

YAQUINA BAY AND HARBOR, OREG.

LETTER

FROM THE

SECRETARY OF WAR

TRANSMITTING TO THE

CHAIRMAN OF THE COMMITTEE ON COMMERCE

UNITED STATES SENATE

PURSUANT TO A

RESOLUTION OF THE COMMITTEE, A REVIEW OF
REPORTS ON YAQUINA BAY, RIVER,
AND HARBOR, OREG.



PRESENTED BY MR. OVERTON

JULY 23 (legislative day, JULY 5), 1946.—Referred to the Committee
on Commerce and ordered to be printed with an illustration

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WASHINGTON : 1946

LETTER OF TRANSMITTAL

WAR DEPARTMENT,
Washington, July 17, 1946.

Hon. JOSIAH W. BAILEY,
Chairman, Committee on Commerce,
United States Senate.

DEAR SENATOR BAILEY: I am transmitting herewith a report dated June 13, 1946, from the Chief of Engineers, United States Army, together with accompanying papers and an illustration, on a review of reports on Yaquina Bay, River, and Harbor, Oreg., requested by a resolution of the Committee on Commerce, United States Senate, adopted on June 27, 1945.

In accordance with section 1 of Public Law 14, Seventy-ninth Congress, the views of the Governor of the State of Oregon and the Department of the Interior are set forth in the enclosed communications.

The Bureau of the Budget advises that there is no objection to the submission of this report.

Sincerely yours,

ROBERT P. PATTERSON,
Secretary of War.

COMMENTS OF THE STATE OF OREGON

[Telegram]

OKLAHOMA CITY, OKLA., May 30, 1946.

UNITED STATES ARMY ENGINEERS,
Washington, D. C.

Endorse and approve small-boat mooring project, Yaquina Bay, Oreg.

EARL SNELL, Governor.

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,
Washington 25, D. C., June 13, 1946.

Lt. Gen. RAYMOND A. WHEELER,
Chief of Engineers, War Department.

MY DEAR GENERAL WHEELER: On June 6 I received your letter transmitting for my information and comment a copy of your proposed report on Yaquina Bay and Harbor, Oreg., small-boat basin.

The proposed project consists of modification of the existing project for Yaquina Bay and Harbor to provide a small-boat mooring basin at Newport, Oreg., by construction of a breakwater and by dredging to an initial depth of 10 feet.

I find that the proposed project will be beneficial to the local fishing interests, and that it will not affect any existing projects of the Department of the Interior. Therefore, I concur in your recommendations.

Sincerely yours,

OSCAR L. CHAPMAN,
Acting Secretary of the Interior.

YAQUINA BAY AND HARBOR, OREG.

REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, June 13, 1946.

The CHAIRMAN, COMMITTEE ON COMMERCE,
United States Senate, Washington, D. C.

MY DEAR MR. CHAIRMAN: 1. The Committee on Commerce of the United States Senate, by resolution adopted June 27, 1945, requested the Board of Engineers for Rivers and Harbors to review the reports on Yaquina Bay, River, and Harbor, Oreg., contained in Senate Document No. 119, Seventy-seventh Congress, first session, and previous reports, with a view to determining whether any modification of the existing project is advisable at this time, particularly with reference to the construction of a small-boat harbor. I enclose the report of the Board in response thereto.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends modification of the existing project for Yaquina Bay and Harbor, Oreg., to provide for a small-boat-mooring basin at Newport, Oreg., by construction of a breakwater about 2,650 feet long and a shore wing about 400 feet long, and initial dredging in the mooring basin to a depth of 10 feet; all at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for maintenance in addition to that now required, in general accordance with the plans of the district engineer as shown on the accompanying map with such modifications as in the discretion of the Secretary of War and the Chief of Engineers may be desirable; provided that local interests furnish free of cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas required for the construction of the project and furnish assurances satisfactory to the Secretary of War that they will maintain necessary depth in the basin; construct, maintain, and operate necessary mooring facilities and utilities within the basin including a public landing with suitable supply facilities open to all on equal terms; and hold and save the United States free from damages due to the improvement.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

Very truly yours,

R. A. WHEELER,
*Lieutenant General,
Chief of Engineers.*

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, May 31, 1946.

Subject: Yaquina Bay and Harbor, Oreg., small-boat harbor.

To: The Chief of Engineers, United States Army.

1. This report is in response to the following resolution adopted June 27, 1945:

Resolved by the Committee on Commerce of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on Yaquina Bay, River and Harbor, Oregon, contained in Senate Document Numbered 119, Seventy-seventh Congress, first session, and previous reports, with a view to determining whether any modification of the existing project is advisable at this time, particularly with reference to the construction of a small-boat harbor.

