

PHILLIPPI CREEK BASIN, FLORIDA

LETTER

FROM

THE SECRETARY OF THE ARMY

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY, DATED SEPTEMBER 3, 1964, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND AN ILLUSTRATION, ON A SURVEY OF PHILLIPPI CREEK BASIN, FLORIDA, AUTHORIZED BY THE FLOOD CONTROL ACT APPROVED JULY 14, 1960



APRIL 27, 1965.—Referred to the Committee on Public Works and ordered to be printed with one illustration

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U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1965

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ILLUSTRATION ACCOMPANYING THE REPORT OF THE DISTRICT ENGINEER

Plate 1. Drainage Area and Plan of Improvement.

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C.



IN REPLY REFER TO:

April 22, 1965

Honorable John W. McCormack
Speaker of the House of Representatives

Dear Mr. Speaker:

I am transmitting herewith a favorable report dated 3 September 1964, from the Chief of Engineers, Department of the Army, together with accompanying papers and an illustration, on a survey of Phillippi Creek Basin, Florida, authorized by the Flood Control Act approved 14 July 1960.

The views of the State of Florida, and the Departments of the Interior, Agriculture and Commerce are set forth in the inclosed communications.

The Bureau of the Budget advises that there is no objection to the submission of the proposed report to the Congress; however, it states that no commitment can be made at this time as to when any estimate of appropriation would be submitted for construction of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation. A copy of the letter from the Bureau of the Budget is inclosed.

Sincerely yours,

A handwritten signature in cursive script that reads "Stephen Ailes".

STEPHEN AILES
Secretary of the Army

1 Incl
Report

COMMENTS OF THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT

BUREAU OF THE BUDGET

WASHINGTON, D.C. 20503

April 13, 1965

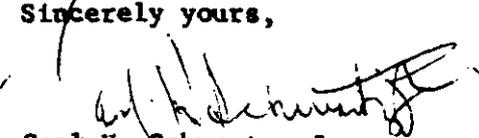
Honorable Stephen Ailes
Secretary of the Army
Washington, D. C. 20310

Dear Mr. Secretary:

Mr. Alfred B. Fitt's letter of October 14, 1964, submitted the favorable report of the Chief of Engineers on a survey of Phillippi Creek Basin, Florida, authorized by the Flood Control Act approved July 14, 1960.

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

Sincerely yours,


Carl H. Schwartz, Jr.
Chief, Resources and
Civil Works Division

COMMENTS OF THE STATE OF FLORIDA

RANDOLPH HODGES, *Director*
TELEPHONE 224-7141

FARRIS BRYANT, *Governor*
TOM ADAMS, *Secretary of State*

Florida



Board of Conservation

107 WEST GAINES STREET • TALLAHASSEE 32304

RAY E. GREEN, *Comptroller*
J. EDWIN LARSON, *Treasurer*
THOMAS D. BAILEY, *Superintendent of
Public Instruction*

DOYLE CONNER, *Commissioner of Agric.*
JAMES W. KYNES, *Attorney General*

June 2, 1964

Ref: ENG CW-PD
7 April 1964

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

Dear Sir:

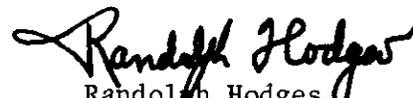
The Florida Board of Conservation is pleased to advise that we concur with the recommendation of the Chief of Engineers in his report on the flood control project at Phillippi Creek, Florida.

The Board of County Commissioners of Sarasota County, the agency of local responsibility for this project, confirms their acceptance of responsibility.

This office concurs in the views on fish and wildlife as expressed in the letters contained as an enclosure to the report.

Your consideration in obtaining the comments of the Florida Board of Conservation is appreciated.

Sincerely yours,


Randolph Hodges
Director

RH/JK/bg

COMMENTS OF THE DEPARTMENT OF THE INTERIOR



UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

May 28, 1964

Dear General Wilson:

This is in reply to your letter of April 7, 1964, requesting our comments on a survey of Phillippi Creek Basin, Florida.

The U. S. Fish and Wildlife Service reports that construction of the proposed Phillippi Creek flood control project would not have significant effects on wildlife or fresh water fish in the area. It is possible that the project may occasion an increase of sedimentation in the estuary to the detriment of the fishery resources and it is urged that every effort be made to develop project design that will minimize sedimentation in the estuary.

No mineral production of any sort has been recorded from the project area in recent years, and no adverse mineral involvement is anticipated.

We appreciate the opportunity of presenting our views.

Sincerely yours,

A handwritten signature in cursive script that reads "Robert W. Nelson".

Deputy Assistant Secretary of the Interior

Lt. General Walter K. Wilson, Jr.
Chief of Engineers
Department of the Army
Washington, D. C. 20315

COMMENTS OF THE DEPARTMENT OF AGRICULTURE



DEPARTMENT OF AGRICULTURE
WASHINGTON 25, D.C.

July 29, 1964

Honorable Cyrus R. Vance
Secretary of the Army

Dear Mr. Secretary:

This is in reply to the Chief of Engineers' letter of April 7, 1964, transmitting for our review and comment his proposed survey report on the Phillippi Creek Basin, Florida.

The report recommends the improvement of Phillippi Creek and its tributaries in Sarasota County, Florida, to provide primary works for flood control and drainage consisting of 15.1 miles of channel enlargement, seven channel control structures, and related construction. The cost of the project is estimated to be \$7,855,000, of which \$4,592,000 would be for Federal construction and \$3,263,000 would be non-Federal cost including an estimated cash contribution of \$1,165,500. The benefit-cost ratio is estimated at 1.3 to 1.0.

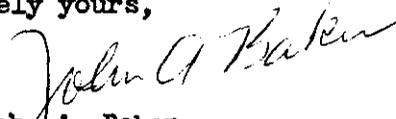
An assumed high rate of urban development and a consequent change in land use is the major basis for the benefits attributed to the proposed project. Urban development is expected to occupy 34,315 acres as compared to 7,060 acres at the present time.

There is a Watershed Protection and Flood Prevention (P.L. 566) project now under construction in the upper part of the Phillippi Creek basin. During planning and design activities the Corps of Engineers proposed project and the P.L. 566 project were carefully coordinated. The area being served by the works proposed in this Corps of Engineers report is primarily an urban area, while the area served by the P.L. 566 project is primarily agricultural. Between the two they appear to adequately meet the needs of the entire drainage area.

There are no National Forests or National Grasslands in the project area and it appears that the project would have no significant effects upon non-Federal woodlands.

We appreciate the opportunity to review this report.

