

PLAYA DEL REY INLET AND BASIN, VENICE, CALIF.

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY, DATED AUGUST 8, 1952, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND AN ILLUSTRATION, ON A PRELIMINARY EXAMINATION AND SURVEY OF HARBOR AT PLAYA DEL REY, CALIF., AND A REVIEW OF REPORTS ON PLAYA DEL REY INLET AND BASIN, VENICE, CALIF., AS AUTHORIZED BY THE RIVER AND HARBOR ACT APPROVED ON AUGUST 26, 1937, AND REQUESTED BY A RESOLUTION OF THE COMMITTEE ON COMMERCE, UNITED STATES SENATE, ADOPTED ON JUNE 2, 1936

MAY 13, 1954.—Referred to the Committee on Public Works and ordered to be printed, with one illustration

DEPARTMENT OF THE ARMY,
Washington 25, D. C., May 11, 1954.

THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated August 8, 1952, from the Chief of Engineers, Department of the Army, together with accompanying papers and an illustration, on a preliminary examination and survey of Harbor at Playa del Rey, Calif., and a review of reports on Playa del Rey Inlet and Basin, Venice, Calif., with a view to determining whether any improvement of the locality is warranted at the present time, authorized by the River and Harbor Act approved on August 26, 1937, and requested by a resolution of the Committee on Commerce, United States Senate, adopted on June 2, 1936.

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

The Bureau of the Budget advises that while there is no objection to submission of the report to Congress, authorization of the improvement recommended therein would not be in accord with the program of the President unless the Federal participation is limited to 50 percent of the cost of the general navigation facilities. The complete views of the Bureau of the Budget are contained in the attached copy of its letter.

Sincerely yours,

ROBERT T. STEVENS,
Secretary of the Army.

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington 25, D. C., April 28, 1954.

The honorable the SECRETARY OF THE ARMY.

MY DEAR MR. SECRETARY: Your letter dated March 20, 1953, states that no modifications or revisions need be made from the standpoint of general policy or procedure in the 27 final proposed reports of the Chief of Engineers pending in the Bureau of the Budget on January 20, 1953. One of these is the report on the project at Playa del Rey, Calif. This report had been authorized by the River and Harbor Act approved on August 26, 1937, and requested by a resolution of the Committee on Commerce, United States Senate, adopted on June 2, 1936. Acting Secretary Johnson submitted the report to this office on August 19, 1952.

The Chief of Engineers recommends, subject to certain conditions of local cooperation, the provision of a harbor at Playa del Rey, Calif. First costs to the United States, including aids to navigation, are estimated at \$6,193,000 by the Board of Engineers for Rivers and Harbors. First costs to local interests are estimated at \$19,427,000. It is noted that the Board's estimate of \$25,620,000 for total first costs is based largely on cost estimates made in 1948. On this basis, annual costs are computed to be \$933,025. Annual benefits are estimated at \$1,296,000. The resulting benefit-cost ratio is 1.4.

The Chief of Engineers considers the proposed Federal participation in the project appropriate "if it is the intent of Congress to provide Federal assistance in the development of recreational boating facilities of the type proposed in this report."

The President in his 1955 budget message stated that, "to the greatest extent possible, the responsibility for resource development, and its cost, should be borne by those who receive the benefits." The benefits from Playa del Rey harbor evidently will be largely local in character. While it is recognized that under the proposed plan local interest will be required to spend large sums for lands,

piers, bulkheads, floats, paving, and other facilities, they would be making no contribution to the cost of the general navigation features of the project. The vessel berthing and shore works are items which traditionally have been furnished by local interests in the case of all navigation improvements to insure effective use of the facilities provided by the Federal Government.

We believe that the Federal share of the costs of all recreational harbors should be limited to not more than 50 percent of the first cost of providing the general navigation facilities. In the case of Playa del Rey the general facilities appear to include the jetties, entrance channel, interior channel, and central basin.

Accordingly, while there would be no objection to submission of the report on Playa del Rey Harbor to Congress, authorization of the improvement recommended therein would not be in accord with the program of the President unless the Federal participation is limited to 50 percent of the cost of the general navigation facilities.

Sincerely yours,

DONALD R. BELCHER, *Assistant Director.*

COMMENTS OF THE STATE OF CALIFORNIA

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS,
Sacramento, June 26, 1952.

Gen. LEWIS A. PICK,
*Chief of Engineers,
Department of the Army, Washington, D. C.*

DEAR SIR: Your proposed report on a review of reports on and preliminary examination and survey of Playa del Rey Inlet and Basin, Venice, Calif., was received on April 7, 1952, and transmitted on the same date to the division of water resources of this department for review and report thereon.

The report of the division of water resources has been received and is transmitted herewith in accordance with the provisions of Public Law 14, 79th Congress, 1st session.

I concur in the recommendations contained in the report of the division of water resources and it is requested that said report be considered as expressing the views and recommendations of the State of California on your proposed report on a review of reports on and preliminary examination and survey of Playa del Rey Inlet and Basin, Venice, Calif. It is further requested that the report of the division of water resources, dated June 26, 1952, on this subject be transmitted to the President of the United States and to the Congress along with the other material that may be so transmitted.

Very truly yours,

FRANK B. DURKEE,
Director of Public Works.

REVIEW BY STATE DIVISION OF WATER RESOURCES OF PROPOSED
REPORT OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY, ON
PLAYA DEL REY INLET AND BASIN, VENICE, CALIF.

INTRODUCTION

In accordance with the provisions of section 1 of Public Law 14, 79th Congress, the proposed report of the Chief of Engineers, United States Army, on Playa del Rey Inlet and Basin, Venice, Calif., together with the reports of the Board of Engineers for Rivers and Harbors and of the district and division engineers, was transmitted by the Chief of Engineers on March 31, 1952, to Mr. Frank B. Durkee, director of public works, the official designated by Gov. Earl Warren as his representative in such matters. The report was received and referred to the State engineer on April 7, 1952, for review and report thereon. Thereafter, the reports were transmitted by the State engineer to Seth Gordon, director, department of fish and game; Rufus W. Putnam, executive officer of the State lands commission; Newton B. Drury, chief, division of beaches and parks of the department of natural resources; and G. T. McCoy, State highway engineer.

Authority for report

The report was prepared pursuant to a resolution adopted June 2, 1936, which reads as follows:

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 Playa Del Rey Inlet and Basin, Venice, California, printed in House Document No. 1880, 64th Congress, 2d session, with a view to determining whether any improvement of the locality is warranted at the present time.

Further authorization was contained in Public Law 392, 75th Congress, approved August 26, 1937, which reads in part as follows:

SEC. 4. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following-named localities, * * * harbor at Playa Del Rey, California * * *.

A review of reports on Playa del Rey Inlet and Basin, Venice, Calif., and preliminary examination of the harbor at Playa del Rey, Calif., dated May 26, 1939, was submitted by the district engineer in accordance with the foregoing authorizations. The district engineer's report was reviewed by the Board of Engineers for Rivers and Harbors, and a report of survey scope was authorized by the Chief of Engineers on April 6, 1944, to determine the advisability and cost of improvement and the local cooperation required.

Recommendations of the Chief of Engineers

The following is quoted from the proposed report of the Chief of Engineers now under review:

After full consideration of the reports secured from the district and division engineers, and after affording local interests full opportunity to be heard, the Board recommends provision of a harbor at Playa del Rey, Calif., to consist of 2 entrance jetties each about 2,300 feet long; an entrance channel 20 feet deep, 600 feet wide, and 1,925 feet long; an interior channel 20 feet deep, 600 feet wide, and 5,600 feet long; a central basin 10 feet deep; and 2 side basins 20 feet deep and 10 side basins 10 feet deep, separated by mole-type piers; the dredged material to be utilized for construction of the piers and for deposition on adjacent lowlands and beaches; all generally in accordance with the plan of the district engineer and the comments herein, 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 \$6,151,000 for construction and \$25,000 annually for maintenance, subject to the condition that local interests agree to (a) provide without cost to the United States all rights-of-way necessary for construction and maintenance of the improvement and furnish suitable spoil-disposal areas for initial work and subsequent maintenance when and as required; (b) secure and hold in the public interest lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; (c) relocate oil wells and relocate and construct public utilities as required; (d) construct a bulkhead around basin K and stone revetment on the side slopes of the remaining basins; (e) extend the north jetty at Ballona Creek to a length sufficient to hold the fill to be placed on the beach to the north thereof; (f) provide adequate berthing and other facilities for small craft; (g) provide adequate parking areas, access roads, and landscaping of the piers; (h) establish a public body to regulate the use and development of the harbor facilities which shall be open to all on equal terms; (i) dredge or bear the actual cost of dredging the 12 side basins; (j) maintain and operate the entire project except aids to navigation, entrance jetties, and project depths in the entrance channel, the interior channel, and in the central basin; and (k) hold and save the United States free from damages due to the construction and maintenance of the improvement; and also subject to the condition that adoption of a project as recommended shall not relieve local interests of responsibility for stabilization of beach fill along the shores of Santa Monica Bay with such Federal assistance as may be authorized following completion of the cooperative beach erosion control study now in progress. The local cooperation is estimated to cost \$19,427,000.

3. The proposed improvements are designed to meet recreational boating needs and are not significant from the standpoint of commercial navigation. The preponderance of benefits accruing to local interests as compared with general benefits of the type which warrant Federal participation is reflected in the relatively large non-Federal expenditures contemplated as compared with the proposed Federal costs. The proportion of Federal and non-Federal participation recommended by the Board of Engineers for Rivers and Harbors is considered appropriate if it is the intent of Congress to provide Federal assistance in the development of recreational boating facilities of the type proposed in this report. Subject to this, I concur in the views and recommendations of the Board. I further recommend that any authorizing legislation provide that construction shall not be initiated until conditions are such that the work will not interfere with the effort needed to meet existing and prospective emergency requirements.

Description of area

Playa del Rey is located in the central portion of the coast of Santa Monica Bay, about 26 miles upcoast by water from Los Angeles Harbor, and 3 miles downcoast from Santa Monica Harbor. The site proposed for the small craft harbor consists of about 1,200 acres of salt marshlands lying immediately north of the Ballona Creek flood-control channel and south of the Venice district. It is included within the incorporated area of the city of Los Angeles.

In 1903, as part of a real estate development, a series of canals was dredged in the Venice area. Many of these canals have since been filled and utilized for city streets, but the main canal still traverses the proposed harbor site, paralleling the coast and connecting with tide gates in the Ballona Creek channel. There is no navigable connection between the sloughs of the proposed harbor area and the ocean, and the Venice canals are utilized only by rowboats. The Federal Government completed the Ballona Creek flood-control channel and jetties in 1938. This trapezoidal channel is 200 feet wide, with stone paved sides on 1 on 3 slopes. The original random stone jetties at the mouth of the channel were extended by the city of Los Angeles in 1946, and are now about 1,350 feet in length. The harbor site includes a part of the Venice oilfield. Production from this field has declined from a peak exceeding 40,000 barrels per day in the discovery year of 1930 to about 2,300 barrels per day during 1946. About 40 wells have been

abandoned due to low production and salt-water intrusion, leaving 111 wells on low production.

Local interests consider that the proposed harbor at Playa del Rey would be an integral unit of an adopted general plan for development of the Santa Monica Bay shoreline. This plan includes widening and improving beaches, providing adequate bath houses, parking areas, picnic facilities, special recreation centers, bathing and wading beaches, fishing piers, youth organization camps, tourist parks with cabin and trailer accommodations, and a bird refuge.

Cost of proposed works

In the report of the district engineer, the total first cost of the project is given as \$25,603,000, with a Federal first cost of \$9,098,000 and non-Federal first cost of \$16,505,000. The total annual carrying charges would be \$919,920, and the annual benefits would be \$1,529,000. The benefit-cost ratio of the proposed harbor project would be 1.7 to 1.

The Board of Engineers for Rivers and Harbors, in reviewing the report of the district engineer, reevaluated the costs and benefits estimated by the district engineer. In considering both the evaluated and intangible benefits, the Board stated in its report that the Federal interest in the proposed improvement would be served by Federal participation to the extent of providing and maintaining the entrance jetties, entrance channel, interior channel, and central basin shown on the maps accompanying the district engineer's report, all at an estimated first cost of \$6,151,000 for construction exclusive of aids to navigation, and \$25,000 annually for maintenance, with local interests providing and maintaining all other works including dredging of the side basins at an estimated first cost of \$19,427,000.

The Board of Engineers for Rivers and Harbors also reduced the benefits allocated by the district engineer to sport fishing vessels from \$280,000 to \$47,000, making the total annual benefits \$1,296,000. Subsequent to the submission of the report by the district engineer, the United States Coast Guard submitted a revised estimate of \$42,000 for first cost of aids to navigation, an increase of \$17,000, making a total first cost of the project of \$25,620,000. The total annual carrying charges are estimated by the Board to be \$933,025, of which \$277,555 is Federal, and \$655,470 is non-Federal, giving a benefit-cost ratio of 1.4. The recommendation of the Board of Engineers for Rivers and Harbors as to Federal participation is concurred in by the Chief of Engineers.

Local contributions

At its meeting on April 25, 1946, the City Council of Los Angeles adopted a report declaring that the public interest and welfare of the city of Los Angeles and vicinity require the provision of additional small craft facilities by means of construction of a small craft harbor at Playa del Rey, assisting the Federal Government in such undertaking by assuming those obligations required under Federal law in connection with the project.

By resolutions adopted September 28, 1948, and June 7, 1949, the Board of Supervisors of the County of Los Angeles declared that the public interest and welfare of the county of Los Angeles and its citizens require that provision be made for additional small craft facilities by means of construction of a small craft harbor at Playa del

Rey. The Board agreed, insofar as it is authorized by law and the favorable vote of the electorate to do so, to assume the following obligations in connection with the Playa del Rey Harbor project:

(1) Provide without cost to the United States all lands, easements, and rights-of-way for the construction and maintenance of the proposed improvements;

(2) Hold and save the United States free from all claims for damages arising from the construction or operation of the improvement;

(3) Assume the cost of alteration, relocation, or rebuilding of highways and highway bridges, or arrange for the alteration, relocation, or rebuilding of these highways and highway bridges without cost to the United States;

(4) Assume the cost of relocation or reconstruction of utilities or drainage structures;

(5) Contribute in cash or equivalent work, the cost of a steel sheet pile bulkhead and stone revetment required in the side basins;

(6) Provide without cost to the United States all necessary slips and slip facilities and facilities for the repair, service, and supply of small craft on terms reasonable and equal to all;

(7) Secure and hold for public interest lands bordering on the proposed improvement to a depth sufficient for the proper functioning of the harbor;

(8) Furnish assurances satisfactory to the Secretary of War that the area will be improved by the construction of slips, utilities, repair facilities, and other appurtenant works, without cost to the United States and at a rate that will result in complete development of the harbor area within a reasonable time in accordance with plans and time schedules to be approved by the Secretary of War;

(9) Assume the cost of extending the upcoast jetty at Ballona Creek flood-control channel.