2. Yaquina Bay is an estuary at the mouth of Yaquina River on the Oregon coast, 113 miles south of the mouth of Columbia River. The bay extends to Yaquina about $4\frac{1}{2}$ miles above the ocean entrance. The mean range of tide is about 6 feet. Tillamook Bay, 66 miles to the north, and Umqua River, 65 miles to the south, with entrance project depths of 18 and 26 feet, respectively, are the nearest harbors improved for ship navigation. Depoe Bay, 13 miles to the north, and Alsea Bay, 16 miles to the south, are used as harbors for fishing boats, the latter to a very limited extent. The existing project for Yaquina Bay and Harbor, Oreg., as modified by the River and Harbor Act approved March 2, 1945, provides for jetties at the entrance 4,700 feet long on the north and 5,800 feet long on the south with spur jetties and groins and a channel 26 feet deep and of suitable width across the entrance bar; for a channel 20 feet deep and 300 feet wide from the outer end of the jetties upstream about 2 miles to McLean Point, with a turning basin at the upstream end 22 feet deep, 1,000 feet wide, and 1,200 feet long; and for a secondary channel 18 feet deep and 200 feet wide along the city docks at Newport, thence upstream about 4.5 miles to the abandoned railroad terminus at Yaquina. The project is about 91 percent complete. Total costs from Federal funds to June 30, 1945, have been \$2,495,484, of which \$1,645,589 was for new work and \$849,895 for maintenance.

3. Area tributary to Yaquina Bay is about 1,400 square miles in extent and includes Toledo, county seat of Lincoln County, and Newport with populations of about 3,000 and 4,000, respectively. The principal natural resource of the area is standing timber consisting of commercial varieties of fir, hemlock, spruce, alder, and cedar. Only about 3 percent of the area is tillable land. Food fish are found in abundance in offshore areas. The catch and related processing industry are the major sources of income for residents of Newport and vicinity. Five processing plants in Newport are supplied by a fleet of about 300 local craft and many transients. Newport is served by United States Highway 101, crossing Yaquina Bay just inside the entrance, and by a State highway. The nearest rail connection is a branch-line railroad formerly extending to Yaquina at the head of the bay but now terminating at Toledo, 7 miles from Newport.

4. Ocean-borne commerce of Yaquina Bay, consisting of receipts of petroleum products and miscellaneous supplies and shipments of logs and lumber averaged 72,850 tons in the period 1932 to 1941 inclusive, but dropped to very small amounts in 1942 and subsequent war years due to suspension of coastwise and intercoastal trade. Resumption of this trade is anticipated. Fish received at Newport increased from 2,600 tons in 1941 to 4,860 tons in 1944, ranging in value of catch from \$510,000 to \$1,033,000. About 300 fishing boats are based in Yaquina Bay, ranging in size from 30-foot trollers to craft 50 to more than 90 feet in length used for bottom fishing. Many transient craft also visit the harbor. Terminal facilities at Newport, owned by the port of Newport, consist of a wharf 400 feet long for berthing ocean vessels and 300 feet of floating walkway for mooring fishing boats. The wharf is in poor repair and is now used for mooring fishing boats. Terminal facilities for the fishing fleet also include four privately owned receiving wharves with a combined frontage of 700 feet. There are no protected mooring grounds for fishing boats which at present are moored to wharves and other structures along the water front. During periods of storm they are forced to seek shelter at various points along Yaquina River, some as far upstream as Toledo.

5. Local interests request participation by the United States in the construction and maintenance of a protected mooring basin for small boats in Yaquina Bay at Newport extending easterly from the port dock about 2,300 feet and occupying a reach of the existing channel along the Newport water front. They cite the present congested conditions along the water front and the need for an adequate protected moorage area to prevent loss to fishermen through damage to boats, cost of riding out major storms, travel cost to safe moorings and lost fishing time, estimated at \$58,800 annually. The port of Newport offers to construct berths for at least 200 boats with necessary walkways in connection with the project, to maintain and operate all the moorage facilities and walkways, to furnish all necessary lands and spoil-disposal areas, and to hold and save the United States free from all claims for damages resulting from the improvement.

6. The district engineer finds that the existing channel along the Newport water front can be utilized for the construction of a small-boat mooring basin since authorized improvements provide for a deep-draft navigation channel to the turning basin outside the mooring-basin area. He proposes the construction by the United States of a pile-and-timber breakwater about 2,650 feet long generally parallel to the water front and extending along a shoal area known as the middle ground lying between the existing channel along the water front and the authorized channel in Yaquina Bay, with a shore wing of similar type and about 400 feet long at the southeasterly (upstream) end of the proposed basin, and dredging within the basin to a depth of 10 feet below mean lower low water except along the northerly edge where depth might be reduced to 6 or 8 feet if rock is encountered. Necessary mooring piles, floats, walkways, and service facilities would be provided by local interests within the mooring-basin area. The estimated first cost of new work for the proposed improvement is \$353,000, of which \$225,000 is Federal and \$128,000 non-Federal.

Annual charges are estimated to total \$24,630 of which \$20,120, including \$5,000 annual cost of maintenance, is Federal and \$4,510 is non-Federal. Annual direct benefits from elimination of damage to boats and cost of moving to safe moorages during storm periods, from increased catch of fish, and annual indirect benefits are estimated to total \$50,000. Since the ratio of estimated annual benefits to estimated annual charges is 2.0 to 1, the district engineer recommends that the existing project for Yaquina Bay and Harbor, Oreg., be modified to provide for a breakwater about 2,650 feet long and a shore wing about 400 feet long, both of pile, timber, and stone construction; and to provide for initial dredging in a mooring basin for small boats to a depth of 10 feet; all at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for additional maintenance; provided, that local interests furnish free of cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas required; agree to maintain necessary depth in the basin; agree to construct, maintain, and operate necessary mooring facilities and utilities within the basin, including a public landing with suitable supply facilities, open to all on equal and equitable terms; and agree to hold and save the United States free from all claims and damages resulting from this improvement. The division engineer concurs.

