

Ninilchik Harbor

Condition of Improvements

31 December 2019

Ninilchik Harbor, Alaska

(CWIS No. 012640, 087345)

Authorization Rivers and Harbors Act, 3 July 1958 (P.L. 85-500 House Doc. 34, 85th Congress, 1st Session) as adopted, provides for a small boat basin 320 feet long by 150 feet wide to a depth of 2 feet above MLLW, an approach channel 400 feet in length and 50 feet wide to a depth of 9 feet above MLLW, and protected by a pile jetty 410 feet long. Amendments to the Alaska Omnibus Act, 19 August 1964 (Sec. 55, P.L. 88-451) authorized the Chief of Engineers to modify civil works projects in Alaska impacted by the March 1964 earthquake; Revised Supplement No. 1 to General Design Memorandum No. 1 evaluated rehabilitation of the harbor to include construction of a timber crib revetment along the shoreline in order to protect the integrity of the basin.

Table 1

Existing Project	Length ft.	Width ft.	Depth ft.
Entrance Channel	575	50	+9
Basin	400	120	+2
North Jetty	240		
South Jetty	240		
Timber Crib Revetment	1,200		

Project Usage The small boat basin was designed to provide protected moorage with half-tide access for 32 vessels; however, 100 or more vessels will fill the basin from bank to bank during peak use in the summer. The project is an important harbor of refuge for lower Cook Inlet that provides moorage for fishing boats to unload their catch and take on supplies.

Progress of Work

1960	A hydrographic survey and subsurface investigation are carried out in November.
1961	During the design stage the pile jetty is deleted and the harbor dimensions are revised to 125'x 400'. Rock sills upstream and downstream of the boat basin are included during construction. Dredging of 82,333 cubic yards and the placement of slope protection are completed in November.

Progress of Work

- 1962 A condition survey in July shows about 12,000 cubic yards of shoaling in the basin since its construction. Most of this deposition was attributed to a flood occurring in late April including scour around the upstream sill.
- 1963 The upstream sill is repaired, the entrance channel is realigned, and 20,780 cubic yards are removed from the basin and entrance channel by October.
- 1964 A survey in June showed that about 4,200 cubic yards had deposited since the completion of maintenance dredging in the previous year.
- 1965 A condition survey in July showed deposition of another 7,100 cubic yards.
- 1966 Emergency work in June consists of the construction of a timber groin on the south side of the channel and realignment of the entrance channel. The timber groin was destroyed by tidal and storm action in October.
- 1967 A rehabilitation contract is initiated in May and completed in September to include: dredging to project depth, placement of slope protection, construction of two rock jetties, river diversion, and metal barrel beach protection.
- 1968 Maintenance dredging of the entrance channel is accomplished in May and June.
- 1969 Emergency work is initiated in April to prevent erosion of the adjacent bluff. The entrance channel is dredged to project depth in May with the removal of 16,000 cubic yards of material. The basin is dredged in October to 0 feet MLLW by removing 11,000 cubic yards of material. A river diversion contract is carried out upstream in October and November. Sedimentation studies continue.
- 1970 Emergency dredging in the southeast corner of the basin is carried out in June. A 400 foot long native spruce log revetment for beach erosion protection is completed in August. Sedimentation studies continue.
- 1971 Emergency dredging is again conducted in June. Maintenance dredging becomes an annual event. Repair of beach protection begins in October.
- 1972 Annual maintenance dredging in May and June removes 12,188 cubic yards. Rehabilitation of beach protection is completed in July.
- 1973 Maintenance dredging is accomplished in May removing 4,621 cubic yards.
- 1974 A beach groin contract is completed in June in addition to timber revetment rehabilitation and annual maintenance dredging of 7,100 cubic yards. A feasibility study for navigation improvements and beach erosion protection concludes there are insufficient benefits to warrant Federal participation at the time.
- 1975 Maintenance dredging removes 5,495 cubic yards.
- 1976 Maintenance dredging removes 7,650 cubic yards.
- 1977 Maintenance dredging removes 6,976 cubic yards.
- 1978 The log groin beach protection is removed and replaced with several types of experimental beach protection. Annual maintenance dredging is accomplished with the Corps owned pipeline suction dredge "WARREN GEORGE" beginning this year through 1988. The dredged quantity this year is 4,915 cubic yards.

