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BLAINE HARBOR, WASH.

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED MAY 4, 1953, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON A REVIEW OF REPORTS ON BLAINE HARBOR, WASH., REQUESTED BY A RESOLUTION OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED ON JUNE 23, 1943

AUGUST 25, 1953.—Referred to the Committee on Public Works and ordered to be printed with two illustrations (pursuant to Public Law 153, 83d Cong.)

LETTER OF TRANSMITTAL

DEPARTMENT OF DEFENSE,
DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., August 10, 1953.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated May 4, 1953, from the Chief of Engineers, United States Army, together with accompanying papers and illustrations, on a review of reports on Blaine Harbor, Wash., requested by a resolution of the Committee on Rivers and Harbors, House of Representatives, adopted on June 23, 1943.

In accordance with section 1 of Public Law 14, 79th Congress, the views of the State of Washington and the Department of the Interior are set forth in the enclosed communications.

Although the Bureau of the Budget advises that there is no objection to the submission of the report to the Congress, it states that no

commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

EARL D. JOHNSON,
Acting Secretary of the Army.

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D. C., July 1, 1953.

The honorable the SECRETARY OF THE ARMY.

MY DEAR MR. SECRETARY: Receipt is acknowledged of your letter dated May 12, 1953, submitting the proposed report of the Chief of Engineers on Blaine Harbor, Wash., requested by a resolution of the Committee on Rivers and Harbors, House of Representatives, adopted June 23, 1943.

The Chief of Engineers recommends improvement of Blaine Harbor to provide enlargement of the existing mooring basin by dredging an area of 14.7 acres to a depth of 12 feet below mean lower low water, with suitable breakwater protection. First costs to the United States are estimated at $354,800 for construction and $2,000 for navigation aids, while first costs to be borne by local interests are estimated at $197,350. Annual benefits are estimated at $44,833, of which $32,523 would accrue to fishing craft and $7,310 to recreational craft. Annual costs are estimated at $31,910. The resulting benefit-cost ratio is 1.40.

I am authorized by the Director of the Bureau of the Budget to advise you that there would be no objection to the submission of the report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

CARL H. SCHWARTZ, JR.,
Chief, Resources and Civil Works Division.

COMMENTS OF THE STATE OF WASHINGTON

STATE OF WASHINGTON,
DEPARTMENT OF CONSERVATION AND DEVELOPMENT,
Olympia, March 10, 1953.

S. D. STURGIS, JR.,
Major General,
Acting Chief of Engineers,
Department of the Army,
Washington, D. C.

DEAR GENERAL STURGIS: This is to acknowledge receipt of the copy of your proposed report, together with the reports of the Board

of Engineers for Rivers and Harbors, and of the district and division engineers, on a review of reports on Blaine Harbor, Wash., and to submit my comments and recommendations relative to this proposed project.

The need for this work at Blaine Harbor, as proposed by the engineers, has grown throughout the past few years from necessary to urgent to critical. Commercial fishing is one of the important industries of the State of Washington and this small-boat harbor at Blaine is used primarily by the fishing fleet. The area in the immediate vicinity produces the best fishing in Puget Sound waters.

This harbor at Blaine is also the nearest port to Alaska and is used extensively by the fishing fleet for repair facilities during the winter. In addition to the fishing boats that use this area many pleasure craft tie up inside this small haven. It is the last port before crossing the border into Canadian waters.

Approximately 345 transient fishing craft use this small harbor during the fishing season on average weekends. The number of craft that tie up here has increased about 15 percent each year for the last few years and there is every indication that this proportion of increase will continue. The present facilities are so inadequate that there is not only great risk of collision and fire but has reached a point where many craft will be unable to find any moorage space.

In making any recommendation which involves the expenditure of Federal funds on a local project I find it desirable to consider the extent to which the local area is helping itself. In this case I am satisfied that the community of Blaine is doing, and will continue to do, all it feasibly can toward fiscal expenditure on this project. There has been complete local cooperation in every respect.

In view of these facts I not only concur in your proposed report but sincerely urge the immediate construction of this extremely important improvement at Blaine Harbor, Wash.

Sincerely yours,

W. A. GALBRAITH, *Director.*

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., April 24, 1953.

Maj. Gen. S. D. STURGIS, JR.,
Chief of Engineers,
Office of the Chief of Engineers,
Department of the Army.

MY DEAR GENERAL STURGIS: This is in response to your letter of February 20, 1953, requesting the comments of this Department on a proposed report of the Chief of Engineers on a review of reports on Blaine Harbor, Wash.

The report proposes the improvement of the small boat harbor at Blaine Harbor, Wash., to provide for enlargement of the existing mooring basin by dredging an area of 14.7 acres to a depth of 12 feet below mean lower low water, with suitable breakwater protection.

The estimated cost to the United States is $354,800 for construction and $8,000 annually for maintenance of the breakwater only. Local

interests would be required to fulfill certain conditions as to their participation, at an estimated first cost of $197,350. The report concludes that the project is justified on a benefit-cost ratio of 1.40 to 1, and recommends that the project be approved. Principal benefits are identified as the elimination of damages to fishing vessels and an increase in the net value of the fish catch.

We note that the proposed expansion of harbor facilities will aid in the operation of fishing vessels. No interests of the Department of the Interior would be adversely affected by the proposed project. Consequently, we are glad to concur in the proposed plan and to endorse the recommendations of the report.

We appreciate the opportunity of reviewing the report.

Sincerely yours,

FRED G. AANDAHL,
Assistant Secretary of the Interior.

REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, D. C., May 4, 1953.

Subject: Blaine Harbor, Wash.
To: The Secretary of the Army.