7. Local interests were advised of the nature of the division engineer's report and afforded an opportunity to furnish additional information to the Board. Two letters were received from owners of water-front property opposing the improvement on the grounds of its interference with their use and development of their property. A communication was received from a representative of the port of Newport, requesting the addition of a westerly shore arm about 350 feet long to the district engineer's plan of improvement and suggesting deletion of a small portion of the easterly end of the main breakwater to compensate for the added cost of the westerly shore arm together with certain changes in the arrangement of walkways and berthage spaces within the moorage area. Careful consideration has been given to the communications received.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

8. The Board concurs generally in the views and recommendations of the reporting officers. Modification of the existing project for Yaquina Bay and Harbor, Oreg., to provide a safe mooring basin for small boats, including the fishing fleet, would provide needed protection from storms and secure important tangible benefits to the fishing industry. The plan of development proposed by the district engineer is generally suitable for the improvement and will provide the desired facilities. The plan suggested by the port of Newport is equally suitable and the addition of the westerly shore arm can be provided with minor modification of the district engineer's plan at no material increase in over-all cost of the new work. Benefits to the fishing industry reasonably to be expected from the provision of the mooring basin are well in excess of the costs and the project is economically justified.

9. The Board recommends modification of the existing project for Yaquina Bay and Harbor, Oreg., to provide for a small-boat mooring

basin at Newport, Oreg., by construction of a breakwater about 2,650 feet long and a shore wing about 400 feet long, and initial dredging in the mooring basin to a depth of 10 feet; all at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for maintenance in addition to that now required, in general accordance with the plans of the district engineer as shown on the accompanying map with such modifications as in the discretion of the Secretary of War and the Chief of Engineers may be desirable; provided that local interests furnish free of cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas required for the construction of the project and furnish assurances satisfactory to the Secretary of War that they will maintain necessary depth in the basin; construct, maintain, and operate necessary mooring facilities and utilities within the basin including a public landing with suitable supply facilities open to all on equal terms; and hold and save the United States free from damages due to the improvement.

For the Board:

R. C. CRAWFORD,
Brigadier General,
Senior Member.

REVIEW REPORT ON YAQUINA BAY AND HARBOR, OREG.

SYLLABUS

The district engineer is of the opinion that the savings to fishermen and to operators of small boats, and general benefits which would result, justify the construction of a sheltered mooring basin for small boats in Yaquina Bay at Newport, Oreg. He therefore recommends that the existing project for Yaquina Bay and Harbor, Oreg., be modified to provide for breakwaters and for dredging in the basin, in accordance with the plan submitted herewith, at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for additional maintenance, subject to specified conditions of local cooperation.

WAR DEPARTMENT,
 UNITED STATES ENGINEER OFFICE,
 Portland, Oreg., February 19, 1946.

Subject: Review of reports on Yaquina Bay and Harbor, Oreg., printed in Senate Document No. 119, Seventy-seventh Congress, and previous reports.

To: Division engineer, Pacific division, San Francisco, Calif.

1. *Authority.*—This report is submitted in compliance with the following resolution adopted June 27, 1945:

Resolved by the Committee on Commerce of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act, approved June 13, 1902, be and is hereby requested to review the reports on Yaquina Bay, River, and Harbor, Oregon, contained in Senate Document Numbered 119, Seventy-seventh Congress, first session, and previous reports, with a view to determining whether any modification of the existing project is advisable at this time, particularly with reference to the construction of a small-boat harbor.

2. *Reports under review.*—The reports under review, contained in Senate Document No. 119, Seventy-seventh Congress, first session, were favorable to modification of the then existing project for Yaquina Bay and Harbor, Oreg., to provide, insofar as the rock bottom will allow, for a channel 26 feet deep and of suitable width across the

entrance bar, for a channel 20 feet deep and 300 feet wide from the outer end of the jetties upstream a distance of about 2 miles, and for a turning basin 22 feet deep, 1,000 feet wide, and 1,200 feet long; all at an estimated cost of \$162,000 for new work and \$50,000 additional annual maintenance, subject to the conditions that local interests furnish assurances satisfactory to the Secretary of War that they will provide adequate terminal facilities open to all on equal and equitable terms, furnish free of cost to the United States all spoil-disposal areas necessary for the improvements and their subsequent maintenance when and as required, and hold and save the United States free from claims for damages resulting from the improvements. This recommended modification was authorized by the River and Harbor Act approved March 2, 1945.

3. *Scope of report.*—This report is of survey scope and is limited to consideration of modification of the existing project to provide a mooring basin for small boats and a breakwater in connection therewith in Yaquina Bay near Newport, Oreg., as requested by local interests. No possibility is seen of coordinating this study with any other involving the use of water resources in this area.

4. *Description.*—Yaquina Bay is an estuary at the mouth of Yaquina River on the Oregon coast, 113 miles south of the mouth of Columbia River. The bay extends to Yaquina about $4\frac{1}{2}$ miles from the ocean entrance. Its maximum width is 2,000 feet at low water, at Newport, about 2 miles from the ocean. The mean range of tide is about 6.0 feet. The highest tides rise to about 11 feet above mean lower low water.

