Civil Works Branch

Public Notice

JUL 22 2013

Alaska District
U.S. Army Corps of Engineers

Date _____ Identification No. ER-11-04-S
Please refer to the identification number when replying.

Supplemental Environmental Assessment
Channel Rock Breakwaters
Corrective Navigation Improvements
Sitka Harbor, Alaska

The U.S. Army Corps of Engineers (Corps) is proposing to further modify the Channel Rock Breakwaters corrective action in Sitka, Alaska, as a result of continued surge entering through gaps in the breakwater and adversely affecting harbor use and damaging boats and harbor facilities.

While preparing plans to construct the original corrective action feature (i.e., closing the 315-foot gap between the main and south breakwaters) described in the March 2011 environmental assessment (EA) (ER-11-04), the Corps continued to examine the surge problem. Instead of using a physical model to examine the surge problem, as in the original corrective action study, the Corps used its CGWAVE numerical wave prediction model. Results indicated that constructing additional modifications to the main and south breakwaters would reduce the surge to a greater extent and help prevent damages to the existing harbor facilities; however, funding constraints limit what features the Corps would actually construct. At a minimum, funding is available to close the 315-foot gap between the main and south breakwaters, as previously planned and authorized. Should additional construction funds become available, the Corps would opt to also construct: (1) a 75-foot or 100-foot diagonal breakwater extension off the northern end of the main breakwater; and/or, (2) an approximately 115-foot-long linear or diagonal extension of the south breakwater towards Japonski Island, but no closer than -4 feet mean lower low water.

The primary environmental issues associated with the proposed breakwater modifications are identical to those issues addressed in the original environmental assessment and include potential impacts on Pacific herring, water quality and circulation, marine mammals, essential fish habitat, and Endangered Species Act species.

Information on the proposed action and anticipated environmental effects are discussed in the enclosed Supplemental EA. The Supplemental EA and unsigned Finding of No Significant Impact (FONSI) are provided for your review and comment in compliance with the Council on Environmental Quality's regulation for implementing the procedural provisions of the National

Environmental Policy Act. The Supplemental EA is also available on the Corps' website at: http://www.poa.usace.army.mil. Click on the Reports and Studies button and look under Documents Available for Review, Civil Works.

The comment period will close 30 days from the date of this notice. Written comments received on or before this date will become part of the official record. No public meeting is scheduled for this action. If you believe a meeting should be held, please send a written request to the address below during the 30-day review period explaining why you believe a meeting is necessary.

The FONSI will be signed upon review of comments received and resolution of significant objections. Please submit comments regarding the proposed action to the following address:

U.S. Army Corps of Engineers, Alaska District
ATTN: CEPOA-EN-G-ER (Crayton)
P.O. Box 6898
Joint Base Elmendorf-Richardson, Alaska 99506-0898

Notice is hereby given that the Corps will be applying for State Water Quality certification from the Alaska Department of Environmental Conservation (ADEC). ADEC may certify there is a reasonable assurance this proposed action and any discharge that might result will comply with the Clean Water Act, Alaska Water Quality Standards, and other applicable State laws. ADEC's certification may authorize a mixing zone and/or a short-term variance under 18 AAC 70. ADEC may also deny or waive certification.

Any person desiring to comment on this proposed action with respect to water quality certification may submit written comments to ADEC at the address below within 30 days from the date on this public notice.

Alaska Department of Environmental Conservation
WQM/401 Certification
555 Cordova Street
Anchorage, AK 99501-2617
Telephone: (907) 269-7564
FAX (907) 269-7508

Please contact Mr. Wayne Crayton of the Environmental Resources Section at (907) 753-2656 or write to the Corps' address if you would like additional information concerning the proposed project. Comments or requests for further information may also be submitted electronically to the e-mail address: Wayne.M.Crayton@usace.army.mil

Michael R. Salyer
Chief, Environmental Resources Section

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
(ER-11-04-S)
AND
FINDING OF NO SIGNIFICANT IMPACT

Channel Rock Breakwaters
Corrective Navigation Improvements
Sitka Harbor, Alaska

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 6898
JBER, ALASKA 99506-0898

JULY 2013

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act of 1969, as amended, the U.S. Army Corps of Engineers, Alaska District (Corps), has assessed the environmental effects of modifications to the following Federal action:

Channel Rock Breakwaters
Corrective Navigation Improvements
Sitka Harbor, Alaska

In 1992, the Corps completed an environmental impact statement for the original Channel Rock Breakwaters, Sitka Harbor project to provide protection for Thomsen Harbor and protect additional moorage to be constructed in the natural anchorage and channel between Sitka and Japonski Island. Project construction was completed in 1995. Soon after its completion, harbor users and the City and Borough of Sitka reported "surge" entering through the breakwater gaps during high tide and swell conditions and adversely affecting harbor use and damaging boats and harbor facilities.

The U.S. Congress determined that the damages being experienced resulted from design deficiencies in the Channel Rock Breakwaters. The U.S. Congress also determined that the deficiencies should be corrected by adding to, or extending, the existing breakwaters to reduce wave and swell motion. The Secretary of the Army, acting through the Corps' Chief of Engineers, was directed by the U.S. Congress to design and construct Channel Rock Breakwaters corrective measures. Subsequently, the Corps prepared a *Deficiency Correction Evaluation Report and Finding of No Significant Impact with Environmental Assessment*, dated March 2012. The Corps used a 5-foot, 12-second wave as the forcing function in its use of models to simulate local harbor users' oceanographic observations. As many as 18 corrective action alternatives were evaluated. The alternative selected that will provide the greatest energy reduction for the least cost was closing the 315-foot gap between the main and south breakwaters.

While preparing plans to construct the original corrective action feature (i.e., closing the 315-foot gap between the main and south breakwaters), the Corps continued to examine the surge, but instead of using a physical model, the Corps used its CGWAVE numerical wave prediction model. Model results indicate that constructing additional modifications to the main and south breakwaters will further reduce the average wave energy up to 28 percent and help prevent damages to the existing harbor facilities; however, funding constraints limit what features the Corps will actually construct. At a minimum, funding is available to close the 315-foot gap between the main and south breakwaters, as previously planned and authorized. Should additional construction funds become available, the Corps will opt to also construct: (1) a 75-foot or 100-foot diagonal breakwater extension off the northern end of the main breakwater; and/or, (2) an approximately 115-foot-long linear or diagonal extension of the south breakwater towards Japonski Island, but no closer than -4 feet mean lower low water.

To comply with the National Environmental Policy Act and other Federal and State environmental laws and regulations, the Corps prepared a Supplemental Environmental Assessment (EA) (ER-11-04-S, dated June 2013) to address the potential environmental impacts associated with the breakwater modifications. The primary environmental issues associated with the breakwater modifications are identical to those issues addressed in the original environmental assessment (ER-11-04, dated March 2011) and include the project's potential impacts on Pacific herring, water quality and circulation, marine mammals, essential fish habitat (EFH), and Endangered Species Act (ESA) species.

The Corps expects the environmental impacts associated with the breakwater modifications to be short term and to not have any long-term, significant, or adverse impacts on the area's fish and wildlife resources. Water circulation behind the breakwaters will continue to be sufficient and not cause degradation in water quality. A major environmental benefit associated with the additional breakwater modifications includes the newly placed armor rock, which when recolonized with marine algae, will provide additional Pacific herring spawning habitat and rocky substrate EFH. Therefore, the Corps concludes that the additional breakwaters modifications may affect, but are not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon. No historical, archeological or cultural resources will be affected by the Corps' recommended plan.

Relative to its responsibility under the ESA, the Corps has determined that the breakwater modifications may affect, but are not likely to adversely affect, the Pacific herring Southeast Alaska distinct population segment (DPS), a candidate species. Because the Corps' project will have minimal effects on the Pacific herring stock or its spawning areas, indirect effects on humpback whales (an endangered species) will be negligible and not measurable. Therefore, the Corps has determined that its breakwater modifications may affect, but are not likely to adversely affect, the humpback whale. The Corps has also determined that its breakwater modifications: (1) may affect, but are not likely to adversely affect, the endangered Steller sea lion western DPS and threatened Steller sea lion eastern DPS; and (2) not effect designated critical habitat for threatened or endangered Steller sea lions.

As described in the body of the Supplemental EA, both adverse and beneficial environmental consequences will occur as a result of constructing the breakwater modifications. "Mitigation" is the process used to avoid, minimize, and if determined to be necessary, compensate for environmental consequences of an action. The Corps does not believe that the subject project warrants compensatory mitigation measures, as the affected marine habitat is not limiting in the Sitka Sound area and the creation of additional subtidal rocky substrate, i.e., about 56,000 square feet of breakwater armor rock, will provide additional habitat for herring spawning and marine kelp to grow upon. Incorporating the following environmental protection measures into the recommended plan will help to mitigate potential impacts on local fish and wildlife resources, including ESA-listed species, marine mammals, and EFH.

- No in-water construction shall be allowed to occur between March 15 and June 1, which coincides with peak herring spawn activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide period unless there is a human safety issue requiring it.

- The selected contractor shall include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which is submitted to the Corps for review and approval.

- Breakwater construction shall use core material and B and armor rock clean of organic debris and invasive species.

- To accelerate recolonization of the additional breakwater segments, all suitable for reuse armor rock removed from the existing breakwaters with sessile or attached adapted marine organisms and marine algae shall be used in constructing the new breakwater segments. If not reused, the rock shall be side cast to the base of the breakwater so that it may continue to provide habitat for marine resources.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

This Finding of No Significant Impact's associated Supplemental EA supports the Corps' conclusion that the additional engineering features of the Channel Rock Breakwaters corrective navigational improvement project in Sitka Harbor, Alaska does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, the preparation of an environmental impact statement is not necessary.

_____ _____

Christopher D. Lestochi Date
Colonel, Corps of Engineers
District Commander

Channel Rock Breakwaters
Corrective Navigation Improvements
Sitka Harbor, Alaska
SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (ER-11-04-S)

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SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

1.1 Project Location

Sitka is in the southeastern panhandle of Alaska (figure 1), 862 miles northwest of Seattle, 95 miles south southwest of Juneau, the state capitol, and 185 miles northwest of Ketchikan. The city of about 8,880 residents (2010 Census Data) is on the eastern shore of Sitka Sound, a bay on the western coast of Baranof Island in Southeast Alaska. The Channel Rock Breakwaters feature

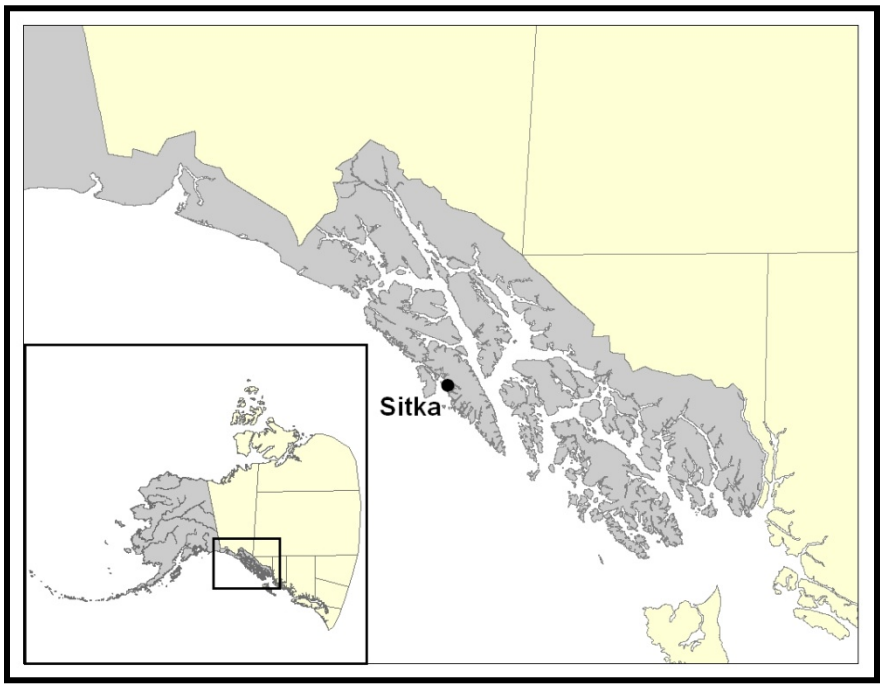

Figure 1. Sitka Location and Vicinity Maps. Sitka is located on the Southeast Panhandle of Alaska, about midway by air between Seattle, Washington and Anchorage, Alaska.

crosses the western channel area of Sitka Sound about 0.6 mile northwest of Eliason Harbor (figure 2), and provides wave protection for Eliason Harbor, Thomsen Harbor, and other shoreline facilities along Sitka Channel (figure 3).

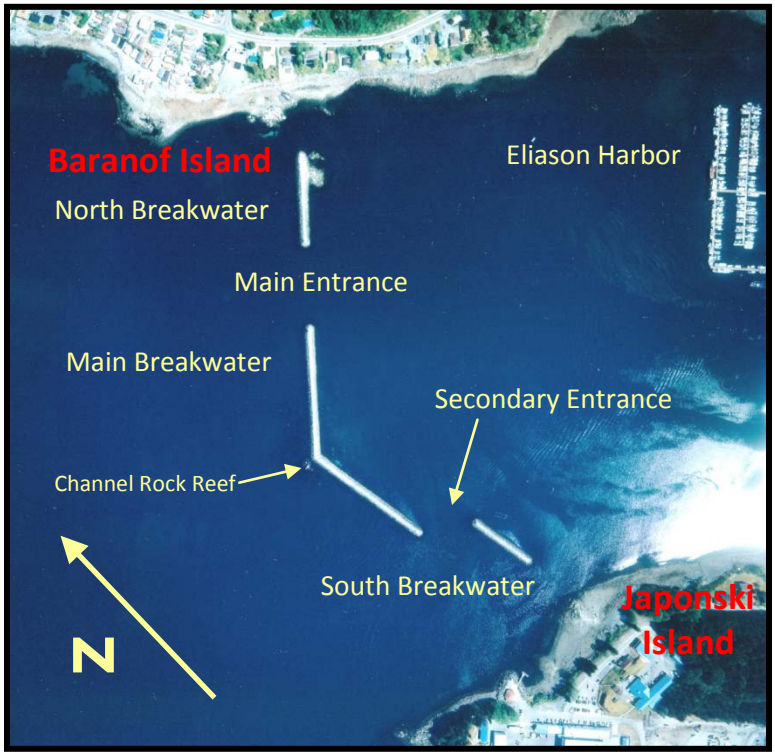

Figure 2. Channel Rock Breakwaters and western anchorage area.