1. I submit herewith for transmission to Congress the report of the Board of Engineers for Rivers and Harbors in response to resolution of the Committee on Rivers and Harbors of the House of Representatives, adopted June 23, 1943, requesting the Board to review the reports on Blaine Harbor, Wash., submitted November 9, 1936, and previous reports, with a view to determining if improvement in the interest of navigation is advisable at this time.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends the improvement of Blaine Harbor, Wash., to provide for enlargement of the existing mooring basin by dredging an area of 14.7 acres to a depth of 12 feet below mean lower low water, with suitable breakwater protection; generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost to the United States of $354,800 for construction and $8,000 annually for maintenance of the breakwater only, subject to the condition that local interests agree to (*a*) furnish without cost to the United States all lands, easements, rights-of-way, and spoil-disposal areas, suitably bulkheaded where necessary, for construction and for subsequent maintenance when and as required; (*b*) hold and save the United States free from damages due to the construction and maintenance of the improvement; (*c*) accomplish and maintain alterations as required in water, sewer, drainage, and other utility facilities, including diversion of the existing sewer draining into the boat basin area; (*d*) maintain the present mooring basin to a depth of at least 12 feet below mean lower low water, maintain that portion of the existing breakwater not included in the Federal project, and maintain the basin extension to project dimensions; and (*e*) construct, maintain, and operate adequate mooring

facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal terms.

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

S. D. STURGIS, Jr.,
Major General,
Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

CORPS OF ENGINEERS, UNITED STATES ARMY,
BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., February 5, 1953.

Subject: Blaine Harbor, Wash.
To: The Chief of Engineers, United States Army.

1. This report is submitted in response to the following resolution adopted June 23, 1943:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, 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 Blaine Harbor, Washington, submitted November 9, 1936, and previous reports, with a view to determining if improvement in the interest of navigation is advisable at this time.

2. Blaine Harbor is in the northwestern part of Washington, immediately south of the international boundary and on the easterly shore of Semiahmoo Bay and Drayton Harbor. It is about 100 miles north of Seattle. Semiahmoo Bay, a funnel-shaped indentation on the easterly shore of Georgia Strait, is connected with Drayton Harbor by a narrow channel at its eastern end. Drayton Harbor, a natural cove about 2 miles square, is separated from the bay at Semiahmoo Spit, a low, narrow sandspit extending about 1.3 miles northeasterly from the southerly shore of the bay. Depths in the bay range up to 58 feet and in Drayton Harbor up to 70 feet. The entrance channel into Drayton Harbor is about 1 mile long, with a minimum width of about 550 feet at a depth of 24 feet. Controlling depth in the channel proper is 28 feet. Adjacent to the wharf of the Alaska Packers Association at Semiahmoo, on the end of the sandspit, depths of 30 feet or more extend over a channel width of 470 feet, except for an isolated shoal 27 feet deep about 370 feet northeast of the wharf. As defined by Federal pierhead lines, Blaine Harbor extends from the international boundary to the southern end of Drayton Harbor. For purposes of this report, the harbor is considered to include the approach channel and the wharf at Semiahmoo. The mean range of tides is 5.9 feet. There is no existing Federal project for improvement of Blaine Harbor, however, during the period 1936 to 1949, inclusive, certain improvements were made by local interests at a total cost of $258,390, of which $38,570 were contributed by the Federal Public Works Administration. These improvements resulted in the provision of a small-boat basin 12 feet deep, and otherwise sufficient to accommodate about 110 vessels. The basin is owned and operated by the port of Bellingham. At present it is used mainly for moorage and servicing of fishing craft. It is used also as a harbor of refuge and for temporary moorage of vessels seeking United States customs clearance.

3. The area tributary to Blaine Harbor includes primarily the city of Blaine and its environs. The area, containing about 60 square miles, had a population of 3,570 in 1940, with 1,524 in the city of Blaine. The principal resources of the area are its fisheries, forests, farmlands, and natural recreational features. Past industrial development centered chiefly on forest resources, but in recent years fishing and allied industries have become increasingly important. The Alaska Packers Association, whose operations are mainly in Alaskan waters, has its headquarters, supply, service, and repair facilities at the north end of Semiahmoo Spit. The city of Blaine is served by rail and highway facilities. Ferry service is available between Blaine and Semiahmoo, the extent of such traffic depending largely upon industrial operations at Semiahmoo. There are three wharves at Blaine, all owned by the port of Bellingham. One, a general cargo wharf, is open to the public, and the others are under lease to fish-buying concerns. The Alaska Packers Association maintains and operates two open-pile wharves and other facilities at the northern end of Semiahmoo Spit in connection with its Alaskan and domestic fishing operations. The wharves have no direct railway connection and are not open to the general public. Annual commerce for Blaine Harbor during the 10-year period 1940 through 1949 averaged about 40,440 tons per year, of which about 16,720 tons were rafted logs. Principal items of commerce are logs, canned salmon, wood products, and seafood. Records show a total fish catch of 7,994 tons in 1949 for the areas adjacent to Blaine, of which 2,543 tons, valued at $571,500, were landed at Blaine. About 80 percent of the total catch was salmon. Except for the log traffic and local fish receipts, most of the traffic is connected with operations of the Alaska Packers Association. Vessel traffic in 1949 consisted of 13 trips by vessels drawing 12 to 24 feet and 9,146 trips by vessels with drafts under 12 feet. The deep-draft vessel traffic stems from operations of the Alaska Packers Association at Semiahmoo. About 54 fishing boats and 23 recreational craft permanently base at Blaine, but an average transient fishing fleet of 300 vessels uses the harbor regularly during fishing seasons and in some years as many as 500 have sought shelter in the harbor during storms.

4. Local interests request Federal assistance in expanding the small-boat basin at Blaine by dredging an additional area of about 14 acres to a depth of 12 feet; providing and maintaining a new entrance to the basin; constructing and maintaining a new breakwater; and assuming maintenance of the existing breakwater. They also desire dredging of the shoal area north of the Semiahmoo wharf. They state that the 300 to 500 fishing vessels which use the harbor as a base of operations during fishing seasons greatly overtax the existing facilities and that the ensuing congestion results in excessive wear and tear, damages, and loss of time in the harbor. Other vessels are forced to seek moorage at more distant points with consequent increase in operating costs and loss of productive time. In urging removal of the shoals north of Semiahmoo, ship operators claim that inadequate maneuvering space at the Semiahmoo wharf results in delays which cause increased vessel-operating and cargo-handling costs. Local interests indicate a willingness to cooperate in the improvement including, among other things, to maintain the extended basin to project dimensions.