5. The entrance has been improved by construction of twin jetties, extending southwesterly toward an opening in Yaquina Reef, a rock ledge which approximately parallels the coast about 4,000 feet offshore. The south jetty is 5,800 feet in length, and the north jetty, 4,700 feet. The jetties are 1,000 feet apart at their outer ends.

6. Yaquina River rises in the Coast Range, about 30 miles easterly from the mouth, and flows in a sinuous course a distance of about 50 miles to Yaquina Bay. The river drains an area of 242 square miles. It has a low summer flow and freshet discharges are not large enough to have a noticeable effect on stages in the bay.

7. *Adjacent ports.*—Tillamook Bay, 66 miles to the north, and Umpqua River, 65 miles to the south, with entrance project depths of 18 and 26 feet, respectively, are the nearest harbors improved for ship navigation. Depoe Bay, a small tidal lagoon used as a harbor for fishing boats and recreational craft, is 13 miles to the north. Alsea Bay, and the Siuslaw River, both used to very limited extent by fishing boats, are 16 and 51 miles, respectively, to the south.

8. *Tributary area and resources.*—The area tributary to Yaquina Bay includes most of Lincoln County and small sections of Benton, Lane, and Polk Counties. It has a total area of about 1,400 square miles. The principal cities are Toledo, county seat of Lincoln County, and Newport, with populations in 1940 of 2,300 and 2,000, respectively. Present populations are probably between 3,000 and 4,000 for each of these cities.

9. Principal natural resource of the area is the standing timber, consisting of about 8,000,000,000 feet board measure of commercial varieties of fir, hemlock, spruce, alder, and cedar. The watershed of Yaquina River was formerly heavily timbered but much of the original stand was destroyed by fire. About 50 percent of the remaining

timber is considered tributary to the Yaquina River in the vicinity of Toledo and the balance tributary to the lower Yaquina Bay.

10. There are many small sawmills throughout the area. Sawing capacity of mills at Toledo and vicinity is about 150,000,000 feet annually, on a one-shift basis. Until stopped by war conditions, about 60,000,000 feet per year were lightered from Toledo to Newport for loading on ocean carriers and it is probable that movement will be resumed in the near future. Owners of the largest mill in the area, at Toledo, state that their present and contemplated future timber holdings assure them an annual cut of 125,000,000 feet on a sustained-yield basis.

11. The area is generally rough and not well adapted for agricultural development, only 3 percent of the area being in tillable land. Bottom lands along the stream are fertile but limited in extent.

12. Food fish are found in abundance in the areas offshore. The catch and the related processing industry are the major sources of income for the inhabitants of Newport and vicinity. Five processing plants are in operation, supplied by a fleet of about 300 local craft and many transients. Fish received at Newport increased from 2,600 tons in 1941 to 4,860 tons in 1944. In the latter year, fishermen received approximately \$1,000,000 for the catch.

13. *Transportation facilities.*—The Oregon Coast Highway (U S 101) crosses Yaquina Bay at Newport. Another improved highway (State 26) extends easterly from Newport, passes through Toledo, and connects with the Pacific Highway (U S 99W) at Corvallis, in the Willamette Valley. From Toledo, a secondary highway runs 8 miles north to the town of Siletz, and then follows the Siletz River downstream to its mouth. Another secondary highway connects Toledo and Yaquina at the head of the bay. Other roads afford access to the settled districts of the tributary region.

14. The only common-carrier railroad in the vicinity is a branch line of the Southern Pacific Co., which leaves the main line at Albany, crosses the Coast Range, and terminates at Toledo, 7 miles from Newport. Formerly this line extended to Yaquina at the head of the bay, but the section between Toledo and Yaquina has been abandoned and the rails have been removed.

15. *Bridges.*—The only bridge spanning Yaquina Bay is that of the Oregon State Highway, at Newport, just inside the entrance. This bridge has a fixed-arch channel span 550 feet between piers, a horizontal clearance of 395 feet between fenders, and a center vertical clearance of 136 feet above mean lower low water. No alteration of this bridge would be required in connection with the improvement considered herein.

16. *Prior reports.*—Yaquina Bay and Harbor has been the subject of many previous reports. The last five reports are listed in the following tabulation:

Date	Document	Nature of report	Recommendation
Feb. 23, 1928	Unpublished.....	Preliminary examination..	Unfavorable.
June 10, 1931	do.....	do.....	Favorable.
June 7, 1935	do.....	Review.....	Unfavorable.
May 12, 1937	Senate committee print, 75th Cong., 1st sess.	do.....	Favorable to extension of north jetty 1,000 feet.
June 19, 1941	S. Doc. No. 119, 77th Cong., 1st sess.	do.....	Favorable to further improvement (basis for existing project).