Figure 3. Looking from southwest, showing Channel Rock Breakwaters, Western Anchorage, Thomsen Harbor and Eliason Harbor.

1.2 Project Purpose and Need

In 1992 the Corps completed an environmental impact statement (EIS) for the original Channel Rock Breakwaters, Sitka Harbor project to provide protection for Thomsen Harbor and to protect additional moorage to be constructed in the natural anchorage and channel between Sitka and Japonski Island. Construction of the project was completed in 1995. Soon after its completion, harbor users and the City and Borough of Sitka (CBS) reported "surge" entering through the breakwater gaps during high tide and swell conditions and adversely affecting harbor use and damaging boats and harbor facilities.

The U.S. Congress determined that the damages being experienced resulted from design deficiencies in the Channel Rock Breakwaters. The U.S. Congress also determined that the deficiencies should be corrected by adding to, or extending, the existing breakwaters to reduce wave and swell motion. The Secretary of the Army, acting through the Corps' Chief of Engineers, was directed by the U.S. Congress to design and construct Channel Rock Breakwaters corrective measures. Subsequently, the Corps prepared a *Deficiency Correction Evaluation Report and Finding of No Significant Impact with Environmental Assessment*, dated March 2012. The Corps used a 5-foot, 12-second wave as the forcing function in its use of models to simulate local harbor users' oceanographic observations. As many as 18 corrective action alternatives were evaluated and the modifications that provided the most energy reduction are shown in Figure 4. The alternative selected that would provide the greatest energy reduction for the least cost was closing the 315-foot gap between the main and south breakwaters.

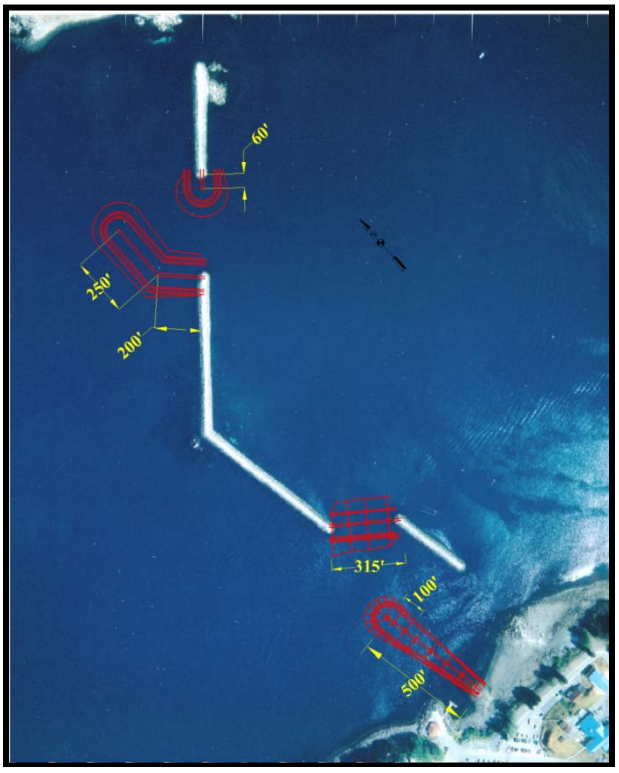

Figure 4. Physical model results illustrating the breakwater modifications that would provide the most energy reduction.

Among other things the subject report: (1) described the corrective action's impacts on prior environmental concerns and commitments; (2) documented mitigation requirements resulting from implementing the corrective action; and (3) documented the coordination of the corrective action with applicable Federal and State agencies.

2.0 PROPOSED CHANNEL ROCK BREAKWATERS MODIFICATIONS

2.1 Modeling Methodology and Results

While preparing plans to construct the original corrective action feature (i.e., closing the 315-foot gap between the main and south breakwaters), the Corps used its CGWAVE numerical wave prediction model to evaluate the effectiveness of additional breakwater segment(s) to more effectively reduce the damaging surge entering through the Channel Rock Breakwaters' main entrances. CGWAVE is a general-purpose, 2-dimensional wave prediction model for simulating the propagation and transformation of ocean waves in coastal regions and harbors and is appropriate for modeling the most significant physical processes in channels, inlets and harbors, open coastal regions, and around islands and structures. An example of the graphical wave output for the Channel Rock Breakwaters analysis is shown in Figure 5. The green, cyan, and magenta colored lines are the locations chosen for model-generated, numerical values from which the effectiveness of various breakwater variations (e.g. breakwater length and location) to reduce wave energy would be evaluated (figure 6).

Tiering off the results of the previously run physical model and applying what was learned using the CGWAVE model, the configurations chosen for further engineering evaluation were a dogleg breakwater off the north end of the main breakwater and, rather than a shore connected spur as evaluated in the physical model, a breakwater extension off the south breakwater towards Japonski Island. If constructed alone, the breakwater extension towards Japonski Island resulted in an average increase (emphasis added) in wave energy of 3.9 percent (cyan line figure 6). The breakwater configuration with the 75-foot-long dogleg extension alone provided an average wave energy reduction of 16.6 percent at Eliason Harbor (green line with triangles in figure 6), while a 100-foot-long extension alone would reduce average wave energy 22.5 percent (light purple line with diamonds in figure 6). However, if both the 75-foot-long dogleg extension and the breakwater extension towards Japonski Island were constructed, the wave energy reduction realized at Eliason Harbor was 25.1 percent (yellow line figure 6), while a 100-foot-long extension and the south breakwater extension would reduce the average wave energy the greatest (28 percent) at Eliason Harbor (light blue line with squares in figure 6).

Funding constraints, however, limit what features the Corps would actually construct. At a minimum, funding is available to close the 315-foot gap between the main and south breakwaters, as previously planned and authorized. Should additional construction funds become available, the Corps would opt to also construct: (1) a 75-foot or 100-foot-long diagonal breakwater extension off the northern end of the main breakwater; and/or, (2) an approximately 115-foot-long linear or diagonal extension of the south breakwater towards Japonski Island, but no closer than -4 feet mean lower low water (MLLW) (figure 7).

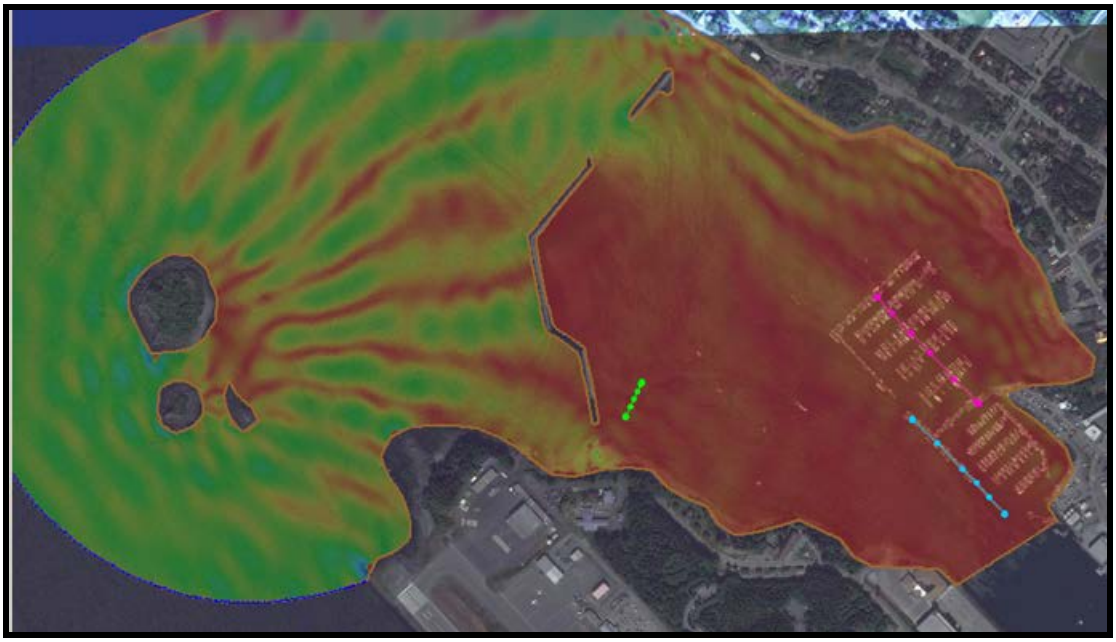

Figure 5. Channel Rock Breakwaters graphical output from CGWAVE model.

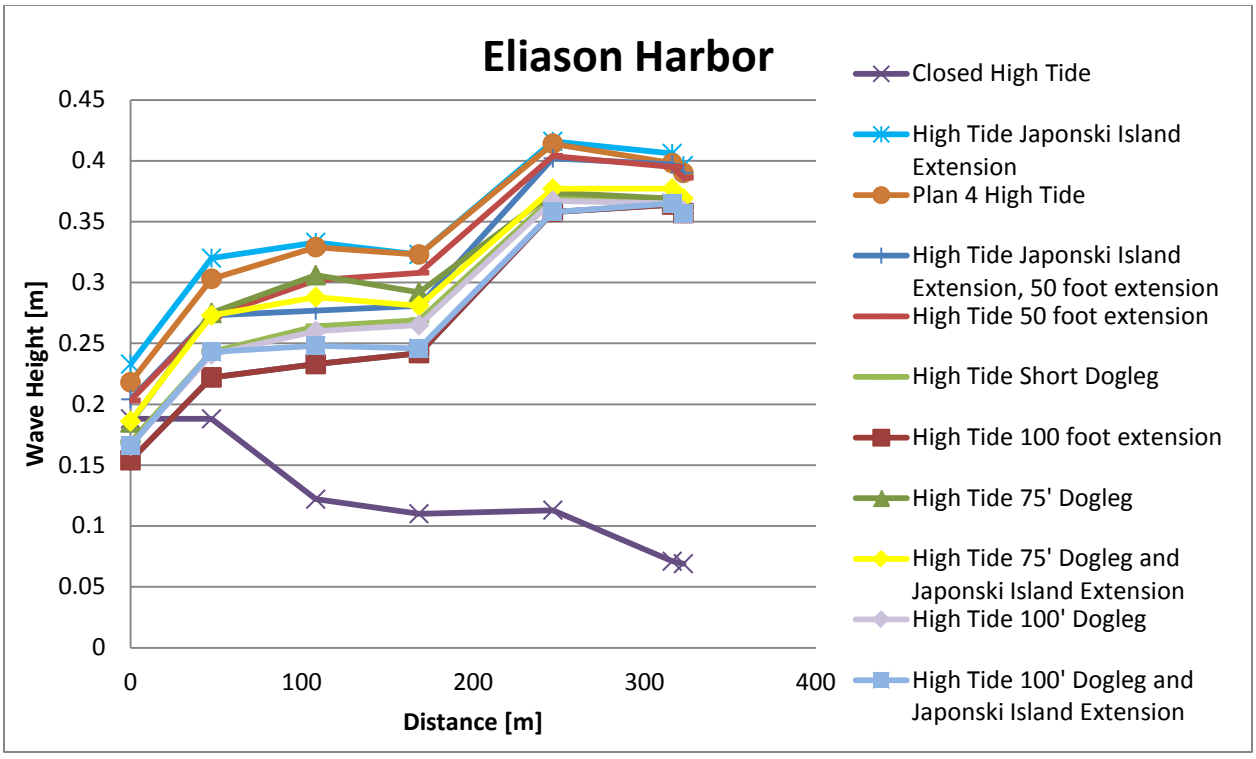

Figure 6. Plotted results of the CGWAVE model for the various breakwater configurations considered.

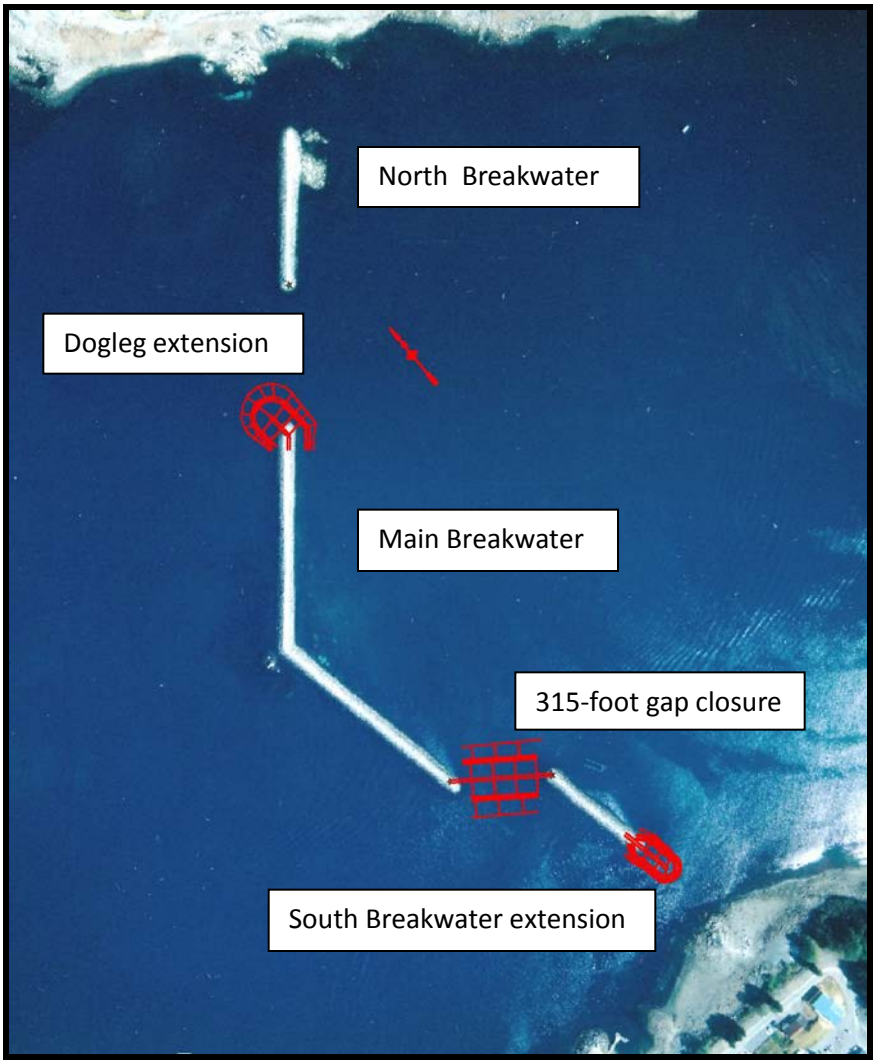

Figure 7. Proposed modifications to the Channel Rock Breakwaters, Sitka, Alaska. Only the linear, not the diagonal, extension of the south breakwater is depicted.