5. The district engineer states that although Drayton Harbor is a landlocked cove, storm winds strike with considerable force and create a hazard to small craft that attempt to anchor in the open waters of the harbor. To alleviate this hazard, local interests have constructed a protected small-boat harbor at Blaine of sufficient capacity to accommodate adequately only the locally owned fleet. Additional facilities are required to meet the needs of the transient fleet. He finds that the most practicable plan for meeting these needs would provide for construction of a rubble-mound breakwater about 1,500 feet long south of the existing basin and proposed extension; and dredging of an additional moorage area of 14.7 acres shoreward of the existing basin to a minimum depth of 12 feet at mean lower low water, with an entrance channel to the addition, 100 to 150 feet wide and 12 feet deep. In addition, the proposed project would include Federal maintenance of the existing 850-foot section of locally constructed breakwater, which is considered necessary for adequate protection of the enlarged basin. Local interests would be required to provide and maintain suitable moorage and service facilities and necessary bulkheads for retention of dredged material that would be used for extending the existing fill; divert an existing storm sewer from the basin site; maintain the dredged basin to project dimensions; and continue maintenance of the existing pile breakwater sections at the entrance to the basin. The basin extension would provide moorage space for 375 boats in addition to the 110 accommodated by present facilities. The district engineer estimates the cost to the United States at $354,800 for construction and $2,000 for navigation aids, a total of $356,800; and the cost to local interests at $197,350 for lands and rights-of-way, bulkheads, moorage facilities, utilities, sewer diversion, and terminal facilities. The total estimated first cost is $554,150. The district engineer estimates the Federal annual carrying charges at $21,990, which includes $8,000 for maintenance of the existing and proposed breakwaters; and the net non-Federal annual carrying charges at $9,920, including the cost of dredging to maintain a depth of 12 feet in the basin. The estimated annual carrying charges total $31,910. Prospective annual benefits are estimated by the district engineer at $44,833, of which $32,523 would accrue to fishing craft and $12,310 to recreational craft. The principal benefits would consist of elimination of damages and losses to fishing vessels and expenses which would otherwise be incurred in precautionary measures to keep such damages and losses at a minimum; and of the net value of the increased fish catch. The benefit-cost ratio is 1.40.

6. The district engineer states further that lack of a turning basin with sufficient depth hinders ship operation at the Semiahmoo wharf. Tug service is not available; consequently ships must execute a turn in the restricted channel adjacent to the Alaska Packers Association wharf by swinging around under their own power. Because of the hazards of grounding, and delays necessitated by awaiting favorable tides and winds, steamship companies are reluctant to consign their ships to Blaine Harbor. The proposed improvement would consist of removing a shoal about 370 feet northeasterly of the Semiahmoo wharf to a depth of at least 30 feet below mean lower low water, and of widening the deepwater area adjacent to the wharf to a width of 625 feet at a minimum depth of 30 feet, which would provide a turning basin about 1,500 feet long and 625 feet wide. The district engineer estimates the Federal first cost at $16,000 and the annual charges at

$840, including $200 for maintenance. No local costs would be involved. He estimates average annual benefits at $1,250, of which $600 would be savings in vessel-operating costs and $650 would be savings in cargo-handling expense due to the elimination of delays in turning. The benefit-cost ratio is 1.49.

7. The district engineer recommends that a Federal project be adopted for Blaine Harbor, Wash., to provide for—

(1) Expansion of the existing small-boat harbor adjacent to E Street by constructing a rubble-mound breakwater about 1,500 feet long; dredging 14.7 acres to a depth of 12 feet at mean lower low water as a shoreward extension of the existing mooring basin, with an entrance channel of the same depth and 100 to 150 feet wide; and maintaining about 850 feet of existing breakwater; all at an estimated first cost to the Corps of Engineers of $354,800 and an annual cost of $8,000 for maintenance.

(2) Removing shoals in the entrance channel adjacent to the main wharf at Semiahmoo to provide a turning basin at least 625 feet wide and 30 feet deep at mean lower low water, at an estimated first cost to the Corps of Engineers of $16,000, and an annual cost of $200 for maintenance.

He further recommends that, before any work is undertaken by the United States, responsible local interests be required to give assurances satisfactory to the Secretary of the Army that they will, without cost to the United States, (*a*) furnish all lands, easements, disposal areas, and rights-of-way necessary for the construction and maintenance of the boat basin when and as required, including title to that portion of the existing breakwater to be maintained by the Federal Government; (*b*) hold and save the United States free from damages that may result from construction and maintenance of the improvements; (*c*) provide and maintain necessary bulkheads for retention of dredged material when and as required; (*d*) accomplish and maintain alterations as required in water, sewer, drainage, and other utility facilities, including diversion of the existing sewer draining into the boat basin area; (*e*) maintain the present mooring basin to a depth of at least 12 feet below mean lower low water, maintain that portion of the existing breakwater not included in the Federal project, and maintain the basin extension to project dimensions; and (*f*) construct, maintain, and operate without profit, adequate mooring facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal and reasonable terms. The division engineer concurs.

8. The Board of Engineers for Rivers and Harbors, after consideration of the reports of the district and division engineers, was not convinced that the removal of shoals in the entrance channel adjacent to the main wharf at Semiahmoo was justified at this time in the interest of general navigation, and it so notified local interests. They subsequently expressed a willingness to forego removal of the shoals but reiterated their desire and need for a larger small-boat harbor.

