

Anchorage Harbor

Condition of Improvements
31 December 2019
Anchorage Harbor, Alaska
(CWIS No. 000360, 010534)

Authorization

- (1) River and Harbors Act of 1958, P.L. 85-500 (House Doc. 34, 85th Congress, 1st Session), Section 101
- (2) Water Resources Development Act of 1976, P.L. 94-587, Section 199.
- (3) Consolidated Appropriations Act, 2005, P.L. 108-447, Title I, Division C, 118(a) and 118(d) modified the project authorization for the Port of Anchorage in Anchorage, Alaska, directing the Secretary of the Army to construct a harbor depth to minus 45 feet mean lower low water for a length of 10,860 feet. Federal maintenance shall be in accordance with Section 101 of the River and Harbor Act of 1958, except that the project shall be maintained at a depth of minus 45 feet mean lower low water for a length 10,860 feet.
- (4) Water Resources Development Act of 2007, P.L. 110-114, Section 3002, Cook Inlet, Alaska modifies Section 118(a)(3) by inserting “*as part of the operation and maintenance of such project modification*” after “by the Secretary”.

Table 1

Existing Project	Length ft.	Width ft.	Depth ft.
Basin	3000	Varies	-35

Project Usage The Federal project accommodates three dry cargo berths and two petroleum handling facilities. It is the main supply and distribution center for the south-central and interior areas and Joint Base Elmendorf-Richardson (JBER) that lies within the Municipality of Anchorage. The Port of Anchorage is the largest cargo port in Alaska, handling 74% of all in-bound non-petroleum freight that enters south-central Alaska. Approximately 3,948,665 tons of cargo (all commodities) passed through the port in 2018.

Progress of Work

1959	The City of Anchorage constructs the first dry cargo berth at City Dock from 1959 through 1961, and dredges its approach to -35 feet MLLW.
1961	The approach to Ocean Dock is increased to a depth of -32 feet MLLW at a distance of 50 feet from the dock face, and with a depth of -10 feet MLLW at the dock face.

Progress of Work

- 1964 The earthquake of March 27th destroys the federally owned Army Dock, and damages Terminal 1 and the POL Dock. Repairs are authorized under the River and Harbor Act of August 19, 1964 (P.L. 88-451) as amended. Terminal 1 and the POL Dock are repaired.
- 1965 Emergency maintenance dredging is performed off the face of City Dock during July and August. The entire project basin is modified to a depth of -35 feet MLLW.
- 1966 Dredging begins in October 1966 and is completed in June 1967; it includes 2 feet of advance maintenance to 37 feet MLLW.
- 1967 Annual maintenance dredging begins by the Corps.
- 1968 Terminal 2 construction begins.
- 1970 Terminal 2 construction is completed.
- 1973 Terminal 3 construction begins.
- 1977 In early fiscal year 1977, Congress approves extending the original 2,000 foot project limit baseline to the present 3,000 foot length (P.L. 94-587, 22 OCT 76). Proposed jetties for the northern and southern ends of the project are de-authorized in November.
- 1978 Development of large shoals in the northern and southern ends of the project necessitates emergency dredging from October 1978 through January 1979. All phases of Terminal 3 construction are completed.
- 1981 Excessive shoaling during the spring and summer of 1981 requires using the Corps-owned dredge "BIDDLE", in addition to a contract dredge, to remove 894,076 cubic yards of material to reach project depth by the end of the ice free season.
- 1982 Annual maintenance dredging by contract begins during the summer; an average of 350 to 400 thousand cubic yards is removed each year through 1988.
- 1988 The angles of the dredging limits at the north and south ends of the project are changed from 45 to 30 degrees.
- 1992 The POL 2 terminal is completed.
- 1994 Sampling and testing of bottom sediments is conducted.
- 1995 Maintenance dredging quantities since 1988 average 200,000 to 250,000 cubic yards per year.
- 1997 The contractor removes 196,162 cubic yards of material during Phase I of the dredging which ended 15 August 1997.
- 1998 During the second year of a five year continuing contract, the combined quantity from 1 October 1997 through 30 September 1998 equals 356,000 cubic yards.
- 1999 Maintenance dredging removes 438,800 from 1 October 1998 through 30 September 1999.
- 2000 The Corps hopper dredge ESSAYONS is mobilized to the port in November 1999, and removes 565,000 cubic yards of hazardous shoaling in 15 days of work. The annual maintenance dredging contract removes an additional 893,236 cubic yards from 1 October 1999 through 30 September 2000.