(10) Operate and maintain the entire project except aids to navigation, entrance jetties, and project depths in the entrance and interior channels, and in central basin.

According to the report of the Board of Engineers for Rivers and Harbors, local interests were advised of the reduction in financial participation by the Federal Government in the first cost of the project and, at a public hearing held by the Board of Engineers for Rivers and Harbors in the area of the desired improvement, local interests indicated they would endeavor to cooperate in the work of improvement to the extent considered necessary by the Board.

COMMENTS BY STATE AGENCIES

The proposed report of the Chief of Engineers on survey, navigation Playa del Rey Inlet and Basin, Venice, Calif., has been reviewed. As a result of this review and study, the following comments are respectfully submitted:

Division of Water Resources

The following is quoted from the district engineer's report concerning the effect of the construction of the project on saline contamination of the ground waters of the west coast basin:

50. *Saline contamination.*—An investigation was made concerning the effects of the proposed harbor on saline contamination of underground water. This investigation indicated that (1) sea water has already contaminated the ground water

within most of the area that would be occupied by the harbor; (2) further landward progress of this contamination depends primarily on the rate of withdrawal of ground water in the vicinity of the harbor site and on the steepness of the landward gradient produced by this withdrawal; and (3) introduction of sea water by constructing the harbor would not modify existing ground-water conditions.

Available information confirms conclusion No. 1 of the district engineer, as quoted above. Fieldwork in the area disclosed the following information:

1. Three active irrigation wells are situated within the perimeter of the proposed site. An additional 7 active irrigation wells are situated within 3,000 feet of the perimeter of the harbor. A total of 26 active irrigation wells are located within the area investigated, the most distant well being situated about 9,000 feet from the harbor perimeter.

2. Partial analyses of water samples obtained in April 1952 from 2 active water wells located within the perimeter of the proposed harbor show 640 and 486 parts per million chloride, respectively. The chloride content of ocean water is about 18,000 parts per million.

Water samples from 2 other active wells located within 2,000 feet of the perimeter contained 213 and 355 parts per million chloride, respectively. Samples from 2 more wells located 3,700 and 8,400 feet east of the eastern perimeter contained 216 and 284 parts per million chloride, respectively.

3. A rapid crop survey covering the area in the vicinity of the proposed Playa del Rey Harbor project indicates approximately 1,200 acres of truck crops are presently irrigated from wells. Based on an assumed consumptive-use factor of 1.7 acre-feet per acre and an assumed irrigation efficiency of 50 percent, annual consumption is about 2,000 acre-feet and well water production about 4,000 acre-feet per annum.

The district engineer's quoted conclusion No. 2 is likewise believed to be essentially correct concerning the present situation. Saline contamination of ground water in the Playa del Rey area was first noted in wells near the ocean in the 1920's. Coincident with increased pumping draft in the west coast basin, accompanied by further lowering of the water table below sea level, the saline intrusion progressively moved inland until by 1945-46 the limit of 500 parts per million of chloride contamination was from 1½ to 2 miles from the ocean in the Playa del Rey area.

Water level measurements in Ballona Gap in the spring of 1950 indicated the water table to be sloping inland from the coastline with a maximum gradient of about 6 feet per mile.

The proposed harbor overlies an important aquifer known as the "50-foot gravel," so named because the average depth of its base is about 50 feet below ground surface. In the vicinity of the site of the harbor the top of this aquifer is 40 to 45 feet below land surface. A study of the logs of 14 wells located within one-half mile of the perimeter of the harbor site indicates the aggregate thickness of relatively impervious material contained in the sediments overlying the aquifer to vary from 0 to 16 feet. Average aggregate thickness of clay above the aquifer is about 9 feet. In general, a large percentage of the impermeable material above the 50-foot gravel occurs near the land surface.

The General Plan of Improvement (enclosure 1 of the report) indicates dredgings to a depth of 20 feet below sea level, representing excavation to a total depth of roughly 25 feet below the present land

surface. Such dredging will obviously decrease the thickness of impermeable material lying between the floor of the harbor and the top of the water-bearing zone, thereby decreasing the resistance offered to the percolation of sea water into the aquifer.

From the foregoing observations, it is believed that the quoted conclusion No. 3 of the district engineer is contrary to what may be expected if the harbor is constructed, and that construction of the harbor would aggravate the present conditions of sea-water intrusion and endanger the water quality of wells located near its perimeter in the following ways:

1. By reducing (through dredging) the thickness of relatively impermeable materials which lie between the surface and the top of the 50-foot gravel aquifer.

2. By increasing the landward slope of the water table and consequently the rate of landward flow of saline water. This slope would be increased as a result of moving the shoreline inland through construction of the harbor.

3. By decreasing the lateral distance that sea water must travel to reach producing wells.

It is believed that if this project is pursued, the ruination of water wells in the immediate vicinity of the harbor should be contemplated. However, the present landward sloping water table indicates that the threat of ocean water pollution already exists at these wells. Also, lands presently irrigated in the vicinity are rapidly being subdivided, and these subdivisions are being served with domestic water imported from outside sources. For these reasons, and because of the probable increase in property values due to the harbor project, ultimate benefits may offset the possible damage to the limited ground-water supply.

Division of Highways

G. T. McCoy, State highway engineer, by communication dated June 11, 1952, submitted the following:

State highway routes will not be directly affected by the recommended plan of the harbor improvement. The proposed development plan of the local planning commission includes provisions for access parkway facilities which will cross and connect with U. S. 101, State Route 60. It is understood that such development involving interchanges or alterations affecting the State highway will be undertaken as part of the obligations of the local interests without commitment of the Division of Highways to costs thereof. The Division of Highways' attitude with respect to the project will, we assure you, be cooperative.

State Lands Commission

Col. Rufus W. Putnam, executive officer of the State Lands Commission, submitted the following comments on April 15, 1952:

The jurisdiction of the tide and submerged lands adjacent to the proposed harbor development is in the city of Los Angeles by legislative grant. No State lands under the jurisdiction of the State Lands Commission are affected by the proposed development.

Department of Fish and Game

Seth Gordon, director, Department of Fish and Game, by communication dated June 6, 1952, submitted the following:

We do not believe the project would have any harmful effect on the fisheries. However, the benefit figures given for sport-fishing operations (p. 33) are optimistic. Operations at Playa del Rey would draw fishermen away from other landings rather than add new fishermen, it is believed.

It would affect a small waterfowl marsh.

Department of Natural Resources

Newton B. Drury, chief, Division of Beaches and Parks of the Department of Natural Resources, on June 18, 1952, stated that the thoughts expressed in the comments previously submitted to the district engineer on January 6, 1949 still reflect the reaction of the division to the project.

The comments, submitted by Gen. Warren T. Hannum, director of natural resources, on January 6, 1949, are as follows:

(a) It is found that plan of development as proposed in the district engineer's report would provide a greatly needed harbor for light craft vessels, and as a harbor refuge for such craft cruising along the coast.

(b) That the proposed harbor development is in general in conformity with the county master plan as approved by the State Park Commission.

(c) That there is no State cooperation proposed in the plan, the city of Los Angeles having expressed its desire and willingness to meet the requirements of local cooperation as set forth by the district engineer.

(d) That the incidental benefits to the State park system, due to the deposit of sand on the beaches both upcoast and downcoast from the proposed entrance jetties would be very great.

It is recommended therefore, that the report be approved with a favorable comment indicating the advantages to the State park system from the deposit of sand on the Santa Monica beaches.

CONCLUSIONS

The following conclusions are submitted with respect to improvements recommended by the Chief of Engineers in his proposed report on Playa del Rey Inlet and Basin, Venice, Calif., giving consideration to (a) need for the project (b) engineering feasibility and effectiveness of the proposed works, and (c) economic justification for the project:

1. The improvements will provide a desirable addition to small-craft facilities along the southern California coast. The project is an integral part of the general plan for development of the shoreline of Santa Monica Bay.

2. Local interest in and approval of the project have been demonstrated by resolution of the city council of the city of Los Angeles, and by resolution of the Board of Supervisors of the County of Los Angeles, giving assurance that the county will assume those non-Federal contributions and obligations in connection with the project which are required by Federal law.

3. The improvements appear to be of sound and adequate design and feasible of construction and operation.

4. Construction of the proposed harbor will introduce ocean water inland a distance of more than 1 mile, and increase the rate of saline contamination of ground waters of the west coast basin. Except in this respect, the proposed works will not conflict with any beneficial consumptive use, present or future, of water for domestic, municipal, stock water, irrigation, mining, or industrial purposes.

RECOMMENDATIONS

It is recommended that the plan of improvement for the small-craft harbor at Playa del Rey Inlet and Basin, Venice, Calif., as recommended by the Chief of Engineers, be authorized for construction, and that Federal funds be appropriated for the purpose.

SACRAMENTO, CALIF., June 26, 1952.

A. D. EDMONSTON,
State Engineer.

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

UNITED STATES DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington 25, D. C., July 25, 1952.

Lt. Gen. LEWIS A. PICK,
Chief of Engineers, Department of the Army,
Washington, D. C.

MY DEAR GENERAL PICK: This is in response to your letter of March 31 transmitting for review by the Department of the Interior copies of your proposed report on the Playa del Rey Inlet and Basin, Calif. Your letter also transmitted copies of the reports of the Board of Engineers for Rivers and Harbors and of the district and division engineers.

Your proposed report recommends that the Federal Government undertake the construction of a harbor at Playa del Rey, Calif., for the use of small boats, subject to deferment of construction until conditions are such that the project would not interfere with existing or prospective emergency requirements on the national economy. The improvement would consist of two entrance jetties, an entrance channel, an interior channel, a central basin, 12 side basins, and a number of piers. The cost to the United States of the improvement would be \$6,151,000 for construction, exclusive of aids to navigation, and \$25,000 annually for maintenance. The construction cost to local interests for the improvement would total an additional \$19,427,000.

The harbor would be built almost wholly for the benefit of pleasure craft owned by private individuals in the Los Angeles area. The benefits from the construction of the harbor are shown to be \$1,529,000 annually in the report of the district engineer, of which \$805,000 are designated as "general (Federal) benefits" and \$724,000 as local (non-Federal) benefits. Those benefits classed as Federal consist of \$450,000 for recreational harbor benefit, \$75,000 for prevention of boat damage, and \$280,000 for increased fish catch. The Board of Engineers for Rivers and Harbors, however, finds the latter figure excessive and reduces it in the Board's report to \$47,000. In our view this is the only legitimate Federal benefit from the project. We have serious doubts that prevention of boat damage or recreational harbor benefits to local boatowners can be classed by any stretch of logic as "general Federal benefits."

We note that the proposed report of the Chief of Engineers indicates that the Department of the Army also has serious question as to the soundness of a policy of spending Federal funds on a single-purpose project primarily for the benefit of local pleasure craft owners. Paragraph 3 of this proposed report states that the proportion of Federal and non-Federal participation is considered appropriate "if it is the intent of Congress to provide Federal assistance in the development of recreational boating facilities of the type proposed in this report."

Should the proposed project be constructed in accordance with the plan presented in the report, it can be expected that hundreds of other communities will seek the same type of project with comparable Federal participation. It therefore seems to us important that a policy covering this point with respect to projects of the Corps of Engineers be clearly established. It is suggested that the final draft of the report of the Chief of Engineers contain a suitable recommendation on this matter.

Paragraph 49 of the district engineers report covers the effect of the harbor improvement on wildlife resources. It is noted that the Fish and Wildlife Service of this Department in a letter of April 26, 1946, indicated that no objection will be interposed to construction of the project on account of the elimination of certain wildlife habitat. The district engineer also received a letter from the regional director of the Fish and Wildlife Service dated September 14, 1949, commenting on the project. It is suggested that these letters from a part of the enclosures accompanying the survey report when it is transmitted to the Bureau of the Budget and to the Congress. I endorse the position taken in these communications to the district engineer from the Fish and Wildlife Service.

Opportunity to review and comment on the reports is sincerely appreciated.

Sincerely yours,

MASTIN G. WHITE,
Acting Secretary of the Interior.

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE
ARMY

DEPARTMENT OF THE ARMY,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington 25, D. C., August 8, 1952.

Subject: Playa del Rey Inlet and Basin, Venice, Calif.

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 Commerce of the United States Senate, adopted June 2, 1936, requesting the Board to review the reports on Playa del Rey Inlet and Basin, Venice, Calif., printed in House Document No. 1880, 64th Congress, 2d session, with a view to determining whether any improvement of the locality is warranted at the present time. It is also in review of the reports on preliminary examination and survey of harbor at Playa del Rey, Calif., authorized by the River and Harbor Act approved August 26, 1937.

2. After full consideration of the reports secured from the district and division engineers, and after affording local interests full opportunity to be heard, the Board recommends provision of a harbor at Playa del Rey, Calif., to consist of 2 entrance jetties each about 2,300 feet long; an entrance channel 20 feet deep, 600 feet wide, and 1,925 feet long; an interior channel 20 feet deep, 600 feet wide, and 5,600 feet long; a central basin 10 feet deep; and 2 side basins 20 feet deep and 10 side basins 10 feet deep, separated by mole-type piers; the dredged material to be utilized for construction of the piers and for deposition on adjacent lowlands and beaches; all generally in accordance with the plan of the district engineer and the comments herein, 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 \$6,151,000 for construction and \$25,000 annually for maintenance, subject to the condition that local interests agree to: (a) provide without cost to the United States all rights-of-way necessary for construction and maintenance of the improvement and furnish suitable spoil-disposal areas for initial work and subsequent main-

tenance when and as required; (b) secure and hold in the public interest lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; (c) relocate oil wells and relocate and construct public utilities as required; (d) construct a bulkhead around basin K and stone revetment on the side slopes of the remaining basins; (e) extend the north jetty at Ballona Creek to a length sufficient to hold the fill to be placed on the beach to the north thereof; (f) provide adequate berthing and other facilities for small craft; (g) provide adequate parking areas, access roads, and landscaping of the piers; (h) establish a public body to regulate the use and development of the harbor facilities which shall be open to all on equal terms; (i) dredge or bear the actual cost of dredging the 12 side basins; (j) maintain and operate the entire project except aids to navigation, entrance jetties, and project depths in the entrance channel, the interior channel, and in the central basin; and (k) hold and save the United States free from damages due to the construction and maintenance of the improvement; and also subject to the condition that adoption of a project as recommended shall not relieve local interests of responsibility for stabilization of beach fill along the shores of Santa Monica Bay with such Federal assistance as may be authorized following completion of the cooperative beach-erosion-control study now in progress. The local cooperation is estimated to cost \$19,427,000.

3. The proposed improvements are designed to meet recreational boating needs and are not significant from the standpoint of commercial navigation. The preponderance of benefits accruing to local interests as compared with general benefits of the type which warrant Federal participation is reflected in the relatively large non-Federal expenditures contemplated as compared with the proposed Federal costs. The proportion of Federal and non-Federal participation recommended by the Board of Engineers for Rivers and Harbors is considered appropriate if it is the intent of Congress to provide Federal assistance in the development of recreational boating facilities of the type proposed in this report. Subject to this, I concur in the views and recommendations of the Board. I further recommend that any authorizing legislation provide that construction shall not be initiated until conditions are such that the work will not interfere with the effort needed to meet existing and prospective emergency requirements.