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

9. The Board of Engineers for Rivers and Harbors, after further consideration of the reports of the district and division engineers and the expressions of local interests following the Board's notice, is of the opinion that the improvement of the small-boat basin at Blaine Harbor, as proposed by the district engineer, is justified. On the other hand, it believes that the benefits from the proposed improvement of the entrance channel by removal of shoals would be primarily local and the work would not be justified in the interest of general navigation.

10. Accordingly, the Board recommends the improvement of Blaine Harbor, Wash., to provide for enlargement of the existing mooring basin by dredging an area of 14.7 acres to a depth of 12 feet below mean lower low water, with suitable breakwater protection; generally in accordance with the plan of the district engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable; at an estimated cost to the United States of $354,800 for construction and $8,000 annually for maintenance of the breakwater only, subject to the condition that local interests agree to (*a*) furnish, without cost to the United States, all lands, easements, rights-of-way, and spoil-disposal areas, suitably bulkheaded where necessary, for construction and for subsequent maintenance when and as required; (*b*) hold and save the United States free from damages due to the construction and maintenance of the improvement; (*c*) accomplish and maintain alterations as required in water, sewer, drainage, and other utility facilities, including diversion of the existing sewer draining into the boat basin area; (*d*) maintain the present mooring basin to a depth of at least 12 feet below mean lower low water, maintain that portion of the existing breakwater not included in the Federal project, and maintain the basin extension to project dimensions; and (*e*) construct, maintain, and operate adequate mooring facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal terms.

For the Board:

B. L. Robinson,
Brigadier General,
Chairman.

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

The district engineer reports that increasing small-boat activities and lack of adequate moorage facilities in Blaine Harbor necessitate enlargement of the present small-boat basin, and that general benefits from this improvement are sufficient to warrant Federal participation in the work. He also reports that difficulties of maneuvering ships at the Semiahmoo wharf because of inadequate turning space are of sufficient consequence to warrant widening of the existing channel at Federal expense. He accordingly recommends adoption of a Federal project for Blaine Harbor providing for (*a*) expansion of the existing small-boat harbor by (1) constructing a rubble-mound breakwater 1,500 feet long; (2) dredging 14.7 acres to a depth of 12 feet at mean lower low water, with an entrance

channel 100 to 150 feet wide; and (3) maintaining 850 feet of existing breakwater; all at an estimated Corps of Engineers first cost of $354,800 and an annual cost of $8,000 for maintenance; and (*b*) a turning basin at the Semiahmoo wharf by dredging the channel to a width of 625 feet at a depth of 30 feet, at an estimated Corps of Engineers first cost of $16,000 and $200 annually for maintenance; both subject to certain conditions of local cooperation as outlined in the report.

CORPS OF ENGINEERS, UNITED STATES ARMY,
OFFICE OF THE DISTRICT ENGINEER,
SEATTLE DISTRICT,
Seattle, Wash., August 15, 1950.

Subject: Review of Reports on Blaine Harbor, Wash.
To: Division Engineer, North Pacific Division, Corps of Engineers Portland, Oreg.

I. GENERAL CONSIDERATIONS

1. *Authority.*—This report is submitted in compliance with a resolution adopted June 23, 1943, by the Committee on Rivers and Harbors of the House of Representatives, United States, which reads as follows:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, 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 Blaine Harbor, Washington, submitted November 9, 1936, and previous reports, with a view to determining if improvement in the interest of navigation is advisable at this time.

2. *Scope of review.*—In response to the foregoing resolution, the district engineer submitted a preliminary examination report on October 10, 1947, recommending a survey of Blaine Harbor. The division engineer and the Board of Engineers for Rivers and Harbors concurred in the recommendation, and the Chief of Engineers, on June 21, 1948, authorized a survey of the harbor. The report studies are based on data available in published documents and in the files of this office, on information furnished by local interests, and on topographic and hydrographic surveys of Blaine Harbor made by this office in June 1949 and May 1950. During the course of the investigation, interested local, port, city, county, State, and Federal agencies were consulted. Their comments and suggestions have been given full consideration in the studies.

3. The following reports are reviewed herein:

(*a*) Report on preliminary examination of Blaine Harbor, prepared under authority of the River and Harbor Act of March 2, 1907, and published in House Document No. 69, 60th Congress, 1st session. The report gave consideration to dredging a channel through the tide flats so that vessels could approach nearer the town. The Chief of Engineers recommended that no survey be made as the desired improvement was in nature an extension of terminal facilities rather than a navigation improvement.

(*b*) An unpublished report on preliminary examination of Blaine Harbor, authorized by the River and Harbor Act approved August 30, 1935, considered a small-boat harbor for fishing vessels. The Chief of Engineers, in his report dated November 6, 1936, recommended that no survey be made.

4. *Description.*—Blaine Harbor is in the northwestern part of the State of Washington, just south of the boundary between the United States and Canada, at approximate north latitude 48°59′ and west longitude 122°46′. It is on the easterly shore of Semiahmoo Bay and Drayton Harbor, about 40 nautical miles by water from Bellingham and 111 nautical miles from Seattle. The locality is shown on United States Coast and Geodetic Survey Charts Nos. 6300 and 6399 and on the map accompanying this report.

5. Semiahmoo Bay is a funnel-shaped indentation on the easterly shore of Georgia Strait, which is part of the inside passage from Washington to Alaska. A narrow channel at its eastern end connects the bay with Drayton Harbor. Depths within Semiahmoo Bay range from 22 to 58 feet except for the tidal flats that extend from 1,000 to 3,500 feet into the bay from the easterly shore. The bay is exposed to the south and west.