2.2 Description of Proposed Breakwaters Modifications

2.2.1 Dogleg Extension off Main Breakwater

This feature would involve peeling back the northern nose of the main breakwater and constructing a 75-foot-long dogleg extension from that peeled-back section. Plan views of this configuration are shown in Figure 8 and a cross section of the breakwater extension is shown in Figure 9. Armor rock for this option is 2,000-pound armor stone. Approximately 4,300 cubic yards of armor stone, 6,000 cubic yards of B-rock, and 5,700 cubic yards of core material would be required to construct this feature. For the 100-foot-long dogleg extension, approximately 5,000 cubic yards of armor stone, 7,100 cubic yards of B-rock, and 9,300 cubic yards of core material would be required to construct this feature.

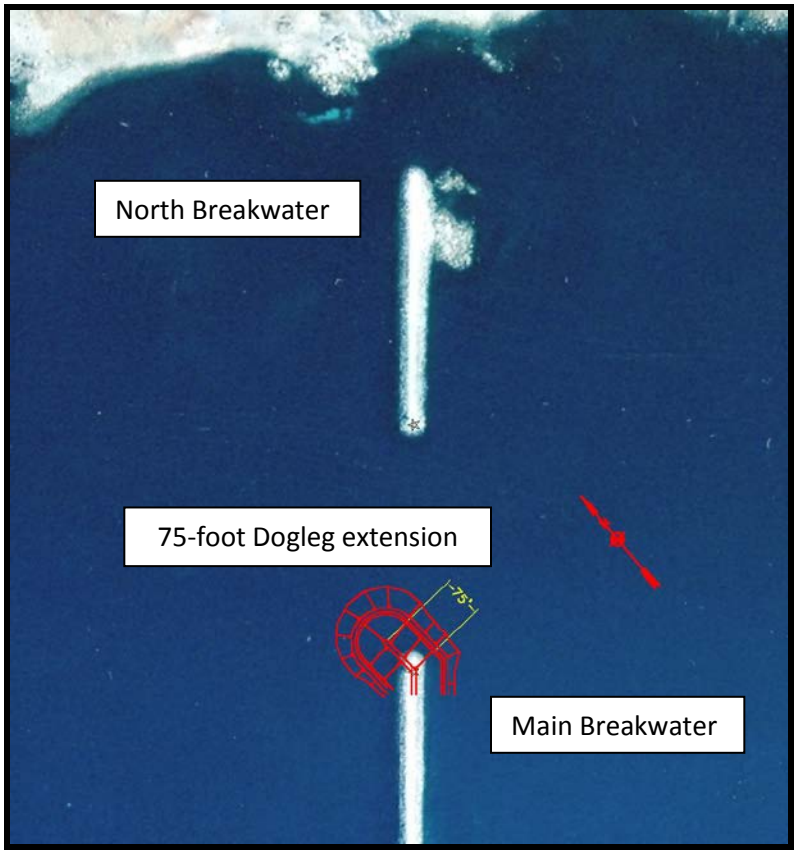

Figure 8. 75-foot-long dogleg extension off the north end of the Channel Rock Main Breakwater.

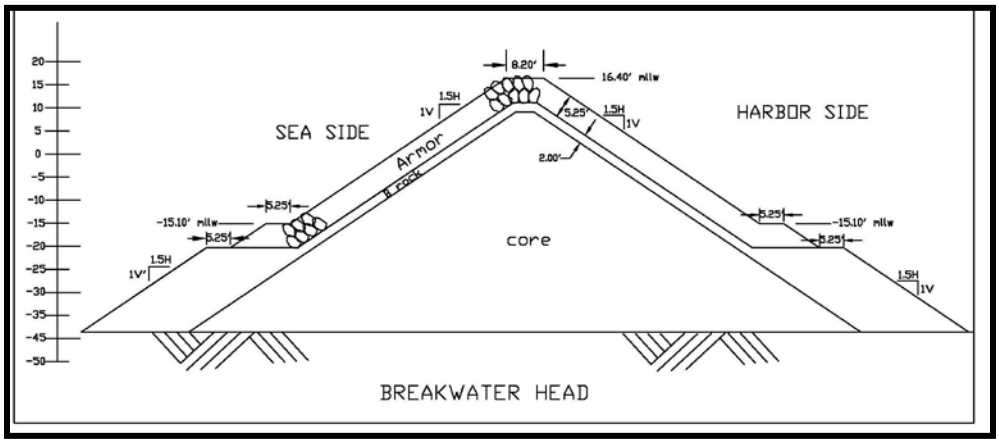

Figure 9. Cross section of the 75-foot-long dogleg extension off the north end of the Channel Rock Main Breakwater.

2.2.2 South Breakwater extension towards Japonski Island

This feature would involve peeling back the southern nose of the south breakwater and constructing from there a 115-foot-long linear or diagonal extension, but no closer than -4.0 feet MLLW. Plan views of the linear option are shown in Figure 10 and a cross section of the breakwater extension is shown in Figure11. Armor rock for this option is 2,000-pound armor stone. Approximately 3,100 cubic yards of armor stone, 2,000 cubic yards of B rock, and 1,700 cubic yards of core material would be required to construct this configuration.

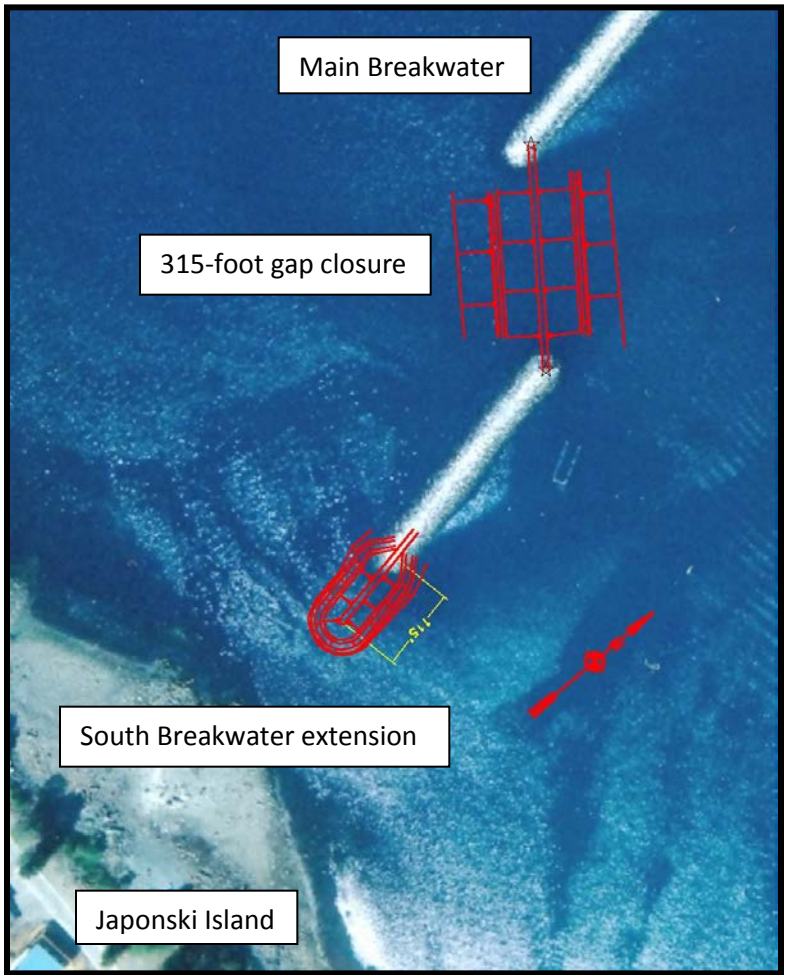

Figure 10. Linear extension off the south breakwater towards Japonski Island. Also shown is the previously approved (but not yet constructed) 315-foot closure between the main and south breakwaters.

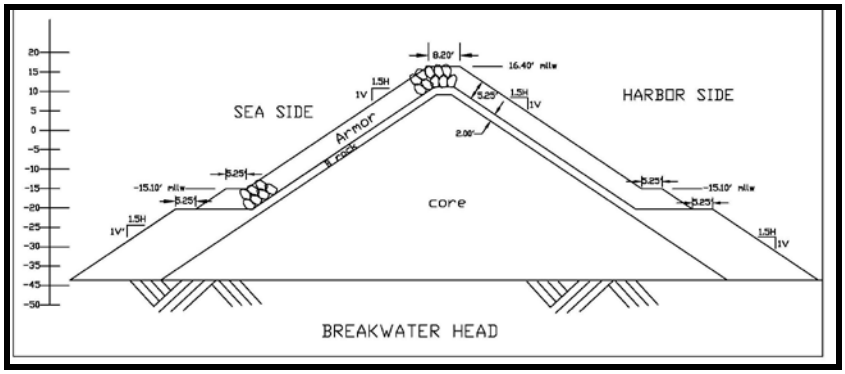

Figure 11. Breakwater cross section of the extension off the South Breakwater towards Japonski Island.

3.0 NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

3.1 Original Channel Rock Breakwaters Project

In 1992, the Corps completed an EIS for the original Channel Rock Breakwaters, Sitka Harbor project (USACE, 1993), which was constructed in 1995. Areas of concern were identified (e.g. degradation of water quality and destruction of herring spawning habitat) and resolved by developing a suitable mitigation plan that included now-completed long-term monitoring of herring spawning habitat/success and water quality. The Corps determined consistency with Section 404(b)(1) of the Clean Water Act, which governs discharge of dredged or fill material, and the State of Alaska issued the Corps a *Certificate of Reasonable Assurance*, meaning that the original project complied with State of Alaska water quality standards. The State of Alaska also found the original project consistent with its then Alaska Coastal Management Program. The U.S. Fish and Wildlife Service (USFWS) prepared a final Fish and Wildlife Coordination Act (FWCA) Report, which included a monitoring study plan and mitigation plan. Coordination with the USFWS and National Marine Fisheries Service (NMFS) pursuant to the Endangered Species Act (ESA) also was conducted. At that time, the NMFS found that the project would have no effect on threatened and endangered species, and the USFWS determined that no federally-proposed or listed threatened and endangered species under their purview occurred in or near the project area.

3.2 Deficiency Design Corrective Action

In 2012, the Corps completed the DCER/FONSI-EA for correcting breakwater design deficiencies in the Channel Rock Breakwaters. The studies documented in the report indicated that construction of modifications to the subject breakwaters were technically feasible and environmentally and socially acceptable. The report recommended that the 315-foot-wide gap (i.e. secondary entrance) between the main and south breakwaters be closed. The environmental assessment (EA) for the project was coordinated with numerous State of Alaska and Federal agencies, and via a Public Notice (ER-11-04) dated April 4, 2011, the public was provided 30 days to review and comment on the EA and unsigned Finding of No Significant Impact (FONSI).

Both the USFWS and NMFS provided input under authority of the ESA, Marine Mammal Protection Act (MMPA), and FWCA. The NMFS also provided essential fish habitat (EFH) information under the authority of the Magnuson-Stevens Fishery Conservation & Management Act (MSFCMA). Harbor water quality and circulation issues were coordinated with staff biologists from the USFWS, NMFS, and the Alaska Department of Fish and Game (ADF&G). An evaluation to determine consistency with Section 404(b)(1) of the Clean Water Act, which governs discharge of dredged or fill material, was completed by the Corps, and on December 13, 2011, the Alaska Department of Environmental Coordination (ADEC) issued the Corps a *Certificate of Reasonable Assurance*.

The Alaska Division of Coastal and Ocean Management coordinated the State's review of the Corps' proposed action for consistency with the Alaska Coastal Management Program (ACMP). Based on an evaluation by the ADEC, ADF&G, Natural Resources and the Sitka Coastal District, the State of Alaska concurred on May 23, 2011, (ACMP I.D. #AK 1104-03J) with the Corps' determination that its proposed activities were consistent with the ACMP to the maximum extent practicable.

The project's FONSI was revised based on comments received by the public and State and Federal agencies and ultimately signed by the Corps' Alaska District Commander on June 23, 2011. The project's contract was awarded in 2013, with construction scheduled to begin in 2013.

3.3 Deficiency Design Corrective Action Supplemental EA

This Supplemental EA (ER-11-04-S) addresses modifications to the 2012 Deficiency Design Correction Action and was prepared in accordance with the Council of Environmental Quality and guidance for implementation of the National Environmental Policy Act (NEPA); ER 200-2-2 *Procedures for Implementing NEPA*; and Corps Headquarters guidance dated May 15, June 16, and October 7, 2009, and January 7, 2010.[1] The sections that follow briefly address the fish and wildlife issues specifically associated with the proposed additional modifications to the Channel Rock Breakwaters.

4.0 AFFECTED ENVIRONMENT

A brief synopsis follows describing the potentially affected biological components of the marine environment in proximity to the proposed modifications to the Corps' Congressionally-directed corrective action.

[1] Per CEQ Regulations for Implementing NEPA, sections 1502.21, 1506.3 and 1506.4, the *Deficiency Correction Evaluation Report and Finding of No Significant Impact with Environmental Assessment* (DCER/EA-FONSI) dated March 2012, is incorporated, adopted and combined by reference, and is available at the following web site: http://www.poa.usace.army.mil/Library/ReportsandStudies.aspx (Reports and Active Projects).

4.1 Marine Environment

The vast majority of the Sitka waterfront is a rocky shoreline. However, the seafloor in the project area contains a mosaic of bottom types including a mixed-soft bottom (mixture of silt, and, pebbles, cobbles, boulders, and shell) and bedrock outcrops. All these habitats support a wide variety of species, including those important for commercial, sport, and subsistence uses.