Progress of Work

- 2001 Two dredging contractors remove 167,140 cubic yards in October 2000 to achieve project depth. From June through September 2001, the dredging contractor removes 284,291 cubic yards of material. Dredging will continue through October.
- 2002 The dredging contractor removes 631,728 cubic yards from June through September, and with a carryover of 131,540 yards from last October, a total of 763,268 cubic yards is removed in this fiscal year. New vertical aerial photography is also taken.
- 2003 Dredging with clamshell only was insufficient to keep up with heavy infill to the project. Raise-the-Flag procedures were implemented in July and September to augment dredging needs with Manson's WESTPORT and Great Lakes' SUGAR ISLAND hopper dredges. With carryover yardage of 117,726 from October 2002 added to the clamshell yardage of 427,242 and the 300,000 cubic yards removed by the hopper dredge, we see a total of 844,968 cubic yards removed by contract in FY03.
- 2004 Utilizing both clamshell and hopper dredges, dredging contractors remove 2,504,511 cubic yards in FY04.
- 2005 The Consolidated Appropriations Act, 2005, P.L. 108-447, Division C – Energy and Water Development Appropriations, Section 118(a) and 118 (d) modified the original project authorization. Maintenance dredging removes 1,832,610 yards in FY05 using both a clamshell and hopper dredge. Plans for port expansion are underway.
- 2006 Port expansion work begins with fill on the north end backlands. Maintenance dredging for FY06 saw the removal of 1,749,385 cubic yards utilizing both a clamshell and hopper dredge.
- 2007 Port expansion continues with the completion of fill for the north end backlands. The planned expansion would move the dock face 400 feet seaward and lengthen it by about 5,000 feet. Annual maintenance dredging saw the removal of 1,766,357 cubic yards in FY07 using both a clamshell and hopper dredge. A total of 48 locations were bored for a geotechnical investigation of the sediments. Six of these locations were sampled to characterize the dredge material and newly exposed materials.
- 2008 Maintenance dredging continues with 1,338,281 cubic yards of material removed from the original project area. Port expansion will continue to the north for barge berth and north port areas. USACE Comprehensive Evaluation of Project Datums Compliance report completed and recorded in November.
- 2009 Installation of the new sheet pile structure is nearly completed in the north expansion. Transitional dredging begins and removes 936,831 cubic yards of material within the new project limits by clamshell. Maintenance dredging continues with 702,366 cubic yards removed by clamshell and hopper dredges. A heavy shoaling rate along the north dock face in terminal three deposits three to five feet of material between November and December.

Progress of Work

- 2013 Manson Construction completed the second of a 3-year maintenance dredging contract, removing 1,021,088 cubic yards. Ten winter condition surveys and 56 dredge surveys were completed this dredge season. Manson used the hopper dredge WESTPORT to complete advance maintenance dredging in preparation for heavy shoaling in the TOTE berth during the winter.
- 2014 Above average shoaling in Terminal 3 between November and March resulted in mobilizing Manson Construction's clamshell dredge Andrew and the scow East Port to dredge the dock face between March 10 and April 30, a time not usually dredged in Anchorage. Sixteen winter surveys were performed. Manson Construction resumed normal dredging operations at the Port of Anchorage in May with the Westport hopper dredge which continued throughout the summer and through October. Fifty-four summer surveys were conducted. This was the last year of a 3-year dredging contract. The open water disposal site abeam the dock continued to be used.
- 2015 Terminal 3 (TOTE berth) again experienced a high rate of shoaling from November to March which was further exacerbated by unseasonably warm weather during the winter of 2014-2015 and impacted loading and unloading activities at low tides. Manson's clam shell dredge NJORD was mobilized under their 2012-2014 contract and dredged the dock face between March 26 and April 19 removing 49,500 cubic yards of material. Thirteen winter surveys were performed. Manson was awarded another 3-year maintenance contract for 2015-2017 and completed the first year of maintenance dredging with the hopper dredge WESTPORT, removing 1,206,151 cubic yards. A total of fifty-nine surveys were completed during the dredge season. Maintenance dredging continued through 10 November and included advance maintenance dredging at Terminal 3 in preparation for another year of heavy shoaling over the winter.