6. Drayton Harbor is a natural cove, about 2 miles square, formed by an indentation in the easterly shore of the mainland and Semiahmoo Spit, a low narrow sandspit extending about 1.3 miles northeasterly from the southerly shore of Semiahmoo Bay. The entrance channel to the harbor is about 1 nautical mile in length and has a minimum width of about 550 feet between the 4-fathom depth curves. The controlling depth in the channel proper is 28 feet at mean lower low water. Adjacent to the Alaska Packers Association wharf at Semiahmoo, depths of 30 feet or more prevail over a channel width of 470 feet except for an isolated shoal 27 feet deep about 370 feet northeast of the wharf. An area about 3,000 feet long and from 1,000 to 3,000 feet wide in the northerly part of the Drayton Harbor has depths ranging from 18 to 70 feet. Immediately south of this deep-water area, in the west central part of the harbor, depths of 9 to 18 feet prevail over an area about 4,000 feet long and 3,000 feet wide. Tidal flats extend 2,000 to 5,000 feet into the bay from the easterly and southeasterly shores of the harbor.

7. Blaine Harbor, as defined by Federal pierhead lines established in 1892, extends southward from the international boundary to the southern end of Drayton Harbor. It consists primarily of the tidal flats along the eastern shore. For the purposes of this report, however, Blaine Harbor is considered to include the approach channel and the wharf at Semiahmoo. The existing harbor-line system includes reservations for five waterways extending from the main pierhead line across the tide flats to shore, as shown on the accompanying map. None of these waterways has been improved for navigation. California Creek, with a drainage area of about 16 square miles, enters the harbor from the southeast. Only its entrance is navigable at high tide by small craft of shallow draft. Dakota Creek, with a drainage area of approximately 30 square miles, enters the harbor from the east about three-fourths of a mile north of California Creek. It is navigable at high water for a distance of one-half mile above its mouth by boats drawing not more than 3 feet.

8. *Tides and currents.*—The mean range of tides in Blaine Harbor is 5.9 feet, the diurnal range is 9.5 feet, and the estimated extreme range is 17.0 feet. Definite data on tidal currents are not available. Information from reliable local sources indicates that in the restricted entrance channel currents may attain velocities of 2.5 to 3 knots. Currents elsewhere in the harbor are negligible.

9. *Climate.*—Records of weather observations at Blaine over a period of 55 years show a maximum temperature of 95°, a minimum of

−9°, and a mean of 48.8°. Extreme temperatures occur rarely and are of short duration, as indicated by the average minimum monthly temperature of 29.5° for January, the coldest month, and the average maximum monthly temperature of 73.6° for July, the warmest month, over a period of 31 years of observation. The mean annual precipitation is 40.98 inches, and the average snowfall is 12.7 inches. The harbor is ice-free and open to navigation throughout the year. The prevailing winds are southwesterly during the months of March to September and southeasterly during the remainder of the year. Storm winds sweep across low-lying Semiahmoo Spit and the relatively low neck of land separating Birch Bay from Drayton Harbor and create waves of sufficient height to constitute a considerable hazard to small craft anchored in the harbor.

10. *Adjacent ports.*—Bellingham Harbor is on the easterly shore of Bellingham Bay, about 40 nautical miles southeast of Blaine. The city of Bellingham, with an estimated population of 33,934 in 1950, is the seat of the county government and the principal port of Whatcom County. The waterborne commerce of Bellingham Harbor, averaging about 1,005,500 tons annually over the past 10 years, consists chiefly of rafted logs, wood and paper products, petroleum products, fish and fish products, and miscellaneous merchandise. Federal harbor improvements include dredging and maintenance of two waterways and maintenance of a breakwater. In a recent review of reports on Bellingham Harbor, enlargement of an existing small-boat harbor is recommended.

11. Anacortes Harbor is on the northern shore of Fidalgo Island, about 53 nautical miles south of Blaine. The city of Anacortes, with an estimated population of 6,916 in 1950, is an industrial, commercial, and agricultural center. The waterborne commerce of Anacortes Harbor, averaging about 587,700 tons annually over the past 10 years, consists chiefly of rafted logs, petroleum products, fresh and canned fish, wood and paper products, and miscellaneous merchandise. A Federal project provides for a channel 12 feet deep in Capsante Waterway. In a recent review of reports on Anacortes Harbor, favorable consideration is given to enlargement of an existing basin for small boats adjacent to the improved waterway.

12. *Tributary area.*—The area commercially tributary to Blaine Harbor covers about 60 square miles of the northwesterly portion of Whatcom County, and includes primarily the city of Blaine and its environs, Point Roberts, and the small cannery village of Semiahmoo. The topography varies from the lowlands bordering Drayton Harbor and Birch Bay and the valleys of Dakota and California Creeks to the rolling hills southwest and northeast of Blaine. The lowlands are utilized for agricultural purposes except the lands adjacent to Birch Bay and the easterly shore of Drayton Harbor which are used for summer homes and suburban residences. The rolling hills, which reach elevations up to 450 feet, are generally covered with second-growth timber. Their lower reaches are used quite extensively for grazing.

13. *National and departmental reservations.*—A United States Custom and Immigration Service border station reservation near the intersection of United States Highway 99 and the international boundary between Canada and the United States has an area of about 2 acres.

14. *Cities and population.*—Blaine, situated on the easterly shores of Blaine Harbor, is the only city within the tributary area. It is a port of entry with local offices of the United States Custom and Immigration Services. Being just south of the international boundary and on United States Highway 99, Blaine is a gateway for coastal land traffic to and from Canada. The distribution and trend of population in Blaine and the remainder of the tributary area are given in table 1, adapted from the Federal census (1950 census data not yet available).

TABLE 1.—*Distribution of population, area tributary to Blaine Harbor*

Locality	Population		
	1920	1930	1940
Blaine (city)	2,254	1,642	1,524
Custer (township)	1,438	1,584	1,530
Point Roberts (township)	275	291	310
Semiahmoo (township)	196	175	206
Total, tibutary area	4,163	3,692	3,570

15. The statistics show a decline in population at Blaine and a slight net increase in the outlying areas for the 20-year period. The decline at Blaine resulted from cessation of a large sawmill operation in the first decade of the period. A Washington State Census Board estimate for 1948 showed a population of 1,730 at Blaine, indicating recent growth in keeping with other coastal areas. This growth has resulted partly from expansion of the salmon-cannery operations at Semiahmoo and partly from the general wartime influx of population. Future growth will be influenced by expansion of the established industries such as fishing and fish processing and new industries that may be established.