Progress of Work

1979	Maintenance dredging removes 8,382 cubic yards.
1980	Maintenance dredging removes 8,385 cubic yards.
1981	Maintenance dredging removes 12,286 cubic yards.
1982	Maintenance dredging removes 10,725 cubic yards.
1984	A feasibility study concludes that no project for navigation improvements at Ninilchik be undertaken by the Corps of Engineers at this time.
1991	Maintenance dredging removes 6,415 cubic yards.
1992	Sampling and testing of bottom sediments is conducted. Maintenance dredging removes 9,319 cubic yards.
1993	Maintenance dredging removes 7,600 cubic yards.
1994	Annual maintenance dredging removes 8,271 cubic yards. Littoral drift along the beach necessitates additional dredging of the entrance channel in June.
1995	Maintenance dredging is performed by contract with 5,750 cubic yards removed in May.
1996	Approximately 9,000 cubic yards are dredged from the project.
1997	Dredging removes 6,764 cubic yards of material from the harbor.
1998	Maintenance dredging removes 8,319 cubic yards.
1999	Maintenance dredging removes 5,795 cubic yards.
2000	Maintenance dredging is performed by contract with 9,000 cubic yards removed in May.
2001	A total of 8,554 cubic yards of material is dredged.
2002	Maintenance dredging removes 6,449 cubic yards.
2003	Severe flooding in November 2002 necessitates a winter hydrographic survey in December. Maintenance dredging is performed by contract with 11,432 cubic yards removed in May.
2004	The normal annual maintenance dredging removes 9,856 cubic yards in May. Shoaling in the outer entrance channel necessitates minor emergency dredging later in the summer.
2005	The contractor removes 5,303 cubic yards in the annual maintenance dredging effort. No dredging is required in the entrance channel.
2006	Annual maintenance dredging removes 7,652 cubic yards from the Federal project.
2007	The dredging contractor removes 9,000 cubic yards from the entrance and mooring basin.

Progress of Work

- 2008 A pre-dredge survey was conducted in early May. Dredging removes 3,114 cubic yards from the inner harbor, 918 cubic from the outer entrance channel, and 134 cubic yards from the inner entrance channel. Thus, a total of 4,166 cubic yards was removed from Ninilchik. A post-dredge survey was conducted in late May.
- 2009 No annual maintenance dredging was performed in the inner harbor due to the absence of a pipeline dredge in the area. Approximately 2,000 cubic yards were removed from the entrance channel with a small dozer and stockpiled on the beach south of the harbor entrance for ADOT&PF for road maintenance.
- 2010 Maintenance dredging removed 13,996 cubic yards of material from the harbor basin and entrance channel. The harbor basin was hydraulically dredged and material in the entrance channel was removed with a dozer. A post-dredge survey revealed that project depth was not achieved in several areas. In late June, an extended dredging effort removed about 2,000 cubic yards in the entrance channel from the rock sill seaward.
- 2011 Hydraulic and mechanical dredging removed a total of 12,296 cubic yards from the harbor basin and entrance channel. A tidal datum update was conducted and submitted to NOAA for approval under the Comprehensive Evaluation of Project Datums (CEPD) compliance program.
- 2012 Hydraulic and mechanical dredging by Alaska Marine Excavation removed 7,510 cubic yards from the harbor basin and entrance channel. Disposal of material was on the beach site for beneficial uses.
- 2013 Annual maintenance dredging removed 13,163 cubic yards from the entrance channel and harbor basin.
- 2014 USACE Comprehensive Evaluation of Project Datums (CEPD) Compliance report completed and recorded in August. Annual maintenance dredging occurred in April removing 6,865 cubic yards and again in late June removing 2,250 cubic yards following reports of excessive entrance channel shoaling. The beach disposal site was expanded toward the southeast to assist with the harbor entrance road stabilization.
- 2015 The expanded beach placement site was used again this dredge season in which 9,188 cubic yards were removed from the entrance channel and harbor basin. Additional dredging was required in early July using conventional excavation equipment to remove about 2,544 cubic yards from the shoaled entrance channel. The Corps initiated a stakeholder meeting in November to discuss annual maintenance dredging and the need for a dredged material management plan for this project. A project condition survey was also completed this year for the jetties, rock sill, and entrance channel.