Sincerely yours,


John A. Baker
Assistant Secretary



COMMENTS OF THE DEPARTMENT OF COMMERCE

THE UNDER SECRETARY OF COMMERCE
FOR TRANSPORTATION
WASHINGTON 25, D. C.

May 11, 1964

Lieutenant General W. K. Wilson, Jr.
Chief of Engineers
Department of the Army
Washington, D. C. 20315

Dear General Wilson:

This is in further reply to your letter of 7 April 1964 transmitting for our information and comment copies of your proposed report, together with the reports of the Board of Engineers for Rivers and Harbors, and of the District and Division Engineers, on a survey of Phillippi Creek Basin, Florida. Comments by the Department of Commerce follow:

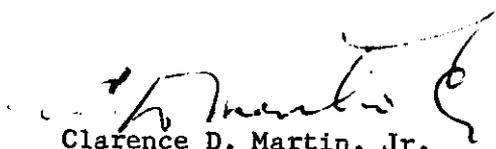
The Coast and Geodetic Survey notes that the nautical charting requirements can be adequately met by extending the limits of Small Craft Chart 857 about 3 miles north and 4 miles east to include the existing canals Main A, Main B and Branch BA. Horizontal and vertical control have been established in the project area and is considered adequate to meet the engineering requirements of the project. If additional control is required for the project, the Survey requests that it be given advance notice so that cost estimates can be furnished.

The Bureau of Public Roads review of the report indicates that the construction of this flood control improvement will require a considerable amount of highway and bridge reconstruction and that the cost of this reconstruction has been made a part of the local contribution to the project. It is necessary, therefore, that the local interests be informed of the fact that Federal-aid highway funds cannot be used in the financing of this highway work.

The Weather Bureau had no comments for inclusion in the Department's report.

We appreciate the opportunity to comment on this report.

Sincerely yours,


Clarence D. Martin, Jr.

PHILLIPPI CREEK BASIN, FLORIDA

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY



HEADQUARTERS
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20315

IN REPLY REFER TO

ENGCW-PD

3 September 1964

SUBJECT: Phillippi Creek Basin, Florida

TO: THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on a survey of Phillippi Creek Basin, Florida, authorized by the Flood Control Act of 14 July 1960. My report includes the reports of the District and Division Engineers and the Board of Engineers for Rivers and Harbors.

2. The District and Division Engineers recommend the improvement of Phillippi Creek and its tributaries in Sarasota County, Florida, to provide primary works for flood control and drainage by construction of about 15.1 miles of channel enlargement, seven channel control structures, and related structures. The first cost of this improvement is estimated to be \$7,855,000 of which \$4,592,000 is the Federal cost for construction, and \$3,263,000 is the non-Federal cost for lands, easements and rights-of-way, highway bridges and relocations, alterations to miscellaneous utilities and improvements, except railroad bridges and approaches, and a cash contribution. This cash contribution by local interests amounts to 22 percent of the sum of the contract price and the costs of supervision and administration thereof for each part of the primary works to be provided, presently estimated to be \$1,165,500. The annual charges for the primary and associated works are estimated to be \$378,700, including \$34,800 for non-Federal operation, maintenance and replacements. The annual benefits are estimated to be \$475,200. The benefit-cost ratio is 1.3.

3. The Board of Engineers for Rivers and Harbors concurs in the findings of the reporting officers and recommends the improvements, subject to the proposed requirements of local cooperation.

4. I concur in the recommendations of the Board. Use of the recently prescribed interest rate of 3-1/8 percent in computing annual charges and benefits would result in no appreciable change in the benefit-cost ratio.


W. K. WILSON, JR.
Lieutenant General, USA
Chief of Engineers

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

ENGBR(31 Oct 63) 2nd Ind
SUBJECT: Phillippi Creek Basin, Florida

Board of Engineers for Rivers and Harbors, Washington, D. C. 20315
19 February 1964

TO: Chief of Engineers, Department of the Army

1. Phillippi Creek basin is in southwest peninsular Florida and is within Sarasota County except for a small fringe area in southern Manatee County. Phillippi Creek, a shallow, alluvial stream about 5.3 miles long, winds toward Little Sarasota Bay through suburban areas south and east of Sarasota. It was extended some years ago by about 80 miles of main canals and laterals which are well distributed throughout the drainage area. The main stream is about 400 feet wide at the mouth and gradually narrows to about 50 feet at its juncture with the canal system. The stream is tidal to a distance of 3.6 miles above the mouth. The watershed consists of level or gently sloping plains separated by low, flat ridges. Elevations vary from sea level to about 30 to 40 feet in the head-water reaches. The soils are mostly fine sands with some shallow areas of peat and muck in the eastern portion of the basin. The total area of the watershed is about 58 square miles.

2. There are no Corps of Engineers flood-control projects in the Phillippi Creek basin. However, an approved work plan prepared by the Soil Conservation Service, under Public Law 566, Eighty-third Congress, includes works for flood relief for 20.5 square miles of vegetable and surrounding farming land in upper Phillippi Creek basin. Construction of the project is expected to begin in the near future. The Sarasota-Fruitville Drainage District covers the major areas of Phillippi Creek basin. This district developed, primarily for drainage of agricultural lands, an extensive canal system, including some control devices consisting mainly of weirs and sluice gates. Local farming interests and developers have provided supplementary drainage facilities in the district. Hyde Park Drainage District lies, for the most part, within the basin and, except for Phillippi Creek, its entire canal system consists of minor canals. It does not include any control devices. Within this district on Phillippi Creek there is an inoperative dam which causes considerable restriction to flow during flood conditions.

3. Significant land uses are for urban and agricultural developments. The city of Sarasota lies partly within the basin and is the principal urban development, occupying about 19 percent of the basin. Agricultural development occupies about 21 percent

of the basin and is mainly for citrus fruit (3.5 percent), vegetable production (3.8 percent), and improved pasture for beef production (14 percent). About 57 percent of the basin is in native range and undeveloped land. The population of Sarasota County in 1962 was about 89,000, an increase of more than 154 percent over that of 1952. The 1963 population of the Phillippi Creek basin is estimated at 30,000. Commercial activity is in varied types of industry and service establishments.

