Due to the constraint of avoiding rock ledge in the harbor and the fixed location of the town wharf, only one channel alignment was analyzed.

Due the presence of PAH contaminants in the upper two feet of sediment in the proposed channel's upper reach, alternatives were developed to handle the material determined unsuitable for unconfined open water placement at either of the two existing and recently used open water sites in Blue Hill Bay. After conferring with the Town and state regulatory agencies it was determined that the 10,600 of material with higher PAH levels could either be

rehandled at the shore and hauled away by truck to an approved landfill or placed in a confined aquatic disposal cell constructed in the harbor to receive that material (Figure 3).

Alternatives were developed based on project depth optimization and disposal options for unsuitable dredged material. Project depths of 5, 6, and 7 feet at mean lower low water (MLLW) were evaluated to aid in optimization of the USACE tentatively selected plan. Alternatives for disposal of unsuitable dredged material include placement in an in-harbor Confined Aquatic Disposal (CAD) Cell, or rehandling material ashore for dewatering and transport to an upland disposal facility. Table 2 below shows the features of the alternative plans.

Table 2: Blue Hill Harbor, Summary of Detailed Plans

Federal Plan Description	Plan 1	Plan 2	Plan 3
Channel Depth (MLLW)	5 Feet	6 Feet	7 Feet
Channel Length - Total	5,400	5,400	5,400
Channel Length - Dredged	2,500	2,600	2,700
Channel Width	80 Feet	80 Feet	80 Feet
Turning Basin	0.6 Acres	0.6 Acres	0.6 Acres
Disposal Alternatives	Plan A	Plan B	
Suitable Material	Open Water EPDS	Open Water EPDS	
Unsuitable Material	CAD cell	Upland	

(1) Plan A – Town Wharf Channel & CAD Cell – This alternative for navigation improvement proposes to establish a channel in Blue Hill Harbor 80 feet wide from deep water northeast of Parker's Point up-harbor to the Blue Hill town wharf with the channel widened to form a turning basin 160 by 160 feet adjacent to the town wharf. Based on the vessel size and the amount of congestion in the area it was determined that a width of 80 feet would provide proper clearance for vessels using the town wharf to maneuver to the offloading docks, and around other vessels.

Under this plan disposal of suitable dredged material would be at one of two available open water placement sites in Blue Hill Bay. Both sites are located about 14 miles from the Town Wharf at Blue Hill Harbor. The remaining 10,600 CY of unsuitable material would be placed in a CAD cell dredged in the inner harbor along the channel. The material dredged to form the CAD cell would be placed in the open water site in the Bay. Suitable material dredged from the lower channel reaches would be used to cap the CAD cell once it was filled with the unsuitable material. To accommodate bulking of the material and the cap about 19,500 CY of material would be dredged to form the CAD cell. After filling the CAD would be capped using suitable material dredged from the lower channel reaches.

Figure 3: Locations of Plan A and Plan B

(2) Plan B –Town Wharf Channel & Upland Disposal – This alternative allows for the same channel dimensions and features as Plan A but with a different disposal method for unsuitable material. The portion of dredged material not suitable for open water placement would be excavated and rehandled ashore for dewatering, then placed into lined trucks and transported to a lined licensed landfill for disposal. Table 3 below shows the quantities of dredged material estimated for each of the three project depth increments and the breakdown of those quantities into suitable and unsuitable materials.

Table 3: Quantity Estimates (in Cubic Yards) for Plans A

Channel Depth Increment	Required Removal	1-Foot Overdepth Allowance	Total Cubic Yards (cy)	Total Suitable Material	Total Unsuitable Material
5-Foot Channel	48,600	11,800	60,400	49,800	10,600
6-Foot Channel	60,400	12,500	72,900	62,300	10,600
7-Foot Channel	73,000	13,200	86,200	75,600	10,600
CAD Cell excavation would require an additional 19,500 cy of dredging under each depth increment.					

3.4 Dredged Material Management Alternatives

Appropriate suitable disposal of the dredged material can impact project cost and engineering feasibility, due to the distance and location associated with the disposal, special handling of the dredged material, the method of dredging required by the disposal method, and the need for any containment or treatment of the dredged material.

The material to be dredged at Blue Hill Harbor is predominantly poorly graded fine to coarse sands with overlying marine clay deposits (see Environmental Assessment). A suitability determination was prepared based on sediment test results and was concurred with by the USACE, EPA and the State of Maine. Approximately 10,600 CY of sediment localized in the upper two feet of sediment located in the upper channel reach and proposed turning basin portions of the project was found present an increased potential to cause toxicity. All sediment from the proposed Blue Hill Harbor Navigation Improvement Project, excluding that 10,600 CY, was found to be suitable for open water placement. Five options for disposal of the material were considered: open water placement, upland disposal, and Confined Aquatic Disposal (CAD) cell, Confined Disposal Facility (CDF), beneficial use:

- Open Water Placement – The nearest available ocean disposal site in Blue Hill Bay is the EPA-designated Eastern Passage Disposal Site (EPDS). This site is approximately 14 miles southeast of Blue Hill Harbor. This site is the preferred disposal site for the portion of this dredging project found suitable for open water disposal.
- Upland Disposal – An upland disposal site was identified in collaboration with Maine DEP. The Juniper Ridge landfill in Alton, ME was determined to be the closest acceptable site for upland placement. The site is located 56 miles north of Blue Hill, ME. The material unsuitable for open water placement would need to be either dewatered and trucked offsite or transported in lined trucks to the disposal site.
- Confined Aquatic Disposal Cell – A CAD cell is an engineered containment feature for the isolation of dredged material determined to be unsuitable for unconfined open water placement. Confined aquatic disposal (CAD) cells are constructed to reduce the risk from

unsuitable sediments by storing them in a depression in the bottom of an aquatic system. Confined aquatic disposal cells may be constructed from (1) naturally occurring bottom depressions; (2) sites from previous mining operations, such as beach nourishment borrow sites; or (3) new dredging operations created expressly for the containment structure. Confined aquatic disposal cells can reduce the risk from unsuitable materials by confining the sediments to a smaller footprint, increasing contaminant diffusion times, removing them farther from physical processes that can result in transport, and providing a means to effectively cap the sediments.

- Confined Disposal Facility – A CDF is an engineered structure for containment of dredged material. The confinement dikes or structures in a CDF enclose the disposal area above any adjacent water surface, isolating the dredged material from adjacent waters during placement.
- Beneficial Use – The project provides opportunity to evaluate beach nourishment and nearshore disposal. These are considered actions that provide beneficial reuse of the dredged material and are generally considered to have positive environmental benefits and generally have the least adverse effects from the proposed navigation improvement.

3.5 Results of Initial Screening of Alternatives

All three project depth increments would improve navigation safety, reduce tidal delays and channel congestion by providing improved channel dimensions and therefore have significant benefits to the commercial fishing fleet. Benefits increase for each increment of depth, with no commercial vessels requiring a depth of more than 7 feet. Plans A and B with their different disposal methods for unsuitable material also address the planning objectives. The combined depth and disposal plans are each complete within themselves. No additional work is required for any plan to generate its evaluated benefits relative to the without-project condition. Those plans are efficient in that increment depth optimization has identified the channel depths for each that produce the maximum net benefit. Plans A and B are acceptable to the Sponsor, port users, and regulatory agencies as they contribute to the viability of the commercial fishing industry.

3.5.1 System of Accounts

The Principals and Guidelines for Water and Related and Resource Implementation Studies (P&G) require all studies to consider the impact of various alternatives with respect to four accounts, National Economic Development, Environmental Quality, Regional Economic Development and Other Social Effects.

- National Economic Development (NED): Plans A produces net NED benefits (benefits greater than the costs of the improvements) by contributing to improvement in the efficiency of navigation. Plan B does not produce net commercial NED benefits.
- Environmental Quality (EQ): Plan A involves dredging to improve navigation access. Dredging results in disturbance to the harbor bottom and a temporary loss of benthic biota and other minor impacts. Placement of the dredged material will bury benthic biota in the placement site. All of these impacts will be temporary and are not considered significant.
- Regional Economic Development (RED): The benefits of port infrastructure improvements typically extend beyond the NED benefits which are measured on the vessel and at the dock in terms of operational efficiencies (crew time, fuel, repairs, etc.), costs of transporting cargo and passengers, and changes in ex-vessel value of catch

landed. More economic activity on the water generally means more activity shore side for provisioning ships, servicing ships, offloading and processing, marketing, buying and transporting catch, operating and maintain shore facilities, operating the port, and other activities. These are examples of the RED benefits that could be expected to accrue to the region from harbor improvements. All of the plans considered would yield RED benefits, as all would improve the efficiency of navigation. But only Plans A could be expected to generate sufficient RED benefits to justify its cost with respect to commercial navigation.

- Other Social Effects (OSE): Other Social Effects include those that extend beyond economic development and environmental quality to include impacts to the community, human health and safety, energy conservation, and cultural resources impacts. Those working in the fishing fleet, those who provision and service the boats and shore facilities, and those who process, transport and distribute their catch are members of the community to which their employment contributes. Infrastructure improvements that improve the efficiency of port operations and navigation safety will have a positive effect on the community as a whole. Improving safety of vessel and port operations, and helping to ensure timely delivery and freshness of catch contribute to human health and safety. Improving navigational efficiency would contribute to energy conservation by saving the fishing fleet at sea time and fuel.

The results of cultural resource investigations and coordination with state and tribal cultural resource officials have concluded that dredging and dredged material disposal under Plan A will have no significant impact on historic or archaeological resources.

4 DETAILED PLANS

4.1 Plan Features

Plan A and Plan B are acceptable alternatives to improve navigation within the study area. Table 4 summaries the alternative and the expected results from implementation with respect to the project purpose and need.

For all dredging plans the channel would extend from deep water in the lower harbor northeast of Parker's Point up-harbor to the town landing at Blue Hill. Only about the upper 2,500 to 2,700 feet of the channel would require dredging. The lower channel reaches would be jurisdictional limits to ensure that the channel remained open and un-encroached by facilities and moorings. The channel would be 80 feet wide, widened to 160 feet at its upper end to provide a turning basin off the town wharf.

Subsurface analysis indicates that the removal of rock or ledge is not required for any plan evaluated. The dredged material for Plan A and Plan B is a mixture of clean sand suitable for open water disposal and unsuitable material that will require an alternative disposal option. The suitable material would be placed at the Eastern Passage Disposal Site (EPDS), located 14 miles south east of Blue Hill Harbor, in Blue Hill Bay. This site was last used in 2010-2011 for disposal of material from the maintenance and improvement dredging of the nearby Bass Harbor Federal Navigational Project.