LEWIS A. PICK,
Lieutenant 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 25, D. C., October 30, 1951.

Subject: Playa del Rey Inlet and Basin, Venice, Calif.

To: The Chief of Engineers, Department of the Army.

1. This report is submitted in response to the following resolution adopted June 2, 1936:

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 Playa del Rey Inlet and Basin, Venice, Calif., printed in House Document No. 1880, 64th Congress, 2d session, with a view to determining whether any improvement of the locality is warranted at the present time.

It is also in review of the reports on preliminary examination and survey of harbor at Playa del Rey, Calif., authorized by the River and Harbor Act approved August 26, 1937.

2. Playa del Rey is on Santa Monica Bay on the coast of California, 20 miles northwest of Los Angeles Harbor. The proposed harbor site consists largely of salt marsh and lowlands traversed by a number of canals and sloughs with depths varying from 2 to 10 feet below mean lower low water. It is separated from Santa Monica Bay by a narrow beach. There is no navigable outlet from the proposed harbor site to Santa Monica Bay. Ballona Creek flows through an artificial channel along the southerly side of the proposed harbor. A tide gate connecting the interior canals and sloughs with Ballona Creek provides a drainage outlet through Ballona Creek and inlet to Santa Monica Bay. The mean range of tide in Santa Monica Bay is 3.7 feet and the extreme range is 10.5 feet. The Venice district of the city of Los Angeles adjoins the proposed harbor on the north. There is no existing Federal project for improvement for navigation at Playa del Rey. There is, however, an existing Federal flood-control project for Ballona Creek which forms part of a comprehensive approved plan for flood control and other purposes for Los Angeles County drainage area, California. It includes construction of channel improvements along Ballona Creek; 2 stone jetties extending into the ocean for approximately 800 feet; highway and railroad bridges; and a tide gate connecting the proposed harbor site with Ballona Creek. Construction of these improvements was completed in 1940. In 1946 the city of Los Angeles extended the jetties 580 feet in connection with a beach-widening program. In times past, local interests constructed canals in the Venice area, constructed sheet-pile jetties on each side of the Ballona Inlet, and made an unsuccessful attempt to dredge an interior basin.

3. The general tributary area, which includes all of metropolitan Los Angeles, is bounded by a line extending from Oxnard through Bakersfield and Bishop, Calif., to Tonopah and Las Vegas, Nev., and back through Needles and Beaumont to San Clemente, Calif. The immediate tributary area comprises 638 square miles of metropolitan Los Angeles extending from the Pacific Ocean to the San Gabriel Mountains and from San Fernando Valley to El Segundo. The estimated population of this immediate area was 2,307,725 in 1946, including 1,522,702 within the city limits of Los Angeles. Principal activities are petroleum production and refining, motion-picture production, manufacturing, and farming. A part of the proposed harbor would extend over the Del Rey Hills and Venice areas of the Playa del Rey oilfield. There is no water borne freight traffic and no terminal or transfer facility at Playa del Rey. Row-boats are used occasionally on the canals within the proposed harbor site. The region is served by railroads and highways.

4. Local interests request provision by the United States of a harbor for small craft at Playa del Rey as part of a comprehensive plan for park and beach development including recreational boating facilities. Various specific requests were advanced by local interests in connection with the plan of improvement but these evolved during the course of the investigation to substantially the plan presented by the district engineer. Local interests point out the need for adequate facilities for small craft in the Santa Monica Bay area and nearby districts,

the overcrowding in existing harbors, the desirability of separating recreational boating areas from commercial and naval waters, and the favorable economic effect of such an improvement including the benefits to be derived from land reclamation.

5. The district engineer finds there is need for additional harbor facilities for small craft in southern California, particularly in the Santa Monica Bay area. He estimates that, on the basis of the California average of 2.79 boats per 1,000 population, the immediate tributary area would sustain about 6,500 small craft, and on the basis of the Los Angeles average of 1.6 per 1,000 population, the remainder of the tributary area would sustain an additional 960 craft. He points out that the number of craft using the harbor probably would greatly exceed these figures inasmuch as the tributary area contains a high percentage of persons most able to own small craft, and the population is steadily increasing. He concludes that the present and future needs of the tributary area require an improvement with an ultimate capacity of 8,000 craft and estimates that half the ultimate capacity will be reached within 5 years after construction of the improvement. Basing his calculations upon the distribution of existing boatowners within the area, he estimates 1,000 would transfer from other harbors, of which 20 would be from Santa Monica Harbor, 400 from Los Angeles Harbor, and 580 from Newport Bay Harbor. He estimates that the remaining 7,000 would be new vessels. Although the improvement is designed for an ultimate capacity of 8,000 craft, the district engineer conservatively bases the estimate of benefits on the 4,000 craft expected to be realized a few years after construction. His cost estimates are based upon construction to provide for the ultimate capacity of 8,000 craft, except that the costs for berthing facilities are based upon construction of the initial 4,000 berths. The cost of the remaining 4,000 berths will be more than offset by the benefits from this additional number of boats. The district engineer considers that the proposed improvement at Playa del Rey is the most suitable for making recreational harbor facilities in Santa Monica Bay available to the largest number of boatowners at the least cost. He states that recovery of petroleum from the existing oilfield could be continued by relocating the wells.

6. The district engineer's plan of improvement provides for construction of an entrance channel 1,925 feet long and an interior channel 5,600 feet long, each 20 feet deep and 600 feet wide, the entrance channel to be protected by 2 jetties, each 2,300 feet long; a central basin 10 feet deep; 2 side basins 20 feet deep and 10 side basins 10 feet deep, separated by mole-type piers; and for certain work to be done by local interests. The dredged material would be used to construct the mole-type piers and to reclaim adjacent lowlands and beaches. The district engineer estimates the total first cost of the proposed plan at \$25,603,000, of which the Federal first cost is \$9,073,000 for construction and \$25,000 for aids to navigation; and the non-Federal first cost is \$16,505,000 for lands and rights-of-way including disposal areas, relocation of oil wells, relocation and construction of public utilities, construction of a bulkhead and stone revetments, provision of berthing and other facilities for small craft, development of the area surrounding the harbor for park and recreational purposes, and extension of the north jetty at Ballona Creek. The Federal annual carrying charge is estimated at \$395,550, including

\$25,000 for annual maintenance of the 2 entrance jetties and of project depths in the entrance and interior channels and in the central basin. The net non-Federal annual carrying charge is estimated at \$524,370 after deducting \$190,600, returns from slip rentals. The total annual carrying charge is \$919,920. The district engineer estimates the average annual benefits from the proposed improvement at \$1,529,000, comprising \$215,000 from land enhancement due to fill, \$16,000 from decreased cost of mosquito control, \$280,000 from increased fish catch from sport fishing activities, \$75,000 from prevention of storm damage to small craft, \$43,000 from decreased automobile travel and decreased boat maintenance resulting from transfer of vessels from distant harbors, and \$900,000 from recreational benefits to owners of new vessels. The benefit-cost ratio is 1.7. The district engineer recommends adoption of a project to establish a harbor in accordance with his proposed plan subject to the conditions that local interests give assurances satisfactory to the Secretary of the Army that they will secure and hold in the public interest lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; provide without cost to the United States rights-of-way, including disposal areas; assume the cost of relocating oil wells and the cost of relocating and constructing public utilities; construct a bulkhead around one basin and stone revetment on the side slopes of the remaining basins; extend the north jetty at Ballona Creek; provide adequate berthing and other facilities for small craft; develop the harbor area for park and recreational purposes; establish a public body empowered to regulate the use, growth, and free development of the harbor facilities, open to all on equal and reasonable terms; prepare definite plans and schedules for construction of small craft facilities, subject to approval by the Secretary of the Army; maintain and operate the entire project, except entrance jetties, project depths in the entrance and interior channels and in the central basin, and aids to navigation; and hold and save the United States free from all claims for damages arising from construction or operation of the project. The division engineer concurs.

7. With respect to the effect of the improvement on adjacent shorelines, the district engineer finds that the shores of Santa Monica Bay down coast of the Santa Monica breakwater have been deprived of normal littoral nourishment since construction of the breakwater in 1933, and that the Playa del Rey jetties, 3 miles south of the breakwater, would act as a complete littoral barrier and would benefit the shore to the north. The plan of improvement proposed by the district engineer provides for deposition of 10,130,000 cubic yards of material, dredged from the harbor, on the beaches immediately upcoast of the Playa del Rey jetties and downcoast between Playa del Rey and Ballona Creek jetties, and deposition of 3,200,000 cubic yards of material downcoast of the Ballona Creek jetties. Disposal of the dredged material on the downcoast beaches as proposed would provide adequate nourishment for many years, and thereafter the beaches can be maintained in their advanced position by mechanical bypassing of material, a method now being considered in a cooperative beach erosion control study between the United States and the State of California. The Beach Erosion Board concurs in the conclusions of the district engineer as to the effect of the proposed improvement on the adjacent shorelines. It points out that adoption of the project

as recommended shall not relieve local interests of responsibility for stabilization of beach fill along the shores of Santa Monica Bay with such Federal assistance as may be authorized following completion of the cooperative beach erosion control study now in progress.

8. The Board of Engineers for Rivers and Harbors was not convinced of the advisability of the United States participating in the improvement to the extent recommended by the reporting officers and questioned whether local interests were in agreement as to operational control and sponsorship of the improvement. The Board so notified local interests and they requested a public hearing. At the hearing held by the Board in the area of the desired improvement, local interests indicated they would endeavor to cooperate in the work of improvement to the extent considered necessary by the Board and would agree among themselves in the matter of operational control and sponsorship of the improvement. The commander, 11th Coast Guard District, stated in a communication that a harbor at Playa del Rey would serve as a refuge, would make available a harbor from which Coast Guard patrol and rescue craft could operate, and would tend to relieve the congestion and contribute to general maritime safety in the Los Angeles Long Beach area. Subsequent to the public hearing, the Hughes Aircraft Co. advised the Board that the proposed improvement would interfere with a contemplated expansion of its facilities and a proposed runway extension. The company was given an opportunity to furnish information in support of its claim but no evidence of importance has been received. The Board also requested the views of the Department of the Air Force and the Civil Aeronautics Administration concerning the claim of the Hughes Co. A communication from the Office, Deputy Chief of Staff, Department of the Air Force, states that the present plans of the Air Force do not contemplate expansion of the Hughes Co. which would result in conflict with the proposed harbor improvement for Playa del Rey, Calif. The Deputy Administrator of Civil Aeronautics, Civil Aeronautics Administration, states in a communication that study by its regional office reveals that no aircraft operation difficulties or conflicts will result by the development and operation of the proposed improvement.

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

9. The Board of Engineers for Rivers and Harbors concurs in the views of the reporting officers that a need exists for a harbor with an ultimate capacity of 8,000 small craft in the vicinity of Playa del Rey, Calif. The plan recommended by the district engineer together with work to be performed by local interests will provide a suitable improvement. Total prospective benefits are sufficient to justify the expenditure required. The Board believes that in addition to the evaluated benefits resulting directly from construction of the small-boat harbor, benefits would accrue to local interests from the use of the area as a park facility. It can be expected that the area will be visited and enjoyed by many persons in no way connected with small-boat commerce. Considering both the evaluated and intangible benefits, the Board is of the opinion that the Federal interest in the proposed improvement would be served by Federal participation to

the extent of providing and maintaining the entrance jetties, entrance channel, interior channel, and central basin shown on the maps accompanying the district engineer's report, all at an estimated first cost of \$6,151,000 for construction exclusive of aids to navigation, and \$25,000 annually for maintenance, with local interests providing and maintaining all other works including dredging of the side basins at an estimated first cost of \$19,427,000. Local interests state they will meet the requirements of local cooperation as indicated by the Board. Benefits from 35 sport fishing vessels are estimated by the district engineer as \$280,000, which is \$8,000 per vessel. Basing its conclusions on investigations of this type of fishing, the Board finds that a total of \$47,000 is more reasonable. The total annual benefits would then amount to \$1,296,000. The Board of Engineers for Rivers and Harbors has carefully considered the data presented by the district engineer and Beach Erosion Board with respect to the effect of the improvement on the adjacent shoreline. It is of the opinion—after taking into account the stabilizing effect on the upcoast beaches, the effect of the existing Ballona Creek jetties, and the deposition on adjacent beaches of approximately 13,330,000 cubic yards of material dredged from the harbor, including the deposition of 3,200,000 cubic yards downcoast of the Ballona Creek jetties—that the beneficial effects to the adjacent shoreline would more than offset any adverse effects that would occur. The Board agrees with the Beach Erosion Board that accomplishment of the improvement shall not modify the relative responsibility of local interests and the United States in connection with any work which may be authorized for stabilization of adjacent beaches following completion of the cooperative beach erosion control study now in progress. Subsequent to submission of the report by the district engineer the United States Coast Guard submitted a revised estimate of \$42,000 for the first cost of aids to navigation, an increase of \$17,000. The total first cost then becomes \$25,620,000. With the distribution of costs as proposed by the Board, including the new estimate for aids to navigation, the total annual carrying charge becomes \$933,025 of which \$277,555 is Federal and \$655,470 is non-Federal. The benefit-cost ratio is 1.4.

10. The Board accordingly recommends provision of a harbor at Playa del Rey, Calif., to consist of 2 entrance jetties each about 2,300 feet long; an entrance channel 20 feet deep, 600 feet wide, and 1,925 feet long; an interior channel 20 feet deep, 600 feet wide, and 5,600 feet long; a central basin 10 feet deep; and 2 side basins 20 feet deep and 10 side basins 10 feet deep, separated by mole-type piers; the dredged material to be utilized for construction of the piers and for deposition on adjacent lowlands and beaches; all generally in accordance with the plan of the district engineer and the comments herein, 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 \$6,151,000 for construction and \$25,000 annually for maintenance, subject to the condition that local interests agree to: (a) provide without cost to the United States all rights-of-way necessary for construction and maintenance of the improvement and furnish suitable spoil-disposal areas for initial work and subsequent maintenance when and as required; (b) secure and hold in the public interest lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; (c) relocate oil wells and relocate

and construct public utilities as required; (d) construct a bulkhead around basin "K" and stone revetment on the side slopes of the remaining basins; (e) extend the north jetty at Ballona Creek to a length sufficient to hold the fill to be placed on the beach to the north thereof; (f) provide adequate berthing and other facilities for small craft; (g) provide adequate parking areas, access roads, and landscaping of the piers; (h) establish a public body to regulate the use and development of the harbor facilities which shall be open to all on equal terms; (i) dredge or bear the actual cost of dredging the 12 side basins; (j) maintain and operate the entire project except aids to navigation, entrance jetties, and project depths in the entrance channel, the interior channel, and in the central basin; and (k) hold and save the United States free from damages due to the construction and maintenance of the improvement; and also subject to the condition that adoption of a project as recommended shall not relieve local interests of responsibility for stabilization of beach fill along the shores of Santa Monica Bay with such Federal assistance as may be authorized following completion of the cooperative beach erosion control study now in progress.