4. Phillippi Creek and its main tributaries are inadequate to remove the runoff from even moderate storms. Unprecedented existing and prospective urban development and corresponding changes in runoff from those areas have created a serious flood hazard. The poor drainage, combined with intense rainfall sometimes supplemented by hurricane storms, results in frequent flooding over much of the Phillippi Creek watershed. Thousands of acres of low valley and plain lands are susceptible to flooding from moderate storms which occur almost yearly. Major floods of recent years were those of 1958, 1959, 1960, and 1962. The 1962 flood covered about 8,000 acres of land causing extensive damages to agriculture and urban development. Under present conditions, the developed area in the basin subject to flooding is about 900 acres of truck-farming lands, 600 acres of improved pasture, and 775 acres of residential area. In addition, about 5,400 acres of undeveloped lands are subject to flooding. The 1959 flood damages for land use expected by 1970 and 2020 are estimated at \$243,000 and \$509,000, respectively, and the 1962 flood damages at \$2,100,000 and \$3,572,000, respectively. Average annual damages for these same conditions are estimated at \$110,000 and \$275,000 for 1970 and 2020 land use, respectively. These estimates exclude that portion of the agricultural area that will be served by the watershed work plan of the Department of Agriculture.

5. Salinity intrusion is a problem in the Phillippi Creek watershed. Planning for water-control facilities in the basin requires cognizance of this hazard. Construction of gates and spillways would prevent overdrainage of the land after floodwaters have been discharged.

6. Frequency of damaging floods during the past few years has brought about an increasing demand for flood relief and water control for the basin. Responsible local interests request and stress the urgent need for provision of facilities in Phillippi Creek basin to prevent disastrous flooding. Small-boat owners desire that existing navigation be preserved; however, they consider flood control to be of paramount importance.

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7. The District Engineer finds the most suitable plan of improvement for flood control and drainage to be primary works consisting of the enlargement of Phillippi Creek and its major tributary channels, realignment of the channel at United States Highway 41, and provision of the spillway and inlet structures required, together with the associated works discussed in the following paragraph. The primary works would be constructed by the United States. The Federal or primary drainage and flood-control project would consist of 15.1 miles of primary canals and construction of 4 primary control structures, 3 terminal control structures, 3 railroad bridges, 13 highway bridges, 2 private road bridges, and provision of the necessary inlet structures and appurtenant works. The design flow from the channel would be 60 percent of the standard project flood. This degree of improvement would remove without damaging ponding the 30-year flood runoff, reduce the depth and duration of floods of greater magnitude, prevent erosion and siltation in project canals, and improve water control. In addition to prevention of flood damage, reduction of flooding to minor extent and infrequent occurrence would permit full utilization of land for expected urban needs.

8. The non-Federal or associated drainage works would consist of the construction or improvement of lateral drainage works where increased land use is expected to result from the Federal project. These works would consist of new secondary canals, enlargement of existing laterals, and construction of tertiary works to utilize the capacity of the main canals.

9. The estimated initial costs, annual charges, and average annual benefits for the primary improvements and for the entire program--primary works by the United States plus associated works by local interests--are given in the following tabulation:

Item	Primary improvements	Entire program
<u>Initial costs</u>		
Construction		
Canals and inlet structures	\$ 4,168,600	
Control structures	1,212,800	
Railroad bridges	375,700	
Lands, highway bridges, and relocations	2,097,700	
Total	\$ 7,854,800	\$ 7,972,800
Aids to navigation (Coast Guard)		4,000
<u>Annual charges</u>		
Interest and amortization	\$ 319,000	
Additional economic loss on lands	16,500	
Operation, maintenance, and replacement	34,800	
Total	\$ 370,300	\$ 378,700
Maintenance of aids to navigation (Coast Guard)		400
<u>Annual benefits</u>		
Average flood damages prevented		\$ 172,300
Average increased land use		280,900
Average recreational boating, navigation		22,000
Total		\$ 475,200
<u>Economic justification</u>		
Benefit-cost ratio		1.3

Initial costs of the primary improvements were estimated in July 1963 and are considered to be representative of prices current as of that date. The interest and amortization charges thereon are for Federal and non-Federal interest rates of 3 and 3.5 percent, respectively, and a 50-year period of analysis. The reporting officers find that the benefits from primary and associated works are inseparable; accordingly, benefits for the entire program only are presented.

10. Local interests would provide as their share of the initial costs of the primary improvements all necessary lands and rights-of-way, including changes to highway bridges and roads, and changes to other miscellaneous utilities and improvements, except railroad bridges

and approaches. They would be required to hold and save the United States free from damages due to the construction works; prohibit encroachment on the flood-carrying capacities of the improved channels; maintain and operate the improvements after completion; and construct and maintain the associated drainage works needed to realize the benefits made available by the proposed primary improvements. Further, since the Federal Government would provide major drainage, which in turn would generate benefits from changed land use, a cash contribution would be required. The District Engineer believes that local interests would be able and willing to meet the requirements of local cooperation. The apportionment of the current estimates of costs for the primary improvements to Federal and non-Federal interests is tabulated below:

Item	Amount
Federal initial costs:	
Construction of primary project works (less cash contribution)	\$ 4,591,600
Aids to navigation (Coast Guard)	4,000
Total Federal initial costs	<u>\$ 4,595,600</u>
Non-Federal initial costs:	
Lands, relocations, highway bridges, etc.	\$ 2,097,700
Cash contribution	1,165,500
Total non-Federal initial costs	<u>\$ 3,263,200</u>
Total Federal and non-Federal initial costs	\$ 7,858,800
Federal annual maintenance of aids to navigation (Coast Guard)	\$ 400
Non-Federal annual maintenance, operation, and replacement costs	\$ 34,800

11. The District Engineer finds that the proposed plan of improvement is the most feasible and economical solution to the drainage problems in the Phillippi Creek basin. He finds that the entire program--primary plus associated works--is economically feasible. Subject to the indicated requirements of local cooperation, he recommends that the United States undertake the primary improvements. The Division Engineer concurs.

12. The Division Engineer issued a public notice stating the recommendations of the reporting officers and affording interested parties an opportunity to present additional information to the Board. Careful consideration has been given to the communications received.

Views and Recommendations of the Board of Engineers for Rivers and Harbors.

13. Views.--The Board of Engineers for Rivers and Harbors concurs in general in the views and recommendations of the reporting officers. The Board notes the finding that benefits derived from primary and associated works are inseparable. Accordingly the benefits of the entire program may be assigned to each of these work groups in proportion to their respective costs, resulting in a benefit-cost ratio for each of 1.3--the same as for the project as a whole. It notes that changing the non-Federal interest rate from 3.5 percent to 3 percent as now prescribed does not change the benefit-cost ratio.