The suitable material could also be placed at the Tupper's Ledge disposal site in Union River Bay at the head of Blue Hill Bay. Tupper's Ledge was last used for the maintenance dredging of the Union River FNP in 2000-2004. Tupper's Ledge could benefit from the placement of

suitable dredged material atop the disposal mound from 2004. For purpose of this report the Eastern Passage Disposal Site is the recommended placement site.

The alternatives for disposal of the 10,600 CY of unsuitable material from the upper project reaches are construction of a Confined Aquatic Disposal (CAD) cell in the harbor, or re-handling and overland transport of the material to a lined landfill licensed to receive such material.

Table 4: Description of Navigation Improvement

	Proposed Action	Resulting Project Condition	Disposal of Dredged Material
Plan A Channel with CAD cell	Both Plans: Construct an 80-foot wide Federal channel from deep water to the town landing and a one acre turning basin.	Both Plans: Provide the necessary channel width and depth for commercial vessels to overcome tidal delays and avoid groundings.	Suitable Material to EPDS Unsuitable Material – Construct a 15,500 cubic yard in-harbor CAD Cell
Plan B Channel with Upland Disposal			Suitable Material to EPDS Unsuitable Material – Rehandling and overland transport to a landfill

Preliminary screening of the several depth options was carried out to determine the optimal depth and the combination of alternatives that would yield the greatest net economic benefits. This analysis is summarized here and described in greater detail in Appendix B – Economic Assessment. Preliminary estimates of project cost and benefits using FY 2018 price levels were used for initial screening of alternatives. Due to risk and uncertainties at that level of analysis unit prices and contingencies used were high. This analysis is shown in Table 5.

In total three project depth increments (-5, -6, or -7 feet MLLW) were compared to determine which depth would optimize net economic benefits. The two disposal alternatives for the dredged material were also evaluated to determine if either were economically feasible. Economic analysis determined that a -7-foot MLLW channel depth would serve 100% of the existing fleet at Blue Hill, so no depths beyond -7 feet were considered in this analysis.

As the results in Table 5 show, none of the depth increments generated a benefit-cost ratio of greater than 0.5:1 for the upland disposal alternative (B). With CAD cell disposal under Plan A, both the 6-foot and 7-foot depth increments generated positive net annual benefits and benefit cost ratios of greater than 1:1. Based on this level of analysis it was determined that only Plans A2 and A3 would be carried forward for detailed cost and economic analysis.

Table 5: Preliminary Screening of Alternatives						
	Alternative A – Dispose of Unsuitable Material in a CAD Cell			Alternative B – Dispose of Unsuitable Material at an Upland Location		
Project Depth	5-Foot	6-Foot	7-Foot	5-Foot	6-Foot	7-Foot
Total Estimated Contract Cost Including Escalation & Contingency	$3,228,000	$3,496,000	$3,778,000	$7,429,000	$7,695,000	$7,972,000
Engineering and Design	$646,000	$699,000	$756,000	$1,486,000	$1,539,000	$1,594,000
Supervision and Administration	$323,000	$350,000	$378,000	$743,000	$770,000	$797,000
Total Estimated Project Cost	$4,197,000	$4,545,000	$4,912,000	$9,658,000	$10,004,000	$10,363,000
Interest During Construction (IDC)	$5,000	$5,000	$6,000	$12,000	$12,000	$12,000
Total Investment Cost	$4,202,000	$4,550,000	$4,918,000	$9,670,000	$10,016,000	$10,375,000
Annual Costs						
Interest and Amortization	$155,600	$168,500	$182,200	$358,200	$371,000	$384,300
Annual Maintenance Costs	$21,000	$22,700	$24,600	$48,300	$50,000	$51,800
Total	$176,600	$191,200	$206,800	$406,500	$421,000	$436,100
Annual Benefits						
Commercial Benefits	$57,500	$153,400	$159,800	$57,500	$153,400	$159,800
Recreational Benefits	$22,400	$59,600	$62,100	$22,400	$59,600	$62,100
Total Benefits	$79,900	$213,000	$221,900	$79,900	$213,000	$221,900
Benefit-Cost Analysis						
Commercial Only BCR	0.33	0.80	0.77	0.14	0.36	0.37
Commercial Net Annual Benefits	-$119,100	-$37,800	-$47,000	-$349,000	-$267,600	-$276,300
Total Benefits BCR	0.45	1.11	1.07	0.20	0.51	0.51
Total Benefits Net Annual Benefits	-$96,700	$21,800	$15,100	-$326,600	-$208,000	-$214,200

Once a tentatively selected plan for disposal method was identified, cost engineering and economic analysis were further refined and updated to better estimate project costs and benefit-cost comparison. The impact of risk on design and construction was examined. Several assumptions were made to evaluate the projected costs as follows:

- The estimate assumes mechanical dredging with a floating plant consisting of a dredge barge with an 8-cy bucket, two split hull bottom dump scows of about 1500 cy capacity, one tug, and survey and work boats.
- Suitable dredged material from the project and CAD cell will be placed at the Eastern Passage Disposal Site (EPDS), a 14-mile tow (one way) from Blue Hill Harbor.
- The dredging and disposal work would take about two months
- Abbreviated Risk Analysis was revised for the feasibility stage resulting in contract contingencies of 15%, 14% for PED, and 17% for S&A.
- No real estate interests (lands or damages) or utility relocations will be needed for the project. All work will be seaward of mean high water and all plant will be floating.
- Construction of the project, given its limited scope and straightforward method is estimated to take about two months.