Progress of Work

2016	The final year of a five-year dredging contract removes 10,591 cubic yards. Most of the material is placed in the expanded beach placement site; however, about 1,500 cubic yards are used by ADOT&PF to re-grade the road along the east side of the harbor basin and Ninilchik River. Samples from the dredge prism and background locations were taken for chemical analysis. A new dredged material management strategy for the project is also completed which covers the period of the new three-year dredging contract.
2017	A new, three year maintenance dredging contract was awarded to Alaska Marine Excavation with 10,166 cubic yards removed. Dredged material was spread in thin lifts along the beach south of the south jetty.
2018	Annual maintenance dredging removes 10,063 cubic yards with material again spread in thin lifts along the beach.
2019	A site visit in late April finds the timber crib revetment has failed in several locations with backfill washed out. Annual maintenance dredging removes 8,518 cubic yards with dewatered dredge material placed beneficially on areas of the failing shoreline revetment and remaining material spread in a thin lift along the beach south of the south jetty. An updated Environmental Assessment was prepared adopting beach nourishment and beneficial use as the long-term dredged material management strategy for the project. An updated control survey, based on the 2018 NOAA tidal publication, is conducted in preparation of the next three-year dredging contract.

Table 2 Cost to Date

Project	Description	Cost \$
012640	O&M Appropriations	11,743,860
	O&M Costs	11,571,100
087345	CG Appropriations	838,245
	CG Costs	838,245

Table 3 Range of Tides in feet

Tide Station	Mean Range	Diurnal Range	Extreme Range
945 5653 Ninilchik, Cook Inlet, AK	16.5	19.16	-

NOAA Publication Date: 04/09/2018

Controlling Depth From the 2019 post-dredge survey, a depth of +4.5 feet MLLW controls near station 14+00 in the middle of the harbor basin. The contractor frequently hits an object while dredging in this location, which is believed to be a pipe pile that used to support the float system but was cut at the mudline during removal. A depth of +12.7 feet MLLW controls along the toe of the entrance channel near station 17+50.

Table 4 Dredged Quantities and Contract Costs

Year	Quantity (cubic yards)	Cost \$
2012	7,510	171,070
2013	13,163	216,263
2014	9,113	228,068
2015	11,732	257,886
2016	10,591	222,515
2017	10,166	377,666
2018	10,063	377,563
2019	8,518	376,018

Maintenance Dredging Supplement

A. General

1. Annual dredging of the entrance channel and basin at Ninilchik small boat harbor is carried out by contract, typically for a three year term. Dredging at Homer Harbor is included under the same contract.
2. Shoaling is most prevalent in the boat basin and outer entrance channel, which is subject to littoral drift and major change from storm events.
3. The dredging window runs from 15 March to 15 May, usually commencing with ice out and ending as soon as possible to avoid conflicts with the in-coming salmon run.
4. Dredging is accomplished with conventional excavation equipment in the entrance channel seaward of the rock sill and with a hydraulic cutter-head and pipeline suction dredge in the basin.

B. Sampling & Testing

1. A total of 5 harbor locations were sampled at three depths for a chemical investigation of the characteristics of the harbor sediments during the period 24-28 April 2016. A limited background metals investigation was also conducted in support of a longer term

dredged material management strategy. Thirteen of fifteen primary sediments samples and two duplicate samples were collected in the harbor.

2. The results of the 2016 chemical analyses were screened against the most stringent ADEC Method 2 soil cleanup level (defined in AAC 75-341, Table B1/B2, Over 40 inch climate zone.
3. Chemical analysis in 2016 was conducted using the test methods as outlined with summarizing results below:

Table 5 Chemical Testing

Method	Chemical analysis	Results
SW846 8260B	Volatile Organics (BTEX+)	Non-detect (ND) at levels above ADEC or DMMP* screening criteria
SW846 8270D	PAHs	ND at levels above ADEC or DMMP screening criteria
SW846 6020A & 7471A	(8) RCRA Metals	Arsenic and chromium above ADEC screening level but typical for natural occurring levels.
SW846 8081B	Chlorinated Pesticides	ND at levels above ADEC or DMMP screening criteria
AK101, AK 102, & AK103	Gasoline Range Organics (GRO), Diesel Range Organics (DRO), Residual Range Organics (RRO)	GRO below ADEC screening levels. DRO low level detections; 1 exceeded ADEC screening level for upland disposal; RRO below ADEC screening levels.