14. Recommendations.--Accordingly, the Board recommends the improvement of Phillippi Creek, Florida, to provide primary works for flood control and major drainage by enlargement of the main stream and its major tributary channels, realignment of the channel at United States Highway No. 41, and provision of spillway and inlet structures, and appurtenant works; all generally in accordance with the plan of the District Engineer and with such modifications thereof as in the discretion of the Chief of Engineers may be advisable, at an estimated cost of \$5,757,000 for construction: Provided that local interests give assurances satisfactory to the Secretary of the Army that they will:

a. Contribute in cash 22 percent of the sum of the contract price and the costs of supervision and administration thereof for each part of the primary work to be provided by the Corps of Engineers, an amount presently estimated at \$1,165,500, to be paid either in a lump sum prior to start of construction, or in installments prior to start of pertinent work items in accordance with construction schedules as required by the Chief of Engineers, the final contribution to be determined after actual costs are known;

b. Construct and maintain the associated works needed to realize the benefits made available by the work to be provided by the United States (this requirement would not prohibit the assistance of other Federal and local conservation programs in constructing and/or maintaining lateral drainage works under authorizations not connected with this project);

c. Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction of the project;

d. Provide without cost to the United States all necessary new highway bridges, alterations or replacement of bridges, roads, miscellaneous utilities, and other existing improvements, except railroad bridges and approaches;

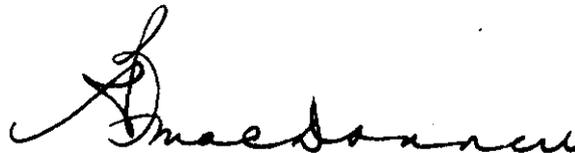
e. Hold and save the United States free from damages due to the construction works;

f. Prevent encroachment on the flood-carrying capacity of the improved channels; and

g. Operate and maintain the works after completion in accordance with regulations prescribed by the Secretary of the Army, except for the aids to navigation which would be maintained by the United States Coast Guard.

Of the Federal construction cost of \$5,757,000, the net cost to the United States is estimated at \$4,591,600.

FOR THE BOARD:



R. G. MacDONNELL
Major General, USA
Chairman

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

Phillippi Creek is a shallow alluvial stream which drains about 58 square miles of coastal lowlands in Sarasota County, Fla. Tributaries flowing through predominantly agricultural lands join to form the 5.3-mile-long creek which winds through suburban areas of the city of Sarasota. Local interests have requested that the United States provide flood control in Phillippi Creek Basin to prevent recurrence of periodic disastrous flooding such as occurred in 1962.

Plans have been analyzed for several alternative degrees of protection for the area. Improvement of Phillippi Creek to about 60 percent of standard project flood capacity was found to provide a reasonably adequate outlet for floodwaters of the basin. That degree of protection--with associated secondary works to be provided by local interests--would eliminate all flooding in the area from floods up to the 1-in-30-year magnitude. It would reduce stages and durations of floods of greater magnitude, permitting full utilization of the lands for agriculture and the expected urban needs. The estimated benefit-cost ratio for the selected plan is 1.3.

Accordingly, it is recommended that the plan for flood control and other purposes, as proposed in this report, be adopted subject to the stated provisions of local cooperation.

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
OFFICE OF THE DISTRICT ENGINEER
CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

SAJWY (Phillippi Creek)

October 31, 1963

SUBJECT: Survey Report on Phillippi Creek Basin, Florida

THROUGH: Division Engineer
U. S. Army Engineer Division, South Atlantic
Atlanta, Ga.

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

I. INTRODUCTION

1. Authority.--This report is submitted in compliance with Section 208 of the Flood Control Act of July 14, 1960 (P. L. 86-645), which authorized and directed the Secretary of the Army, acting through the Chief of Engineers, "to cause surveys for flood control and allied purposes, including channel and major drainage improvements, and floods aggravated by or due to wind or tidal effects, to be made * * * in drainage areas of the United States * * * which include the following-named localities: * * * Phillippi Creek, Florida * * *." The duty of making the investigation and report thereon was assigned to the District Engineer by the Division Engineer, South Atlantic Division, on August 5, 1960.

2. Scope of investigation.--This report considers the flood- and water-control problems in the Phillippi Creek watershed and presents a plan of improvement to meet the needs of the area, insofar as is practicable. Field investigations for this report included meteorologic, hydrographic, geologic, and economic surveys of the area. Consideration was given to available data developed in prior reports of local, State, and Federal agencies. Special attention was given to reports prepared by consultants engaged by the County of Sarasota. Several field inspections were made concerning the areas subject to flooding, and many local homeowners were consulted. Coordination with other Federal, State, and local agencies has been effected as discussed later in this report.

3. Prior reports.--There are no prior reports of survey scope on Phillippi Creek.

II. DESCRIPTION

4. Area under consideration.--a. Location and extent.--Phillippi Creek Basin is located in southwest peninsular Florida about 50 miles south of Tampa. The watershed comprises about 58 square miles of coastal lowlands, all within Sarasota County except for a small fringe area in southern Manatee County. Phillippi Creek is one of a number of small streams interspersed with the major Florida west coast watersheds which drain local areas to coastal bays, to the Intracoastal Waterway, or directly to the Gulf of Mexico. Maps of the basin are shown on plate 1.

b. Physical characteristics.--Phillippi Creek is a shallow, alluvial stream about 5.3 miles long, which winds toward Little Sarasota Bay through suburban areas south and east of Sarasota. About 40 years ago, the natural stream was extended by construction of about 80 miles of main canals and laterals which are well distributed throughout the drainage area. The main stream is about 400 feet wide at the mouth and gradually narrows to about 50 feet at its juncture with the canal system. Below the junction of the main tributary canals, the stream slope averages about 0.9 foot a mile. Above the junction, the average fall is about 4.0 feet a mile. Throughout its length, the channel is fairly well defined. The bankfull discharge of Phillippi Creek is less than 1,000 cubic feet a second. The basin is subject to infestations of hyacinths and other prolific weeds which reduce channel capacities and aggravate flood problems. The stream is tidal up to an existing water-control structure 3.6 miles above the mouth. The watershed consists of level or gently sloping plains separated by low, flat ridges. Elevations vary from sea level to about 30 to 40 feet* in the headwater reaches. The soils are mostly fine sands with some shallow areas of peat and muck in the eastern portion of the basin.