For the Board:

G. J. NOLD,
Major General, Chairman.

REPORT OF THE DISTRICT ENGINEER

SYLLARUS

The district engineer finds that there is need for additional small-craft facilities in Santa Monica Bay. He finds that the provision of such facilities at Playa del Rey is practicable, that the site is the one most suitable for construction of a small-craft harbor near the Los Angeles metropolitan area, and that the facilities would be used to capacity.

The district engineer estimates the tangible benefits at \$1,529,000 a year and that large intangible benefits would accrue. He estimates the total first cost of the project at \$25,603,000 (including \$25,000 costs to the United States Coast Guard for aids to navigation), and the annual charges at \$919,920. The benefit-cost ratio would be 1.7 to 1.

The district engineer recommends that a project be adopted to establish a harbor for small-craft navigation at Playa del Rey, Calif., to consist of two harbor entrance jetties; an entrance channel 600 feet wide and 20 feet deep; an interior channel 600 feet wide, 5,600 feet long, and 20 feet deep; 2 side basins 20 feet deep and a central basin and 10 side basins 10 feet deep separated by mole-type piers; and deposition of dredged material in the mole-type piers, on adjacent lowlands, and along beach frontage; all at an estimated Federal first cost of \$9,073,000, exclusive of aids to navigation, and \$25,000 annually for maintenance; subject to the condition that local interests shall give assurances satisfactory to the Secretary of the Army that the required cooperation will be furnished, such cooperation to be performed by a competent and duly authorized public body, financially able to accomplish the obligations so assumed and empowered to regulate the use, growth, and free development of the harbor facilities with the understanding that such facilities shall be open to all on equal terms. The required local cooperation would consist of: (1) Securing and holding in the public interest, lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; assuming the cost of all rights-of-way, including disposal areas, the cost of relocating oil wells, and the cost of relocating and constructing public utilities; constructing stone revetments, a vertical bulkhead, and an extension of the upcoast jetty at Ballona Creek flood-control channel; providing adequate facilities for operating, berthing, maintaining, repairing, servicing, and supplying small craft; and for developing the harbor area for park and recreational purposes, all at an estimated non-Federal first cost of \$16,505,000; (2) preparing definite plans and construction schedules for the construction of

small-craft facilities, including development of the mole-type piers, which shall be subject to approval by the Secretary of the Army; (3) maintaining and operating the entire project except aids to navigation, entrance jetties, and project depths in the entrance and interior channels and in the central basin; and (4) holding and saving the United States free from all claims for damages arising from the construction or operation of the project works.

DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS,
LOS ANGELES DISTRICT,
Los Angeles, Calif., August 16, 1948.

Subject: Survey of harbor at Playa del Rey, Calif.
Through: Division engineer, South Pacific Division, Oakland, Calif.
To: The Chief of Engineers, Department of the Army.

AUTHORITY

1. This report is submitted pursuant to a resolution adopted June 2, 1936, which reads as follows:

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 Playa Del Rey Inlet and Basin, Venice, Calif., printed in House Document No. 1880, 64th Congress, 2d session, with a view to determining whether any improvement of the locality is warranted at the present time—

and to River and Harbor Act, Public Law 392, 75th Congress, approved August 26, 1937, which reads in part as follows:

SEC. 4. The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following-named localities,
* * *:

*	*	*	*	*	*	*
Harbor at Playa Del Rey, Calif.						
*	*	*	*	*	*	*

(In accordance with United States Geological Survey maps and with local usage, the harbor under consideration is designated in this report as Playa del Rey.)

2. A review of reports on Playa del Rey Inlet and Basin, Venice, Calif., and preliminary examination of harbor at Playa del Rey, Calif., dated May 26, 1939, submitted by the district engineer in accordance with the resolution and act quoted above, was reviewed by the Board of Engineers for Rivers and Harbors. This report of survey scope was authorized by the Chief of Engineers in letter of April 6, 1944, to determine the advisability and cost of improvement and the local cooperation required.

DESCRIPTION

3. *Charts and maps.*—Playa del Rey inlet and vicinity are shown on United States Coast and Geodetic Survey charts 5101 and 5144; on Venice Quadrangle, United States Geological Survey of 1923; and on maps, enclosures 5¹ and 6¹ of this report.

4. *General.*—Playa del Rey is located in the central part of Santa Monica Bay on the coast of southern California, 26 miles by water northwesterly (upcoast) from Los Angeles Harbor, 3 miles southeasterly (downcoast) from Santa Monica Harbor, and about 410 miles southeasterly of San Francisco Bay. The Venice district, a seaside resort annexed to the city of Los Angeles in November 1925, adjoins the proposed harbor area on the north. The business center

¹ Not printed.

of the city of Los Angeles is 15 miles inland to the east. A considerable portion of the area immediately north of Ballona Creek consists of the Venice Slough and canals which drain into the ocean through the outlet of Ballona Creek flood-control channel. This area comprises about 1,513 acres of salt marsh and low farm and residential lands located in the area between the Venice district and the Ballona Creek flood-control channel, and between United States Highway 101 Alternate (Lincoln Boulevard) and the Pacific Ocean. The farm and residential land, except the strip of residential and commercial property adjacent to the beach, is subject to flooding by moderate rainfall. The farmland is along the west side of Highway U. S. 101 Alternate, and the residential property is concentrated along the shoreline and between Washington Street and Venice Boulevard. The salt-marsh area comprises about 1,200 acres.

5. *Depth of water.*—The water depths in the canals and in the connecting sloughs vary from 2 feet to 10 feet below mean lower low water. The elevation of the salt-marsh area averages about 3 feet above mean lower low water.

6. *Tides.*—In Santa Monica Bay the mean tide range is 3.7 feet, the diurnal range is 5.6 feet, and the extreme range is about 10.5 feet.

7. *Exposure and weather.*—Severe ocean winds are rare in the immediate vicinity, as in all southern California coastal waters. Offshore ocean storms of varying intensities occur generally during the period December to March, inclusive, and may cause large ground swells. The ocean front is unprotected except to a small degree by Point San Vicente and by Santa Catalina Island (approximately 30 miles offshore) on the south, and by the trend of the coast and by Point Dume on the northwest. Prevailing winds are principally westerly and southwesterly and seldom attain storm violence, as indicated by the wind rose on map, enclosure 1. During the winter southerly offshore winds occasionally cause destructive wave action.

8. In general, the climate is mild and uniform. A summary of average annual wind and weather conditions and a tabulation showing the number of days each month during 1944 and 1945 that small-craft warnings were posted for the area is given in the following tables.

Average annual meteorological conditions in vicinity of Playa del Rey Harbor, Calif.

Month	Sun- shine (per- cent)	True wind velocity (miles per hour)				Number of days—					
		Aver- age hourly veloc- ity	Pre- vail- ing direc- tion	Maxi- mum veloc- ity	Dirrec- tion of maxi- mum veloc- ity	Clear	Partly cloudy	Cloudy	With precipi- tation (0.01 inch or more)	Thun- der storms	Dense fog
January.....	70	6.1	NE...	38	NE...	15	9	7	6	(0)	1
February....	68	6.0	NE...	34	NW...	13	8	7	6	(0)	2
March.....	68	6.2	SW...	37	SW...	13	10	8	6	1	2
April.....	68	6.0	SW...	34	W...	12	11	7	4	(0)	2
May.....	65	5.9	SW...	30	W...	11	14	6	2	(0)	2
June.....	70	5.7	SW...	28	SW...	13	14	3	1	(0)	3
July.....	78	5.6	SW...	21	SW...	16	14	1	(0)	(0)	3
August.....	79	5.5	SW...	25	SE...	19	11	1	(0)	(0)	3
September..	77	5.4	SW...	31	S...	17	11	2	1	(0)	3
October....	76	5.5	SW...	28	NE...	18	9	4	2	(0)	3
November...	79	5.8	NE...	35	NE...	18	8	4	3	(0)	2
December...	73	6.2	NE...	35	NE...	17	8	6	6	(0)	1
Year.....	72	5.9	W.....			182	127	56	37	5	27

¹ Less than 1 day.

Small-craft storm warnings posted

Month	Year—	
	1944	1945
January.....	6	3
February.....	10	6
March.....	3	6
April.....	6	5
May.....	3	0
June.....	1	0
July.....	0	0
August.....	0	0
September.....	2	1
October.....	0	2
November.....	6	6
December.....	6	8
Total for year.....	43	37

9. *Navigation.*—There is no navigable connection between the ocean and the Venice canals and connecting sloughs. The ocean outlet is through a steel and concrete tide gate which connects the canals with the Ballona Creek flood-control channel. The canals are occasionally navigated only by small rowboats.

10. The only natural harbor in the southern California area is San Diego Bay, 133 miles to the south. Newport Bay Harbor was created in the tidal outlet of Santa Ana River by diverting the river from the harbor, dredging, and constructing jetties at the harbor entrance. This port is used primarily for recreational craft but has limited facilities for commercial fishing.

11. Los Angeles and Long Beach Harbors are two of the principal Pacific coast commercial harbors. During the war years, 1941–45, many owners of small craft who had been using these harbors were required to find mooring facilities in other harbors. The harbor departments of both Los Angeles and Long Beach are reluctant to assign space to smallcraft and do so only on short-time leases subject to cancellation. The operation of small craft in a commercial and naval harbor is hazardous to the small craft and is a nuisance to the commercial or naval interests.

12. Redondo Beach Harbor has a partially sheltered area of about 20 acres but this area is exposed to southerly storms. Boats anchoring in this harbor are extensively damaged each year.

13. Santa Monica Harbor, which originally comprised 92 acres, is now shoaled to 46 acres. The harbor area is partially protected by an offshore breakwater which was constructed by local interests in 1934. This breakwater has not been maintained and has deteriorated to a considerable extent. About 64 fishing boats and 21 recreational craft are moored within the lee of the breakwater. Because of insufficient mooring space and the poor protection afforded during storms, over 100 small boats are stored on the adjacent Santa Monica pier and several fishing boats anchor outside the breakwater. Boat losses in the harbor have been high in the past years, and marine-insurance agencies are very reluctant to insure boats anchored there. The master plan for shoreline development of Los Angeles County provides for removal of the existing breakwater at Santa Monica Harbor.

14. The number of small craft moored at harbors in the Los Angeles metropolitan area are shown in the following table:

Number of small craft in Los Angeles metropolitan area, California (1946)

Harbor	Number of pleasure craft	Number of commercial fishing craft	Total
Long Beach.....	285	1 100	1 385
Los Angeles.....	779	272	1,051
Newport Bay.....	1,888	600	2,488
Redondo Beach.....	0	50	50
Santa Monica.....	21	64	1 85
Alhambros Bay.....	0	0	0
Total.....	2,973	1,086	4,059

¹ Estimated by Long Beach Harbor Department.

² Exclusive of about 100 boats stored on pier and several fish boats moored outside breakwater.

TRIBUTARY AREA

15. *General tributary area.*—The area generally tributary to the proposed harbor at Playa del Rey is shown on enclosure 6.¹ The tributary area includes all of metropolitan Los Angeles and the entire area enclosed by a line extending from Oxnard through Bakersfield and Bishop, Calif., to Tonopah and Las Vegas, Nev., and back through Needles and Beaumont to San Clemente, Calif.

16. *Immediate tributary area.*—The area immediately tributary to Playa del Rey, comprising about 638 square miles, is that part of metropolitan Los Angeles which lies closer to the proposed harbor than to any other existing or proposed harbor. In general, this area extends from the Pacific Ocean to the San Gabriel Mountains, and from the San Fernando Valley to El Segundo, shown as zone 1 on enclosure 5.¹ It includes the cities of Arcadia, Alhambra, Beverly Hills, Burbank, Culver City, El Monte, El Segundo, Glendale, Inglewood, Monrovia, Monterey Park, Pasadena, South Pasadena, San Fernando, San Gabriel, San Marino, Santa Monica, Sierra Madre, and Vernon, and part of the city of Los Angeles with its suburbs of Van Nuys, Hollywood, North Hollywood, and West Los Angeles. This area comprises 16 percent of Los Angeles County, contains 67 percent of the population of the county, and contributes 60 percent of the county tax. The population of cities and unincorporated areas of the immediate tributary area is shown in the following tables:

¹ Not printed.

Population of cities in the immediate tributary area

City	1930 census	Percent gain	1940 census	Percent gain	1946 estimate ¹	Approximate distance from Playa del Rey
						Miles
Arcadia.....	5,216	74.9	9,122	53.5	14,003	35
Alhambra.....	20,472	32.1	38,935	10.9	43,174	23
Beverly Hills.....	17,429	53.9	20,823	5.2	28,217	10
Burbank.....	10,662	100.1	34,337	80.2	61,859	24
Culver City.....	5,669	58.3	8,076	51.3	13,580	5
El Monte.....	3,479	30.4	4,746	33.8	6,349	28
El Segundo.....	3,503	6.7	3,738	52.8	5,710	3
Glendale.....	62,736	31.6	82,582	14.0	94,134	20
Inglewood.....	19,480	54.6	30,114	32.9	40,034	6
Los Angeles.....	1,105,205	21.5	² 1,312,885	13.4	³ 1,522,702	13
Van Nuys ⁴			20,298	32.0	26,784	17
Hollywood ⁴			142,262	10.7	157,491	15
North Hollywood ⁴			24,449	48.0	30,179	20
West Los Angeles ⁴			58,690	27.2	74,049	7
Monrovia.....	10,809	17.6	12,807	37.5	14,863	37
Monterey Park.....	8,406	33.2	8,531	20.6	10,291	23
Pasadena.....	76,088	7.6	81,864	9.7	89,789	25
South Pasadena.....	13,730	4.6	14,356	10.6	15,880	22
San Fernando.....	7,567	20.2	9,094	13.6	10,332	39
San Gabriel.....	7,224	64.3	11,867	25.0	14,828	26
San Marino.....	3,730	119.2	8,175	29.6	10,598	26
Santa Monica.....	37,146	44.0	53,500	18.5	63,396	5
Sierra Madre.....	3,550	29.0	4,591	20.7	5,529	33
Vernon.....	1,269	-33.0	850	13.0	961	18
Total.....	1,436,368	25.9	1,807,961	15.5	2,088,839	-----

¹ Estimate by Los Angeles County Regional Planning Commission.

² Includes the population of only that part of the city of Los Angeles in zone 1.

³ Included in population figures for Los Angeles.