16. *Resources and industries.*—The principal resources of the tributary area are its fisheries, forests, agriculture, and natural recreational features. Past industrial development centered chiefly on forest resources, but in recent years fishing and allied industries have become increasingly important.

17. *Fisheries.*—Blaine Harbor is adjacent to the productive salmon and bottom-fishing banks of Georgia Strait extending from the San Juan archipelago northward to the international boundary, including particularly Point Roberts and boundary, Semiahmoo, and Birch Bay areas. Salmon runs of the Fraser River in Canada, which is one of the principal salmon-spawning streams of this region, pass through these waters. Besides salmon and bottomfish, some herring and shellfish are caught in the locality. Statistics compiled by the State of Washington Department of Fisheries showed a total catch of 7,994 tons in 1949 for the areas adjacent to Blaine, including 6,362 tons of salmon, 1,198 tons of bottomfish, 16 tons of herring, and 418 tons of shellfish, mostly crabs. The value of the total catch is estimated to be $1,796,600 at the fishermen's price level. About 2,543 tons, valued at $571,500, were landed at Blaine. Except for a few landings directly by fishermen, the remainder of the catch (mostly salmon) was collected on the grounds by fish buyers and landed by them at Bellingham, Anacortes, and various Puget Sound ports. Future productivity of the fishing grounds adjacent to Blaine is expected to continue at a high level in view of the higher salmon runs

expected as a result of the recent installation of fishways and removal of obstacles on the Fraser River and because the bottom fisheries of the area have not yet been fully developed.

18. Local industries at Blaine related to fishing include a vitamin-processing plant, a fish-reduction plant, and six buying stations. The Alaska Packers Association, a corporation whose operations are carried on mainly in Alaskan waters, has its headquarters, supply, service, and repair facilities at the north end of Semiahmoo Spit. The corporation also has a cannery at Semiahmoo for processing locally caught salmon. Only part of the fish landed at Blaine is processed locally, the remainder being trucked to various processing plants and wholesalers as far south as Seattle. The processing plants provide seasonal and regular employment for about 290 people. Locally processed fish and fish products, aggregating about $555,000 in value annually, are shipped to interior points by truck and by rail. Because of its advantageous location with respect to the fishing banks, Blaine has become increasingly important as a base for a considerable number of local and transient boats. The locally based fleet has grown from about 20 in 1944 to 54 in 1949 and the transient fleet using Blaine seasonally has grown from about 60 to 300 in the same period. The current permanent and transient fleets employ about 1,330 fishermen.

19. *Forest resources and industries.*—Statistics compiled by the Pacific Northwest Forest and Range Experiment Station, United States Forest Service, as of September 1941 and January 1943, showed the total volume of merchantable timber resources in Whatcom County to be approximately 9 billion board-feet, of which about 7.2 billion board-feet were on unreserved lands. The merchantable timber is mainly western hemlock, Douglas fir, balsam fir, and western red cedar. Practically all of the original stand of timber in the western part of the county, including the area tributary to Blaine Harbor, was logged in earlier years and a stand of second-growth timber is now reaching merchantable size. Wood manufacturing and processing plants at Blaine consist of a sawmill with a capacity of 70,000 feet board measure per 8-hour shift, a shingle mill with a capacity of 50 squares per 6-hour shift, and a small boatyard, all situated along Dakota Creek. There is also a small sawmill on California Creek. About 18 million board-feet of logs are used annually by the mills. About 90 percent of these logs are imported from British Columbia by water. Mill products are shipped by rail. About 130 persons are employed in the wood-manufacturing and 50 in the boatbuilding industries. The average annual value of the business from these industries amounts to about $2,300,000 and $450,000, respectively.

20. *Agriculture.*—The principal source of farm income is from livestock, dairy, and poultry products. Other farm products in the tributary area include fruits, berries, forage crops, and vegetables. An estimated 600 persons were employed on farms in 1949, and the value of the farm products amounted to about $1,240,000. These products, however, do not contribute to the commerce of Blaine Harbor as they are marketed through Bellingham and other ports to the south.

21. *Recreation.*—The area tributary to Blaine Harbor has many natural recreational features. Many summer homes, beach resorts, and sports-fishing facilities are found on the shores of Drayton Harbor and Birch Bay. The waters of the San Juan Archipelago

attract pleasure craft from all parts of Puget Sound and the coastal areas of British Columbia. Largely because of the lack of adequate moorage facilities, only 23 pleasure craft are based in Blaine Harbor. The Strait of Georgia is a favorite salt-water sports-fishing area. Local interests estimate that approximately 8,000 pounds of food fish (mostly salmon) were landed in Blaine Harbor by sportsmen in 1948. Based on the present average price received by commercial fishermen for troll-caught salmon (which commands a high price), the value of this catch would be about $1,600. Many lakes, suitable for fishing, boating, swimming, and summer homes, are accessible by highway. Many camp grounds, fishing streams, and hunting areas are available in the mountainous areas of the county.

22. *Minerals.*—Whatcom County has extensive nonmetallic and some metallic resources, both developed and undeveloped, but there are no known deposits in the area tributary to Blaine Harbor. Mining activities, such as coal mining and limestone quarrying, are carried on through the neighboring city of Bellingham, where several mineral-using industries are located.

23. *Railroads.*—A coastal line of the Great Northern Railway extends from the main line at Everett, Wash., to Vancouver, British Columbia, passing through Blaine. It provides daily passenger and freight service.

24. *Highways.*—The Pacific Highway (U. S. 99 and State Highway 1), extending from California to British Columbia, passes through Blaine. Local feeder roads provide access to this highway from all parts of the tributary area.

25. *Air transportation.*—Bellingham Airport, about 16 miles south of Blaine by highway, provides adequate facilities for commercial airlines. West Coast Air Lines and United Air Lines provide direct and interconnected daily service to all parts of the United States, Canada, and Alaska.