III. ECONOMIC DEVELOPMENT

5. Development of the area.--a. General.--About 45 percent of the area under consideration is now developed for urban, agricultural, and other related uses. The remainder of the watershed is woodland, native range, and other undeveloped land. About 47 percent of the developed land is urbanized, including commercial, industrial, recreational, and residential areas. Agricultural uses--excluding native rangelands--account for about 53 percent of the developed area. The usually favorable climate, proximity to the gulf beaches, and abundant recreational facilities all contribute to expanding tourism in the area of interest. The principal agricultural activities in the study area are the production of citrus fruits, vegetable crops, beef cattle,

NOTE: *Unless otherwise stated, all stages and elevations throughout this report and accompanying appendixes refer to mean sea level datum.

and dairy products. Minor acreages are used for the growing of specialty crops, such as ornamental plants and flowers; since these areas are small, they are not identified on the existing-land-use map. A large part of the city of Sarasota is located within the Phillippi Creek drainage area. Sarasota County had a population of 76,895 on April 1, 1960. The estimated population on January 1, 1963-- according to reliable estimates--was about 90,000. A summary of the most important land uses and acreages in the basin is given in table 1.

TABLE 1
Phillippi Creek Basin
Existing land use

Land use	Area (acres)
Urban-----	5,035
Sparse urban-----	2,025
Citrus groves-----	1,290
Vegetables-----	1,430
Improved dairy pasture-----	620
Improved beef pasture-----	5,175
Golf courses, parks, etc.-----	510
Native range, other, and undeveloped land-----	20,845
Total-----	36,930

b. Transportation.--The study area is served by United States Highways 41 and 301 and State Roads 72, 780, and 785 in addition to numerous secondary roads. (United States highways are generally alined north-south, with State roads providing the east-west links in the road system.) The Seaboard Air Line and Atlantic Coast Line Railroads serve the area with both passenger and freight service. Commercial airline service is available at the Sarasota-Bradenton Airport. The study area is also served by two national bus lines.

c. Urban development.--The only city of any size is Sarasota, which lies partly within the study area. Population estimates based on densities of persons per acre and sample house counts in urban and sparse urban areas indicate that about 30,000 persons now reside within the watershed. The average density is about 1.5 houses per acre and about three persons per house. During the decade 1952-62, the estimated population of Sarasota County increased over 154 percent--from about 35,000 to about 89,000. In-migration is high because of the excellent

climate and Florida's favorable tax structure, coupled with other economic factors such as adequate housing and recreational facilities of a varied nature. Past studies show that about 15 percent of the urban area is used for industrial, commercial, and related service activities and that the remainder is residential. The past population trends for the entire county for 10-year intervals during the period 1930-60 and estimated trends for 5-year intervals from 1963 to 1973 are given in table 2.

TABLE 2
Sarasota County
Population

Years	Population
1930 (1)-----	12,440
1940 (1)-----	16,106
1950 (1)-----	28,827
1960 (1)-----	76,895
1963 (2)-----	90,000
1968 (2)-----	120,000
1973 (2)-----	161,000

NOTES: (1) Federal Census.
(2) Estimated.

e. Agriculture.--The study area now produces citrus fruits on about 2 square miles of suitable soils. Those groves are scattered largely throughout the western portion of the drainage area, generally west of Cattlemen Road. Types of citrus trees found in the area are oranges, grapefruit, tangerines, mandarins, lemons, and limes. The more important groves are orange and grapefruit. Truck crops are produced annually on about 1,400 acres, with some acreage planted more than once during the year. Those crops are generally planted on the organic soils, the more important crops being celery, cabbage, and escarole. About 5,800 acres of improved pastures are located generally east of Cattlemen Road. The principal improved pasture grasses are Pensacola Bahia and Pangola. Some white clover is also used as pasture cover during part of the year. On an annual basis, improved beef pastures can support approximately one cow on 1-1/2 to 2 acres. Improved dairy pastures can support one cow per acre annually if sufficient supplemental feed is provided. Some woodland and native range are also used for grazing cattle. Native range--depending on soils, drainage, and pasture cover--supports one animal annually on from 10 to 50 acres. Net returns from agriculture vary from year to year. Table 3 gives an indication of average net returns for several years.

TABLE 3
Phillippi Creek Basin
Agricultural net returns

Land use	Net return (per acre)
Vegetables-----	\$265
Citrus fruits-----	175
Improved dairy pasture-----	44
Improved beef pasture-----	11
Native range-----	2 or less

e. Fish and wildlife.--Many kinds of native birds and animals live on the expanses of undeveloped lands in Sarasota County. The open flatwoods, prairies, swamps, marshes, shallow ponds, and dense hammocks have provided them with favorable habitat. Sarasota County is on the major flyways of migratory birds, and many of those birds winter in the area. Sportsmen and many landowners in the county have an active interest in wildlife preservation. Much of the Phillippi Creek watershed, however, is developed for urban use, which is expected to continue to expand eastward. Landward of the bay or estuary area, fishery utilization and public hunting are limited, and improvement for flood control is not likely to have a significant effect on fish and wildlife.

f. Navigation.--Boating activity in Phillippi Creek, which consists principally of recreational cruising, has been restricted by channel shoaling, especially since the September 1962 flood. The reach from United States Highway 41 bridge upstream to the existing dam is navigable only by outboards during favorable tides. Outboards and small inboards navigate with caution the reach from the bridge downstream to the Intracoastal Waterway. In order to facilitate boating in that reach after the September 1962 flood, local boating interests spent about \$600 to have a shoal area deepened by propeller wash. Most of the damage incurred by boats navigating the creek results from grounding on shoals, which usually necessitates propeller repair or replacement. Few of the properties along the creek have docks. One housing development of about 40 lots has a boat ramp for the exclusive use of property owners in that development and their guests. Three other developments--totaling about 2,000 lots--include tentative plans for similar private ramps. The only public-use boating facility along the creek is a privately operated marina, consisting of 55 berths and supply and service facilities, just above the United States Highway 41 bridge. Some boats formerly berthed

along the creek have been sold because of increased shoaling of the channel. Investigation indicated that other residents along the creek would purchase boats if the creek were improved.

IV. METEOROLOGY AND HYDROLOGY

6. Climatology.--a. General.--The area under consideration is in the transitional zone between temperate and subtropical climates and is influenced by proximity to the Gulf of Mexico. There are not now any long-term climatological stations within the watershed. Twenty-one years of record for rainfall station Sarasota 5 E, which was centrally located, together with data from stations near, but outside, the Phillippi Creek drainage area, are sufficient to indicate the climatological characteristics of the area. Summer temperatures are moderately high, but rarely reach maximums of 95 degrees. Pleasant days and cool nights are usual during the winter months, although minimums of 32 degrees or below occasionally occur during the months of November through February. Winds are generally light to moderate but may be strong and gusty in the vicinity of frequent summer thunderstorms. Occasional winds of hurricane force are caused by tropical storms, which pass over or near the area about once in three years, on the average. Seasonal rainfall distribution is well defined.

b. Rainfall.--Rainfall over the area averages about 54 inches a year, with wide variations in annual amounts and amounts for any month. About 65 percent occurs during the four wettest months, June through September, while only about 15 percent occurs during the four driest months, November through February. Monthly and annual means and extremes for 21 years of record for station Sarasota 5 E are given in table 4. Most summer rainfall is produced by thunderstorms, although heavy, prolonged rainfall is usually caused by tropical disturbances, which are most likely to occur in September and October. Unusual storms may cause locally heavy rainfall during any month of the year. About 15.3 inches of rain occurred over the area on September 20-21, 1962.