Progress of Work

- 2016 Manson Construction completed the second year of a 3-year maintenance dredging contract (W911KB-15-C-0006) with the hopper dredge WESTPORT, removing 739,012 cubic yards. Low infill rates combined with Port of Anchorage test pile and current profiler contracts, in support of a Port Modernization project, contributed to the lower dredge quantity and a total of 79 standby days. Terminal 3 (TOTE berth) shoaled 5 to 7 feet above project depth during the winter of 2015-2016 and winter dredging was required to maintain Terminal operations. As the result of a relatively ice-free winter, the hopper dredge WESTPORT was mobilized early to perform the winter dredging in lieu of a clam shell dredge as utilized in previous years. The WESTPORT arrived on March 20th and removed about 60,000 cubic yards of material between March 22nd and April 19th. Sixty summer surveys and sixteen winter surveys were completed. The Port of Anchorage submitted a Section 408 permission request for Phase 1 of the Anchorage Port Modernization Program. Projects included the North Extension Stabilization Step 1 (partial removal of fill north of Terminal 3) and a new Petroleum and Cement Terminal at the south end of the Port.
- 2017 Manson completed the final year of their 3-year maintenance dredging contract and removed 1,011,548 cubic yards with the hopper dredge WESTPORT. Dredging of Area B at the north end of Anchorage Harbor was discontinued since the new Port Modernization Program does not include a plan to utilize the north end. Sixty-one summer surveys and fifteen winter surveys were completed. No winter dredging was performed primarily due to winter ice conditions. Hydrodynamic and sedimentation modeling for the Section 408 reviews were completed for the North Extension Stabilization Step 1 and the Petroleum and Cement Terminal. Section 408 permission for the North Extension Stabilization Step 1 was issued on 30 November 2017 however the project has been placed on hold by the Port. The Port changes their name to the Port of Alaska.
- 2018 Manson Construction completed the first year of a new 3-year maintenance dredging contract (W911KB18C0004) and removed 747,379 cubic yards with the hopper dredge WESTPORT between May 1st and November 1st. The WESTPORT also removed an estimated 60,000 cubic yards during early season dredging during the period of April 1-30. Fifty-four (54) summer surveys and seventeen (17) winter condition surveys were conducted as well as an additional condition survey on 1 December following a magnitude 7.1 earthquake in Knik Arm on 30 November. The post-earthquake survey showed no changes in the harbor. Section 408 permission for the new Petroleum and Cement Terminal under Phase 1 of the Port of Alaska Modernization Program was issued on 31 May 2018. The Port awarded a contract to Kiewit/Manson, JV perform transition dredging for the new Petroleum and Cement Terminal.

Progress of Work

2019 Manson Construction completed the second year of a 3-year maintenance dredging contract (W911KB18C0004) and removed 1,166,000 cubic yards with the hopper dredge WESTPORT between May 1st and November 1st. The WESTPORT also removed an estimated 60,000 cubic yards during early season dredging during the period of April 1-30. Fifty-four (54) summer surveys and eighteen (18) winter condition surveys were conducted. The Port of Alaska completed transition dredging for a new Petroleum and Cement Terminal (PCT) at the southern end of the harbor removing 521,932 cubic yards and awarded a contract to Pacific Pile & Marine to construct the PCT trestle and platform in 2020.