4.1.1 Mammals

The following NMFS-managed marine mammals have been observed in the Sitka Sound area: killer whales, gray whales, harbor porpoise, Dall's porpoise, minke whales, sperm whales, Pacific white-sided dolphins, pygmy sperm whales, humpback whales, fin whales, Steller sea lions, and harbor seals. The only USFWS-managed marine mammal known to occur in the Sitka Harbor area is the northern sea otter. All marine mammals are protected under the federal MMPA, and selected marine mammals are also protected under the ESA.

Sea otters in the Southeast Alaska stock are not listed as "depleted" under the MMPA or listed as "threatened" or "endangered" under the ESA. However, all northern sea otters are listed by the State of Alaska as a *Species of Special Concern* under their listing program. A *Species of Special Concern* is any species or subspecies of wildlife or population of mammal native to Alaska that has entered a long-term decline in abundance or is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance. In general, northern sea otters are widely distributed in Sitka Sound and commonly occur in the Corps' project area.

The humpback whale and Steller sea lion (both the eastern distinct and western distinct populations) are protected under the ESA, and their status is discussed respectively in Section 3.3 Threatened and Endangered Species.

4.1.2 Benthos and Phycology

Several habitat types are associated with the Channel Rock Breakwaters area: unconsolidated bottom, bedrock, and aquatic bed algal/bedrock. Major infauna species include polychaete worms, little neck clams, cockle, and butter clams.

Subtidal surveys by the USFWS, post-construction of the original Channel Rock Breakwaters, both seaward and harbor side, revealed robust stands of algae (*Macrocystis pyrifera*, *Laminaria saccharina*, *Agarum fimbriatum*), which are known to provided substrate for Pacific herring spawn. Use of the breakwater algae by spawning Pacific herring has been documented in 1996 (USFWS 1996 and ADF&G 1998) and more recently in 2013 by Corps staff (using underwater video-photography) on an April site visit (Photograph 1).

Photograph 1. Pacific herring spawn (white substance) on rock surface and attached *Fucus sp*., Sitka, Alaska. (Corps Photo, Wayne Crayton).

4.1.3 Fishery Resources and Essential Fish Habitat

Fish and shellfish that reside in the project area include Pacific salmon and herring, various species of bottomfish, and several species of crab, shrimp, and other shellfish. Groups of foraging fish include rockfishes, greenling, flatfishes, blennies, sculpins, poachers, gunnels, and eelpouts.

Pacific herring, an ecologically and commercially important fish species, occurs abundantly in both the project and surrounding area. Pacific herring typically congregate in large schools at traditional sites along the shore, spawning in shallow vegetated areas in the intertidal and subtidal zones. All its life stages are central to the marine food web. Herring provide an abundant, high energy food source for a wide variety of fishes, mammals, and birds. Herring are also commercially important and support a roe fishery in Sitka that remains one of the largest and most valuable roe fisheries in Alaska. In 1986, about 25.5 million pounds of seafood were landed in Sitka. In the same year, herring spawning habitat in the immediate project area contributed to a $6 million herring sac roe fishery in Sitka Sound. The Pacific herring (Southeast Alaska distinct population segment) is an ESA candidate species and is discussed in more detail in Section 3.3 Threatened and Endangered Species.

EFH is defined in the MSFCMA as "…those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The proposed project is located within an area

designated as EFH for two fishery management plans (FMP) — Gulf of Alaska Groundfish and Alaska Stocks of Pacific Salmon. These two FMPs include 23 species or species complexes of groundfish and invertebrate resources and the five Pacific salmon species. The most likely species to be found in the project area include salmonids, sculpins, flatfish, rockfish, and forage fish. For a description of the life history stages of these species, refer to the relevant EFH designations in NMFS 2005 and 2005a.

4.1.4 Water Quality and Harbor Circulation

Marine waters in Sitka Sound are classified by the Alaska State Water Quality Standards for a variety of uses, including aquaculture, seafood processing, industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, and harvesting for consumption of raw aquatic life. However, Sitka's harbor and Sitka Sound are classified by the ADEC as Category 3 water bodies, which means that sufficient data or information does not exist to determine the water quality standards for any of the aforementioned designated uses.

Prior to the original project being constructed, the Corps collected water and sediment samples in areas that might be affected by the harbor expansion. The samples were collected to determine baseline water and sediment quality and to give a basis of comparison for future sampling. No water quality or sediment quality criteria were exceeded. The purpose of the Corps' 1997 sampling effort was to determine whether there was an effect on water and sediment quality that could adversely impact the herring fishery in the vicinity of Thomsen Harbor. None of the 1997 samples were found to exceed water quality or sediment quality criteria; therefore, it was assumed that the herring fishery in the vicinity of the Channel Rock Breakwaters had not been adversely impacted.

Between 2004 and 2006, the Corps measured various oceanographic parameters to characterize the proposed corrective action area's hydraulic features. A physical model was constructed at the Corps' Hydraulic and Coastal Laboratory at the Engineer Research and Development Center (ERDC) to determine the amount of wave energy that reaches Eliason Harbor and to aid in the development of alternatives. A 5-foot wave height was selected for the majority of runs, which was the original design wave for the breakwaters. Results of the physical model study are documented in the ERDC report: ERDC/CHL TR-08-2 *Physical Model Study of Wave Action in the New Thomsen Harbor* (i.e., Eliason Harbor), *Sitka, Alaska*.

The overall net circulation in the Sitka Sound area is northwestward, parallel to the coastline, and the normal tidal range in the area exchanges about 25 percent of the water on each tide. Regional currents are typically driven by water density differences and weather conditions. Local currents are tidally driven with predicted flood tides (rising tides) generally less strong (0.6 knot maximum) than ebb tides (receding tides, 1.2 knots maximum) through the channels on either end of Japonski Island (FAA, 2009). The extreme tide range is approximately 15 feet and the high tide line is at +12.7 feet.

A qualitative circulation study was performed using the ERDC physical model. The study looked at the circulation associated with a falling tide. Circulation associated with wind or wave

activity in addition to the tide was not examined, which resulted in a conservative circulation evaluation. Viewing the recordings in time lapse mode revealed general circulation patterns for the existing breakwater configuration and the project alternatives. Locally, the tidal influx enters the harbor through the breakwater gaps and along the shoreline. Water in the protected area behind the breakwaters circulates in a clockwise fashion and exits back through the breakwater gaps.

4.2 Avifauna

In broad terms, many species, such as common raven, northwestern crow, and gulls are consistently present across seasons in the project area. Shorebirds exhibit some degree of seasonality, with higher numbers occurring during spring migration and reduced numbers in winter months. Long-tailed ducks comprise the greatest relative abundance across all seasons.

The bald eagle is the only raptor directly associated with the marine environment in the Sitka area; however, merlin and northern harrier have been observed in the Sitka area (FAA, 2009). Bald eagles typically hunt fish in near shore and open water, snatch alcids, seabirds, and gulls flushed from the water or land, and scavenge carrion washed into the intertidal zones. One bald eagle nest is known to exist on Japonski Island, and numerous bald eagles perch in trees overlooking the harbor site.

The USFWS lists marbled murrelets as a species of high concern in Alaska (USFWS, 2006). They are also listed as being of high concern in North America and endangered globally, according to the USFWS Alaska Seabird Information Series. The Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, and Townsend's warbler are listed as *Special Species of Concern* by ADF&G and also have the potential to exist in the project area.

4.3 Threatened and Endangered Species

The following NMFS-managed ESA species may occur in the project area: Humpback whale (Endangered) and Steller sea lion (Threatened eastern population and Endangered western population). The Pacific herring Southeast Alaska Distinct Population Segment (DPS) is a NMFS Candidate species. No USFWS-managed ESA species exist in the project area.

Humpback whales were listed as endangered under the ESA in 1970, depleted under the MMPA in 1972, and endangered under the State of Alaska Endangered Species list. Local boaters have observed humpback whales in the project area "lounging" or resting in Whiting Harbor, and scratching on the intertidal reefs in Whiting Harbor is referred to by some locals as Seal Rocks (FAA, 2009).

In 1997 the NMFS recognized two Steller sea lion DPSs: the western DPS and eastern DPS. There is no critical habitat designated within the Corps' project area for the western and eastern populations. However, there is one major eastern Steller sea lion haulout approximately 15 miles southwest of Sitka Harbor at Biorka Island. Eastern Steller sea lions occur in Sitka Sound throughout the year but are in much higher numbers during the spring herring season. Local fishermen and boaters have reported large groups of foraging sea lions in Whiting Harbor, in

Sitka Channel, near Sealing Cove, near Middle Island during the bait fishery, and at other times during winter months.

On April 11, 2008, the NMFS announced (73 FR 19824) that they would be initiating a status review for the Pacific herring Southeast Alaska DPS. Status reviews are comprehensive assessments of a species' biological status and its threats, and are the basis for making determinations as to whether a species warrants listing under the ESA. In Southeast Alaska, at least five major herring populations are identified by managers: Sitka, Auke Bay, Craig-Hydaburg, Deer Island-Etolin Island (near Wrangell), and Ketchikan.

4.4 Subsistence Resources

Based on subsistence harvest data collected by ADF&G, subsistence collection by Sitka residents includes marine and riverine resources such as salmon, halibut, herring roe, eulachon, rockfish, sea otters, sea lions, harbor seals, seaweeds, and kelp (ADF&G, Alaska Community Profile Database (http://www.commerce.state.ak.us/dca/commdb/CF_COMDB.htm). More than 97 percent of Sitka households use subsistence resources, and estimated per capita harvest of subsistence resources is more than 200 pounds (FAA, 2009). Herring are also used for personal bait by area residents.

4.5 Cultural, Historical and Archeological Resources

The Corps conducted cultural resource surveys in 1989 in the Sitka project area as part of the Corps' EIS preparation process for the original Channel Rock Breakwaters project. The majority of Alaska Heritage Resources Survey (AHRS) sites are associated with a National Register Historic District (NRHD) and National Historic Landmark (NHL) adjacent to the Sitka airport. Those resources present in the AHRS database and not associated with the NRHD or NHL are human burials.

Inventories for subsurface obstructions by the National Oceanic and Atmospheric Administration (NOAA) and staff members of the Sitka Tribe of Alaska have identified historical resources in the waters immediately surrounding the airport, which include a sunken World War II-era cargo ship and discarded World War II-era military equipment (FAA, 2009). The sunken cargo ship is not in the Corps' project area. No archaeological or historical resources specifically related to traditional, sacred, or customary activities were identified to be present within the Corps' project area that could be directly or indirectly impacted by the Corps' proposed action.

Customary and traditional gathering activities in the project area does occur; however, it is limited because the surrounding shoreline is heavily developed with residences and commercial operations and urban runoff and wastewater flows/discharges into the area. The area also is heavily used by boats and floatplanes, and more undisturbed and productive areas are accessible outside the influences of the city center.

5.0 ENVIRONMENTAL CONSEQUENCES

This section briefly discusses how the proposed corrective action modifications might affect the Sitka area's environmental resources of concern. The potential environmental consequences of (1) no further Corps action; (2) extending the main breakwater diagonally up to 100 feet; (3) extending the south breakwater shoreward linearly or diagonally to -4 feet MLLW; and (4) the combination of breakwater modification features, are addressed in the sections that follow and are summarized in Appendix 1's tables.

The three action alternatives would create similar types and magnitude of environmental consequences. In those instances, the consequences for all three are addressed collectively rather than repeating the discussion individually. Ultimately, the analysis of environmental consequences is used to (1) make a determination of "significance" relative to deciding whether preparing an EIS is warranted and (2) develop a mitigation plan.

"Significance" as defined in the NEPA requires considerations of both context and intensity. "Context" means that the significance of an action must be analyzed in several contexts such as the affected region, affected interests, and the locality. "Intensity" refers to the severity of impact, including the degree to which an action may adversely affect, for example, an endangered or threatened species or its critical habitat.

The direct effects study area encompasses the footprint of the Channel Rock Breakwaters and the protective marine waters behind them. Within this area, resources that are present could be directly affected by physical disturbance associated with implementation of project alternatives requiring the placement of fill.

The indirect effects study area is larger than the direct effects study area and encompasses those marine areas around Japonski Island where indirect effects such as changes in water flow or boat traffic patterns might occur as a result of improvements to the Channel Rock Breakwaters.

NEPA requires that cumulative effects be evaluated along with the direct and indirect effects of the actions. Cumulative impacts on the environment result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. As with direct and indirect effects, the no-action alternative serves as the baseline against which to evaluate cumulative effects.

Major past projects in vicinity of the Corps' project area include World War II-related construction on Japonski Island, heavy shoreline development related to Sitka's growth, Sitka Rocky Gutierrez Airport construction and development, and the construction of New Thompson Harbor and the Channel Rock Breakwaters. Major current projects include ADOT&PF's filling of the Airport Lagoon and road relocation projects, airport terminal expansion, and the Corps' construction project to close the 315-foot-wide gap between the main and south Channel Rock Breakwaters. Reasonably foreseeable future actions include airport expansion, development of a

state park on the Japonski Island causeway, Sitka seaplane base relocation, and mariculture expansions in Whiting Cove.

5.1 Marine Environment

5.1.1 Mammals

The placement of fill material to construct the additional segments of the Channel Rock Breakwaters would temporarily and indirectly disturb marine mammals in proximity to the site due to construction noise, construction vessel traffic, and construction-generated turbidity. Airborne noise would be generated by the operation of heavy equipment, and waterborne noise would be generated by work boats and rock and fill placement. At levels of sound resulting from the work activities expected to be less than 150 dB re 1 uPa, the primary reaction of marine mammals is likely to be to move away from the work area during the construction period. Similarly, the noise generated by barges and tugs in transit to or from the work area from other locations in Southeast Alaska would be similar to that generated by routine small vessel traffic in the shipping lanes. Low levels of turbidity would be generated by fill and rock placement in the marine environment, causing marine mammals to temporarily avoid the area until such time that the construction-generated plume dissipates to background levels. All the aforementioned disturbances are associated with constructing each segment; however, constructing all the features at the same time would disturb marine mammals more because it involves additional construction time and in-water work. Overall, marine mammals that would otherwise be present would temporarily move away from the area during construction and not be significantly impacted in the long term.