TABLE 4
Rainfall at station Sarasota 5 E (1)
Monthly and annual means and extremes, 1930-50

Month	Observed rainfall				
	Highest (2)		Mean (in.)	Lowest	
	Inches	Year		Inches	Year
January-----	4.53	1936	1.86	0	1950
February-----	8.48	1936	2.55	0.12	1950
March-----	7.46	1947	2.86	0.02	1939
April-----	8.36	1933	2.77	0.09	1946
May-----	6.18	1939	2.59	0.03	1945
June-----	21.77	1943	7.81	1.58	1931
July-----	18.78	1938	8.96	3.82	1932
August-----	22.60	1939	10.38	3.45	1938
September-----	19.94	1935	8.06	2.29	1937
October-----	7.47	1938	2.70	0	1942
November-----	5.31	1941	1.25	0	1931
December-----	5.71	1941	1.78	0.14	1938
Annual-----	75.93	1943	53.57	35.75	1944

NOTES: (1) This station located 5 miles east of Sarasota.
(2) Observations at nearby stations indicate that some of these maximums have been exceeded since 1950.

7. Runoff and streamflow data.--Available data are limited to records from two recently installed crest-stage indicators and one ground-water well. Stages and other pertinent data for those gages are given in table A-3 of appendix A. In the absence of streamflow data and long-term periods of record, runoff relations developed for areas of similar topographic characteristics were used in determining runoff criteria for developing design floods. These synthesized relations are presented in appendix A.

8. Floods of record.--a. General.--Intense rainfall combined with inadequate drainage facilities causes frequent flooding over much of the Phillippi Creek watershed. The more serious floods usually result from rainfalls of varying durations associated with storms, or a sequence of storms. Storms may occur at any time during the year but are most frequent during the five summer months, centered on the period June through September. The region is also subject to occurrences of tropical hurricanes during the rainy season. The principal cause of flooding is the limited capacity of outlet channels. There is some flooding almost annually in the lowland areas. Flood damages occur to both agriculture and residences, but with the rapid urban expansion of the last few years, damage to urban development has

increased considerably. Several of the most severe floods of recent record are discussed in the following subparagraphs.

b. Flood of 1962.--The September 1962 flood was the most damaging of record in the Phillippi Creek Basin. A low-pressure cell which moved in from the Gulf of Mexico caused extremely heavy rainfall over the coastal area from Tampa to Naples on September 19-21. Most of the rain fell between midnight of September 19 and 8 a.m. of September 21. Phillippi Creek Basin was in the area of heaviest rainfall. Over 16 inches fell during a 48-hour period. That amount and others in areas of heaviest rainfall have an estimated occurrence frequency of once in about 100 years. The highest stages and discharges of known record were recorded in Phillippi Creek Basin. The resultant flooding was widespread and disastrous throughout the basin. The County Sheriff's Department, assisted by the County Public Works Department and volunteer Civil Defense units, conducted rescue operations throughout the area. Several hundred families were moved by those departments from their flooded homes to areas of safety. Shelter, food, clothing, and other necessities were provided by the local chapter of the American National Red Cross, assisted by the local Welfare Department. Flood durations ranged from 1 to 3 days in areas adjacent to streams and drainage canals and up to several weeks in some crop and pasture lands. Practically all crop and pasture lands were inundated to depths of 3 feet or more. About 500 homes sustained minor to major flooding. Many of those homes and a number of commercial installations were flooded to depths of 3 to 7 feet. Virtually all streets and roads in and around Sarasota were under water. Several feet of water stood over main highway bridges crossing Phillippi Creek and drainage canals. Estimated damages to agriculture, private property (homes, lawns, automobiles, and personal effects), and public properties totaled about \$2,300,000.

c. Flood of September 1960.--The summer of 1960 was one of the wettest of record in peninsular Florida. The 10-week (July 21 to September 30) rainfall amounts for Phillippi Creek Basin averaged about 39 inches. The most intense rainfall was associated with hurricane "Donna," which passed over central Florida on September 10 and 11. The heavy rains during the latter part of July caused widespread flooding throughout the area. Those floodwaters had barely subsided before the intense rainfall accompanying hurricane "Donna" subjected the area to major flooding for the second time within 60 days. Virtually all the agricultural lands in the basin were inundated from 1 to 7 days. Extensive damages were sustained by urban developments. Many homes were flooded and roads, bridges, and other public facilities suffered heavy damages. Total estimated damages from the flood in Phillippi Creek Basin exceeded \$1,000,000. Estimated frequency of occurrence for this flood is once in about 20 years.

d. Flood of 1959.--Rainfall over Phillippi Creek Basin was above normal much of the year. Two minor floods occurred in the basin

prior to the heavy rainfall of September 16, which caused widespread and disastrous flooding in both agricultural and urban developments. Practically all farmlands in the basin were inundated for 1 to 3 days. Improved pastures sustained extensive damages. The fall and winter vegetable crops had not been planted, but preparation of croplands for planting was delayed for several weeks, causing considerable loss to the affected farmers. Heavy damage was inflicted on urban developments by the floodwaters. About 30 homes along Phillippi Creek had to be evacuated and about 250 others had enough water around them to cause flood damage. Extensive damages were inflicted on roads, bridges, and other public facilities. Estimated frequency of occurrence of this flood is once in about 10 years.

e. Flood of 1958.--The month of March 1958 was one of the wettest of record in Phillippi Creek Basin. Rainfall totals for the month rank among the greatest on record at many points in south Florida. The heavy rainfall of March 19--on the area already saturated from above-normal rainfall--resulted in damaging flooding in agricultural and urban developments. Damages estimated at about \$700,000 were inflicted on agricultural developments where about 700 acres of mature truck crops, principally celery, were destroyed. About 12 homes were subjected to 1 to 2 feet of flooding, with 3 homes on the bank of the creek seriously damaged by the moving water. Substantial damages were inflicted on roads, bridges, and other public facilities. The flood is estimated to have a frequency of once in about 5 years.