17. *Existing project.*—The existing project for Yaquina Bay and Harbor, Oreg., as modified by the River and Harbor Act approved March 2, 1945, provides for two high-tide, rubble-mound jetties at the entrance, 1,000 feet apart at their outer ends, the north jetty 4,700 feet in length and the south jetty 5,800 feet in length; for a spur jetty on the channel side of the south jetty, 4,700 feet from its sea end, 800 feet in length; for five groins channelward from the south jetty; insofar as the rock bottom will allow, for a channel 26 feet deep and of suitable width across the entrance bar; for a channel 20 feet deep and 300 feet wide from the outer end of the jetties upstream and along the south side of the bay a distance of about 2 miles to McLean Point, with a turning basin at the upstream end 22 feet deep, 1,000 feet wide, and 1,200 feet long; and for a secondary channel 18 feet deep and 200 feet wide along the city docks at Newport, thence upstream to the abandoned railroad terminus at Yaquina, a distance of about 4.5 miles. The total estimated cost of new work, including funds contributed by local interests, is \$2,536,800 and the latest (1945) approved estimate for annual maintenance dredging in the bay and entrance is \$82,500. The latest (1937) approved estimate of cost of maintenance of the north jetty is \$12,000 annually. There is no approved estimate of maintenance of the south jetty.

18. The project is now 91 percent complete. The remaining work required for completion consists of dredging the existing channel across the entrance bar, insofar as rock bottom will allow, to a depth of 26 feet; dredging a channel 20 feet deep and 300 feet wide, extending from the ends of the jetties upstream and along the south side of the bay a distance of about 2 miles to McLean Point; and dredging a turning basin at the upstream end 1,000 feet wide, 1,200 feet long, and 22 feet deep. The remaining work to complete the project is that authorized by the River and Harbor Act approved March 2, 1945. Total costs under the existing project from Federal funds to June 30, 1945, have been \$2,495,484, of which \$1,645,589 was for new work and \$849,895 for maintenance.

19. *Local cooperation.*—The River and Harbor Act of March 2, 1919, required that one-half the cost of the new work authorized by that act should be borne by local interests. This condition has been complied with by local interests who contributed in useful work performed and in funds a total of \$729,168. The report under review herein, Senate Document No. 119, Seventy-seventh Congress, first session, recommended further improvements on condition that local interests furnish assurances satisfactory to the Secretary of War that they will provide adequate terminal facilities open to all on equal and equitable terms, and furnish free of cost to the United States all spoil-disposal areas necessary for the improvements and subsequent maintenance when and as required. So far as the present desired improvement is concerned, local interests have agreed to furnish free of cost to the United States all lands, easements, and rights-of-way required; to provide areas for spoil disposal; and to construct in the proposed basin floats, walkways, and mooring facilities for boats open to all on equal terms.

20. *Terminal and transfer facilities.*—At Newport the port of Newport owns and operates a wharf 400 feet long used for berthing ocean vessels while loading lumber from barges alongside. Now in poor

repair, it is used at present for berthing fishing boats. The port also owns 300 feet of floating walkway where fishing boats are moored. Its normal capacity is about 15 boats but frequently several times that number seek moorage there. The two facilities are open to all on equal terms. They have no mechanical equipment.

21. Terminal facilities for the fishing fleet include four privately owned receiving wharves for fish, with a combined frontage of 700 feet. Two more such structures are contemplated or under construction. At present fishing boats are moored to wharves and other structures along the Newport water front, where there is no protection from waves driven by southerly winds. Transfer and supply facilities for the fishing fleet are believed adequate but there are no protected mooring grounds for small boats. During periods of storm they are forced to seek shelter at various points on Yaquina River, some as far upstream as Toledo.

22. *Commerce.*—The ocean-borne commerce of Yaquina Bay, not including fish brought into the port by fishing craft, is shown below, in tons:

Year	Receipts	Shipments	Total	Year	Receipts	Shipments	Total
1932.....	3,318	34,267	37,585	1939.....	2,449	75,601	78,050
1933.....	6,663	48,406	55,069	1940.....	2,048	86,900	88,948
1934.....	4,687	36,092	40,779	1941.....	2,304	85,658	87,962
1935.....	8,891	108,113	117,004	1942.....		6,983	6,983
1936.....	3,462	73,761	77,223	1943.....			
1937.....	9,374	51,274	60,648	1944.....	247		247
1938.....	2,822	82,387	85,209				

Receipts consisted of petroleum products and a small amount of miscellaneous supplies. Shipments consisted entirely of logs and lumber. The lack of tonnage during the years 1942 to 1944, inclusive, was due to suspension of coastwise and intercoastal trade during the war.

23. In addition to the commerce carried in cargo ships, as shown in the foregoing table, there is an increasing tonnage of fresh fish brought in to receiving and processing plants at Yaquina Bay by the various classes of fishing craft. Landings of fish by local craft and value, for the years 1941 to 1944, inclusive, are as follows:

Year	Tons	Value	Year	Tons	Value
1941.....	2,600	\$510,000	1943.....	4,140	\$718,000
1942.....	3,080	612,000	1944.....	4,860	1,033,000

24. *Vessel traffic.*—About 300 fishing boats now are based at Yaquina Bay, ranging in size from 30-foot trollers to craft 50 to 90 feet or more in length, used for bottom fishing. In addition, many transient boats visit the harbor to take on fuel and supplies or to discharge their catch. The tonnage of fish discharged by transients, however, is not of available record. During 1944, the United States Coast Guard checked 4,500 arrivals of fishing boats at the entrance to the bay. Use of the harbor by cargo vessels was discontinued during the war

years but is expected to be resumed in the near future. Calls made by commercial vessels during the past 5 years are listed below.