5.1.2 Benthos and Phycology

Placing fill material on the sea floor as part of breakwater-associated construction is the primary source of impact on the area's marine benthic and algal habitat and associated communities. All additional breakwater modifications involve placing new, un-weathered rock from upland sources over existing habitats, thus causing mortality and displacement of a wide variety of existing marine resources attached to the existing habitat surfaces (e.g. unconsolidated bottom and breakwater armor rock). Algae, sessile invertebrates, and infauna (animals living within the sediments) would be crushed and/or buried. Cavity dwelling motile fish and invertebrates may escape crushing, but many would seek shelter within the cavities in the existing rock structure and would subsequently be buried.

Rapid succession of biota colonizing new rock substrata in the Sitka-area marine environment has been well documented. Corps-funded monitoring studies conducted by the ADF&G and USFWS on the newly constructed Channel Rock Breakwaters found that macroalgae favored for Pacific herring spawning developed rapidly, and herring were found to have spawned on the breakwaters within 2 years of rock placement (ADF&G, 1995, 1994, 1994a). Researchers have also shown a generally positive relationship between numbers of herring eggs deposited and the size (i.e. kelp height) and complexity (i.e. number of fronds) of the kelp in the habitat. However, herring also can be fairly indiscriminant in their spawning preference with respect to plant substrate and location. Table 1 provides a comparative summary of the types and amounts of subtidal habitat losses and gains associated with constructing the various modified segments of the Channel Rock Breakwaters.

Collectively constructing the additional breakwater features (i.e., filling the 315-foot-wide gap between the main and south breakwaters, extending the south breakwater towards Japonski Island, and the 75-to-100-foot-long diagonal extension to the main breakwater) would eliminate approximately 51,000 to 68,000 square feet (1.18 to 1.56 acres) of soft-substrate benthic habitat and replace it with an approximate net gain of 42,000 to 56,000 square feet (0.96 to 1.29 acres) of rocky-substrate breakwater habitat suitable for a wide variety of marine organisms, including Pacific herring spawning habitat. However, the cumulative net loss of benthic habitat (soft-substrate or rocky-substrate) would be approximately 9,100 to 11,400 square feet (0.21 to 0.27 acre) of soft-substrate benthic habitat suitable for a wide variety of epifauna and infauna. Overall, the Corps expects that in areas below approximately +6 feet MLLW, algal colonization following one complete growing season should be sufficient to support some of the normal ecological functions of the area, including Pacific herring spawning and grazing by a variety of fish and crustaceans.

Table 1. Comparative tabulation of subtidal habitat losses and gains associated with constructing the various modified segments of the Channel Rock Breakwaters, Sitka, AK

Channel Rock Breakwaters Modified Segments	Surface area of soft-substrate, benthic habitat, unavoidably lost by constructing breakwater segment(s).		Surface area of breakwater rocky-substrate, benthic habitat, below mean high water, …						Net gain (+) or loss (-) of benthic habitat (either soft-substrate or breakwater rocky-substrate)	
			… unavoidably lost by constructing breakwater segment(s).		… created by constructing breakwater segment(s).		… net loss (-) or gain (+) by constructing breakwater segment(s).			
No Action	Not applicable		Not applicable		Not applicable		Not applicable		Not applicable	
Main Breakwater diagonal extension option #1: 100 feet	26,899 ft² 0.62 acres		20,224 ft² 0.46 acres		44,764 ft² 1.03 acres		+24,540 ft² +0.56 acres		-2,359 ft² -0.05 acres of soft-substrate	
Main Breakwater diagonal extension option #2: 75 feet	10,335 ft² 0.24 acres		20,224 ft² 0.46 acres		30,456 ft² 0.70 acres		+10,232 ft² +0.23 acres		-103 ft² -.002 acres of soft-substrate	
South Breakwater extension shoreward to -4 feet MLLW	16,124 ft² 0.37 acres		4,922 ft² 0.11 acres		17,035 ft² 0.39 acres		+12,113 ft² +0.28 acres		-4,011 ft² -0.09 acres of soft-substrate	
Combined modified segments	w/100 ft. option 43,023 ft² 0.99 acres	w/75 ft. option 26,459 ft² 0.61 acres	w/100 ft. option 25,146 ft² 0.58 acres	w/75 ft. option 25,146 ft² 0.58 acres	w/100 ft. option 61,799 ft² 1.42 acres	w/75 ft. option 47,491 ft² 1.09 acres	w/100 ft. option +36,653 ft² +0.84 acres	w/75 ft. option +22,345 ft² +0.51 acres	w/100 ft. option -6,370 ft² -0.15 acres	w/75 ft. option -4,114 ft² -0.09 acres
Original Corrective Action: 315-ft. gap closure	24,829 ft² 0.57 acres		37,313 ft² 0.86 acres		57,092 ft² 1.31 acres		+19,779 ft² +0.45 acres		-5,050 ft² -0.12 acres of soft-substrate	
Cumulative surface area impacted by all corrective actions	w/100 ft. option 67,852 ft² 1.56 acres	w/75 ft. option 51,288 ft² 1.18 acres	w/100 ft. option 62,469 ft² 1.44 acres	w/75 ft. option 62,469 ft² 1,44 acres	w/100 ft. option 118,891 ft² 2.73 acres	w/75 ft. option 104,583 ft² 1.40 acres	w/100 ft. option +56,432 ft² +1.29 acres	w/75 ft. option +42,124 ft² +0.96 acres	w/100 ft. option -11,420 ft² -0.27 acres of soft-substrate	w/75 ft. option -9,164 ft² -0.21 acres of soft-substrate

5.1.3 Fishery Resources and Essential Fish Habitat

Placement of fill material to construct the additional segments of the Channel Rock Breakwaters would have little direct effect on those mature fish inhabiting the project area as their mobility allows them to avoid construction activities (e.g. placement of breakwater material and generated turbidity, vessel movements, and underwater construction noise). No modified breakwater segment would disrupt the long-shore movements of juvenile fish.

The primary direct impact of placing fill material to construct the additional segments of the Channel Rock Breakwaters on the area's fishery resources is the temporary loss of Pacific herring spawning on selected segments of the existing breakwaters. Results of a 5-year multiagency study (1993-1998) that monitored spawning activity on the newly constructed Channel Rock Breakwaters indicated that the breakwaters had quickly become colonized with algae species suitable for herring spawning (ADF&G 1998). Regarding mitigation, the ADF&G and USFWS concluded that the algae growth on the breakwaters was compensating, at least in part, for habitat degraded by the project, and no further mitigation was recommended at that time.

In 2005, the Corps and USFWS entered into an agreement to conduct a biological evaluation of the Channel Rock Breakwaters with emphasis on their habitat value as Pacific herring spawning substrate. It was found that after 10 years, the subtidal surface (between -30 feet MLLW and the surface) of all three breakwaters, both seaward and harbor side, supported robust stands of algae (e.g. sugar kelp and fringed sieve kelp) (USFWS, 2005). The primary difference between the outside and inside surfaces of the breakwater appeared to be the presence of perennial kelp (*Macrocystis pyrifera*) outside the harbor and near absence inside. However, the USFWS concluded that an abundance of suitable Pacific herring spawning habitat was available on the harbor side of the breakwaters.

The Corps prepared a detailed EFH evaluation for the Channel Rock Breakwaters original corrective action, i.e., closing the 315-foot-wide gap between the south and main breakwaters, and (1) determined that the project would result in short-term alterations of EFH for marine species and species such as rockfish, flatfish, gadids, salmonids, and forage fish such as capelin and sand lance as well as for species such as Pacific herring that are important prey for species with designated EFH, and (2) concluded that its Federal action may affect, but is not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon (Environment Assessment, Appendix 2 in USACE, 2012).

Collectively constructing the additional breakwater features (i.e., filling the 315-foot-wide gap between the main and south breakwaters, extending the south breakwater linearly or diagonally toward Japonski Island, and the 75- to100-foot-long diagonal extension to the main breakwater) would eliminate approximately 51,000 to 68,000 square feet (1.18 to 1.56 acres) of soft-substrate benthic habitat and replace it with an approximate net gain of 42,000 to 56,000 square feet (0.96 to 1.29 acres) of rocky-substrate breakwater habitat suitable for Pacific herring spawning and other marine organisms. However, the cumulative net loss of benthic habitat (soft-substrate or

rocky-substrate) would be approximately 9,100 to 11,400 square feet (0.21 to-0.27 acre) of soft-substrate benthic habitat suitable for supporting a wide variety of epifauna and infauna.

Overall, the Corps believes that placement of fill material to construct the additional segments of the Channel Rock Breakwaters would have the same net beneficial effect on Pacific herring and their spawning habitat as the original corrective action would have. Therefore, the Corps believes the same EFH determination and conclusion for the original corrective action is applicable for the placement of fill material to construct the additional segments of the Channel Rock Breakwaters, i.e. (1) the project would result in short-term alterations of EFH for marine species and species such as rockfish, flatfish, gadids, salmonids, and forage fish such as capelin and sand lance as well as for species such as Pacific herring that are important prey for species with designated EFH, and (2) the project may affect, but is not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon.

5.1.4 Water Quality and Harbor Circulation

For the original Channel Rock Breakwaters corrective action, a physical model of the Sitka Harbor area was constructed at the Corps' Hydraulics and Coastal Laboratory at the Waterways Experiment Station to (1) determine the amount of wave energy that reaches Eliason Harbor; (2) study circulation and harbor-flushing patterns; and (3) aid development of alternatives to reduce wave energy and not adversely affect water quality. Results of the physical model study are documented in the Engineering Research and Development Laboratory's report: ERDC/CHL TR-08-2 *Physical Model Study of Wave Action in New Thomsen Harbor, Sitka, Alaska*.

The time lapse videos of the circulation model runs were viewed together with biologists from USFWS and NMFS during a meeting in Juneau, Alaska, and with an ADF&G biologist in Sitka, Alaska, in December 2009. It was the general consensus from all who viewed the video that circulation behind each of the original corrective action's 18 alternatives (i.e. harbor configurations) was at least the same as, if not better than, the circulation modeled for the existing Channel Rock Breakwaters configuration. No alternative appeared to produce "dead zones" where the water did not circulate. The physical model was not saved after the circulation model runs were performed; therefore, no circulation-model-runs were performed on the currently proposed modifications/configurations. However, it is likely that by closing off or constricting some of the gaps in the breakwaters, as is being proposed by the Corps, the circulation would be improved since the same volume of water would be forced through smaller or fewer openings.

When placed in the marine environment, the core material used in breakwater construction is expected to generate in the immediate vicinity a short-term increase in turbidity as the core material will contain a minimal amount of fines. Except for this short-term impact, no long-term adverse impacts to water or sediment quality is expected to occur as a result of constructing the Channel Rock Breakwaters modifications.

5.2 Avifauna

The primary activities possibly affecting local avian populations within and in proximity to the project site are the to-and-from mobilization of construction equipment, vessels and personnel, and rubble mound breakwater construction. Vessels moving through the area would displace waterfowl and sea ducks within their intended course and boat wake. Because construction activities would be conducted during the daylight summer season, vessel lights are not expected to be used. However, if vessel and construction lights are used, they could become an attractive nuisance causing bird collisions and subsequent injury or death. The greater potential for environmental impacts associated with vessels would be the possible effect of petroleum compounds and other hazardous materials spills. The effects of fuel spills on avian populations are well documented as direct contact and mortality is caused by ingestion during preening as well as hypothermia from matted feathers. The displacement of local avian populations from the project area during construction would be short term. Overall, the Corps believes that the proposed modifications to the Channel Rock Breakwaters would not have a long-term effect on local avian populations. No significant adverse impacts are expected.

5.3 Threatened and Endangered Species

Section 7 of the ESA requires that any action by a Federal agency shall ensure that its actions are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat of such species. As a result, the Corps prepared a biological assessment for the Channel Rock Breakwaters original corrective action (closing the 315-foot-wide gap between the south and main breakwaters) to determine if listed species, special status species, or designated critical habitat would likely be adversely affected.[2] The Corps' conclusion, which the NMFS and USFWS concurred, was that its proposed action (1) would not modify or adversely affect designated critical habitat; and (2) may affect but is not likely to adversely affect humpback whales, Steller sea lions (eastern and western distinct population segment) or Pacific herring (Southeast Alaska distinct population segment).

The Corps believes that the additional modifications to the Channel Rock Breakwaters would not generate any new impacts beyond those already addressed in the subject biological assessment. Project construction activities and newly constructed breakwater segment(s) would result in short-term alterations to habitat used by Steller sea lions and Pacific herring. Vessel noise and transit associated with construction activities would have the potential to cause avoidance, disturbance, or displacement of Steller sea lions and humpback whales from the Sitka Harbor area during peak Pacific herring spawn activities when Steller sea lions and humpback whales feed on staging and spawning adult herring. Following completion of the breakwater segment(s), the breakwater armor rock would recolonize itself with productive populations of invertebrates and algae that would support spawning Pacific herring, and in time, the revegetated breakwater segment would ecologically function similarly to the Sitka Harbor shoreline and other already-revegetated Channel Rock Breakwater segments.

[2] *Endangered Species Act, Biological Assessment. Channel Rock Breakwaters Navigation Improvements, Sitka, AK.* February 2011, 20 pp. + appendices. USACE, 2011.

To address the potential impacts, the Corps would cease in-water construction during peak Pacific herring spawning activities (between March 15 and June 1). Construction activities outside this period coincide to periods when a minimum quantity of marine mammals is present. Additionally, speed limits would continue to be imposed on construction vessels moving between the project area and material suppliers to mitigate the danger of vessel-marine mammal collisions.

5.4 Subsistence Resources

The Alaska Native Interest Lands Conservation Act identifies three factors related to subsistence uses as items affected by changes in management activities or land uses: (1) resource distribution and abundance; (2) access to resources; and (3) competition for the use of resources. Subsistence resources, such as marine plants and animals primarily affected by the various alternatives, are predominantly food resources collected for primary diet, customary and traditional practices, or to supplement other existing food resources. Many Sitka residents use seaweed, bull kelp, and marine invertebrate shells as fertilizer for gardens.