Table 2 Cost to Date

Project	Description	Cost \$
010534	CG Appropriations	533,235
	CG Costs	533,235
000360	O&M ARRA Appropriations	26,874,313
	O&M ARRA Costs	26,874,313
	O&M Appropriations (3123)	218,458,064
	O&M Costs (3123)	213,585,591
	O&M Appropriations (5125)	3,274,000
	O&M Costs (5125)	3,274,000
	O&M Contributed Appropriations	638,080
	O&M Contributed Costs	638,080

Table 3 Range of Tides in feet

Tide Station	Mean Range	Diurnal Range	Extreme Range
945 5920 Anchorage AK	26.19	29.16	41.25

NOAA Publication Date: 07/03/2019

Controlling Depth The post-dredge survey conducted 1 November 2019 shows that project depth is available within the Federal project. The port is subject to heavy shoaling and strong tidal currents.

Table 4 Dredged Quantities and Contract Costs

Year	Quantity (cubic yards)	Cost \$
2008	1,338,281	12,269,992
2009	1,639,197	19,745,417
2010	1,632,628	20,141,985
2011	1,628,318	13,326,782
2012	1,067,684	7,777,772
2013	1,021,088	7,084,970
2014	1,117,886	9,890,755
2015	1,206,151	8,223,423
2016	739,012	6,542,900
2017	1,011,548	7,791,632
2018	807,379	9,685,474
2019	1,226,000	10,230,000

Note - Quantities and costs are based on the summer maintenance dredging season.

Maintenance Dredging Supplement

A. General

1. Anchorage Harbor is an annual maintenance dredging project; contracts have varied in duration from 1 to 5 years in the past however starting in 2012, contract durations are 3 years.
2. Heavy shoaling typically occurs along the main dock face (especially Terminal 3), the POL dock, the area between the POL dock and the main dock, and along the 30 degree project limit extensions.
3. The project is open to dredge activity during the ice-free season. Work begins in the spring and continues through summer; when shoaling is greatest, and on into the fall until depth is achieved or ice conditions make further dredging untenable.
4. Historically, maintenance dredging operations were most often conducted with a clamshell and barge. Since 2012, a small hopper dredge has been employed. In 2016, 2018 and 2019, the hopper dredge was also able to accomplish winter dredging due to a warmer winter and minimal ice conditions.

B. Sampling & Testing

1. Samples were taken at five sites within the project, June 1994; all material was classified as silt (ML). One disposal site sample was taken and classified as silty gravel (GM).
2. Chemical analysis was conducted using seven (7) test methods as outlined with results below

Table 5A Chemical Testing (1994)

Method	Chemical analysis	Results
8080	Pesticides and PCB's	ND (none detected)
Series 6000-7000's	(8) RCRA Metals* (6 samples)	Arsenic 7-17 ppm, Barium 74-167 ppm, Chromium 23-47 ppm, Lead 4.1-13 ppm
415.1	Total Organic Carbon (1 sample)	2,450 ppm
418.1	Total Recoverable Petroleum Hydrocarbons	ND
160.3	Percent Solids	65.5 - 77.1 %
8260	Volatile Organic Compounds	ND
8270	Semi-Volatile Organic Compounds	ND

* All heavy metal concentrations well below management levels; no cadmium, mercury, selenium, or silver were detected.

3. Twelve primary samples were collected from six new borings, September 2007. Most of the sediments consisted of fine grained silts and clays, however some gravels were encountered in a few borings.
4. Chemical analysis was conducted using six (6) test methods as outlined with results below:

Table 5B Chemical Testing (2007)

Method	Chemical analysis	Results
8260B	Volatile Organic Compounds	ND (none detect) or below minimum cleanup levels
8270C	Semi-Volatile Organic Compounds	ND or below cleanup levels
8082	Polychlorinated Biphenyls (PCBs)	ND
Series 6000-7000's	(8) RCRA Metals	(8) of (8) detected; all below cleanup levels
8081A	Chlorinated Pesticides	ND or below minimum cleanup levels
9060	Total Organic Carbon	2000-7000 ppm

Results were screened against Puget Sound Dredge Disposal Analysis (PSSDA) and the State of Washington Sediment Management Standards (SMS).