4.2 Project Costs

The project first costs and annual charges are directly related to the volume of material to be removed, increasing as the dredging depth increases, shown in Table 6. The cost of CM activities from award through mobilization to arrival at the project site, and post-construction will likely be greater than actual inspection costs during dredging. The resulting total first cost of design and implementation is the amount cost-shared with the non-Federal Sponsor. No new aids to navigation would be required. Appendix D, Cost Engineering, provides a more detailed cost breakdown.

Annual costs include interest and amortization of the design and implementation cost plus the annualized cost of future project operation and maintenance. Interest and amortization (I&A) is based on the interest rate for the current Federal fiscal year (2020), 2.75 percent amortized over 50 years in the case of navigation projects, or a factor 0.03704. To compute I&A the cost of interest during construction (IDC) must first be added to the project first cost.

The frequency of project maintenance in Blue Hill Harbor is expected to be minimal for the proposed alternative. Shoaling has not been a major issue in nearby Federal channels. In the nearby Bass Harbor FNP channel there has only been one maintenance dredging (2010) action needed in the years after the initial improvement effort in 1963. A total of 9,700 CY of maintenance material were removed. That represents an annual shoaling average of 206 CY over the 47 year period between 1963 and 2010 or an annual shoaling rate of about 0.2% of the 1963 improvement volume of 87,000 CY. Other Federal projects in the area (Stonington Harbor and Southwest Harbor) have not required maintenance since their initial construction in 1984 and 1961, respectively. These harbors are typical of this section of the Maine coast in that they all lack sediment input from either tributary rivers or longshore transport. For this analysis an annual shoaling rate of 0.5% was used for Blue Hill Harbor, which would result in accumulation of about 365 cubic yards each year, or about 18,200 cubic yards every 50 years.

Table 6: Updated Cost for the Selected Plan of Improvement	
Costs Updated October 2019 (FY 2020)	Plan A2 – 6-Foot Project Depth with CAD
First Costs	
Mobilization/Demobilization	$378,000
Remaining Construction Items	$108,000
Mechanical Dredging and Disposal	$1,758,000
Total Contract Cost	$2,243,000
Contingencies (15%)	$337,000
Subtotal	$2,580,000
Planning, Engineering and Design	$207,000
Construction Management	$129,000
Total First Costs	$2,916,000
Interest During Construction (IDC)	$3,000
Total Implementation Cost	$2,919,000
Annual Costs	
Interest & Amortization (0.03704)	$108,100
Maintenance Dredging	$14,600
Total Annual Charges	$122,700

4.3 Project Benefits

This section summarizes the benefits of establishing a channel with all tide access to the town landing in Blue Hill Harbor. Table 7 summarizes the breakdown of annual project benefits. Commercial benefits were derived from reductions in congestion and tidal delays, including vessel damage cost, lost labor cost, increased fuel consumption cost and increased ordinary maintenance cost to the fishing fleet. Appendix B provides greater detail.

Table 7: Annual Benefits of Detailed Plans			
FY2020 Updated Commercial Benefits	5-Foot	6-Foot	7-Foot
Damages Prevented to Fishing Vessels	$22,000	$58,600	$61,000
Damages Prevented to Wharves and Floats	$10,000	$26,700	$27,800
Offloading Delays Reduced - Time Savings	$8,900	$23,700	$24,700
Offloading Delays - Fuel Savings	$6,800	$18,100	$18,900
Tidal Delays Reduced - Time Savings	$3,900	$10,300	$10,700
Tidal Delays Reduced - Fuel Savings	$5,900	$15,700	$16,400
Total Commercial Benefits	$57,500	$153,100	$159,500

4.4 Comparison Summary

Table 8 provides a summary of annual project benefits compared to annual project costs for Plan A2, consisting of a -6-foot MLLW channel 80 feet wide from deep water off Parker Point up-harbor to the town landing with a one-half acre turning basin at its head. To dispose of the unsuitable portion of the dredged material a 19,500 cubic yard CAD cell would be constructed north of the channel. All suitable dredged material, including that produced by construction of the CAD cell, would be placed at the previously used Eastern Passage Disposal Site.

Plan A2 has been developed consistent the USACE Environmental Operating Principals and in a manner which meets to goals of the USACE Campaign Plan with respect to water resources infrastructure and the civil works program. The plan has been formulated to meet the planning objectives for this project by improving the safety and efficiency of commercial fishing fleet operations at Blue Hill Harbor. Plan A2 also meets the plan formulation criteria of completeness, effectiveness, efficiency, and acceptability and is compatible with existing laws, regulations, and policies.

Table 8: Blue Hill Harbor – Projected Economic Impacts Plan A – With CAD Cell Disposal of Unsuitable Material	
FY 2020 Price Levels and Benefits	Plan A2 6-Foot Depth
Annual Costs	$122,700
Commercial Navigation Benefits	$153,100
Benefit-Cost Ratio - Commercial Navigation	1.25
Net Annual Benefits - Commercial Only	$30,400

Plan A2 produces net annual NED commercial navigation benefits, will have no significant impact on environmental quality, will promote regional economic development through improved port operations, and will have an overall positive impact from the perspective of other social effects.