Population in unincorporated areas in the immediate tributary area

Area	1940 census	Percent gain	1946 estimate ¹	Approximate distance from Playa del Rey
				Miles
Belvedere and East Los Angeles.....	71,541	12.2	80,289	20
Burbank and Glendale ²	11,866	26.5	15,007	25
El Monte and San Gabriel ³	52,565	35.9	71,459	25
Pasadena ⁴	32,419	26.4	40,990	28
West Los Angeles.....	6,361	75.1	11,141	7
Total.....	174,752	25.2	218,886	-----
Total for cities.....	1,807,961	15.5	2,088,839	-----
Grand total (zone 1).....	1,982,713	16.4	2,307,725	-----

¹ Estimate by Los Angeles County Regional Planning Commission.

² Area includes districts of La Crescenta, Verdugo City, Montrose, and La Canada.

³ Area includes districts of Temple City, Wilmar, Rosemead, Potrero Heights, Garvey, and Duarte.

⁴ Area includes districts of Altadena and Lamanda Park.

17. The 1945 assessed valuation of taxable property in the immediate tributary area, as shown on the records of the Los Angeles County assessor, is given in the following table:

Assessed valuation of property in the immediate tributary area

Location	Type of property			Total
	Land	Improvements	Personal	
Arcadia.....	\$4, 820, 780	\$6, 725, 120	\$861, 460	\$12, 407, 360
Alhambra.....	10, 579, 815	14, 271, 120	4, 105, 710	28, 956, 645
Beverly Hills.....	25, 332, 265	27, 450, 200	5, 959, 080	58, 741, 545
Burbank.....	14, 787, 325	28, 135, 030	21, 294, 340	64, 216, 695
Culver City.....	3, 671, 565	6, 536, 090	9, 930, 650	20, 138, 305
El Monte.....	1, 261, 355	1, 498, 600	289, 500	3, 049, 455
El Segundo.....	2, 476, 770	12, 280, 020	4, 100, 895	18, 857, 685
Glendale.....	28, 689, 455	31, 945, 810	5, 217, 345	65, 852, 610
Inglewood.....	8, 956, 325	12, 097, 180	1, 900, 030	22, 953, 535
Los Angeles (zone 1).....	609, 057, 855	431, 732, 010	133, 171, 255	1, 073, 961, 720
Monrovia.....	2, 887, 055	3, 553, 620	1, 034, 930	7, 475, 165
Monterey Park.....	2, 065, 630	2, 266, 010	297, 840	4, 629, 480
Pasadena.....	32, 955, 175	34, 308, 160	9, 330, 755	76, 594, 090
South Pasadena.....	4, 121, 025	4, 965, 440	708, 630	9, 795, 095
San Fernando.....	1, 925, 710	2, 019, 710	461, 590	4, 406, 010
San Gabriel.....	3, 432, 960	5, 508, 330	665, 450	9, 606, 140
San Marino.....	6, 469, 050	9, 985, 800	1, 759, 740	18, 204, 590
Santa Monica.....	19, 860, 570	21, 445, 290	5, 638, 245	46, 944, 105
Sierra Madre.....	1, 203, 055	1, 436, 220	231, 390	2, 870, 665
Vernon.....	9, 994, 525	15, 743, 190	31, 480, 950	57, 224, 665
Total.....	694, 539, 165	673, 916, 050	238, 451, 845	1, 606, 907, 060
Unincorporated areas.....	74, 316, 165	60, 804, 135	29, 660, 555	164, 780, 855
Grand total.....	768, 855, 330	734, 720, 185	268, 112, 400	1, 771, 687, 915

18. *Occupations, resources, and industries.*—The principal industries in the area immediately tributary to Playa del Rey are petroleum production and refining; motion picture production; airplane construction; automobile assembly; manufacture of tires and rubber goods, furniture, and apparel; and agriculture. Statistical data are not available for the gross value of manufacturing and agriculture in the immediate tributary area. However, the entire county of Los Angeles contributes toward the support of each small-craft harbor within the metropolitan area, and Playa del Rey would receive its share. The gross output for Los Angeles County in 1939 was in excess of \$3,800 million from industry and commerce and \$76 million from agriculture. Data subsequent to 1939 were not available because of wartime restrictions.

19. *Transportation.*—The tributary area is served by the Southern Pacific, Union Pacific, Pacific Electric, and the Atchison, Topeka & Santa Fe Railroads, and by 1 foreign and 4 domestic passenger airlines and 6 freight airlines. The harbor site is served by the Pacific Electric Railway and by municipal and Pacific Electric buslines connecting Playa del Rey with the beach cities and with the center of Los Angeles. United States Highway No. 101 Alternate (Lincoln Blvd.) and several secondary highways pass through the proposed harbor area and connect with the network of State, county, and city highways.

20. *Bridges.*—There are no bridges, existing or planned, in the area of the proposed harbor at Playa del Rey. Several bridges crossing the Ballona Creek flood-control channel are planned by local interests as a part of the park development outside the harbor area.

PRIOR REPORTS

21. The only published report concerning harbor improvements in the vicinity of Playa del Rey is listed in the following table:

List of prior reports

Report	Published as—	Recommendation
Preliminary examination of Playa del Rey Inlet and Basin dated Nov. 4, 1916.	H. Doc. No. 1880, 64th Cong., 2d sess.	Improvement not advisable at that time.

OTHER IMPROVEMENTS

22. *Navigation.*—Navigation improvements in the area resulted from early attempts by local interests to create a commercial harbor at Playa del Rey and from the construction of canals as a part of a real estate development. In 1887 the Ballona Harbor Improvement Co. constructed sheet-pile jetties on each side of the inlet and attempted to dredge an interior basin. The dredge was inadequate and the enterprise was abandoned.

23. Beginning in 1903 the Beach Land Co. dredged a series of canals in the Venice area and constructed tide gates in the inlet. After the tide gates were destroyed by storms many of the canals were artificially filled to create city streets in lieu of the canals which had failed to attain popularity.

24. *Flood control.*—The Federal Government completed the Ballona Creek flood-control channel and jetties in 1938. This project was constructed in part under the Emergency Relief Act of 1935 and the remainder under the Flood Control Act approved June 22, 1936. The lower reach of the flood-control channel constitutes the southerly boundary of the proposed harbor area. In this section the channel is trapezoidal, 200 feet wide at the bottom with side slopes of 1 on 3. The side slopes are paved with one-man stone supported by a fill of dumped stone at the toe of paving. The invert is not paved. The jetties at the entrance are random stone, and the voids between the stones above mean lower low water have been filled with concrete to a depth of 3 feet. The jetties as originally constructed were about 775 feet long, measured from mean high-tide line, and are 340 feet from centerline to centerline. The jetties were extended 580 feet in 1946 by the city of Los Angeles. The crest width is 16 feet and the elevation at the crest is 13 feet above mean lower low water. The side slopes are 1 on 1.5. A steel and concrete tide gate was installed to connect the main Venice canal with the flood-control channel. The cost of Ballona Creek Channel (including entrance jetties and tide gate) was about \$7 million.

25. *Petroleum production.*—In 1930 an oilfield was discovered in this area and about 151 producing wells have been drilled. The field has been in production continuously since that time. In recent years salt water has encroached in the field and production has been reduced so that about 40 wells have been abandoned, leaving only 111 on low production. The daily production of the entire field is reported to have been 2,300 barrels during 1946, whereas the peak daily production exceeded 40,000 barrels in November 1930. A part of the proposed

harbor area would be over the Del Rey Hills area and the ocean front or Venice area of the Playa del Rey oilfield. Only one productive zone, the lower zone, is present in the Del Rey Hills area. In the older ocean front area, production is obtained both from the lower zone and from a relatively shallow zone, the upper zone. Although acquisition of all oil rights in fee within the proposed harbor was considered, it would be feasible to redrill a part of the wells and to allow production to continue in those wells that would not interfere with the harbor function. In the interest of conservation of mineral resources, it would be more desirable to continue petroleum recovery by redrilling from offset wells equipped with low-height surface pumps than to abandon the field. Local interests do not anticipate difficulty in settlement of the oil rights.

26. *Proposed shoreline improvements.*—The city of Los Angeles voted a bond issue of \$10 million, to which other cities in the metropolitan area and the State of California have added \$11 million, making a total of \$21 million, which will be used for the construction of a complete sewage-treatment plant at Hyperion to replace the present screening plant and outfall sewer. In connection with the preparation of the site for the sewage-treatment plant, the city of Los Angeles has excavated 14,100,000 cubic yards of dune sand, and has deposited it on the beach between Ocean Park and El Segundo (about 5.5 miles). This resulted in a general widening of the beach about 450 feet throughout that distance. The deposit of this material constitutes the initial step in the overall plan for beach improvement. The city extended the Ballona Creek jetties 580 feet seaward to protect the flood-control outlet from the shoaling caused by the new beach fill.

27. Local interests consider that the proposed harbor at Playa del Rey would be an integral unit of the plan for the development of the Santa Monica Bay shoreline. The plan of development proposed by local interests includes the following features: Widened and improved beaches, adequate bathhouses and parking areas, picnic facilities, special recreation centers, salt-water bathing pools and children's wading pools, fishing piers, youth organization camps, tourist parks with cabin and trailer accommodations, and a bird sanctuary to perpetuate the wildlife now inhabiting the area. In addition to scenic and through highways along the improved beach front, local authorities also have completed plans for the construction of a highway and freeway system to facilitate access to the beach areas. The proposed freeway system would avoid the congested metropolitan areas and would shorten both the distance to be traveled and the time required to reach the proposed beach recreation and park area and the proposed harbor facilities at Playa del Rey from any locality within the immediate tributary area.

28. The city of Los Angeles has employed a consulting firm of New York City to prepare an economic analysis and report for financing purposes on the entire beach development, including the proposed harbor, at a cost of \$35,000.

TERMINAL AND TRANSFER FACILITIES

29. There are no terminal or transfer facilities at Playa del Rey.

30. Santa Monica Harbor, 3 miles upcoast from the proposed harbor at Playa del Rey, has terminal and transfer facilities for small commercial fishing and recreational craft at the municipal pier. This pier

is partially protected by the Santa Monica breakwater. The breakwater has deteriorated to such an extent that the harbor probably would be abandoned if facilities for small craft are constructed at Playa del Rey. The construction of additional terminal facilities in Santa Monica Bay is impracticable because of the unprotected shoreline.

EXISTING PROJECT

31. There has never been a Federal navigation project at Playa del Rey.

IMPROVEMENTS DESIRED

32. *Public hearings.*—Two public hearings were held in Venice, Calif., by the district engineer to consider the advisability of improving Playa del Rey, one on July 29, 1936, and the other on August 12, 1938, in connection with the preliminary examination report. The hearings were attended by public officials, real estate and other business interests, and representatives of various civic organizations, as well as the general public.

33. *Improvements desired by local interests.*—At the public hearing on August 12, 1938, the Regional Planning Commission of Los Angeles County and local civic organizations requested that a small-craft harbor be provided at Playa del Rey by the United States. The improvements desired by the regional planning commission consisted of (1) extending the jetties of the Ballona Creek flood-control outlet a distance of 800 feet; (2) constructing 2 jetties 1,475 feet in length to provide a second entrance to the interior basin; (3) dredging an interior basin about 1 square mile in area to a depth of 15 feet below mean lower low water, connected by an entrance channel to Ballona Creek flood-control channel; (4) dredging the Ballona Creek entrance and the second entrance to a depth of 15 feet below mean lower low water; (5) constructing secondary roads, miscellaneous drainage structures, and utilities; (6) constructing boat facilities and recreational park improvements; and (7) purchasing rights-of-way and land. The total cost estimated by local interests in 1938 was \$9,750,000.

34. *Local interests' justification of the desired project.*—Local interests are unanimous in desiring improvement of Playa del Rey Inlet and Basin for small-craft navigation. They offer the following considerations in support of the navigation improvements.

(a) There is need for added mooring space for small craft in Santa Monica Bay, in view of the increasing scarcity of small-craft anchorage areas in Los Angeles Harbor and because of the inconvenience attending the use of that harbor.

(b) The desired improvements are required for recreation and small-craft boating by people living in the northern part of Los Angeles County, which includes the heavily populated Los Angeles city area, as well as Hollywood, Beverly Hills, Culver City, Inglewood, Santa Monica, and other suburban districts.

(c) The improvement would be an effective aid in the development of the boatbuilding industry.

(d) The improvement would satisfy an increasing need for small-craft facilities, create a widespread economic benefit through an increase in permanent employment and in business, and cause an increase in values of both real estate and other property, thereby increasing the tax base.

(e) Indirect benefits would accrue from reclaiming a large swamp area, which would result in an improvement of conditions affecting public health and in the stimulation of development of 5 or 6 square miles of partially developed land. The development of these areas would increase the taxable wealth.

35. Small-craft owners in the Los Angeles metropolitan area state that the proposed harbor at Playa del Rey is required because of unsatisfactory conditions in Los Angeles and Long Beach Harbors, such as overcrowding of available space, decrease in number of berths because of increasing commercial and naval requirements, short-term leases, high maintenance costs, long distances from the ocean, and inadequate automobile parking facilities.

COMMERCE AND VESSEL TRAFFIC

36. *Commerce.*—There is no existing commerce at Playa del Rey Inlet and Lagoón. Future commerce at the proposed harbor would consist of recreational small craft, excursion boats, and commercial sport-fishing boats. Representatives of the city of Los Angeles and of Los Angeles County state that in their opinion the proposed small-craft harbor should be used only by recreational craft and that provision should be made for commercial fishing interests at other ports. No commercial fish canneries would be permitted in the harbor area, and no facilities would be provided for the unloading of fresh fish for transshipment by truck to canneries outside the area.

37. The population of 2,308,000 in the tributary area of Playa del Rey gives an indication that about 6,500 boats would be available for berthing in the harbor. This number is based on the average number of craft in California for each 1,000 population.

38. Inasmuch as the area tributary to Playa del Rey contains a high percentage of persons most able to own small craft, it is expected that the number of 6,500 boats would be considerably exceeded. The records of the Los Angeles County assessor show that there are 2,300 small craft now owned by residents of the immediate tributary area. It is conservatively estimated that within 1 year after completion of the project, 1,000 boats would be transferred from other harbors to Playa del Rey Harbor, and that within 5 years after completion of the project, 3,000 new craft would be constructed, sold to individual owners, and based in the proposed harbor. This figure does not include new boats that would be constructed or purchased by residents outside the immediate tributary area (zone 1). The population of the area outside zone 1, but which logically would be tributary to Playa del Rey rather than to one of the other existing or proposed harbors in the area, exceeds 600,000 persons. This would create an additional potential boat reserve of 960 new craft. To be prepared for future requirements, the proposed harbor would have a capacity of 8,000 craft. It is estimated that 35 of the boats would be commercial sport-fishing vessels carrying charter parties or making regularly scheduled runs.

39. Playa del Rey Harbor would be open to all craft as a port of refuge in case of emergency. Furthermore, the harbor would be used by visiting craft from San Diego Bay, Newport Bay Harbor, Los Angeles and Long Beach Harbors, and Redondo Beach Harbor, and as a port of call for small craft making the longer trips to Santa

Barbara, Monterey, and San Francisco, and for northern small craft cruising in southern waters.

40. *Vessel traffic.* There is no vessel traffic at Playa del Rey other than an occasional rowboat on the Venice canals. Numerous boats cruise in the open sea adjacent to the shore.