5. In April and September 2016, samples were collected at four locations within the project and five background locations; all material was classified as silt (ML) or silt and sand (ML).
6. Chemical analysis was conducted using the test methods as outlined with results for the samples within the project location shown below:

Table 5C Chemical Testing (2016)

Method	Chemical analysis	Results
AK101	Gasoline Range Organics	ND (none detected)
AK102/103	Diesel Range Organics/ Residual Range Organics	ND or below minimum levels
6000-7000's	(10) RCRA Metals	(10) of (10) detected; all below minimum levels
8260B	Volatile Organic Compounds	ND
8270D	Semi-volatile Organics	ND or below minimum levels
8270D_Pest	Pesticides	ND

Project limits are defined by USACE Seattle District Dredged Material Management Program (DMMP) User's Manual, August 2016, Table 8-3.

C. Disposal

1. Dredged material is transported to the deep water site, dumped, and dispersed by tidal activity.
2. Prior to the 2009 dredging season, material was disposed in a rectangular site (2,000' x 3,000') 3,000 feet seaward from the southern end of the project. The geographic coordinates are as follows:

Table 6A Original Disposal Area

Corner	Latitude (N)	Longitude (W)
1	61°14'17.492"	149°54'29.236"
2	61°14'24.255"	149°55'07.622"
3	61°13'56.506"	149°55'28.663"
4	61°13'49.745"	149°54'50.285"

- In 2009 the dredge disposal site was expanded to the north (2,000' x 6,000') to accommodate the new transitional dredging project. New geographic coordinates are as follows:

Table 6B 2009-2019 Disposal Area

Corner	Latitude (N)	Longitude (W)
DS1	61°13'56.506"	149°55'28.663"
DS2	61°15'19.751"	149°54'25.510"
DS3	61°15'12.985"	149°53'47.108"
DS4	61°13'49.745"	149°54'50.285"

D. Environmental Permits and Reports

- A Final Environmental Impact Statement (FEIS) for operation and maintenance was circulated in January 1974. Environmental Assessments for maintenance dredging were completed in January 1978, March 1983, March 2001, August 2008 and most recently in October 2017 by the Corps of Engineers. Findings of No Significant Impact (FONSI's) for maintenance dredging were signed in January 1978, April 1980, May 1983, April 2001, October 2008, June 2009 and most recently in October 2017. A Biological Assessment (BA) of the Cook Inlet beluga whale was completed in April 2009 for Port expansion and associated dredging. The U.S. Fish and Wildlife Service issued a Final Coordination Act Report in April 2008 for dredging and disposal operations.
- The following permits or authorizations have been issued for current dredging operations:

Table 7 Environmental Permits

Agency Name	Date of Issue	Date of Expiration
AK Department of Natural Resources	30-Sep-08	n/a
Environmental Assessment (Maint. Dredging)	Oct 17	n/a
Finding of No Significant Impact (Maint. Dredging)	31-Oct-17	n/a
National Marine Fisheries Service	16-Oct-17	n/a
AK Dept. of Environmental Conservation (Water Quality Cert.)	30-Jan-19	29-Jan-24

3. Environmental Assessments were completed in October 2017 by the Corps of Engineers for the Port of Anchorage Modernization Program Phase 1, to include the North Extension Stabilization Step 1 and the Petroleum and Cement Terminal. A Findings of No Significant Impact (FONSI) for alteration to the federal project as a result of the North Extension Stabilization Step 1 (Section 408 permission) was signed on 28 November 2017. A Findings of No Significant Impact (FONSI) for the alteration to the federal project (Section 408 permission) as a result of the Petroleum and Cement Terminal was signed on 29 May 2018.

4. Water Quality: Four physical parameters were measured through (40) feet of water column in June of 1994; temperature, pH, conductivity, and oxidation-reduction potential (ORP). No chemical analysis was conducted. A geotechnical investigation for the Harbor Deepening Study was conducted in September 2007. Six locations were chosen for chemical sampling. Analysis showed no contamination detected above or approaching the Puget Sound Dredge Disposal Analysis (PSDDA) screening levels.

Anchorage Harbor, Alaska



Terminal 1 & 2 Port of Alaska



Terminal 1 & 2 Port of Alaska

Anchorage Harbor, Alaska



Westport Dredging in Terminal 3, May 2015



Westport Dredging, August 2019

Anchorage Harbor, Alaska



Anchorage Harbor, March 2016



Anchorage Harbor, March 2017