5 ASSESSMENT AND EVALUATION OF DETAILED PLANS

This section summarizes the analyses for the alternatives selected for detailed study based on their impacts on the environment, existing navigation, and social and cultural resources of the study area. Economic costs and benefits of project implementation have also been analyzed.

5.1 Environmental Impacts

The proposed Federal action has been reviewed under the authorities of the National Environmental Policy Act and all applicable Federal environmental laws, regulations, Executive Orders and Executive Memorandums. The NEPA analysis (see Environmental Assessment) outlines the expected impacts to habitats and environmental resources from dredging and at the disposal sites. This section summarizes the expected environmental effects from dredging and disposal of dredged material.

5.1.1 Dredged Material Suitability

The materials to be dredged have been sampled and tested for physical and chemical parameters and subjected to tier II biological testing. In October 2015 USACE collected sediment vibracores from seven locations throughout the proposed dredging area and depth horizon (see EA, Figure EA-3). Each sediment core was described in the field and composited for analysis of grain size, total solids, and water content. The composited samples were then analyzed for chemical analysis of the contaminants of concern (COC) specified in the Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters (RIM, USACE/EPA 2004).

The sediments in the outer portion of the proposed channel were predominantly poorly graded fine to coarse sands with overlying marine clay deposits and fine woody organic debris. Core penetration for the inner harbor samples was limited due to gravel and coarse sand deposits near the sediment surface and did not reach the proposed dredge depth due to refusal.

There were detectable concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals in all four composite samples. To examine sediment chemistry concentrations in an ecologically meaningful context, results values were screened Sediment Quality Guidelines (SQGs). Applicable SQG screening values for marine and estuarine sediments are the National Oceanic and Atmospheric Administration (NOAA) effects-range low (ERL) and effects-range median (ERM). ERL/ERM values are empirically derived guidelines that identify contaminant levels that indicate when toxic effects are unlikely (ERL) and when an increased probability of toxic effects is evident (ERM).

No COCs were identified in the outer channel samples. All COCs in the inner channel samples were also below the ERL value with the exception PAHs which were above the ERL in one composite and above the ERM in another. This suggests that there is increased potential for a toxic response from exposure to sediments from the inner channel sediments due to elevated PAHs.

A second sampling effort was conducted in May 2016 to better define the vertical and spatial extent of the elevated PAH concentrations in the inner channel area. Push cores were taken at low tide from ten stations in the inner harbor and one location at the mouth of the each of the three tributary streams and outfalls. Core lengths were again limited by refusal. Subsamples for PAH analysis were taken from the top six inches and from six inches to the end of each core. Results from this analysis showed no discernable pattern for the spatial distribution of PAHs in the harbor (see Appendix I - Suitability Determination).

Due to the inability to penetrate inner harbor sediments to the design depth and determine the vertical extent of the elevated PAH concentrations, the Town of Blue Hill dug four 4-9 foot deep test pits in October 2016 in the upper channel/turning basin area using a small excavator. NAE personnel were on-site to describe the lithology of the pit walls and subsample the sediment in two foot horizons for PAH analysis. Results showed the material to be a stony till with PAH contamination limited to the upper two feet of the inner harbor sediments.

The proposed dredged material from the Blue Hill Harbor Navigation Improvement Project was evaluated through §230.61 of the CWA and found suitable for open water placement at EPDS with the exception of 10,600 cubic yards of material from the upper two feet of the inner harbor area. The sediment from this portion of the harbor is not suitable for open water placement due to elevated PAH concentrations and it is proposed to contain the unsuitable material in a CAD cell. The material excavated to create the CAD cell is outside of the elevated PAH footprint and is suitable for open water placement at ELDS

5.1.2 Summary of Expected Environmental Effects of Dredging

Dredging in the proposed channel and turning basin area would result in both permanent and temporary impacts to the benthic communities in Blue Hill Harbor. Permanent impacts include the conversion of 3.7 acres of intertidal habitat to subtidal habitat which in turn will permanently change the benthic community structure of those areas. Temporary impacts

include short-term loss of benthos within the direct footprint of the dredging areas and CAD cell area and localized increases in turbidity in areas adjacent to the dredging.

The ecological functions of existing 3.7 acres of intertidal area, as related to benthic invertebrate communities, is currently impaired. Surveys of the benthic communities in these areas show very low diversity and abundance numbers which suggest the habitat is being subject to some stressor beyond naturally occurring ecological pressure. As the material in these area contains elevated concentrations of contaminants (predominantly PAHs) which have been determined to be unsuitable for open water placement, it was concluded that the contamination is the cause of the diminished benthic community. The removal and sequestering of the unsuitable material should allow the newly created shallow subtidal areas to be contaminant free and allow for the colonization of the area by adjacent benthic populations. Community structure in the new subtidal habitat is expected to be similar to that in the outer harbor subtidal areas. As the benthic community throughout the existing channel and side slopes is a mix of opportunistic early-successional stage benthic communities and mid-successional stage benthic communities, a return to a similar community following dredging is expected within approximately 1-3 years. Mitigation is not being proposed for the loss of intertidal habitat as the area is currently impaired and will be replaced with a habitat that will provide higher quality ecological value to the Blue Hill Harbor system.