26. *Port district.*—Blaine Harbor is within the jurisdiction of the Port of Bellingham, whose boundaries are coterminous with those of Whatcom County.

27. *Bridges.*—There are no bridges over any part of Blaine or Drayton Harbors. The tidal portion of Dakota Creek is spanned by three bridges, descriptive data for which are given in table 2.

TABLE 2.—*Bridges over tidal portion of Dakota Creek, Blaine Harbor, Wash.*

Miles above mouth	Owner	Type	Used	Clearance (feet)		Date built	Date War Department approved
				Horizontal	Vertical [1]		
0.25 mile	Whatcom County	Fixed	Highway	57.3	18	1931	Nov. 13, 1930
0.75 mile	Great Northern Ry	do	Railroad	26	15	1930	
0.75 mile	State of Washington	do	Highway	40	14.5	1928	Oct. 1, 1927

[1] Referred to mean higher high water.

The sawmill on Dakota Creek is located upstream from these bridges, and the shingle mill and shipyard are situated downstream from them.

28. A fixed highway bridge, having a horizontal clearance of 10 feet and a vertical clearance of 5 feet above mean high water, spans California Creek at its mouth.

29. *Prior reports.*—All prior reports by the Corps of Engineers on improvement of Blaine Harbor are described in paragraph 3.

30. *Existing Corps of Engineers project.*—No project for improvement of Blaine Harbor in the interest of navigation has ever been authorized by Congress.

31. *Other improvements.*—Improvements for navigation made by local interests are shown in table 3. All of these improvements were made in connection with the present small-boat harbor adjacent to E Street extended. The expenditures for these improvements totaled $258,390, of which the port of Bellingham contributed $118,055; State of Washington, $57,000; city of Blaine, $44,765; and the Federal Public Works Administration, $38,570.

TABLE 3.—*Improvements to navigation on Blaine Harbor made by local interests*

Date	Nature of improvement	Expenditure
1936–37	Dredging an area of about 90,000 square feet to depth of −12 feet at mean lower low water for a small-boat harbor; constructing 475 linear feet of untreated timber pile breakwater; 6,940 linear feet of bulkheads; filling 3,500 linear feet of access roadway 30 feet wide	$98,350
1939	Constructing 90 linear feet of treated timber pile breakwater	5,400
1947–49	Enlarging the existing small-boat harbor by dredging an additional area of 220,000 square feet to depth of −12 feet at mean lower low water; constructing 335 linear feet of treated timber pile breakwater; 834 linear feet of 2-step untreated timber pile breakwater with rock reinforcement; 1,381 linear feet of bulkhead for retention of dredged material; 2,600 linear feet of floats and ramps; and additional access road	154,640
	Total expenditures	258,390

32. *Terminal and transfer facilities.*—At the city of Blaine are three wharves, all of open pile construction and all owned by the port of Bellingham. One, a general cargo wharf open to the public, extends along the pierhead line on the east side of the entrance channel, opposite the outer extremity of Semiahmoo Spit. The wharf is 170 feet long and 60 feet wide, and has depths of 18 feet or more alongside. It is equipped with marine fueling and fresh-water facilities, and has a manually operated derrick for cargo handling. An earth-fill approach, retained by timber bulkhead, extends from the wharf across the tide flats to shore. The approach is 3,600 feet long and generally 30 feet wide except in the outer portion, where an earth-fill terminal area 400 feet wide and 580 feet long extends southward into the small-boat basin This fill is also retained by a timber bulkhead.

33. The two other port wharves extend from the terminal fill into the small-boat basin. One has a face length of 150 feet and a depth of 12 feet alongside, and the other a face length of 30 feet and a depth of about 6 feet. These wharves are equipped for fish handling and are under lease to fish-buying concerns. The terminal fill area is occupied by a fish-processing plant, a fish-reduction plant, and a marine-repair shop. The small-boat basin has an area of 310,000 square feet and is equipped with floats providing about 2,600 linear feet of moorage space and accommodating about 110 boats of the type now using the harbor. It is protected on the north by the wharf approach and on the south by a breakwater. The basin is owned and operated by the port of Bellingham. At present it is used mainly for moorage and servicing of fishing craft but is open to the public on equitable terms. It is also used as a harbor of refuge by vessels plying adjacent waters, and for temporary moorage by vessels seeking United States customs

clearance. Fire protection, boat supply, and service facilities are available in the harbor.

34. Although there is no direct railway connection with any of the wharves in Blaine Harbor, the terminal facilities for general cargo are considered adequate. The small-boat basin and moorage facilities, however, are inadequate for the total number of fishing boats using the harbor during fishing seasons and storms, and for the increasing number of pleasure craft seeking moorage in the harbor.

35. The Alaska Packers Association maintains and operates two open pile wharves, a marine way, and drydock at the northern end of Semiahmoo Spit in connection with its Alaskan and domestic fishing operations. The main cargo wharf has a face length of 530 feet and a minimum depth alongside of 30 feet at mean lower low water. This wharf is equipped for general cargo handling. The other wharf has a face length of 130 feet and a minimum depth of 12 feet alongside. An adjoining float provides 70 feet of additional berthing space. This wharf is used for transfer of cannery oil supplies and servicing of vessels. The wharves have no direct railway connections and are not open to the general public. Adjoining the wharves are the association's cannery, warehouse, cold-storage facilities, and shop, storehouse, and office structures. The wharves and facilities are adequate for present and prospective operations of the association.

36. *Improvements desired by local interests.*—A public hearing was held at Blaine, Wash., on April 11, 1946, by the district engineer in connection with this review. It was attended by 38 persons representing Federal, State, and local governmental agencies, the port of Bellingham, business and civic organizations, and fishing and other industrial and general interests. At the hearing the port of Bellingham and city of Blaine jointly requested (*a*) enlargement of the existing small-boat harbor and (*b*) dredging of waterways Nos. 2, 3, and 5. The Alaska Packers Association and other operators of deep-draft ships requested (*a*) dredging of the entrance channel to Drayton Harbor to a depth of 30 feet at mean lower low water over a width of 300 feet, (*b*) provision of a turning basin at least 600 feet wide and 30 feet deep adjacent to the main Semiahmoo wharf, and (*c*) provision of a winter-moorage basin for ships.