DIFFICULTIES ATTENDING NAVIGATION

41. In the vicinity of Playa del Rey, westerly and southwesterly winds prevail most of the year, but there are intermissions of calm during autumn and winter, as indicated by the wind rose on map, enclosure 1. The most severe storms are produced by the occasional southerly winds which occur in winter. The prevailing westerly winds seldom become more than moderate gales.

42. There are no adequately protected areas for small craft in Santa Monica Bay. Partial protection is provided at Redondo Beach, 8 miles to the south, and at Santa Monica, 3 miles to the north, of the site of the proposed harbor at Playa del Rey. At Redondo Beach the harbor formed by the breakwater consists of only about 20 acres of semiprotected area. The breakwater provides protection from westerly storm waves, but craft in its lee are exposed to the southerly storms. During these storms about 10 craft are washed ashore at Redondo Beach each year.

43. At Santa Monica Harbor an area of about 46 acres is partially protected by an offshore breakwater 2,000 feet in length. The breakwater was constructed by the city of Santa Monica in 1934 and has so deteriorated that storm waves break over the structure and create rough water within the harbor area. An average of 50 boats a year break loose from their moorings and are washed ashore. About 20 percent of these boats are a complete loss, as the surf breaks up the beached craft. It is improbable that the breakwater structure will be restored and maintained, mainly because the inadequate facilities and the restricted-water area cannot be remedied owing to site limitations.

44. All small-craft navigation in Santa Monica Bay is endangered by the lack of an adequate harbor of refuge.

SPECIAL SUBJECTS

45. *Shoreline changes.*—Pursuant to section 5 of the River and Harbor Act approved August 30, 1935 (Public Law 409, 79th Cong.), a detailed investigation was made with a view to determining probable effect of the proposed improvement upon the adjacent shoreline. A full report of the investigation is contained in enclosures 19¹ and 20.¹ Specific studies undertaken included a geological investigation to determine general trends in physiographic development of the coastal area, a determination of wave characteristics, surveys to trace the movement of beach material, investigation of the effect of existing structures, analysis of slopes of artificial fills made on southern California beaches, and an estimation of littoral characteristics in the Santa Monica Bay area.

46. Conclusions reached in the investigation of shore effects are quoted as follows:

¹ Not printed.

(a) The shores of Santa Monica Bay downcoast from Santa Monica breakwater have been deprived of normal littoral nourishment since construction of Santa Monica breakwater in 1933.

(b) Proposed jetties at Playa del Rey would act as a complete littoral barrier for a considerable period of time and would benefit the shore to the north by preventing further littoral loss from that area. Beach fill made in this area with material dredged from Playa del Rey Harbor would assist in completion of the comprehensive shore development planned by the city of Los Angeles.

(c) Between Ballona Creek jetties and proposed Playa del Rey jetties, the shore would stabilize after minor realinement.

(d) Downcoast from Ballona Creek, establishment of a feeder beach would be required to provide nourishment for shores to the south, and to prevent depletion of the fill recently completed by the city of Los Angeles. Deposit of 3,200,000 cubic yards along 5,000 feet of shore would be expected to provide adequate supply for a period of about 20 years.

(e) Future maintenance of Santa Monica Bay shores between Santa Monica breakwater and Playa del Rey may be accomplished by periodic replenishment of a suitably located feeder beach, or by removal of the breakwater and reestablishment of normal littoral transport at Santa Monica.

(f) Shores downcoast from Ballona Creek can be maintained in their advanced position by mechanical bypassing of sand past the proposed harbor entrance or by periodic deposit of sand from inland areas on the feeder beach. The most economic method can best be determined after the plan for maintenance of upcoast beaches has been established.

47. *Field surveys.*—Hydrographic and topographic surveys of the harbor and adjacent shore areas were made in March and April 1945, and during 1948. The surveys included the area from Washington Street to the Playa del Rey Hills and extended from Highway U. S. 101 Alternate (Lincoln Blvd.) seaward to about the 40-foot-depth contour. Shore topography was traced from aerial photographs and existing maps. The character of materials to be dredged was determined from auger borings.

48. *Coordination with other improvements.*—The improvement would not involve flood control, water power, water supply, or other subjects that could be coordinated with the improvement to compensate the United States for expenditures made. The project is an integral part of an overall plan of improvement of the beach areas by municipal and county agencies.

49. *Effect on wildlife.*—Construction of the proposed harbor would eliminate existing marshlands of some wildlife value. However, the Fish and Wildlife Service by letter dated April 26, 1946, state that no objection will be interposed to the construction of the project. Local representatives of the Fish and Wildlife Service state that few game birds occupy the area because of oil pollution which results from the operation of the oil field. Local interests propose to construct a bird refuge about 800 feet wide and 2,500 feet long adjacent to the flood-control channel as a part of the overall park development to provide for the shore birds nesting in the area. Principal among these birds are killdeer, sandpiper, stilt, and tern. In addition there are many other species of birdlife which are not dependent on the area. To

provide for the continuation of this existing birdlife, local interests should construct the bird refuge simultaneously with the construction of the harbor.

50. *Saline contamination.*—An investigation was made concerning the effects of the proposed harbor on saline contamination of underground water. This investigation indicated that (1) sea water has already contaminated the ground water within most of the area that would be occupied by the harbor; (2) further landward progress of this contamination depends primarily on the rate of withdrawal of ground water in the vicinity of the harbor site and on the steepness of the landward gradient produced by this withdrawal; and (3) introduction of sea water by constructing the harbor would not modify existing ground-water conditions.

51. *Harbor lines.*—Harbor lines have not been established in Santa Monica Bay. The plan considered would not adversely affect the future establishment of harbor lines.

52. *Aids to navigation.*—If the proposed harbor is constructed, the district Coast Guard officer, 11th Coast Guard District, recommends the installation of coded lights on the seaward ends of the proposed harbor jetties, the installation of a fog signal on the upcoast jetty, and installation of additional lights at the beginning of the curve on each jetty. Three light buoys would be required to mark the turns in the basin channel. The district Coast Guard officer estimates the total cost of aids to navigation at \$25,000.

PLANS OF IMPROVEMENT

53. *Plans considered.*—In determining the best plan of improvement the district engineer gave consideration to the desires of local interests as stated at the public hearings, to the more recent desires of local interests as developed by conferences, to modifications suggested by experienced small-craft operators, and to the requirements of navigation interests in general.

54. The plan originally proposed by local interests included a symmetrically arranged U-shaped harbor which had two entrances and capacity for about 5,200 craft. Local interests now believe that a harbor of that capacity would be inadequate to meet all the demands for anchorage, berthing, and maneuvering, and for adequate servicing and concessionary facilities; therefore, a modified elliptical area approximately 6,500 feet by 6,300 feet was proposed for consideration. The elliptical harbor would have capacity for about 8,000 craft. The two entrances were decided to be undesirable, as a stretch of beach about 2,100 feet long would be rendered inaccessible except by boat. This isolated island would not conform to the general plan of improvement approved by the Los Angeles City Council.

55. Combining the entrance channel with the Ballona Creek flood-control outlet would prove unsatisfactory, from the standpoint of navigation and maintenance of harbor depths. To eliminate both the isolated beach and entrance through the flood-control outlet, local interests proposed a curving entrance adjacent to the flood-control outlet. However, experienced small-craft operators state that a curved entrance is difficult to navigate, especially in foggy or heavy weather. Accordingly, consideration was given to straightening the proposed entrance. This would result in a long and rather wide en-

trance that would require a large area which would not make the most efficient use of the available space. Also, with a southerly side entrance, boats based in the northerly portion of the proposed harbor would be required to travel an excessive distance to reach the ocean. Furthermore, any entrance at the southerly side would subject the southerly shore of the proposed harbor to unfavorable and destructive wave conditions during storms.

56. The plan considered by the district engineer, which comprises a single, short, central entrance, would adequately overcome all the undesirable features of the side entrance.

57. The plans for side basins bordering the main central basin were modified so that the long axes of most side basins would be radial to the central basin. This modification would facilitate berthing small craft in the side basins.

58. All factors affecting the design of the harbor at Playa del Rey were discussed with interested local agencies, and the plan of improvement considered by the district engineer is the plan now desired by all responsible local interests. The plan has been approved by the Los Angeles City Council, the city planning commission, the city engineer, the Los Angeles County Board of Supervisors, the county regional planning commission, and the county engineer.

59. *Recommended plan.*—The plan recommended by the district engineer provides for the following principal features, as shown on enclosure 1.

(a) An entrance channel about 1,925 feet long and 600 feet wide, dredged to a depth of 20 feet below mean lower low water.

(b) Two random-stone jetties, each 2,300 feet in length.

(c) A 300-foot extension to the upcoast jetty at Ballona Creek flood-control channel outlet.

(d) A main interior channel 600 feet wide and 5,600 feet long, and two southerly side basins (designated C and K), all dredged to a depth of 20 feet below mean lower low water.

(e) A central basin and 10 additional side basins (designated A, B, D, E, F, G, H, I, J, and L), all dredged to a depth of 10 feet below mean lower low water.

(f) Disposal of material dredged from the proposed harbor, amounting to about 20,360,000 cubic yards, to construct solid-fill mole-type piers between the side basins, to reclaim lowlands adjacent to the harbor, and to provide about 160 acres of land by widening the beach as permanent beach improvement upcoast from the harbor entrance and to provide a separate feeder beach south of Ballona Creek flood-control channel for nourishment of the downcoast shore.

(g) Vertical bulkhead around side basin K, and random-stone revetment on the slopes of the remaining side basins and the central basin.

(h) Slips and facilities for berthing, servicing, supplying, and repairing small craft.

(i) Roads, parking areas, administration buildings, comfort stations, landscaping, clubhouses, and all other facilities required for a modern recreational small-craft development.

60. Under the general plan, 11 mole-type piers and the entrance abutments would divide the bay into 12 side basins with a capacity for berthing 8,000 small craft at slips. See exhibit 1, enclosure 16,¹

¹ Not printed.

for a diagrammatic sketch of the arrangement of slips used to determine the capacity of the harbor. Ultimate development of a typical mole arrangement proposed by local interests is shown on enclosure 4,¹ "General plan of harbor," by the Los Angeles City Planning Commission. The pierheads would be reserved for concessions, such as gasoline and oil stations, small stores, cafes, and boat clubs. The pier between basins marked D and E on the general plan, enclosure 1, would be used for harbor administration. The pier on each side of basin K would be reserved for boat-repairing facilities and other commercial purposes. The pier between basins A and B would be used by marine-outing clubs. Parking areas are located wherever space permits. The harbor area is considered as that section encircled by the perimeter road. Justification of all features of design and all items included in the recommended project are contained in enclosure 16.¹

FIRST COST AND ANNUAL CHARGES

61. *Estimate of first cost.*—The total first cost of the improvements, based on 1948 prices, is estimated at \$25,603,000, of which \$16,505,000 would be borne by local interests and \$9,098,000 by the United States. Details of the estimate are given in enclosure 16¹ and are summarized in the following table:

Estimate of first cost, Playa del Rey, Calif.

Federal costs:

Corps of Engineers:

Dredging entrance channel and interior basins and filling lowlands.....	\$5,090,000
Stone jetties, entrance channel.....	2,168,680
Subtotal.....	7,258,680
Engineering and contingencies, 25± percent.....	1,814,320
Total.....	9,073,000
U. S. Coast Guard: Aids to navigation.....	25,000
Total Federal 1st cost.....	9,098,000

Non-Federal costs:

Stone jetty extension, Ballona Creek.....	126,450
Stone revetment, interior basins.....	388,500
Vertical bulkhead, boat repair basin.....	1,314,400
Landscaping mole-type piers.....	25,670
Administration building.....	150,000
Floats, slips, light and water facilities.....	860,000
Paving (parking areas).....	736,050
Paving (roads).....	911,650
Relocation of Venice sewer and constructing mains and laterals.....	2,150,000
Public utilities, relocation and construction of water and electric lines, and removal of oil pipelines.....	1,200,000
Subtotal.....	7,862,720

¹ Not printed.

Estimate of first cost, Playa del Rey, Calif—Continued

Non-Federal costs—Continued

Engineering and contingencies, 25 ± percent..... \$1, 965, 280

Total non-Federal, except land and rights-of-way..... 9, 828, 000

Land and improvements..... \$4, 410, 500

Drilling offset wells and capping existing wells... 1, 422, 000

Subtotal..... 5, 832, 500

Contingencies, 10 ± percent..... 583, 300

Acquisition cost, about 10 percent of land and
rights-of-way..... 441, 200

Subtotal..... 6, 857, 000

Less immediate salvage value of improvements.. -180, 000 6, 677, 000

Total non-Federal cost..... 16, 505, 000

Total Federal cost..... 9, 098, 000

Total first cost of project..... 25, 603, 000

62. *Estimate of annual charges.*—In computing the interest charges, it was assumed that the construction would require 3 years. The salvage value of all improvements is assumed to be nominal or negligible at the expiration of the useful life of the project, estimated at 50 years. However, the net salvage value of the land is estimated at \$3,352,000. This amount is equal to the total estimated value, immediately after filling and prior to construction of any improvements, of filled lands within the taking area described as areas B and C in enclosure 17.¹ The salvage value of the 160 acres of new beach to be constructed is not assumed to be creditable to this project inasmuch as nourishment of this beach would be provided for under the master plan for beach development by the city and county of Los Angeles, Calif. In computing the non-Federal carrying charges the estimated returns from improvements represent only the net return from slip rentals after deduction of operation and maintenance costs, as shown in the following table. This net return is based on using 50 percent of the estimated total annual return from slip rental for 4,000 boats, as follows:

Boat size	Percent	Number of boats	Estimated annual slip charge	Total
Under 20 feet.....	43.1	1, 724	\$56. 00	\$96, 544
20 feet to 35 feet.....	41.6	1, 664	102. 00	169, 730
36 feet to 50 feet.....	11.6	464	146. 60	67, 976
51 feet to 100 feet.....	2.9	116	253. 00	29, 350
Over 100 feet.....	.8	32	550. 00	17, 600
Total.....	100.0	4, 000		381, 200
Estimated operation and maintenance costs.....				190, 600
Estimated direct net returns from improvement.....				100, 600

¹ Not printed.

63. The estimated annual charges for the improvements are given in the following table:

Estimated annual charges for Playa del Rey Harbor, Calif.