Turbidity impacts to benthos are dependent on the concentration and the duration of the suspended sediments (Wilber and Clarke, 2001; Suedel 2014). Motile benthic organisms (e.g., lobster and crab) can generally avoid unsuitable conditions in the field and, under most dredging scenarios, encounter localized suspended sediment plumes for exposure durations of minutes to hours. Although adult bivalve mollusks are silt-tolerant organisms (Sherk, 1974), they can be affected by high suspended sediment concentrations. Hard clams (Pratt and Campbell, 1956), and oysters (Clarke and Wilber, 2001), exposed to fine silty-clay sediments have exhibited reduced growth and survival, respectively. Suspended sediment concentrations required to elicit these responses and mortality, however, are extremely high, i.e., beyond the upper limits of concentrations reported for most estuarine systems under natural conditions, as well as typical concentrations associated with dredging operations. Therefore, the temporary increases in turbidity associated with the proposed project are not anticipated to significantly adversely impact the benthic communities adjacent to the dredge areas

5.1.3 Summary of Expected Disposal Impacts

No eelgrass is located in or adjacent to the disposal site. Placing sandy material at the proposed EPDS should not have significant long-term effects on the benthic communities at the site. No significant shellfish or lobster resources are located in the disposal site. Direct impacts to fish resources at the placement site are expected to be minimal. Any fish in the vicinity of the placement site would be either expected to avoid the areas of disturbance, be smothered by the material, or be exposed to elevated turbidity for brief periods. Elevated suspended sediment levels should be short-term and localized to the placement site area since the material to be placed at the site is sand. Benthic organisms buried at the disposal site will temporarily eliminate a forage area for fish. Recolonization by benthic species from adjacent areas and new recruitment is expected to occur in a relatively short period of time. The proposed dredging and placement of the sediment will occur during the period of October 1 through April 1. This window minimizes the presence of aquatic resources in the project area

and takes advantage of the lower levels of natural, environmental stresses placed on species that may be resident in the work areas. USACE made the preliminary determination that the proposed project is not likely to adversely impact any state or Federally-listed threatened or endangered species. Several listed marine mammals may occur as transient species in the general area, but are unlikely to occur within the dredging or placement areas.

5.1.4 Summary of the NEPA Evaluation

A NEPA evaluation (see the EA and draft FONSI) was prepared for the proposed action. Based on the findings the District Engineer has determined that the environmental effects, as presented in the Environmental Assessment, for the improvement dredging of Blue Hill Harbor is not a major Federal action significantly affecting the quality of the human environment. The FONSI will be finalized when signed by the District Engineer at the conclusion of the 30-day public review period, and after consideration of all comments received.

5.2 Economic Impacts

The expected economic impacts from construction and operation of the alternatives were evaluated by determining costs and benefits. The cost estimates and annual costs, listed in Table 6 and described fully in Appendix D are based on several factors including the quantity and type of dredged material, mobilization and demobilization costs, equipment costs, project design (engineering and supervision) and administrative costs and contingencies. Charges for interest during construction (IDC) are based on construction durations and are computed for the purpose of comparing benefits to costs. IDC charges are not included in the cost apportionment.

Costs and benefits are based on a 50 year evaluation period, starting in late 2021, and presented in annual terms using the FY20 Federal interest rate for water resources projects of 2.75 percent. The benefits of the proposed plans of improvement have been based on the following assumptions:

- Elimination of tidal delays would result in decreased labor and fuel costs for harvest of the existing catch.
- Increasing the channel depth and length would reduce grounding damage and provide maneuverability and access to existing facilities built by local interests.

The benefits to the existing commercial fleet would occur immediately following the implementation of these improvements. The navigation improvements will not affect harvest rates or prices for the commercial fish market. There will be benefits resulting from a reduction in harvesting costs for the existing level of catch.

6 SELECTION OF A PLAN

6.1 The Selected Plan

The Selected Plan for navigation improvements is Plan A2. The Selected Plan is based on consideration of economic efficiency, minimization of environmental impacts, navigational safety and the needs of state government and local stakeholders. Plan A2 results in the greatest net benefits, and is the preferred National Economic Development (NED) plan. This

plan provides the most favorable improvement method for meeting the project objective of reducing navigation hazards and delays.

This plan would establish a channel from deep water in the outer harbor off Parker Point up-harbor to the Blue Hill town landing. The channel would be 80 feet wide and have a depth of -6 feet at MLLW and would have a half-acre turning basin at its upper end opposite the town wharf. Only the upper 2,600 feet of the channel would require dredging. The project would involve the dredging of about 92,500 cubic yards of material, of which 73,000 cubic yards would be from the channel and an estimated 19,500 cubic yards from the CAD cell construction. The dredging would be by mechanical dredge and scow that will be able to operate in shallow draft areas in the channel.