Sailing draft	Number of calls by steam or motor vessels				
	1940	1941	1942	1943	1944
21 feet.....	2	1	1		
18 to 20 feet.....	22	33	2		
16 to 18 feet.....	9	4			
14 to 16 feet.....	9				
12 to 14 feet.....					
Under 12 feet.....	494	350	265	355	486
Total.....	536	388	268	355	486

25. *Improvements desired.*—At a public hearing held September 20, 1945, at Newport, Oreg., local interests, represented by the port of Newport, the port of Toledo, the city of Newport, and individuals, requested participation by the United States in the construction and maintenance of a protected mooring basin for small boats in Yaquina Bay. The requested basin would be along the north shore of the bay, extending easterly from the port dock about 2,300 feet. It was requested that the United States construct a breakwater about 2,400 feet long on a shoal area known as the middle ground, located between the proposed basin and the bay; a shore wing breakwater about 400 feet long at the southeast end of the proposed mooring area; and perform the necessary dredging in the basin. The area inside the requested breakwater would include a reach of the present authorized channel north of the middle ground.

26. At the hearing, local interests cited the present congested conditions along the water front and the need for an adequate protected moorage area. Loss to fishermen through physical damage to boats, guarding or watching cost, pilfering loss, cost of riding out major storms, travel cost to safe moorings, and value of lost fishing time were estimated at \$58,800 a year. Local interests believe these losses will be eliminated if adequate moorage facilities are provided.

27. The port of Newport expressed willingness to construct berths for at least 200 boats with necessary walkways as soon as the United States completes construction of the breakwater and performs the requested dredging. The port further agreed to furnish all lands, rights-of-way, and easements necessary for the project; to furnish suitable spoil-disposal areas for dredged materials; to construct, maintain, and operate all the moorage facilities and walkways; and to hold and save the United States free from all claims for damages resulting from the improvement.

28. *Difficulties attending navigation.*—There are no unusual difficulties attending navigation in Yaquina Bay except the danger to fishing boats and recreational craft resulting from inadequately protected moorings. The water front of Newport is protected against wind and wave action caused by storms from the west, north, and northwest, but is exposed to the storm winds from the southeast, south, and southwest. The storms that cause most of the damage blow from the south and southeast. Winds from the southerly quadrants blow about 120 days per year. The velocity from that direction exceeds 20 miles an hour, an average of 30 days annually.

Occasional maximum velocities are on the order of 80 to 100 miles per hour.

29. *Survey.*—A hydrographic survey of the navigation channel and adjacent areas made during July 1945 in connection with maintenance dredging was extended by further soundings in November 1945. The area in which improvements are requested was probed to determine the character of bottom materials after preliminary investigations had indicated the presence of shale and hard rock. It was found that the shale underlies most of the proposed basin area, in a stratum of considerable thickness, sloping gently from the shore line to a depth of 10 feet at a distance of 200 to 300 feet channelward.

30. *Plan of improvement.*—The existing project for Yaquina Bay and Harbor, Oreg., provides two channels in the bay at Newport. The northerly channel has a project depth of 18 feet and width of 200 feet, and lies along the north side of the harbor, affording access to the existing docks. The southerly channel, authorized by the River and Harbor Act of March 2, 1945, and described in Senate Document No. 119, Seventy-seventh Congress, first session, which document contains the reports under review, is separated from the north channel by a shoal area known as the middle ground. Both channels enter a turning basin upstream from the middle ground.

31. The plan of improvement submitted by the local interests includes construction of a breakwater about 2,400 feet long, located on the middle ground and roughly parallel to the navigation channels. The mooring basin for small boats would be located between this breakwater and the north shore of the harbor and the mooring area would encroach upon the present north ship channel.

32. A survey made in connection with this report indicates that excavation of the basin, as requested, would require dredging of about 70,000 cubic yards of sand and silt and 30,000 cubic yards of shale. This latter item, estimated at \$10 per cubic yard, would cost \$300,000.

33. The alternate plan of improvement proposed herein, which is believed preferable, would make use of the present north channel primarily as a channel and harbor area for small boats. The authorized south channel would provide satisfactory access to the new turning basin and terminal proposed to be constructed thereon. Under this plan the shale material would not have to be excavated and the cost of the project would be greatly reduced. The breakwater would be constructed in approximately the same location as that proposed by local interests, but the walkways and mooring floats would be considerably farther from shore so as to avoid the shale excavation. Little dredging will be required along the north shore of the middle ground, as the north channel will not longer be used by deep-draft vessels.

34. The present port dock, owned and operated by the port of Newport, is in poor condition and not suitable for transfer of heavy cargo to oceangoing ships. The port is required, in order to comply with the conditions of local cooperation set up in the modification of the project authorized by the River and Harbor Act of March 2, 1945, to provide adequate terminal facilities open to all on equal and equitable terms. Officials of the port are cognizant of the fact that loading of ocean ships along the Newport water front at or in the vicinity of the present port dock is incompatible with accommodation of the

large and growing fishing fleet. By resolution adopted January 8, 1946, the port of Newport has agreed to build a new dock and terminal facilities on the south side of Yaquina Bay, adjacent to the authorized turning basin, and has agreed to a modification of the existing project for Yaquina Bay and Harbor to require only such depth of channel along the water front and on the north side of the middle ground as is necessary for maneuvering of boats of the fishing fleet and other light draft vessels.