(a) Federal investment:		
(1) Corps of Engineers	-----	\$9, 073, 000
(2) U. S. Coast Guard	-----	25, 000
(3) Total Federal 1st cost (see estimate of 1st cost)	-----	9, 098, 000
(4) Interest during $\frac{1}{2}$ of construction period: 3 percent of item (a) (3) for 1.5 years	-----	409, 410
(5) Total Federal investment to be justified by benefits and subject to amortization	-----	9, 507, 410
(b) Federal annual charges:		
(1) Interest at 3 percent of item (a) (5)	-----	285, 220
(2) Amortization for 50 years at 3 percent: 0.00887 times item (a) (5)	-----	84, 330
(3) Maintenance	-----	1 26, 000
(4) Total Federal annual charges	-----	395, 550
(c) Non-Federal investment:		
(1) Funds to be contributed or cost of improvements to be undertaken by local interests	-----	9, 828, 000
(2) Value of rights-of-way to be furnished	-----	6, 677, 000
(3) Total non-Federal 1st cost (see estimate of 1st cost)	-----	16, 505, 000
(4) Interest during $\frac{1}{2}$ of construction period: 3.5 percent of item (c) (3) for 1.5 years	-----	866, 510
(5) Gross non-Federal investment to be justified by benefits	-----	17, 371, 510
(6) Less net salvage value of land	-----	-3, 352, 000
(7) Net non-Federal investment subject to amortization	-----	14, 019, 510
(d) Non-Federal annual charges:		
(1) Interest at 3.5 percent of item (c) (5)	-----	608, 000
(2) Amortization for 50 years at 3.5 percent: 0.00763 times item (c) (7)	-----	106, 970
(3) Maintenance	-----	(²)
(4) Gross non-Federal annual charges	-----	714, 970
(5) Less estimated direct net returns from slip rentals	-----	-190, 600
(6) Net non-Federal annual charges	-----	524, 370
(e) Total estimated annual charges	-----	919, 920

Summary of 1st costs and annual charges

Item	First cost	Interest	Investment	Annual charges	Annual maintenance
Federal	\$9, 098, 000	\$409, 410	\$9, 507, 410	\$395, 550	¹ \$26, 000
Non-Federal	16, 505, 000	866, 510	17, 371, 510	524, 370	(²)
Total	25, 603, 000	1, 275, 920	26, 878, 920	919, 920	¹ 26, 000

¹ Includes \$1,000 maintenance by U. S. Coast Guard.

² Estimated \$190,600 income from slip rentals to be used for operation and non-Federal maintenance.

ESTIMATES OF AVERAGE ANNUAL BENEFITS

64. *Increased value of filled land.*—In constructing a harbor at Playa del Rey, the Federal Government would dredge approximately 20,360,000 cubic yards of material to provide about 717 acres of water area. The dredged material would be deposited to fill adjacent lowlands and to create additional beach land. Local interests plan to develop the adjacent area as an all-year beach resort and recreation center. The artificial widening of the beach would result in an immediate increase in value of the filled area. The low, undeveloped land between Ballona Creek and the Playa del Rey Hills and the marshland in the harbor area would be reclaimed and would increase in value. In estimating the benefits that would result from filling low lands pursuant to construction of the proposed harbor at Playa del Rey, only those areas that would be filled with material dredged from the harbor have been considered. The estimated increase in value of the areas reclaimed or filled in no way reflects any enhancement in value that would accrue to the land by virtue of its proximity to the proposed harbor.

65. The water area for the proposed harbor would be created by dredging about 717 acres of marsh and low land. An estimated additional 844 acres of land would be filled with the dredged material as listed below:

	Acres
Area A: South of Ballona Creek.....	358
Area B: Mole-type piers.....	203
Area C: West of Lincoln Blvd.....	123
New beach.....	160
Total.....	844

The average annual benefits from the increased value of land by reason of filling only are estimated at \$215,000. Further details concerning benefits from increased land value are given in enclosure 17.¹

66. *Mosquito control savings.*—The site of the proposed harbor consists of low, marshy land with inadequate provisions for drainage and, as a result, a large area of water is almost stagnant. The Ballona Creek Mosquito Abatement District spends about \$21,000 annually on mosquito control. Approximately 75 percent of these funds would be spent in the area to be improved. The elimination of this problem by the filling of marsh areas or by improvement of drainage would provide an annual benefit of \$16,000. In addition to tangible monetary benefits, conditions affecting public health would be improved by the elimination of mosquito breeding areas. (See enclosure 17.¹)

67. *Benefits from navigation.*—The benefits that would accrue to the proposed harbor project from navigation are dependent on the type and number of craft that would use the facility. Based on the records of similar developments in California and on reports from small-craft manufacturers on their backlog of orders for new craft, the anticipated number of boats would exceed 6,500. According to local interests and boat manufacturers, if accommodations were available, 10,000 new craft would be built in the next few years. The proposed harbor at Playa del Rey would have a capacity of 8,000 small craft. However, in computing the recreational benefit that would accrue from navigation, the number of new craft of average

¹ Not printed.

size that would be based in the harbor has been estimated to be only 3,000. The proposed Playa del Rey Harbor would be open to all craft as a port of refuge and as a port of call by many small craft. Additional tangible benefits that would accrue from the navigation features of the proposed project are automobile travel savings, boat maintenance savings, prevention of boat damage, and increased fish catch. Some of the intangible navigation benefits which would accrue from the project are, increase in the recreational activities of the community, creation of additional business opportunities, increase in safety of navigation, and increase in opportunity for boatowners to operate their small craft.

68. *Recreational harbor benefit.*—The monetary benefit from the recreational use of a small-craft harbor is estimated to be the annual income from a capital investment equivalent to the average value of the small-craft fleet at that harbor. On the basis of an average value of \$6,000 each, the monetary benefit that would result from the estimated minimum fleet of 3,000 new small-craft that would occupy the proposed Playa del Rey Harbor, is estimated at \$900,000. (See enclosure 17.¹)

69. *Automobile travel savings.*—Most boatowners living in the area tributary to Playa del Rey (zone 1) are unable to anchor their boats at Santa Monica Harbor and must keep them at Los Angeles Harbor, Long Beach Harbor, Newport Bay Harbor, or at some more distant port because of the lack of proper harbor facilities in Santa Monica Bay. The actual monetary saving of automobile operating costs by the estimated 1,000 boatowners who would transfer their boats from one of the more distant harbors to Playa del Rey Harbor is estimated at \$35,000. (See enclosure 17.¹)

70. *Boat maintenance savings.*—The boatowners living in the area tributary to Playa del Rey whose craft are moored in the commercial harbors of Los Angeles or Long Beach would benefit by having a recreational harbor. Provision of such a harbor would result in a saving through decreased maintenance costs to small craft because of their removal from sources of contamination as exists in a commercial harbor. The annual savings in maintenance cost by the estimated 400 boatowners who would transfer their boats from Los Angeles and Long Beach Harbors to Playa del Rey Harbor is estimated at \$8,000. (See enclosure 17.¹)

71. *Prevention of boat damage.*—Small craft in Santa Monica Bay are exposed to the sudden and sometimes moderately severe storms that occur annually during the period December to March, inclusive. Records of past storms indicate that about 60 small craft are beached annually by storms because of the lack of a safe anchorage area. The proposed Playa del Rey and Redondo Beach Harbors would replace existing inadequate facilities and offer refuge to all small craft operating in Santa Monica Bay. The total annual benefit from the prevention of this damage to small craft that would be creditable to the proposed Playa del Rey Harbor is estimated at \$75,000. (See enclosure 17.¹)

¹ Not printed.

72. *Increased fish catch.*—Fish caught by sport fishermen add to the national wealth to the extent that this fish catch finds its way into the national food supply. From the records of operators of sport-fishing boats, it is estimated that an additional 2,800,000 pounds of fish would be caught each year because of the estimated increased number of sport-fishing boats that would operate from the proposed Playa del Rey Harbor. In addition to trips made by patrons of sport-fishing boats, the estimated increased number of individual boat owners would take an additional fish catch for which no benefit is claimed. The monetary average annual benefit from fish caught by sport fishermen is estimated at \$280,000. For additional details of benefits from fish catch. (See enclosure 17.¹)

73. *Intangible benefits.*—Intangible benefits (those not susceptible of monetary evaluation) that would accrue under the plan of improvement considered are large. Benefits would result from increased safety of small-craft navigation in the Santa Monica Bay area by providing a port of refuge for transient craft and a safe port for anchorage of home-craft. The pleasure of small-craft operation would be increased by the provision of an adequate facility close to the greatest number of small-craft owners in the Los Angeles metropolitan area and separated from the activities of a large commercial and naval port.

74. Construction of the navigation facility proposed at Playa del Rey Harbor would increase the use of adjacent waters and neighboring ports by small craft because of an additional place to visit, which would increase the pleasure derived from operation of recreational craft. This, in turn, would create new business, additional tax income, and new opportunities for industry in the manufacture, repair, and servicing of additional craft in established harbors. These benefits cannot be evaluated because of the difficulty of determining the proportion of increased use of the established harbors that would be due to the construction of the new facility.

75. Large intangible benefits would also accrue by reason of increased land values in areas adjacent to the proposed harbor, primarily the Venice area and the partially developed area located between Highway U. S. 101 Alternate and Culver City. The proposed harbor constitutes one unit of a large resort and recreation area planned by local interests that would extend from El Segundo to Topanga Canyon on Santa Monica Bay, and a large part of the increased land values would be creditable to that project. The creation of an all-year beach playground would attract visitors from all parts of the country, afford new opportunity for travel, and create an additional economic benefit to the beach communities.

76. *Summary of tangible benefits.*—The average annual tangible benefits that would accrue under the plan considered are summarized in the following table. A detailed analysis of benefits is given in enclosure 17.¹

¹ Not printed.

Estimated average annual tangible benefits from improvements considered, Playa del Rey, Calif.

Type of benefit	General (Federal)	Local (non-Federal)	Total
Other than navigation:			
Increased value of filled land.....	0	\$215,000	\$215,000
Mosquito control savings.....	0	16,000	16,000
Subtotal.....	0	231,000	231,000
Navigation:			
Recreational harbor benefit.....	\$450,000	450,000	900,000
Automobile travel savings.....	0	35,000	35,000
Boat maintenance savings.....	0	8,000	8,000
Prevention of boat damage.....	75,000	0	75,000
Increased fish catch.....	280,000	0	280,000
Subtotal.....	805,000	493,000	1,298,000
Total.....	805,000	724,000	1,529,000

COMPARISON OF BENEFITS AND COSTS

77. The total cost of the proposed improvement is estimated at \$25,603,000. The total annual carrying charges would be \$919,920. The annual benefits would be \$1,529,000. The benefit-cost ratio of the proposed harbor project would be 1.7 to 1. In addition to the tangible benefits there would be considerable intangible benefits which, while not susceptible of monetary evaluation, are worthy of consideration.

PROPOSED LOCAL COOPERATION

78. At the public hearings local interests expressed a willingness to cooperate in the cost of the project. The formation of a recreation and harbor district was proposed for the purpose of meeting financial requirements through sale of bonds. One object of the report being prepared by the firm of consulting engineers employed by local interests is to determine the best methods of financing the beach development and harbor projects. The city of Los Angeles and the county of Los Angeles, by resolutions, furnished as enclosure 18, agreed to assume the following obligations: (1) Provide all rights-of-way for construction and maintenance of improvements; (2) hold and save the United States free from all claims for damages resulting from the construction or operation of the improvement; (3) assume the cost of alteration, relocation, or rebuilding of highways and highway bridges, or arrange for the alteration, relocation, or rebuilding of these highways and highway bridges; (4) assume the cost of relocation or reconstruction of utilities or drainage structures; (5) contribute in cash or equivalent work, the cost of constructing a vertical bulkhead, stone revetments in all basins, and extension of the north jetty at Ballona Creek; (6) provide without cost to the United States all necessary slips and facilities for repair, service, maintenance, and supply of small craft; (7) secure and hold for the public interest, lands bordering the proposed development to a width sufficient for proper functioning of the harbor; (8) furnish assurances satisfactory to the Secretary of the Army that the area will be improved in accordance with plans and time schedules to be approved by the Secretary of

¹ Not printed.

the Army; and (9) maintain and operate the entire project except aids to navigation, entrance jetties, project depths in the entrance and interior channels and the central basin, with the understanding that all facilities shall be open to all on equal terms.

ALLOCATION OF COSTS

79. The distribution of costs between Federal and non-Federal interests is based on (1) the distribution of local and general benefits, (2) the ability of local interests to pay, and (3) consideration of the general nature of the work items. Accordingly, of the total first cost of the proposed project estimated at \$25,603,000, the United States would provide those items of construction that would benefit navigation in general, comprising the construction of entrance jetties and aids to navigation, and the dredging of channels and basins, all at an estimated Federal first cost of \$9,098,000, as itemized in the preceding paragraph, "Estimates of first cost." Local interests would provide the items of local cooperation named in the preceding paragraph, "Proposed local cooperation," all at an estimated non-Federal first cost of \$16,505,000, and as itemized in the preceding paragraph, "Estimates of first cost." The United States would maintain the entrance jetties, aids to navigation, and harbor depths in the entrance and interior channels and in the central basin, all at an estimated annual cost of \$25,000 for the Corps of Engineers, and \$1,000 for the United States Coast Guard. Non-Federal annual maintenance would be paid from operating revenues.

DISCUSSION

80. Local interests base justification for the project on (1) the lack of adequate facilities for small-craft navigation in the Santa Monica Bay area, (2) the desirability of separating small craft and recreational boating from commercial and naval waters, (3) the need for facilities to permit growth of recreational and commercial small-craft operation, (4) requirements for safety of small-craft operation in Santa Monica Bay, and (5) the favorable economic effect that development of small-craft operation and the provision of an adequate small-craft facility would have on the community.

81. The district engineer concurs in general with the statements made by local interests concerning justification of the project. However, in determining the extent of the tributary area, consideration was given to the proposed improvement of the small-craft harbor at Redondo Beach, 8.2 miles downcoast from the proposed harbor at Playa del Rey. The protection afforded by Santa Monica breakwater is inadequate and gives the boatowner a false sense of security. City officials of Santa Monica have stated that the structure will not be maintained. Consideration also was given to the existing harbors at Los Angeles, Long Beach, and Newport Bay. Accordingly, only that portion of the general tributary area that is closer to Playa del Rey than to any other existing or proposed harbor has been considered in determining the need for, or the benefits that would result from, a navigation project at Playa del Rey.

82. Recovery of petroleum from the Venice oilfield could be continued by relocating existing oil wells so as not to interfere with operation of the proposed harbor.

83. Annual tangible benefits from the navigation improvement would be \$215,000 from increased value of filled land, \$16,000 from cost of mosquito control savings, \$900,000 from recreational harbor benefits, \$35,000 from automobile travel savings, \$8,000 from boat maintenance savings, \$75,000 from prevention of boat damage, and \$280,000 from increased fish catch, a total of \$1,529,000 a year.

84. In addition to the tangible benefits, the proposed navigation project would result in large intangible benefits which have considerable weight in justification of the project. The intangible benefits would include the noncalculable benefits from (1) the increased safety of navigation, (2) the recreational value of an all-year small-craft harbor near the largest concentration of boatowners in the Los Angeles metropolitan area, (3) the promotion of general welfare by the increase in opportunities for employment, and (4) increase in land values in the vicinity of the proposed harbor area that would be partially attributable to the proposed navigation improvement.