The dredged material to be disposed is a mixture of clean sandy material suitable for open water disposal and unsuitable material that will require an alternative disposal option. The suitable material will be placed at the Eastern Passage Disposal Site (EPDS), located 14 miles southeast of Blue Hill Harbor, in Blue Hill Bay. This site has been used in the past for disposal of material from the maintenance dredging of the nearby existing Federal Navigational Projects. The disposal of the unsuitable material will be in a Confined Aquatic Disposal (CAD) cell to be constructed within Blue Hill Harbor adjacent to the channel. USACE work estimates are based on an 8 cubic yard bucket dredge or excavator, two or more split-hull scows of about 1500 CY, and a tug to tow the scows to the disposal sites. Small survey and workboats would also be used. All construction equipment would be waterborne plant. No onshore staging would be required. The contractor would be responsible for securing any shore side access for personnel and fuel according to their specific needs. All work at the dredging and disposal sites would be within the waters of the United States.

The total annual benefits in fuel and time cost savings for each project alternative are weighed against the costs of each alternative to determine the benefit-cost ratio. Benefit-cost ratios of each alternative are determined by dividing annual benefits by annual costs. A project is considered economically justified if it has a benefit to cost ratio of 1.0 or greater. The Recommended Plan maximizes net annual commercial navigation benefits is the National Economic Development (NED) plan. The Recommended Plan has a BCR of 1.25 and produces net annual benefits of $30,400.

6.2 Implementation Responsibilities

6.2.1 Cost Apportionment

For harbor improvements for commercial navigation purposes with a design depth of 20 feet or less, local interests are required to provide cost-sharing of ten percent of the cost of design and construction up-front upon execution of a Project Partnership Agreement (PPA). The remaining 90 percent up-front share of the first cost of design and construction is the Federal contribution. A further additional non-Federal contribution of ten percent of the cost of design and construction is payable at the conclusion of construction and can be paid over a period of up to a 30-years. These cost sharing requirements are as specified in the Water Resources Development Act of 1986 (Public Law 99-662), as amended. Table 9 below provides the cost-sharing responsibilities for design and implementation of the Recommended Plan.

Table 9: Cost Apportionment for the Recommended Plan			
FY 2022 – Q1 Costs	Total Fully Funded Cost	Federal Share 90%	Non-Federal Share
Dredging and Disposal	$2,403,000		
Contract Contingencies	$361,000		
Construction Total	$2,764,000		
Engineering and Design	$218,000		
Construction Management	$140,000		
First Cost of Design and Construction	$3,122,000	$2,809,800	$312,200
Post-Construction Additional Contribution	- - - - -	- - - - -	$312,200
Total Cost Allocation	$3,122,000	$2,809,800	$624,400

6.2.2 Federal Responsibilities

The Federal government will be responsible for preparation of plans and specifications and contract advertisement, award and supervision and inspection of the work. The Federal government will be responsible for project compliance with Federal environmental laws and regulations, including the National Environmental Compliance Act (NEPA), endangered species act (ESA), consistency with the Coastal Zone Management Act (CZM), and the Clean Water Act (CWA). Federal responsibility includes only the dredging and maintenance of the designated Federal channels, and does not include any berthing facilities, shoreline protection, or site work at upland disposal areas.

6.2.3 Non-Federal Responsibilities

The following is a list of some of the items of local cooperation required for projects authorized under Section 107. The non-Federal sponsor must provide assurance that they intend to meet these items prior to project authorization. The Project Partnership Agreement details these and other requirements of the Government and the Sponsor for implementation and future maintenance of the project.

1. Provide without cost to the United States, all necessary lands, easements, rights of way, relocations, and dredged material placement and borrow areas (LERRD) necessary for completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project. This project consists solely of dredged general navigation features and will be constructed using waterborne dredging plant and placement of the dredged materials will be in nearshore waters. All work areas are seaward of mean high water and subject to the government's navigation servitude. Therefore no LERRDs are required from the Sponsor for initial construction. At this time it is assumed that future operation and maintenance of the project will be accomplished in the same manner. However should different construction methods be used for future O&M Sponsor provision of LERRDs may be required.
2. Hold and save the United States free from all damages arising from construction, operation, maintenance, repair, replacement, and rehabilitation of the project, except for damages due to the fault or negligence of the United States or its contractors;
3. Assume full responsibility for all non-Federal costs associated with the project. Current law requires that the non-Federal sponsor provide at least 10 percent of the first cost of design and construction of General Navigation Facilities not exceeding 20 feet in depth

up-front, and provide an additional 10 percent after completion of initial construction of the project.

4. Agree to be responsible for total project costs in excess of the Federal cost limit of $10 million in accordance with Section 107 of the River and Harbor Act, as amended.
5. Not use funds from other Federal programs, including any non-federal contribution required as a matching share therefore, to meet any of the non-Federal sponsor's obligations for the project unless the Federal agency providing the funds verifies in writing that such funds are authorized to be used to carry out the project;
6. Provide, maintain and operate without cost to the United States, an adequate public landing open and available to use for all on an equal basis. The state pier and other state and municipal facilities around the harbor are adequate to satisfy this responsibility for both the existing FNP and for the recommended improvement.
7. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the outputs produced by the project, hinder operation and maintenance of the project, or interfere with the project's proper function;
8. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended, (42 U.S.C. 1962d-5b) and Section 101(e) of the WRDA 86, Public Law 99-662, as amended, (33 U.S.C. 2211(e)) which provide that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until the non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;
9. Keep, and maintain books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, and other evidence are required, to the extent and in such detail as will properly reflect total cost of the project, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments at 32 CFR, Section 33.20;
10. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601-9675, that may exist in, on, or under lands, easements, or rights-of-way that the Federal government determines to be necessary for the initial construction, operation and maintenance of the project;
11. Assume, as between the Federal government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way required for the initial construction, or operation and maintenance of the project;
12. Agree, as between the Federal government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability;
13. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended, (42 U.S.C. 4601-4655) and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way necessary for operation, and maintenance of the project

including those necessary for relocations, the borrowing of material, or the placement of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said act;

14. Comply with all applicable Federal and state laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d), and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a et seq.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 et seq.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c));
15. Give the Federal government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project."