No subsistence resources (e.g. macroalgae and associated herring spawn) would be adversely affected by constructing the new breakwater segments as the breakwaters are not known to be used for subsistence harvest activities. In conclusion, the Corps believes that there would be no anticipated significant impacts to marine-related subsistence resources or access to and competition for subsistence resources from the corrective action.

5.5 Cultural, Historical and Archeological Resources

Constructing modifications to the Channel Rock Breakwaters would not impact customary and traditional practices in the vicinity of project area. Besides being a subsistence activity, herring spawn harvesting is also a cultural characteristic. The Channel Rock Breakwaters themselves are not known as a herring spawn harvesting site, and because no in-water construction would occur during peak Pacific herring spawning activities (between March 15 and June 1), harvesting activities in the vicinity of the breakwaters are not expected to be adversely impacted.

The Alaska State Historic Preservation Officer (ASHPO) concurred with the Corps' initial determination that the original Channel Rock Breakwaters project constructed in 1995 would have no effect on any historic or prehistoric resources in the area. The Corps believes that the proposed modifications to the Channel Rock Breakwaters are not expected to impact any of the historic properties described in Section 3.5 (Cultural, Historical and Archeological Resource).

5.6 Environmental Justice and Protection of Children

On February 11, 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations was issued. The purpose of the order is to avoid the disproportionate placement of Federal actions and policies having adverse environmental, economic, social, or health effects on minority and low-income populations. No racial, ethnic, age, or other population group would be adversely affected disproportionately. The Sitka boating community is virtually the only group of individuals to be adversely affected by construction activities as navigating through breakwater entrances would have to be coordinated with work on the breakwaters.

On April 21, 1997, Executive Order 13045, Protection of Children from Environmental Health and Safety Risks was issued to identify and assess environmental health and safety risks that may disproportionately affect children. The proposed modifications would have a net economic and navigational benefit affecting the community as a whole. No environmental health or safety risks are associated with the action that would disproportionately affect children. All the alternatives considered are located offshore, in proximity to commercially developed areas, and away from homes, schools, and playgrounds.

6.0 PUBLIC INVOLVEMENT AND FEDERAL COMPLIANCE

6.1 Public Involvement

In 1992, the Corps completed an EIS (which went through public review) for the original Channel Rock Breakwaters, Sitka Harbor project. In 2011, the subsequent Channel Rock Breakwaters deficiency corrective action (i.e., filling in the 315-foot-wide gap between the main and south breakwaters) EA went through an extensive public involvement and review process, culminating in the June 23, 2011, signing of a FONSI. This Supplemental EA and unsigned FONSI have been prepared relying on previous (1) NEPA-related scoping efforts; (2) public input associated with the original and corrective action projects; (3) correspondence with State and Federal resource agencies; and (4) an April 2013 biological field investigation. Per the NEPA process and Corps regulations and guidance, this Supplemental EA and unsigned FONSI are subject to a 30-day public and Federal and State agency review. If warranted, a public meeting could be held to discuss and solicit public views and opinions on the proposed modifications to the Channel Rock Breakwaters.

6.2 Federal Compliance

The development and preparation of this Supplemental EA and unsigned FONSI have taken into consideration previously submitted and directly applicable Federal and State agency coordination and correspondence related to the original corrective action, closing the 315-foot-wide gap between the main and south breakwaters (EA Appendix 4 in USACE, 2012). The NMFS provided input under authority of the ESA, MMPA, and provided EFH information under the authority of the MSFCMA. The USFWS provided input under authority of the FWCA and ESA.

In accordance with Section 401 of the Federal Clean Water Act and provisions of the Alaska Water Quality Standards, the ADEC issued a *Certificate of Reasonable Assurance* for the original corrective action, closing the 315-foot-wide gap between the main and south breakwaters. To further address the proposed modifications to the Channel Rock Breakwaters, the Corps prepared for ADEC's review, a Section 404(b)(1) Evaluation, which governs discharge of dredged or fill material (Appendix 2).

Both the Corps and Alaska State Historic Preservation Officer determined that the original, larger-scaled navigation project would have no effect on known historical or prehistoric resources in the Sitka area, and the Corps believes that the previous determination is applicable for the proposed breakwaters modification.

Based on an evaluation of the original corrective action by the ADEC, ADF&G, ADNR, and the Sitka Coastal District, the Alaska Division of Coastal and Ocean Management concurred with the Corps' determination that the original corrective action is consistent with the Alaska Coastal Management Program (now defunct) to the maximum extent practicable.

7.0 CONCLUSIONS AND MITIGATION RECOMMENDATIONS

The following conclusions and mitigation recommendations mirror those made for the 2012 DCER/FONSI-EA and 1995 construction of the Channel Rock Breakwaters.

Primary environmental issues continue to center around the project's potential direct and short-term impacts on Pacific herring, water quality and circulation, marine mammals, and ESA species. The Corps believes that the proposed modifications to the Channel Rock Breakwaters would have a net beneficial environmental effect on Pacific herring and their spawning habitat, as well as other marine organisms. Constructing the additional breakwater segments would collectively eliminate approximately 62,400 square feet of breakwater-established Pacific herring spawning habitat. However, after construction, approximately 118,800 square feet of suitable breakwater rocky substrate would be available for kelp and other marine algae species to become established and support spawning Pacific herring and the marine mammals that feed upon them. The cumulative net loss of benthic habitat (soft-substrate or breakwater rocky-substrate) would be approximately 9,100 to 11,400 square feet (0.21 to 0.27 acre) of soft-substrate benthic habitat.

After reviewing CGWAVE modeled wave energy patterns, water quality parameters in the protected waters behind the Channel Rock Breakwaters would not be adversely impacted by constructing the additional breakwater segments.

The Corps determined that modifications to the Channel Rock Breakwaters (1) would not modify or adversely affect designated ESA critical habitat; and (2) may affect but are not likely to adversely affect humpback whales, Steller sea lions or Pacific herring.

Based upon the project design and the minimal short-term impacts associated with the breakwater modifications, the Corps concludes that its Federal action may affect, but is not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon.

As described in the body of the Supplemental EA, both adverse and beneficial environmental consequences would occur as a result of constructing the breakwater modifications. "Mitigation" is the process used to avoid, minimize, and if determined to be necessary, compensate for environmental consequences of an action. All appropriate and practicable measures have been incorporated into the project to offset unavoidable environmental impacts. The Corps does not believe that the subject project warrants compensatory mitigation measures as the affected marine habitat is not limiting in the Sitka Sound area and the creation of additional subtidal rocky substrate, i.e., breakwater armor rock, would provide additional high quality habitat for herring spawning and marine kelp to grow upon. Incorporating the following

environmental protection measures into the recommended plan would help to mitigate potential impacts on local fish and wildlife resources, including ESA-listed species, marine mammals, and EFH.

- No in-water construction shall be allowed to occur between March 15 and June 1, which coincides with peak herring spawn activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tides unless there is a human safety issue requiring it.

- The selected contractor shall include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which is submitted to the Corps for review and approval.

- Breakwater construction shall use core material and B and armor rock clean of organic debris and invasive species.

- To accelerate recolonization of the additional breakwater segments, all suitable for reuse armor rock removed from the existing breakwaters with sessile or attached adapted marine organisms and marine algae shall be used in constructing the new breakwater segments. If not reused, the rock shall be side cast to the base of the breakwater so that it may continue to provide habitat for marine resources.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

The Corps concludes that the recommended modifications to the Channel Rock Breakwaters corrective action in Sitka, Alaska, are consistent with the Coastal Zone Management Act to the maximum extent practicable. The Corps also concludes that the Supplemental EA supports the conclusion that the proposed navigation improvements do not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, preparing an environmental impact statement is not necessary and signing a FONSI is appropriate.

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APPENDIX 1

Comparative General Summary of Possible Environmental Impacts Associated with the Channel Rocks Breakwater Corrective Action Alternatives Considered in Greater Detail

Appendix 1: Summary of potential environmental impacts associated with proposed modifications to the Channel Rock Breakwaters, Sitka, AK.

Resources of Primary Concern	No Action	100 foot diagonal extension of the Main Breakwater	Extension of the South Breakwater shoreward to -4 ft mean lower low water (MLLW)	Combination of breakwaters modification features
1. Marine Mammals	Local marine mammal populations would continue to use the action area and be affected by ongoing harbor and shoreline/urban development activities.	A <1 year construction season would result in a temporary disturbance of ambient noise, increased suspended sediment conditions & cause marine mammals near the construction site to temporarily move away from the area. No significant adverse impacts expected.	A <1 year construction season would have impacts similar to those associated with construction the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	A <1 year construction season would have impacts similar to those associated with construction the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.
2. Benthos and Phycology	Benthic and associated algal communities in the region would continue to be affected by harbor and shoreline/urban development activities requiring intertidal/subtidal fill. No-action would cause no impacts on topic resources.	26,899 ft² of soft bottom habitat unavoidable lost and a net gain of 24,540 ft² of rocky substrate habitat created. No significant adverse impacts expected.	16,124 ft² of soft bottom habitat unavoidable lost and a net gain of 12,113 ft² of rocky substrate habitat created. No significant adverse impacts expected.	43,023 ft² of soft bottom habitat unavoidable lost and a net gain of 36,653 ft² of rocky substrate habitat created. No additive significant adverse impacts expected.
3. Fishery Resources & Essential Fish Habitat (EFH)	Fish communities and EFH in the region would continue to be affected by harbor and shoreline/urban development activities requiring intertidal & subtidal fill. No-action would not impact fishery resources and EFH within the project footprint.	Temporary displacement of fish communities And EFH during construction. Benthic habitat used by EFH-species for feeding and rearing unavoidably lost by breakwater construction; however, a net gain of 24,540 ft² of Pacific herring spawning habitat would be produced. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater; however, a net gain of 12,113 ft² of Pacific herring spawning habitat and EFH would be produced. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater; however, a net gain of 36,653 ft² of Pacific herring spawning habitat and EFH would be produced. No additive significant adverse impacts expected.

Resources of Primary Concern	No Action	100 foot diagonal extension of the Main Breakwater	Extension of the South Breakwater shoreward to -4 ft MLLW	Combination of breakwaters modification features
4. Water quality and circulation	Urban runoff and permitted wastewater discharges would continue to affect local water quality. Water circulation in the harbor is sufficient enough to prevent degradation in local water quality. No breakwater construction-related impacts on topic resources.	Modeled circulation was at least the same as or, in most cases, better than the circulation modeled for the existing breakwater configuration. No water quality/circulation "dead zones" would be produced. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.
5. Avians	No breakwater construction-related impacts on avian populations would occur. Local avian populations would continue to use the project area and be affected by ongoing vessel traffic and other harbor and shoreline/urban development activities.	No long-term effects on local avian populations. Short-term displacement from project area during construction (i.e. noise and human disturbance). No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.

Resources of Primary Concern	No Action	100 foot diagonal extension of the Main Breakwater	Extension of the South Breakwater shoreward to -4 ft MLLW	Combination of breakwaters modification features
6. Endangered &Threatened Species	No breakwater construction-related impacts on endangered and threatened species would occur. Future shoreline/in-water developments might have the potential to affect subject resources and their habitat.	Vessel noise and transit associated with construction activities have the potential to cause avoidance, disturbance, or displacement of Steller sea lions and humpback whales from the Sitka Harbor area during peak Pacific herring spawning activities. The Corps determined that its proposed action: (1) would not modify or adversely affect designated critical habitat; and (2) may affect but, is not likely to adversely affected humpback whales, Steller sea lions or Pacific herring.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	Impacts would be similar to those associated with the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.
7. Subsistence Resources	No breakwater construction-related impacts on subsistence resources would occur. Existing local herring and herring egg harvesting would continue in adjacent areas unabated.	Construction activities might cause a short term impact on herring and herring egg harvesting in adjacent areas. No terrestrial impacts.	Construction activities might cause a short term impact on herring and herring egg harvesting in adjacent areas. No terrestrial impacts.	Construction activities might cause a short term impact on herring and herring egg harvesting in adjacent areas. No terrestrial impacts.

Resources of Primary Concern	No Action	100 foot diagonal extension of the Main Breakwater	Extension of the South Breakwater shoreward to -4 ft MLLW	Combination of breakwaters modification features
8. Cultural, Historical & Archaeological Resources	No breakwater construction-related impacts on cultural, historical and archaeological resources would occur. Local shoreline and terrestrial developments might have the potential to affect said resources.	No impacts on customary & traditional practices or historical/archaeological features.	No impacts on customary & traditional practices or historical/archaeological features.	No impacts on customary & traditional practices or historical/archaeological features.
9. Direct Impacts	No marine benthic habitat would be affected by breakwater fill activities. No temporary degradation of water quality. No short term displacement of fish and avian communities and marine mammals from using the construction site. Local coastal developments would have the potential to directly affect the nearshore marine environment.	Marine benthic habitat (soft bottom and rocky substrate) unavoidably lost by fill activities. Temporary degradation of water quality during breakwater construction. Short term displacement of fish and avian communities and marine mammals from using the construction site. No significant adverse impacts expected.	Direct impacts identical to those associated with constructing the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	Direct impacts identical to those associated with constructing the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.

Resources of Primary Concern	No Action	100 foot diagonal extension of the Main Breakwater	Extension of the South Breakwater shoreward to -4 ft MLLW	Combination of breakwaters modification features
10. Indirect Impacts	Users of the harbor would continue to experience adverse oceanographic conditions resulting in vessel damage and conditional use of the harbor facilities.	Constructed breakwater would, when revegetated with marine algae, create 44,764 ft² of Pacific herring spawning habitat and provide additional habitat for seabirds. No significant adverse impacts expected.	Constructed breakwater would, when revegetated with marine algae, create 17,035 ft² of Pacific herring spawning habitat and provide additional habitat for seabirds. No significant adverse impacts expected.	Constructed breakwater would, when revegetated with marine algae, create 102,277 ft² of Pacific herring spawning habitat and provide additional habitat for seabirds. No significant adverse impacts expected.
11. Cumulative Impacts	The perturbations associated with breakwater construction would not contribute to the cumulative impacts occurring in the Sitka-area marine environment. Coastal development, including seaplane base relocation, mariculture expansion, and harbor expansion and increased use is likely. Proposed improvements to Sitka's airport include intertidal fill.	The amount of fill required to construct the diagonal extension represents a minor incremental change relative to those intertidal/subtidal fills that have already been experienced in the area. The recommended action, in concert with past, present, and foreseeable actions are not likely to have any significant cumulative impact on the Sitka area's fish, wildlife and human resource	Cumulative impacts identical to those associated with the diagonal segment on the Main Breakwater. No significant adverse impacts expected.	Cumulative impacts identical to those associated with the diagonal segment on the Main Breakwater. No additive significant adverse impacts expected.