85. The estimated total first cost of the proposed navigation project is \$25,603,000. Of this amount, \$16,505,000 would be borne by local interests. The total annual charges would be \$919,920 and the total annual benefits \$1,529,000. The benefit-cost ratio is 1.7 to 1.

86. The project considered by the district engineer meets the present desires of local interests. The project has the approval of the city of Los Angeles and Los Angeles County. The harbor project forms one unit of the master plan of the county of Los Angeles for shoreline development. The project is also one unit of the plan of the city of Los Angeles for the development of the shoreline between El Segundo and Topanga Canyon. This plan was approved by the Los Angeles City Council. The overall plan of development proposed by the city of Los Angeles is included as enclosure 11.¹

87. Departures from the original plans desired by local interests were made by the district engineer to provide better navigation conditions within the proposed harbor and entrance channel, to make more efficient use of the dredged water area, and to reduce the total cost of the proposed improvements.

88. Both the city of Los Angeles and the county of Los Angeles have expressed their desire and willingness to cooperate with the Federal Government by sharing in the cost of the project through fulfilling all items of local cooperation required. Either the city or county of Los Angeles would be able to meet the requirements of local cooperation through direct bond issue or formation of a harbor district. The State of California has adopted a policy of assisting local bodies in meeting items of cooperation for flood control required by the Federal Government, as evidenced by the State Water Resources Act approved July 19, 1945, appropriating \$30 million for that purpose. The State also has a policy of cooperating with local public bodies on a matching basis in the acquisition of beaches. It is reasonable to assume that these policies will be extended to include other Federal projects.

89. An investigation of the small-craft harbors in southern California indicates an urgent need for additional facilities. Newport Bay Harbor is the only first-class small-craft harbor in the southern California

¹ Not printed.

area. An integrated recreational marine park and small-craft harbor project at Mission Bay, San Diego, Calif. (120 miles downcoast), was authorized by act approved July 24, 1946. A review of reports on Redondo Beach Harbor is in progress. These harbors would be inadequate to meet the demand for berthing small craft in southern California. Shipbuilding and ship brokerage firms in the Los Angeles area have a backlog of small-craft orders that would increase the number of small craft in southern California coastal waters at the rate of 3,000 boats a year for the next 2 years, provided berths are furnished for these craft. It is reasonable to assume that this trend would continue. Boatbuilders state they are unable to consummate sales of small craft because berthing space is not available. The limited facilities for small craft in Los Angeles and Long Beach Harbors are constantly subject to encroachment by commercial and naval needs.

90. The history of established harbors shows that construction of a new harbor does not result in the transfer of commercial facilities from the existing ports, but tends to increase the facilities in the older established ports in addition to encouraging establishment of new port facilities in a new harbor.

91. A detailed study of the probable effects of the proposed jetties at Playa del Rey upon the adjacent shoreline revealed that between the cities of Santa Monica and Redondo Beach, the shore is now receiving inadequate natural nourishment for maintenance of stable shore alignment. The predominate direction of littoral drift is downcoast throughout this area. The proposed jetties would act as a complete barrier to littoral drift for a considerable period of time and would benefit the shore upcoast therefrom by preventing further littoral loss. From the proposed Playa del Rey Harbor entrance to the existing upcoast Ballona Creek jetty, the shoreline would become stable after minor realignment. Downcoast from Ballona Creek to Redondo breakwater, no natural littoral supply would be available. Nourishment by mechanical means would be necessary to prevent erosion. The most suitable permanent plan for maintaining this area cannot be determined until a plan for maintaining beaches upcoast from Playa del Rey is established. Studies are now in progress with a view to determining the most suitable permanent plan for maintenance of all of the Santa Monica Bay shores. Many interests are involved and considerable time probably will elapse before such a plan is put into effect. In order to insure nourishment of the shore downcoast from Ballona Creek pending a permanent solution to the problem, the proposed plan of improvement includes the establishment of a feeder beach below Ballona Creek by depositing 3,200,000 cubic yards of material that would be dredged from Playa del Rey Harbor. It is estimated that this quantity of material will be adequate to provide normal maintenance in the downcoast area for approximately 20 years.

CONCLUSIONS

92. The district engineer concludes that:

(a) There is need for additional small-craft facilities in southern California and, in particular, in Santa Monica Bay.

(b) The improvement would be used to capacity within a period of 5 years after its completion.

(c) The proposed harbor would not seriously impair the recovery of petroleum from the existing Venice oilfield.

(d) The proposed harbor would augment existing harbors, and, while adjustment in small-craft berthing and business would be made, they would not intentionally reduce the use of existing harbors or conflict in any manner with the development of the proposed improvement at Redondo Beach.

(e) The proposed harbor jetties would intercept downcoast littoral drift for a considerable period of time. Other improvements in Santa Monica Bay have altered the natural regimen of littoral forces and a comprehensive plan is required to maintain stability of the shoreline. Provision of a feeder beach in accordance with the proposed plan of improvement would prevent harmful effect upon adjacent shorelines by the proposed jetties pending completion of the comprehensive beach-development plan. The harbor would have a stabilizing effect on the upcoast beaches expected to be improved. The general effect of the proposed harbor on the beaches probably would be beneficial.

(f) An adequate navigation facility can best be provided by constructing entrance jetties and dredging an entrance channel and interior basins.

(g) The plan considered is the best plan for making recreational harbor facilities in Santa Monica Bay available to the largest number of boatowners and potential owners in southern California at the least cost.

(h) The project for small-craft navigation is justified.

(i) In view of the nature of the work and the distribution of benefits, it would be appropriate for the Federal Government to pay the entire cost of constructing aids to navigation, the entrance jetties, and dredging the channels and basins, all at an estimated total Federal first cost of \$9,073,000 for work to be accomplished by the Corps of Engineers.

(j) Local interests should pay the cost of extending the upcoast Ballona Creek jetty; constructing a vertical bulkhead; revetting the side slopes of all the basins; providing all slips and other facilities for operating, berthing, maintaining, repairing, servicing, and supplying small craft; constructing all roads, pavements, and parking facilities; providing all rights-of-way, including the cost of relocating existing oil wells, all at an estimated total first cost of \$16,505,000.

(k) The proposed project would be constructed over a period of 3 years and about \$3,073,000 should be made available initially, \$3 million the second year, and \$3 million the third year.

RECOMMENDATIONS

93. The district engineer recommends that a project be adopted to establish a harbor for small-craft navigation at Playa del Rey, Calif., as follows: construct two harbor entrance jetties; extend the upcoast jetty of Ballona Creek flood-control channel; dredge an entrance and interior channel, an interior central basin, and side basins, and deposit the dredged material in areas to be reclaimed for mole-type piers, in lowlands, and along beach frontage; construct stone revetment and vertical bulkheads; construct adequate harbor facilities for operating,

berthing, maintaining, repairing, servicing, and supplying small craft; relocate and provide utilities and sewage facilities; and relocate existing oil recovery facilities; all at an estimated total first cost of \$25,603,000.

94. The district engineer recommends that the United States provide the 2 harbor entrance jetties; an entrance channel 600 feet wide and 20 feet deep; an interior channel 600 feet wide, 5,600 feet long, and 20 feet deep; 2 side basins 20 feet deep and a central basin and 10 side basins 10 feet deep separated by mole-type piers; and deposition of dredged material in the mole-type piers, on adjacent lowlands, and along beach frontage; all at an estimated Federal first cost of \$9,073,000, exclusive of aids to navigation, and \$25,000 annually for maintenance.

95. The district engineer further recommends that adoption of the project be subject to the conditions that local interests shall give assurances satisfactory to the Secretary of the Army that the required cooperation will be furnished, such cooperation to be performed by a competent and duly authorized public body, financially able to accomplish the obligations so assumed and empowered to regulate the use, growth, and free development of the harbor facilities with the understanding that such facilities shall be open to all on equal terms. The required local cooperation would consist of (1) securing and holding in the public interest lands bordering on the proposed development to a width sufficient for proper functioning of the harbor; assuming the cost of all rights-of-way, including disposal areas, the cost of relocating oil wells, and the cost of relocating and constructing public utilities; constructing stone revetments, a vertical bulkhead, and an extension of the upcoast jetty at Ballona Creek flood-control channel; providing adequate harbor facilities for operating, berthing, maintaining, repairing, servicing, and supplying small craft; and for developing the harbor area for park and recreational purposes, all at an estimated non-Federal first cost of \$16,505,000; (2) preparing definite plans and construction schedules for the construction of small-craft facilities, including development of the mole-type piers, which shall be subject to approval by the Secretary of the Army; (3) maintaining and operating the entire project except aids to navigation, entrance jetties, and project depths in the entrance and interior channels and in the central basin; and (4) holding and saving the United States free from all claims for damages arising from the construction or operation of the project works.

A. T. W. MOORE,
Colonel, Corps of Engineers, District Engineer.

[First endorsement]

SOUTH PACIFIC DIVISION,
CORPS OF ENGINEERS,
UNITED STATES ARMY,
OAKLAND ARMY BASE,
Oakland 14, Calif., August 22, 1949.

Subject: Survey of Harbor at Playa del Rey, Calif. (Basic: August 16, 1948.)

To: Chief of Engineers, Department of the Army, Washington 25, D. C.

1. I concur in the conclusions and recommendations of the district engineer.
2. I have reviewed the economics of the report and consider reasonable the district engineer's estimates of total annual benefits amounting to \$1,529,000 and total annual charges amounting to \$919,920, indicating a favorable benefit-cost ratio of 1.7 to 1.

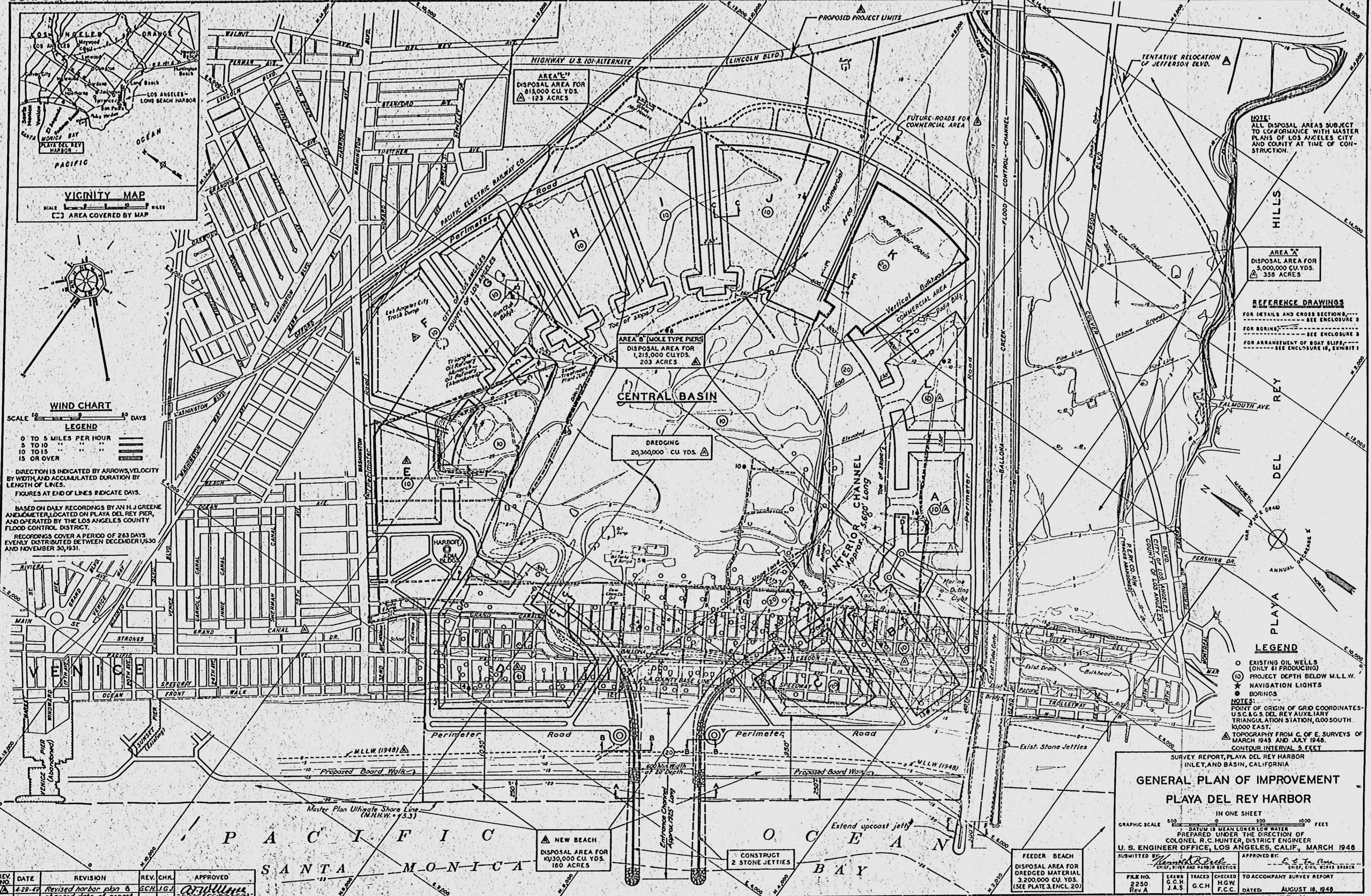
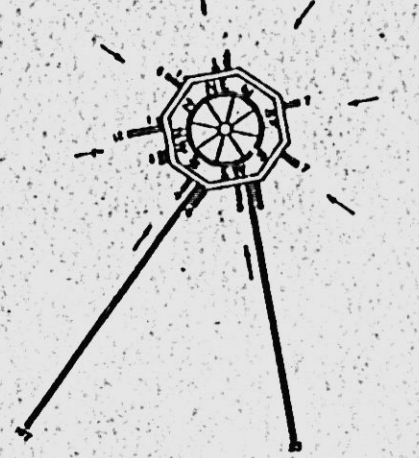
DWIGHT F. JOHNS,
Colonel, Corps of Engineers, Division Engineer.

LIST OF ENCLOSURES MADE IN CONNECTION WITH THE REPORT
OF THE DISTRICT ENGINEER

(Only enclosure 1 printed)

No.	Title
1.	General plan of improvement.
2.	Details and cross sections.
3.	Borings.
4.	General plan by Los Angeles City Planning Commission.
5.	Immediate tributary area.
6.	Tributary area accessible to small-craft harbor development.
7.	Permit drawing showing proposed beach fill.
8.	Distribution of boatowners.
9.	Sardine and mackerel fishing localities.
10.	Cost tabulation on small-boat navigation.
11.	Proposed development plan, Santa Monica Bay shoreline.
12.	Cost estimate of shoreline development.
13.	Photographs.
14.	Correspondence and data submitted by local interests.
15.	Letters from boatbuilders.
16.	Bases for design and cost estimates.
17.	Benefits from improvements.
18.	Resolutions by local interests.
19.	Geology.
20.	Shoreline effect.





REV. NO.	DATE	REVISION	REV. CHK.	APPROVED
1	4-29-48	Revised harbor plan & changed date of report	GCH, J.G.J.	<i>W. L. Rouse</i>