9. Standard project flood.--The standard project flood was derived by application of daily rainfall-excess values of the standard project storm to inflow unit hydrographs for the contributing area. Estimated antecedent and base flow rates were added to the direct runoff values to produce the total inflow hydrograph. Standard project storm rainfall depths were established as 125 percent of the 100-year-frequency rainfall values, in accordance with established criteria. The frequency of the standard project storm and the standard project flood--considered to be the most severe flood reasonably likely to occur, except for extraordinarily rare combinations of meteorological conditions--is estimated to be in excess of 200 years. Standard project flood estimates are given in appendix A.

10. Design flood.--The design flood is usually determined from consideration of several alternative degrees of protection, with selection of the design which would provide the greatest excess of benefits over costs. Studies in other areas have shown that the maximum excess of benefits over costs is obtained with improvements designed to remove flooding expected once in about 10 years in agricultural areas and flooding up to standard project flood magnitude in wholly urban areas. The studies presented herein considered design floods up to standard project magnitude. A 30-percent standard project flood corresponds to about a 1-in-10-year frequency of

occurrence, while the 60-percent standard project flood corresponds to about a 1-in-30-year occurrence.

11. Extent and character of flooded area.--A description of the area is given in chapter II above. Thousands of acres of low valley and plain lands are susceptible to flooding from moderate storms which occur almost yearly. During major floods, such as that of September 1962, about 8,000 acres are inundated. Flooding results primarily from limited primary outlet capacity. About 33 percent of the problem area is now developed for urban or agricultural uses, including about 900 acres of truck-farming lands, 600 acres of improved pasture, and 775 acres of residential development. In addition, about 5,400 acres of undeveloped lands used as native range are subject to flooding. With the city of Sarasota extending into the drainage area and expanding rapidly, most of those flood-prone lands are ideally situated for urban development except for flooding. Elimination of flooding would permit maximum use of those lands and increase their value to that of surrounding suitable lands. Existing development and estimated future normal development are discussed in detail in appendix B and are shown on figures B-1 and B-2, respectively.

12. Flood damages.--a. General.--The estimates presented herein are applicable to the flood-plain area along Phillippi Creek and canals. They exclude that portion of the agricultural area east of Cattlemen Road which will be served by the watershed work plan of the Department of Agriculture. Damage estimates were made for the 1959 and 1962 floods and are based on: Flooded-area charts which were constructed from high-water marks; information obtained in the field or furnished by local individuals or agencies; and unit-damage relations used in combination with land-use data.

b. Damage estimates.--The flooded-area maps for the 1959 and 1962 floods are shown on figures B-5 and B-4, respectively, of appendix B. Existing and estimated future land use without project incentive are shown on figures B-1 and B-2 of appendix B. Flooded-area maps, together with duration data, were compared with maps of existing and estimated 2020 land use without project incentive to obtain the area, depth, and duration of flooding on each type of land use. Project life was considered to begin in 1970 for the economic analysis and damage estimates were projected accordingly by use of the appropriate land-use development factor. Estimated damages for the 1959 and 1962 floods for the years 1970 and 2020 are given in the following tabulation.

Flood	Estimated damages	
	1970 land use	2020 land use
1959-----	\$243,400	\$509,300
1962-----	2,120,000	3,571,800

c. Annual damages.--Damage-frequency curves constructed directly from the damage and frequency estimates for 1970 and 2020 land use on existing drainage facilities are shown on figure B-12 of appendix B. Annual damages were estimated at \$110,000 and \$275,000 for 1970 and 2020 land use, respectively.

V. EXISTING AND DESIRED IMPROVEMENTS

13. Projects of the Corps of Engineers.--There are no Corps of Engineers' flood control projects in Phillippi Creek Basin. However, Phillippi Creek flows into the Intracoastal Waterway south of Sarasota Bay. That waterway project--authorized by the River and Harbor Act of March 2, 1945 (H. Doc. 371/76/1)--provides for a channel 9 feet deep by 100 feet wide. The project is 32 percent completed, with the reach from Dona Bay to Tampa Bay practically completed.

14. Improvements by other Federal and non-Federal agencies.--
a. Federal agencies.--The Soil Conservation Service--under authority of Public Law 566--has prepared a work plan for the Sarasota West Coast Watershed. Construction of the project has been approved and initial construction is expected to begin before the end of calendar year 1963. The project area includes the eastern third of the Phillippi Creek watershed and the adjacent Cow Pen Slough. The planned works of improvement include land-treatment measures for watershed protection and structural measures for flood prevention and agricultural water management. The structural measures include 36 miles of channel improvement, one dike, one pumping plant, and nine grade-stabilization and water-conservation structures. The project calls for flood relief for 20.5 square miles of vegetable and surrounding farming areas in upper Phillippi Creek Basin by improving parts of two existing canals, constructing spillway control structures in those canals, excavating a new diversion channel, and providing a pumping plant to divert 735 cubic feet a second of peak flood flows to Cow Pen Slough--outside the basin--when runoff is too great to be handled safely through Phillippi Creek. Runoff not diverted by pumping will flow by gravity through existing Phillippi Creek channels in the Sarasota urban area. Locations of pertinent portions of this plan are shown on figure A-1.

b. Non-Federal agencies.--(1) The Sarasota-Fruitville Drainage District.--This district covers the major areas of Phillippi Creek Basin. It was absorbed by Sarasota County on June 30, 1961. In the past, an extensive system of canals and laterals was developed by the district to drain sawgrass marsh bottoms for muckland farming. The canal system also included some limited control devices consisting mainly of weirs and sluice gates. In portions of the district, local farming interests often provide their own supplementary control devices which include a number of drainage pumps placed on district property. Recent developers in the area have provided similar local

drainage works. In general, the canal system--which is for the most part over 35 years old--was designed for drainage of agricultural lands.

(2) Hyde Park Drainage District.--This district comprises about 4 square miles southwest of the Sarasota-Fruitville Drainage District. Existing development in the district is predominantly urban. Phillippi Creek bisects the district, which for the most part lies within the basin. The southwestern fringe and northwestern corner of the district lie within the city limits of Sarasota. Except for Phillippi Creek, the entire Hyde Park canal system consists of minor canals. The system does not include any control devices. However, within the district on Phillippi Creek is an existing dam, which, according to local interests, was initially constructed to provide irrigation supply for citrus groves in the vicinity. Control of the dam was originally effected by gates, supplemented by stoplogs. When maintained and operative, the dam provided a measure of flood control and ground-water conservation, and also acted as a salinity barrier. After most of the groves were subdivided for urban development, the stoplogs were removed and the dam became inoperative. The dam causes considerable restriction to flow during flood conditions. In an effort to improve this condition, the county acquired the dam and converted it to an uncontrolled low weir. This work--along with some channel improvements--was completed about June 1962.