APPENDIX 2

Evaluation under 404(b)(1) Clean Water Act
40 CFR part 230

APPENDIX 2

SUPPLEMENTAL EVALUATION UNDER SECTION 404(b)(1) CLEAN WATER ACT 40 CFR PART 230

NAVIGATION DEFICIENCY CORRECTIVE ACTION CHANNEL ROCK BREAKWATERS SITKA HARBOR, ALASKA

I. Project Description

The U.S. Army Corps of Engineers (Corps) is proposing to further modify the Channel Rock Breakwaters in Sitka, Alaska, as a result of continued "surge" entering through the breakwater gaps and adversely affecting harbor use and damaging boats and harbor facilities.

The Secretary of the Army, acting through the Corps' Chief of Engineers, was directed by the U.S. Congress to design and construct Channel Rock Breakwaters corrective measures, as it was determined that the damages being experienced resulted from deficiencies in the original breakwaters' design. The U.S. Congress directed that the deficiencies should be corrected by adding to, or extending, the existing breakwaters. Subsequently, the Corps prepared a *Deficiency Correction Evaluation Report and Finding of No Significant Impact with Environmental Assessment,* dated March 2012. Using a physical model to carefully evaluate as many as 18 corrective action alternatives, the Corps selected an alternative that showed the greatest energy reduction for the least cost, which was closing the 315-foot gap between the main and south breakwaters. Among other things, the subject report: (1) described the corrective action's impacts on prior environmental concerns and commitments; (2) documented mitigation requirements resulting from implementing the corrective action; and (3) documented the coordination of the corrective action with applicable Federal and State agencies.

While preparing plans to construct the original corrective action feature (i.e., closing the 315-foot gap between the main and south breakwaters), the Corps continued to examine the surge, but instead of using a physical model, the Corps used its CGWAVE numerical wave prediction model. Model results indicate that constructing additional modifications to the main and south breakwaters would further reduce the average wave energy up to 28 percent and help prevent damages to the existing harbor facilities; however, funding constraints limit what features the Corps would actually construct. At a minimum, funding is available to close the 315-foot gap between the main and south breakwaters, as previously planned and authorized. Should additional construction funds become available, the Corps would opt to also construct: (1) a 75-foot or 100-foot diagonal

breakwater extension off the northern end of the main breakwater; and/or, (2) an approximately 115-foot-long linear or diagonal extension of the south breakwater towards Japonski Island, but no closer than -4 feet mean lower low water (Figure 1).

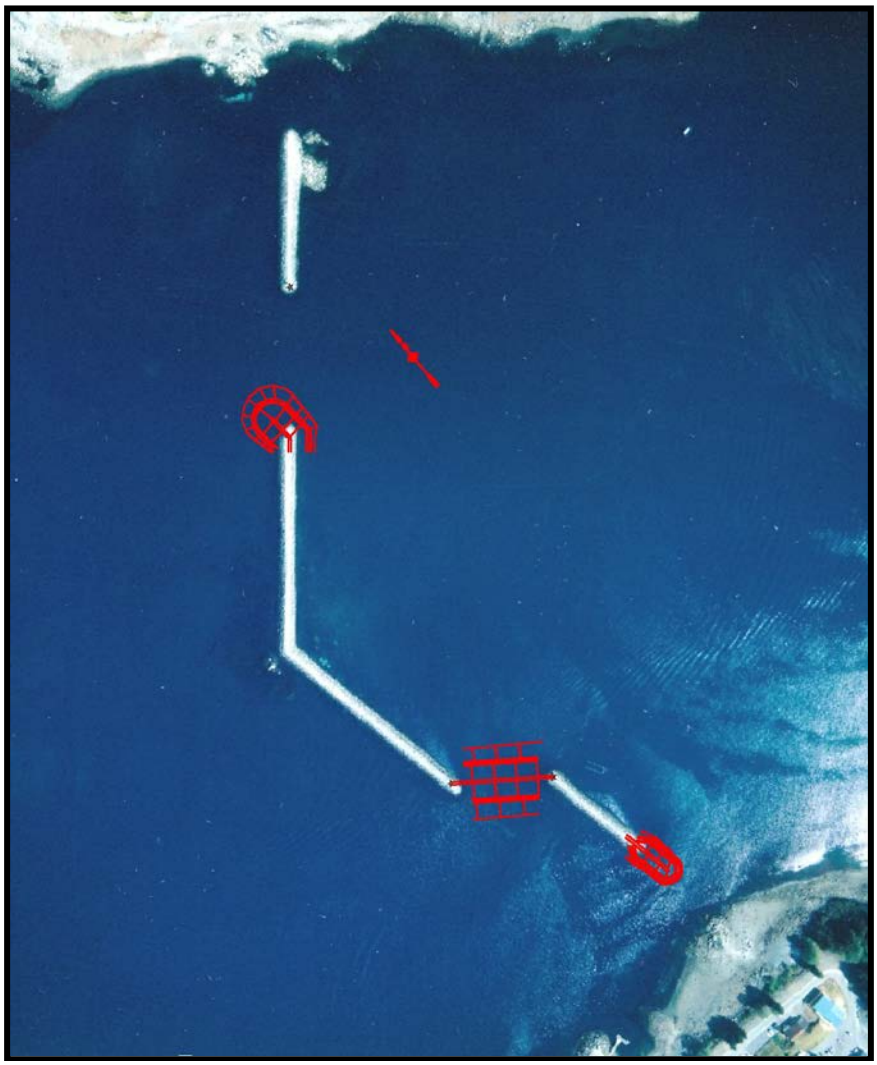

Figure 1. Proposed modifications to the Channel Rock Breakwaters, Sitka, Alaska.

Dogleg extension off Main Breakwater

This feature would involve peeling back the northern nose of the main breakwater and constructing a 75-foot-long dogleg extension from that peeled-back section. Plan views of this configuration are shown in Figure 2 and a cross section of the breakwater extension is shown in Figure 3. Armor rock for this option is 2,000-pound armor stone. Approximately 4,300 cubic yards of armor stone, 6,000 cubic yards of B-rock, and 5,700 cubic yards of core material would be required to construct this feature. For the 100-foot-long dogleg extension, approximately

5,000 cubic yards of armor stone, 7,100 cubic yards of B-rock, and 9,300 cubic yards of core material would be required to construct this feature.

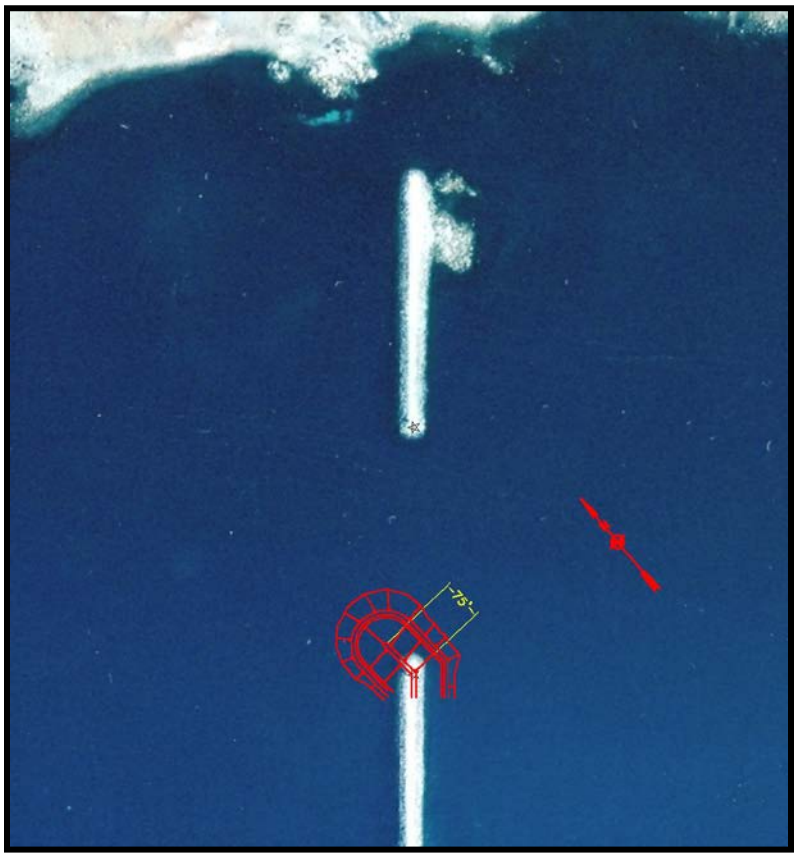

Figure 2. 75-foot dogleg extension off the north end of the Channel Rock Main Breakwater.

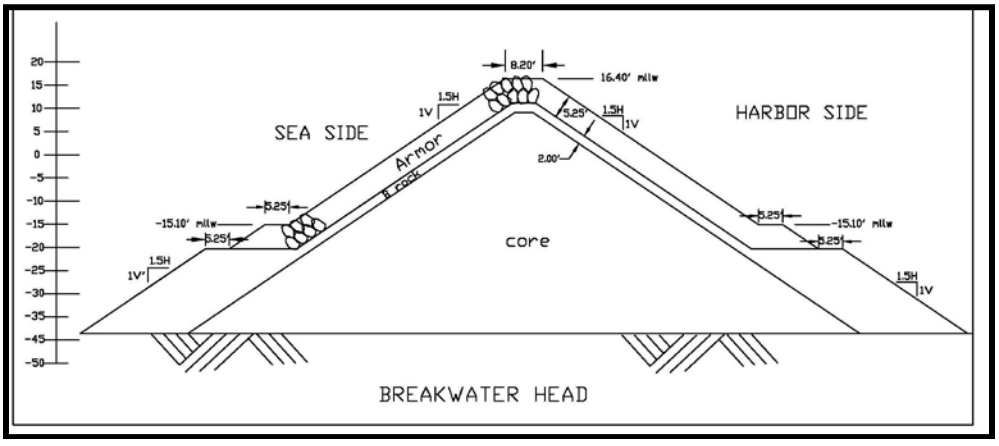

Figure 3. Cross section of the 75-foot dogleg extension off the north end of the Channel Rock Main Breakwater.

South Breakwater extension towards Japonski Island

This feature would involve peeling back the southern nose of the south breakwater and constructing a 115-foot-long linear or diagonal extension, but no closer than -4.0 feet mean lower low water. Plan views of this option are shown in Figure 4, and a cross section the breakwater extension is shown in Figure 5. Armor rock for this option is 2,000-pound armor stone. Approximately 3,100 cubic yards of armor stone, 2,000 cubic yards of B rock, and 1,700 cubic yards of core material will be required to construct this configuration.

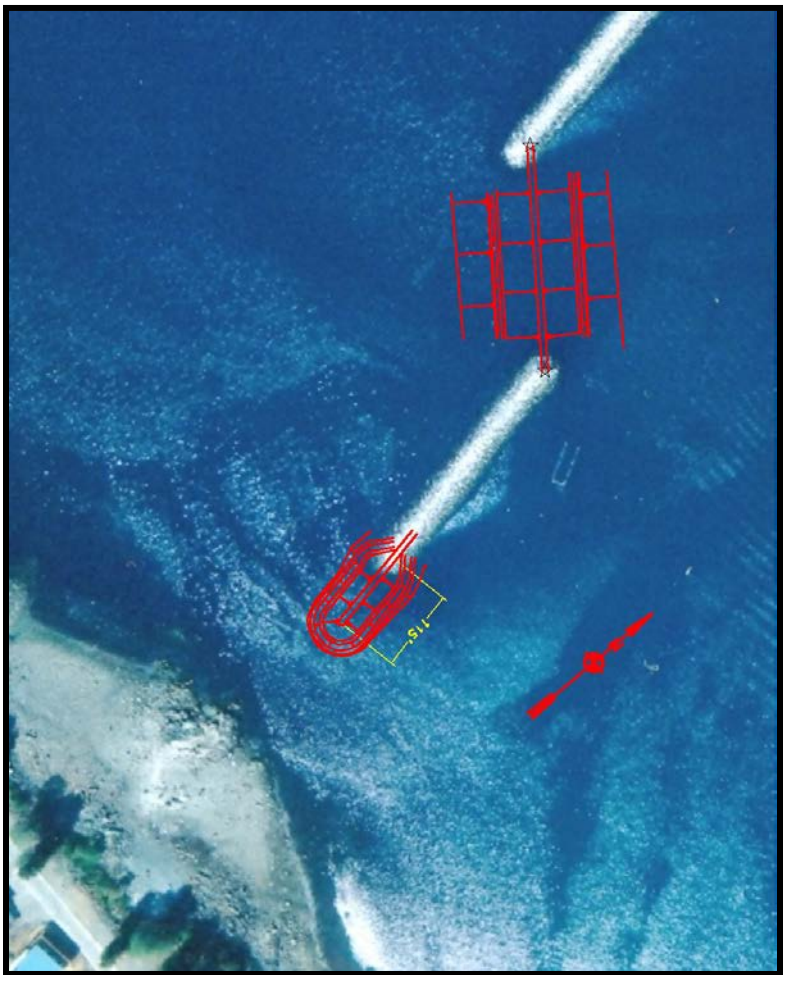

Figure 4. Extension off the South Breakwater towards Japonski Island. Also shown is the 315-foot closure between the Main and South breakwaters.