35. The recommended plan of improvement consists of a pile and timber breakwater about 2,650 feet long with top elevation 14 feet above mean lower low water on the middle ground, in the approximate location proposed by local interests, and a shore wing of similar type and about 400 feet long at the southeasterly end of the proposed basin. The area within the mooring basin would be dredged to a depth of 10 feet below mean lower low water except along the northerly edge where the depth might be reduced to 6 or 8 feet if rock is encountered. The material dredged would consist entirely of sand and silt. Cost of this improvement is estimated as follows:

Cost to United States:

Breakwaters:

Piling, timber, creosoted, 19,600 linear feet, at \$1.50.....	\$29, 400
Lumber, creosoted, 555,000 feet board measure, at \$150.....	83, 300
Hardware, 27,150 pounds, at 14 cents.....	3, 800
Stone, 22,000 tons, at \$4.....	88, 000
Dredging, 41,000 cubic yards, at 50 cents.....	20, 500
Total.....	<u>225, 000</u>

Cost to local interests:

Walks, floats, and mooring piles:

Piling:

Timber, creosoted, 33,000 linear feet, at \$1.50.....	49, 500
8-inch steel pipe, 7,000 linear feet, at \$2.25.....	15, 700
Lumber, 297,000 feet board measure, at \$120.....	35, 600
Float logs, 317,000 feet board measure, at \$35.....	11, 100
Hardware, 44,000 pounds, at 14 cents.....	6, 100
Utilities, lump sum.....	10, 000

Total..... 128, 000

Total estimated cost of improvement..... 353, 000

36. Maintenance dredging by the United States of the small-boat channel in front of the mooring facilities in the basin may not be required every year, but over the life of the project is estimated to cost an average of \$2,000 annually. Maintenance of the breakwaters is estimated to be \$3,000 annually, making the total estimate of Federal annual maintenance \$5,000. The non-Federal cost of operation and maintenance of the mooring facilities and maintenance dredging in the basin is estimated at \$8,000 annually.

37. *Benefits.*—The benefits expected to result from the proposed improvement will accrue to a large proportion of the population of the Yaquina Bay area, principally through the fishing and fish-processing industries. The present fleet can increase the annual catch of fish, thus augmenting the fishermen's income and adding to the national food supply. While Newport is primarily a commercial fishing port, benefits would also accrue to local and transient recreational craft, particularly coastwise cruisers seeking relief from heavy weather or desiring to replenish fuel and supplies.

38. Direct annual benefits attributable to the proposed improvement would result principally from the elimination of conditions that cause physical damage to fishing craft while in the harbor, reduce their fishing time, and lessen the volume of fish caught. The losses are stated and summarized in the following paragraphs.

39. *Direct damage to boats at moorings.*—Due to the inadequate and unprotected moorage facilities, some 250 fishing vessels are subjected to recurring loss and damage estimated to average \$40 per boat and to total \$10,000 per year. Those losses arise from the chipping of hulls and breakage of structural parts, by the surge of boats battered against wharves and against each other by waves and by frequent shifting which is inevitable when they are moored to each other as many as seven abreast. When so moored, the outer vessels are well out in the fairway of the harbor and there is much additional expense incurred in servicing the fleet with fuel and supplies.

40. *Cost of moving to safety.*—When storms arise, most of the fleet must seek safety at Toledo, about 10 miles upstream. It is estimated that 200 boats are forced to so move five times annually at a cost of \$10 each round trip, or a total cost of \$10,000, not including the operator's expense of land travel between Toledo and his home at Newport.

41. *Increased catch of fish.*—A moorage in a safe harbor convenient to receiving stations and service facilities will enable fishing craft to get to their fishing grounds sooner and stay there longer and thus enable them to increase their catch. As any increase adds to the national food supply, such addition is considered as a public benefit, particularly when accomplished without increase of plant or personnel. Under present conditions fishing time is lost when storms arise, due to the necessity of making the 10-mile run to Toledo to find a safe berth and return to the lower bay. It is estimated that elimination of these delays would enable the 250 boats based at Newport to increase their catch at least 1,000 pounds annually per boat, or a total of 125 tons, for which the fishermen would receive an average of \$200 per ton or a total of \$25,000.

42. *Intangible benefits.*—In addition to the direct benefits, there will be indirect benefits to which an annual value of \$5,000 is assigned, all of which will accrue to the public through increased property values, more stable employment in fish-processing industries and the various service industries of the area, and in aiding the fish industry of the Pacific coast to establish and maintain itself as a permanent institution.

Summary of benefits

Elimination of damage to boats at moorage.....	\$10,000
Elimination of cost of moving to safety.....	10,000
Increased catch of fish.....	25,000
Indirect benefits.....	5,000
Total.....	50,000

43. *Aids to navigation.*—The cost of any additional channel or obstruction markers required for the recommended improvement is small. Local United States Coast Guard officials have been contacted and fully concur in the proposed location, stating that they will provide ordinary navigation aids required in connection with the improvement recommended.