**Dredged Material Management Program*

C. Disposal

1. Currently, conventional construction equipment (e.g. frontend loaders, bulldozers, and trucks) is used to maintenance dredge the Ninilchik SBH entrance channel and initially use the material to construct a temporary dewatering basin on the beach south of the entrance channel. Sediment hydraulically dredged from the mooring basin, using a cutterhead suction dredge, is discharged into the aforementioned dewatering basin.
2. Arrangements were made with the Alaska Department of Transportation and Public Facilities (ADOT/PF) in 1995 to use the dredged material stockpiled along the upper reaches of the beach for beneficial purposes. Therefore, each year ADOT/PF may elect to beneficially use the dewatered dredged material from the entrance channel and mooring basin on annually-identified eroding sections of the south beach shoreline and/or use the material for road maintenance activities. ADOT/PF is responsible for their own permit coordination and approval to beneficially use the dredged material in this manner.

3. Any remaining dredged material not used by ADOT/PF from the entrance channel and mooring basin will be beneficially placed on the existing Corps revetment and/or spread in thin layers (12 inches or less) on south beach's nearshore environment between +18.6 feet mean lower low water (MLLW) and +10 feet MLLW using conventional construction equipment. This elevation range was selected to mitigate impacts to the razor clam habitat.

D. Environmental Permits and Reports

1. A Final Environmental Impact Statement for operation and maintenance (O&M) was circulated in December 1973 and a Statement of Findings was signed in January 1974. The Corps prepared O&M Environmental Assessments (EA) for maintenance dredging in April 1976, January 1978, March 1996, September 2016, and September 2019. Findings of No Significant Impact (FONSI) were signed in April 1980, February 1987, April 1996, October 2016, and October 2019. The Corps also prepared a Disposal Management/Monitoring Plan and Beneficial Uses of Dredged Materials report at the time of the 1996 EA/FONSI.
2. The Ninilchik small boat harbor and intertidal dredged material disposal area is located within the State of Alaska Clam Gulch Critical Habitat Area.
3. During the planning stages of the 2017-2019 contract, the Corps identified additional dredging in the mooring basin and entrance channel to correct for the tidal datum update published by the National Oceanic and Atmospheric Administration. However, the additional dredging was deferred after speaking with local harbor users which stated there was no problem with the depth as provided in recent years. If or when it becomes necessary, the work for additional dredging is covered in the September 2019 EA (ER 19-010) and State of Alaska permits and authorities so long as the same means and methods are used.
4. The following permits or authorizations have been issued for current dredging operations:

Table 6 Environmental Permits

Agency Name	Purpose	Date of Issue	Date of Expiration
AK Department of Environmental Conservation	Section 401 Certificate of Reasonable Assurance ER-19-010	04-Oct-19	04-Oct-24
AK Department of Transportation and Public Facilities	Agreement Letter for Beneficial Uses of Dredged Material	21-Apr-97	n/a
Kenai Peninsula Borough, Kenai River Center	Floodplain Development Permit, RC No. 10792	4-Sep-19	4-Sep-24
AK Department of Fish and Game	Special Area Permit 19-V-0231-SA	9-Sep-19	31-Dec-22
AK Department of Natural Resources	Section 106 Assessment – National Historic Preservation Act	26-Aug-19	n/a

Note: A substantial change in project scope would trigger additional agency review and project authorization.

Ninilchik Harbor, Ninilchik, Alaska



Harbor basin during low tide, July 2019



Basin side slope near the north dock and float, September 2016

Ninilchik Harbor, Ninilchik, Alaska



Placement of dredged material on the timber log revetment, May 2019



Leveling of dredged material over the revetment, May 2019