6.2.4 Risk Informed Decision-Making

The Sponsor and the public must be informed of the risks associated with the formulation, evaluation and recommendation of a plan of improvement for Blue Hill Harbor. The contingency risk analysis performed as part of the cost estimate sought to capture these risks and their potential impacts on cost and implementation. The following are some of the risks captured in the contingency analysis.

- With construction limited to late fall to mid-winter for environmental resource impact reasons, it is possible the contractor will encounter significant weather-related delays that will impede his ability to mobilize to the site or transit to and from the disposal area. Further, the project is in eastern Maine, meaning there is potential for ice in the channel which may obstruct contractor access and reduce dredge efficiency.
- The work is in an area influenced by glaciation and characterized by ground moraine and outwash plain deposits. It is possible that materials such as gravel and small boulders will be encountered. These materials can be removed by the mechanical bucket dredge plant that would be used to dredge the project features and can be placed in the disposal site, but may slow production somewhat if encountered.
- The economic benefit of this project has been measured in improved efficiency of vessel operations – fuel and labor savings, reductions in vessel damages, etc. Blue Hill is an active stable port which has shown growth in ships, catch volume and catch value over time. Any risk that the projected benefits will not be achieved is low.
- Availability of competent responsive bidders can be an issue when funding for such small projects regionally results in more work being advertised than the dredging industry can accommodate. In past years some projects have failed to attract any responsive bidders. Given the low level of funding in the past several years for small harbor projects a lack of responsive bidders is not expected to be an issue.
- Knowledge of potential environmental resource impacts from marine construction projects and the concern given species can change over time. If significant time passes between completion of the feasibility phase and project construction, then it is possible that

changing resource concerns could change the work window for the project or make mitigation of impacts necessary. New species could be listed as threatened or endangered, or additional habitat could be noted as critical for fisheries resources or climate change could result in a change in species in the project area. At this time coordination with Federal and State resource agencies has not shown any concerns of this nature.

- On rare occasions previously unknown cultural resources can be encountered during construction. In such cases coordination with state and tribal historic preservation officials is re-initiated. Documentation of any finds is a minimal requirement. Depending on the nature of the resource encountered work may be delayed at least in part while coordination is pursued. Research and site investigations made during this study indicate that the potential for such resources in the project area is low.
- Federal funding for small harbor maintenance has been difficult to budget in recent years. Though under current law maintenance of the Federal Navigation Projects is eligible for 100% Federal funding, the budget situation has delayed maintenance of these project. While we cannot predict the situation with respect to future Federal budgets, the Sponsor should be aware that delays in Federal funding may delay necessary maintenance dredging.

6.3 Conclusion

USACE has evaluated the data for the proposed Federal plan for improving navigation at Blue Hill Harbor. USACE will review, evaluate, and consider the comments and views of interested agencies, stakeholders, and the concerned public regarding the alternative plans. The potential consequences of each alternative will be evaluated on the basis of engineering feasibility, environmental impact and economic efficiency.

We find substantial benefits are to be derived by providing the commercial fishermen with reliable and improved access to the facilities in Blue Hill Harbor. The proposed Federal action was considered individually and cumulatively under the provisions of the National Environmental Policy Act and the action was determined not to have significant effects on the quality of the human environment. The proposed action also incorporates the provisions for protection and ensures compliance with other Federal environmental laws, regulations, Executive Orders and Executive Memorandum such as, for example, the Endangered Species Act, the Fish and Wildlife Coordination Act, the National Historic Preservation Act, the Clean Water Act, etc. The USACE has concluded the proposed navigation improvements would cause a temporary disruption of the environmental resources present in the construction work area and immediately adjacent during dredging operations and no significant long term effects are anticipated. Due to the significant benefits attributable to the commercial fishing industry, any effects are considered to be offset by the improvement and the resulting overall economic growth of the region.

The Recommended Plan, Plan A2, would result in the greatest economic net benefits and is therefore the NED Plan. The Recommended Plan establishes a -6-foot MLLW by 80-foot wide Federal channel extending about 5,400 feet from deep water off Parker Point up-harbor to the town landing with a one-half acre turning basin at its head. To dispose of the unsuitable portion of the dredged material a CAD cell would be constructed north of the channel. All suitable material, including material dredged to create the CAD cell, would be placed at the previously used Eastern Passage Disposal Site.

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8 RECOMMENDATION

The USACE recommends that a Federal navigation project be adopted at Blue Hill Harbor, Maine, under the authority of Section 107 of the River and Harbor Act of 1960, as amended, in accordance with the Recommended Plan identified in this Detailed Project Report, with such further modifications thereto as in the discretion of the Chief of Engineers may be advisable.

The recommendations contained in this report reflect the information available at this time and current USACE Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are authorized for implementation funding.

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Date

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William M. Conde
Colonel, Corps of Engineers
District Engineer