44. *Analysis of economic justification.*—The estimated Federal and non-Federal first costs together with annual carrying charges, maintenance, operation, savings, and benefits, and the ratio of savings and benefits to annual carrying charges are summarized below:

(1) Federal investment.....		\$225, 000
(2) Federal annual carrying charges:		
(a) Interest (3 percent).....	\$6, 750	
(b) Amortization (20 years).....	8, 370	
(c) Maintenance.....	5, 000	
	20, 120	
(3) Non-Federal investment.....		128, 000
(4) Non-Federal annual carrying charges:		
(a) Interest (3½ percent).....	\$4, 480	
(b) Amortization (20 years).....	4, 531	
(c) Maintenance and operation.....	8, 000	
	17, 011	
(d) Total non-Federal carrying charges.....	17, 011	
(e) Net return from rentals and charges.....	12, 500	
	4, 511	
(5) Total annual carrying charge.....	24, 631	
(6) Total annual benefits.....	50, 000	
(7) Ratio of benefits to costs.....		2.0 to 1

DISCUSSION

45. Newport, Oreg., located on Yaquina Bay, is the center of a large and growing fishing industry. About 300 fishing boats, ranging from 30 to 90 feet in length, are based there. From their fishing area offshore, these boats delivered to the receiving and packing plants in Newport 4,860 tons of fish in 1944, valued at \$1,033,000.

46. No protected moorage exists in Yaquina Bay where any considerable portion of the fleet may find shelter from storms, or may berth with convenience and safety for repairs or supplies. The Newport water front is exposed to winds from the southerly quadrants, often attaining gale velocities. Mooring at various docks along the water front and at a float owned by the port of Newport is hazardous and results in damage to many craft. During storm periods, many craft are compelled to ride out storms in the bay or seek shelter at Toledo, 10 miles inland.

47. At a public hearing in Newport, on September 20, 1945, local interests requested participation by the United States in the construction and maintenance of a mooring basin protected from storm waves by a breakwater located on the "middle ground," a shoal area lying between the existing 18-foot project channel in the bay and the recently authorized 20-foot channel which will lead from the bay entrance to a turning basin opposite McLean Point. Investigation of the site discloses that the area proposed by local interests to be utilized for the basin is underlain by shale, the dredging of which to obtain adequate depth would be very expensive.

48. An alternate and more satisfactory plan has been developed and is presented herein, with concurrence of local interests. Under this plan a breakwater would be constructed approximately in the location suggested by local interests, but the mooring area would be moved channelward so as to avoid the dredging of hard materials.

49. Local interests requested that maintenance dredging in the basin be done by the United States. It appears, however, that such work, in the restricted spaces between piling and among boats, may not be done by the dredges customarily used for maintenance dredging in the main channel in the harbor, and can be handled more economically by local interests.

50. This proposed modification of the existing project is in conflict with the established pier head and bulkhead lines on the north side of Yaquina Bay. Local interests have requested abrogation of such lines within the proposed basin.

51. Benefits to accrue as a result of the improvement, by eliminating damage to boats and cost of moving to safe moorages during storm periods, by increasing the catch of fish, and indirect benefits, are estimated to be \$50,000 annually. Annual charges on the Federal investment are estimated to be \$20,120, and on the non-Federal investment \$17,011, of which \$12,500 would be offset by return to the port of Newport from rentals and other charges. The ratio of estimated annual benefits to estimated annual charges is 2.0 to 1.

CONCLUSIONS AND RECOMMENDATIONS

52. In view of the savings to fishermen and to operators of small boats, and general benefits which would result from provision of a sheltered mooring basin in Yaquina Bay at Newport, Oreg., the district engineer is of the opinion that modification of the existing project to provide for this improvement is justified. It is, therefore, recommended that the existing project for Yaquina Bay and Harbor, Oreg., be modified to provide for a breakwater about 2,650 feet long and a shore wing about 400 feet long, both of pile, timber, and stone construction; and to provide for initial dredging in a mooring basin for small boats to a depth of 10 feet, all at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for additional maintenance; provided, that local interests furnish free of cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas required; agree to maintain necessary depth in the basin; agree to construct, maintain, and operate necessary mooring facilities and utilities within the basin, including a public landing with suitable supply facilities, open to all on equal and equitable terms; and agree to hold and save the United States free from all claims and damages resulting from this improvement.

O. E. WALSH,
Colonel, Corps of Engineers,
District Engineer.

[First endorsement]

OFFICE, DIVISION ENGINEER,
NORTH PACIFIC DIVISION,
Portland, Oreg., March 26, 1946.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. I have reviewed the review of reports on Yaquina Bay and Harbor, Oreg., and concur in the recommendation of the district engineer that the existing project for Yaquina Bay and Harbor, Oreg.,

be modified to provide for a breakwater about 2,650 feet long and a shore wing about 400 feet long, both of pile, timber, and stone construction; and to provide for the initial dredging in a mooring basin for small boats to a depth of 10 feet below mean lower low water; all at an estimated cost to the United States of \$225,000 for new work and \$5,000 annually for additional maintenance; provided, that local interests furnish free of cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas required; agree to maintain, necessary depth in the basin; agree to construct, maintain, and operate necessary mooring facilities and utilities within the basin, including a public landing with suitable supply facilities, open to all on equal and equitable terms; and agree to hold and save the United States free from all claims and damages resulting from this improvement.

2. I have reviewed the economics of this report and consider reasonable the district engineer's estimates of annual benefits in the amount of \$50,000 and of net annual charges on the Federal and non-Federal investment in the amount of \$24,631 and indicating a ratio of estimated annual benefits to estimated annual charges of approximately 2.0 to 1.

Theron D. Weaver,
*Colonel, Corps of Engineers,
Division Engineer.*

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