37. In justification of the boat-harbor enlargement, local interests cited the inadequacy of the existing basin and the lack of local funds for harbor expansion. Waterway No. 2 was suggested as an alternate site in the event that Federal funds could not be expended for dredging at the existing site. It was also suggested as a winter base for small craft. Proponents for improvement of waterways Nos 3 and 5 stated that existing tide flats prevented floating of large logs to the mills on Dakota Creek and restricted operations of the boatyard to construction of vessels drawing less than 10 feet. Proponents of the improvements for deep-water navigation stated that the existing entrance channel depths restricted passage of ships drawing 24 to 30 feet to high tide periods and hindered maneuvering of all ships drawing 18 to 30 feet; that the shoal area north of Semiahmoo wharf restricted turning of ships at the wharf; and that a moorage basin for deep-draft vessels was necessary in order to utilize Drayton and Blaine Harbors as a winter base for ships that the association planned to acquire.

38. Subsequent to the hearing and following a restudy of local harbor needs, the City Council of Blaine and the Port of Bellingham

Commission, representing all local interests, adopted resolutions rescinding requests for improvement made at the public hearing and expressing local desires on the basis of present needs. They now desire Federal assistance in expanding the small-boat basin by (*a*) dredging an additional area of about 14 acres to a depth of 12 feet; (*b*) providing and maintaining a new entrance to the basin; (*c*) constructing and maintaining a new breakwater; and (*d*) assuming maintenance of the existing breakwater. They also desire dredging of the shoal area north of the Semiahmoo wharf.

39. In support of their recent requests, the local agencies stated that 300 to 500 fishing vessels use the harbor as a base of operations during fishing seasons, greatly overtaxing existing facilities, especially during weekend closed fishing periods and when seeking refuge from storms. They submitted data showing that the ensuing congestion results in excessive wear and tear, damages, and loss of time in the harbor and stated that some vessels were forced to seek moorage at more distant points with consequent increase in operating costs and loss of productive time. They estimate that these extra expenses and losses represent a monetary loss of $65,000 annually. In urging removal of the shoals north of Semiahmoo, steamship operators report that inadequate maneuvering space at the Semiahmoo wharf delays vessels an average of 7½ hours annually, amounting to about $600 in extra vessel-operating costs. They also estimate that these vessel delays increase cargo-handling costs about $2,240 a year.

40. Local interests expressed their willingness to cooperate in the expansion of the small-boat harbor to the extent of (*a*) providing the necessary lands, rights-of-way and easements; (*b*) constructing and maintaining necessary bulkheads; (*c*) constructing, maintaining, and operating without profit adequate moorage facilities, utilities, and a public landing with suitable service and supply facilities open to all on equal and reasonable terms; (*d*) constructing and maintaining a suitable diversion channel for the sewer draining into the area proposed for development; (*e*) maintaining that portion of the existing breakwater constructed of contact timber piles; and (*f*) maintaining the extended basin to project dimensions.

41. *Commerce.*—A summary of the annual waterborne traffic of Blaine Harbor adapted from annual reports of the Chief of Engineers is given in table 4.

TABLE 4.—*Summary of waterborne traffic for Blaine Harbor, Wash.*

[Tons (2,000 pounds)]

Year	Vessel traffic	Rafted	Total	Passengers (ferry)	Year	Vessel traffic	Rafted	Total	Passengers (ferry)
	Tons	*Tons*	*Tons*			*Tons*	*Tons*	*Tons*	
1939	1,585	9,930	11,515	3,000	1945	27,801	13,520	41,321	9,120
1940	1,054	16,001	17,055	2,492	1946	35,938	30,942	66,880	19,600
1941	2,395	6,457	8,852	2,518	1947	52,009	22,036	74,045	8,310
1942	1,713	7,296	9,009	4,429	1948	48,733	10,891	59,624	17,592
1943	23,543	12,608	36,151	7,300	1949	25,780	11,555	37,335	43,240
1944	18,253	35,858	54,111	5,400					

42. The material increase in vessel traffic in 1943 and subsequent years resulted mainly from the transfer of the Alaska Packers Association base of operations from California to Semiahmoo. The substantial increases for the years 1947 and 1948 are partly due to the change in method of recording foreign log imports. For 1946 and prior years logs imported from Canada were shown as rafted logs, whereas in subsequent years they have been recorded as unmanufactured wood and included in vessel traffic. In 1947 these log imports totaled 10,327 tons, and in 1948 they totaled 9,713 tons. Although increased activity in connection with development of the fishing-boat basin has tended to increase the vessel commerce of the port, the absence of foreign imports and the smaller coastwise receipts of canned salmon in 1949 resulted in a lower overall tonnage for that year.

43. Variations in log traffic shown in the table are generally consistent with fluctuating economic conditions as affected by supply and demand. Future tonnage will probably be influenced largely by the availability of local timber and the need for imports from Canada.

44. Passenger traffic listed in table 4 consists of ferry traffic between Blaine and Semiahmoo. Variation in this traffic depends to a large extent on the industrial operation at Semiahmoo.

45. The nature of present commerce in Blaine Harbor is indicated by the distribution of tonnages for the years 1947 through 1949, shown in table 5. The table shows the principal items of traffic to be logs imported from Canada, coastwise receipts of Alaskan canned salmon and shipments of forest products, boxes, manufactured and miscellaneous goods; internal traffic in rafted logs, canned salmon, and miscellaneous goods; and local receipts of fresh fish and crabs. Except for the log traffic and local fish receipts, the bulk of the traffic is connected with operations of the Alaska Packers Association.