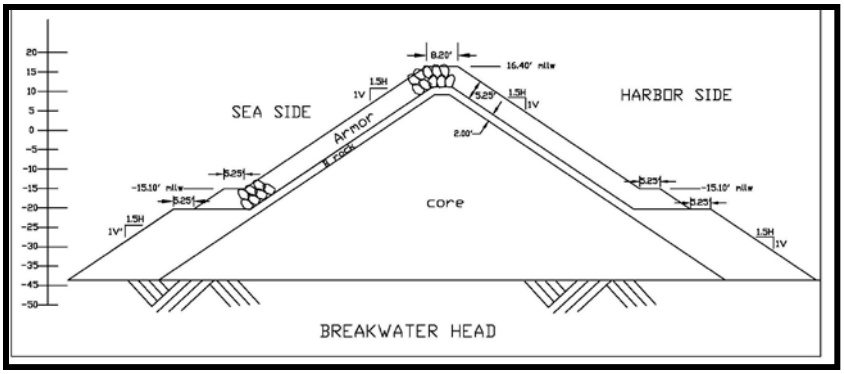

Figure 5. Breakwater cross section of the extension off the South Breakwater towards Japonski Island.

II. Factual Determinations

A. Physical Substrate Determinations

The vast majority of the Sitka waterfront is a rocky shoreline. However, the seafloor in the project area contains a mosaic of bottom types including a mixed-soft bottom (mixture of silt, sand, pebbles, cobbles, boulders, and shell) and bedrock outcrops.

B. Water Circulation, Fluctuations, and Salinity Determinations

The local net circulation in Sitka Sound is northwestward, parallel to the coast. Japonski Island diverts most of the flow to the west around Makhnati Island. Tidal currents are approximately 0.3 to 0.4 knots in Sitka Channel. The normal tidal range exchanges about 25 percent of the water near the Channel Rock Breakwaters on each tide. Salinity determinations are not applicable for this action as the corrective action would not affect the area's salinity concentrations.

C. Suspended Particulate/Turbidity Determinations

An increase in suspended sediment load and turbidity would be expected during and immediately following periods of work. Due to the size and type of material used to construct the breakwater [see Appendix 1 (Rubble Mound Breakwater Construction) in environmental assessment, ER-11-04, dated March 2011], significant plumes would not be expected to occur. Should small plumes occur, they would be localized and short-lived. Based upon an analysis of the forces acting on the disposal of the breakwater material as it is placed below the water surface, most material would be directly deposited over approximately 51,000 to 68,000 square feet of sea bottom; however, fines would be displaced over a larger area. Concentrations would not be expected to approach lethal dosages for aquatic species known to occur in the area.

D. Contaminant Determinations

The proposed construction project would not be associated with any contaminated materials and no dredging of bottom sediments is proposed.

E. Aquatic Ecosystems and Organism Determinations

The variety of marine habitat found within the Sitka area ranges from calm, protected embayments to high energy, wave-swept exposed coastlines. Much of the Sitka waterfront area has a rocky shoreline. The seafloor in the project area contains a mosaic of bottom types including a mixed-soft bottom (mixture of silt, sand, pebbles, cobbles, boulders, and shell) and bedrock outcrops. All these habitats support a wide variety of fish and wildlife species, including those important for commercial, sport, and subsistence uses.

The following National Marine Fisheries Service-managed marine mammals have been observed in the Sitka Sound area: killer whales, gray whales, harbor porpoise, Dall's porpoise, minke whales, sperm whales, Pacific white-sided dolphins, pygmy sperm whales, humpback whales, fin whales, Steller sea lions, and harbor seals. The only U.S. Fish and Wildlife Service (USFWS)-managed marine mammal known to occur in the Sitka Harbor area is the northern sea otter. All marine mammals are protected under the Federal Marine Mammal Protection Act, and select marine mammals are also protected under the Endangered Species Act (ESA).

The following marine mammal species have been observed in Southeast Alaska and may occur in Sitka Sound on an infrequent to rare basis: minke whale, fin whale, sperm whale, Pacific white-sided dolphin, and pygmy sperm whale. Based upon available information, these species are unlikely to rely upon habitats in the project area, but may travel through the vicinity of Sitka. The humpback whale and Steller sea lion (both the eastern distinct and western distinct populations) are protected under the ESA.

Prior to construction of the Channel Rock Breakwaters, the USFWS conducted subtidal dive surveys of the benthic habitat and infaunal habitat within the footprint of the proposed breakwaters. Several habitat types were associated with the Channel Rock Breakwaters area: unconsolidated bottom, bedrock, and aquatic bed algal/bedrock. The overall biomass and numbers of individuals collected from the project footprint area was greater than those collected from other areas in the Sitka sound area. Major infauna species collected were polychaete worms, little neck clams, and cockle and butter clams.

Post-construction subtidal surveys of the Channel Rock Breakwaters by the USFWS, both seaward and harbor side, revealed robust stands of algae. Use of the breakwater algae by spawning Pacific herring was documented in 1996 and 1998. Other marine surveys conducted in the area discovered blue mussels, cockles,

butter clams, and horse clams in the rocky, sandy, and muddy intertidal zone, as well as many species of worms, marine snails, chitons, abalone, sea stars, crabs, sea urchins, and octopus in other coastal habitats.

Many species of fish and shellfish reside in the project area. Chief among them are Pacific salmon and herring, various species of bottomfish, and several species of crab, shrimp, and other shellfish. Many other groups of fish contribute to the Sitka Sound forage base, each of which is represented by many species: rockfishes, greenling, flatfishes, blennies, sculpins, poachers, gunnels, and eelpouts. Pacific herring is a very ecologically and commercially important fish species that abundantly occurs in the Corps' project area and surrounding area. Pacific herring (Southeast Alaska distinct population segment) is an ESA candidate species.

F. Proposed Disposal Site Determinations

No dredging is associated with the recommended corrective action. Some rock material, however, would be removed from the ends of two existing breakwaters in order to construct the additional segments. Construction operations associated with filling the breakwater gap would have only a temporary effect on the water column. The proposed action would comply with applicable water quality standards and would have no appreciable detrimental effects on municipal and private water supplies, recreational and commercial fisheries, water-related recreation, or aesthetics.

G. Determination of Cumulative and Secondary Effects on the Aquatic Ecosystem

The amount of fill required to construct the additional breakwater segments represents a minor incremental change relative to those major intertidal/subtidal fills that have already been experienced in the area. Coastal development, including relocating a seaplane base, mariculture expansion, harbor expansion, and increased vessel use is likely. Proposed improvements to Sitka's airport are known to include intertidal fill. The recommended corrective action would, when revegetated with marine algae, create approximately 42,000 to 56,000 square feet of Pacific herring spawning habitat and provide additional habitat for seabirds. In conclusion, the recommended corrective action, in concert with past, present, and foreseeable actions is not likely to have any significant cumulative or secondary impact on the Sitka area's fish, wildlife, and human resources.

III. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

A. Adaptation of the Section 404 (b)(1) Guidelines to this Evaluation

The proposed project complies with the requirements set forth in the Environmental Protection Agency's Guidelines for Specification of Disposal Sites for Dredged or Fill Material, and no adaptations of the guidelines were made relative to this evaluation.

B. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem

The proposed corrective action's planning objective is to reduce the existing wave energy and swell motion behind the Channel Rock Breakwaters in a cost effective manner for the remaining life of the project. The Corps used a cost effective analysis to screen out plans that produced the same output level (i.e. desired results of energy reduction at Eliason Harbor) as another plan, but cost more, or cost either the same amount or more than another plan, but produced less output. The Corps assumed that all rock needed for breakwater construction would be obtained from an existing commercial quarry. Of the 18 plans screened, the Corps determined only four plans to be cost effective and most responsive to project objectives.

The corrective action, as proposed, is the least damaging practicable alternative after taking into consideration the area's fish and wildlife resources, project costs, existing technology, and logistics in light of the overall project purpose.

C. Compliance with Applicable State Water Quality Standards

The proposed project would not be expected to have an appreciable adverse effect on water supplies, recreation, growth, and propagation of fish, shellfish and other aquatic life, or wildlife. It would not be expected to introduce petroleum hydrocarbons, radioactive materials, residues, or other pollutants into the waters of Sitka Sound. A temporary increase in turbidity would result locally from construction activities. The project would comply with State water quality standards.

D. Compliance with Applicable Toxic Effluent Standards or Prohibition under Section 307 of the Clean Water Act

No toxic effluents that would affect water quality parameters are associated with the proposed project. Therefore, the project complies with toxic effluent standards of Section 307 of the Clean Water Act.

E. Compliance with Endangered Species Act of 1973

Project construction activities and the newly constructed breakwater segment would result in short-term alterations to habitat used by Steller sea lions and Pacific herring. However, the results of Corps field studies indicate that within 2 to 5 years following completion of the breakwater segment, the breakwater armor rock would re-colonize itself with productive populations of invertebrates and algae that would support spawning Pacific herring. In time, the revegetated breakwater segment would function ecologically similarly to the Sitka Harbor shoreline and other already-revegetated Channel Rock Breakwater segments.

Vessel noise and transit associated with construction activities have the potential to cause avoidance, disturbance, or displacement of Steller sea lions and humpback whales from the Sitka Harbor area during peak Pacific herring spawn activities when Steller sea lions and humpback whales feed on staging and spawning adult herring. Therefore, the Corps has proposed to cease in-water construction during peak Pacific herring spawning activities (between March 15 and June 1). Construction activities outside this period coincide with periods when a minimum quantity of marine mammals is present. Additionally, speed limits would be imposed on construction vessels moving between the project area and material suppliers to mitigate the danger of vessel-marine mammal collisions.

The Corps believes that its proposed action: (1) would not modify or adversely affect designated critical habitat; and (2) may affect, but is not likely to adversely affect, humpback whales, Steller sea lions (eastern and western distinct population segment) or Pacific herring (Southeast Alaska distinct population segment).

F. Evaluation of Extent of Degradation of the Waters of the United States

There are no municipal or private water supplies or freshwater waterbodies in the area that could be negatively affected by the proposed project. There would be no significant adverse impacts to plankton, fish, shellfish, wildlife, and/or special aquatic sites in the project area.

G. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Environment.

As described in the body of the Supplemental EA, both adverse and beneficial environmental consequences would occur as a result of constructing the breakwater modifications. “Mitigation” is the process used to avoid, minimize, and if determined to be necessary, compensate for environmental consequences of an action. The Corps does not believe that the subject project warrants compensatory mitigation measures, as the affected marine habitat is not limiting in the Sitka Sound area and the creation of additional subtidal rocky substrate, i.e., breakwater armor rock, would provide additional habitat for herring spawning and

marine kelp to grow upon. Incorporating the following environmental protection measures into the recommended plan would help to mitigate potential impacts on local fish and wildlife resources, including ESA-listed species, marine mammals, and EFH.

- No in-water construction shall be allowed to occur between March 15 and June 1, which coincides with peak herring spawn activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide periods unless there is a human safety issue requiring it.

- The selected contractor shall include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which is submitted to the Corps for review and approval.

- Breakwater construction shall use core material and B and armor rock clean of organic debris and invasive species.

- To accelerate recolonization of the additional breakwater segments, all suitable for reuse armor rock removed from the existing breakwaters with sessile or attached adapted marine organisms and marine algae shall be used in constructing the new breakwater segments. If not reused, the rock shall be side cast to the base of the breakwater so that it may continue to provide habitat for marine resources.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

SUPPLEMENTAL SECTION 404(b)(1) CLEAN WATER ACT (40 CFR PART 230)

FINDING OF COMPLIANCE

NAVIGATION DEFICIENCY CORRECTIVE ACTION CHANNEL ROCK BREAKWATERS SITKA HARBOR, ALASKA

1. No Significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

2. The U.S. Army Corps of Engineers (Corps) is proposing to further modify the Channel Rock Breakwaters corrective action in Sitka, Alaska, as a result of continued surge entering through gaps in the breakwater and adversely affecting harbor use and damaging boats and harbor facilities.

While preparing plans to construct the original corrective action feature (i.e., closing the 315-foot gap between the main and south breakwaters) described in the March 2011 environmental assessment (EA) (ER-11-04), the Corps continued to examine the surge problem. Instead of using a physical model to examine the surge problem, as in the original corrective action study, the Corps used its CGWAVE numerical wave prediction model. Results indicated that constructing additional modifications to the main and south breakwaters would reduce the surge to a greater extent and help prevent damages to the existing harbor facilities; however, funding constraints limit what features the Corps would actually construct. At a minimum, funding is available to close the 315-foot gap between the main and south breakwaters, as previously planned and authorized. Should additional construction funds become available, the Corps would opt to also construct: (1) a 75-foot or 100-foot diagonal breakwater extension off the northern end of the main breakwater; and/or, (2) an approximately 115-foot-long linear or diagonal extension of the south breakwater towards Japonski Island, but no closer than -4 feet mean lower low water.

3. The Alaska Division of Coastal and Ocean Management concurred with the Corps' determination that the original corrective design (i.e., closing a 315-foot gap between the main and south breakwaters) was consistent with the Alaska Coastal Management Program (ACMP), now defunct, to the maximum extent possible (ACMP I.D. # AK 1104-03J, dated May 23, 2011). Subsequently, ADEC issued the Corps a Certificate of Reasonable Assurance (CRA) (Reference No. ER-11-04, dated December 13, 2011).

4. Proposed modifications to the Channel Rock Breakwaters will not violate any applicable State of Alaska Water Quality Standards with the possible exception of short term and localized impacts on turbidity. The Toxic Effluent Standards of Section 307 of the Clean Water Act will also not be violated

5. Proposed modifications to the Channel Rock Breakwaters will not harm any threatened and endangered species or their critical habitat.

6. Proposed modifications to the Channel Rock Breakwaters will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreation, aesthetic and economic values will not occur.

7. Appropriate measures to minimize potential adverse impacts include the following:

- No in-water construction shall be allowed to occur between March 15 and June 1, which coincides with peak herring spawn activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide period unless there is a human safety issue requiring it.

- The selected contractor shall include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which is submitted to the Corps for review and approval.

- Breakwater construction shall use core material and B and armor rock clean of organic debris and invasive species.

- To accelerate recolonization of the additional breakwater segments, all suitable for reuse armor rock removed from the existing breakwaters with sessile or attached adapted marine organisms and marine algae shall be used in constructing the new breakwater segments. If not reused, the rock shall be side cast to the base of the breakwater so that it may continue to provide habitat for marine resources.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

8. On the basis of the guidelines, the proposed modifications to the Channel Rock Breakwaters in Sitka, Alaska, comply with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the Sitka Sound's aquatic ecosystem.

10 July 2013
Date

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Alaska District
Chief, Environmental Resources