15. Improvements desired by local interests.--a. General.--Until fairly recently, Phillippi Creek Basin was oriented almost entirely toward agriculture. Agricultural drainage districts provided improvements suitable for agricultural needs. However, unprecedented urban development now existing and in prospect in the area and corresponding changes in runoff from those developed areas have created a serious flood hazard. Frequency of damaging flooding during the past few years has brought about an ever-increasing demand for flood relief and water control for the basin. In addition to information obtained from local interests at the public hearing regarding the flood problem (see subparagraph c below), there were numerous consultations with officials of State and county government agencies, with the consulting engineers hired by the Sarasota County Commissioners, and with other interested local officials. In addition, improvements desired were reflected in resolutions adopted by local organizations.

b. Consultants' reports.--Following the damaging floods of 1957 and 1958, the county engaged consultants to investigate and report on several of the more important water- and flood-control problems. After the disastrous flooding in 1960, the county authorized a firm of consulting engineers to conduct a far more complete study covering the entire basin. The Board of County Commissioners, as coordinator of this program, administered the consultants' contracts and obtained the completed reports. Material from the reports was presented at the public hearing in November 1962. Copies of the completed reports were made available to the Corps and they have been used to considerable advantage in this investigation.

c. Public hearing.--The views of local interests regarding the need for improvement of Phillippi Creek were presented at a public hearing held in Sarasota November 30, 1962. About 165 persons attended, including Congressman James A. Haley; representatives of State and Federal agencies, Sarasota County, and the City of Sarasota; and private citizens whose property had been lost or damaged by flooding of the creek. All the speakers stressed the urgent need for immediate provision of improvements to prevent another recurrence of the disastrous flooding which they have experienced several times in recent years--most recently in September 1962, when the basin suffered more than \$2 million flood damages. No opposition was expressed. Small-boat owners would like existing navigation preserved, if possible; however, they consider flood control to be of paramount importance. A transcript of the hearing accompanies this report.

VI. PLAN OF IMPROVEMENT

16. Flood problem.--The flood problem is discussed in paragraphs 11 and 12 of this report. The discharge capacities of Phillippi Creek and its main tributaries are inadequate even for moderate floods. The urbanization of a large portion of the watershed has increased the frequency of damage-producing runoff, thus aggravating the already severe flood hazard. The need is for primary drainage works to remove the runoff from frequent and intense rainfall.

17. Salinity intrusion.--In general, salinity intrusion is a problem along the gulf coastal areas. Increased demand from urban population, agriculture, and industry and excessive drainage lower the water table. Heavy pumping assists intrusion of salt water into the aquifer laterally and vertically--laterally, seepage from the ocean and from saline tidal canals and streams; and vertically, from underlying ancient residual sea water. While the problem in Phillippi Creek watershed may not be as severe as in other areas, planning for water-control facilities requires cognizance of the salt-intrusion hazard. Control by gates and spillways would be provided to prevent overdrainage of the land after floodwaters have been discharged. In tidal areas, control spillways act as salt-water barriers by preventing the flow of salt water up the channels. Maintaining a head of fresh water behind the spillways would recharge the ground water and prevent infiltration of salt water.

18. Solutions considered.--Reconnaissance and office studies indicated that there was little or no storage capacity available in the basin that could be used to reduce flood stages along Phillippi Creek. Diversion to the coast would involve very expensive rights-of-way and was considered impracticable. In general, flood damages are caused when the creek overflows, primarily because of a lack of adequate outlet capacity. Remedial works for expediting the runoff from the area are needed. The most practicable means of accomplishing this increased removal rate is to

improve the existing main channels. Major channel improvement was considered to the extent necessary to alleviate the problem in the areas having the major flood damages. No improvements were considered for the area generally east of Cattlemen Road where the watershed work plan to be provided by the Department of Agriculture under Public Law 566 will serve the existing development.

19. The plan of improvement.---a. General.---The plan of improvement would provide for gravity drainage of the area by enlargement of Phillippi Creek and its major tributary channels, realignment of the channel at United States Highway 41, and provision of the spillway and inlet structures required for flood control of the area. Where practicable, the channel would be constructed within the limits of rights-of-way established by local interests. The secondary drainage improvements required to convey storm runoff to the project canals would be a local responsibility. The plan of improvement would perform the following functions:

(1) Remove the once-in-30-year-flood (approximately 60 percent of the standard project flood) runoff from the area contributing to the canal;

(2) Reduce the depth and duration of floods of greater magnitude than the 30-year flood;

(3) Prevent erosion and siltation in project canals by provision of spillways and inlet structures; and

(4) Provide water control for the area by maintaining optimum water levels above control structures, insofar as practicable.

b. Proposed works.---The proposed plan includes enlargement of 15.1 miles of primary canals and construction of 4 primary control structures, 3 terminal control structures, 3 railroad bridges, 13 highway bridges, 2 private road bridges, and provision of the necessary inlet structures and appurtenant works. The plan would require enlargement of the following: 5.3 miles of Phillippi Creek from the Intracoastal Waterway to the confluence of Main A and Main B Canals, including realignment of the canal at United States Highway 41; 5.2 miles of canal along Main A Canal and Branch AA from Phillippi Creek to Sugar Bowl Road (State Road 72A); 3.4 miles of Main B Canal from its confluence with Phillippi Creek to 1.2 miles north of 17th Street; and 1.2 miles of Branch BA from its confluence with Main B Canal to Gocio Road. The existing weir on Phillippi Creek would be replaced with a gated concrete spillway. Two gated spillway structures would be provided on Main B Canal and one on Main A Canal. Terminal control structures would be provided for erosion control at the limit of improvement on Branch AA, Main B Canal, and Branch BA. The plan of improvement and the location of proposed works are shown on plate 1.

c. Recreational boating.--The proposed flood-relief channel would be more than adequate for recreational boating. In order to develop full boat usage of the channel, the plan of improvement includes provision for navigation aids to mark the intersection of the channel with the Intracoastal Waterway; and a public boat ramp, parking area, and small wharf downstream from the existing dam. The ramp would be suitable for launching boats customarily transported by trailer. The public wharf would be suitable for servicing boats up to 30 feet long.

VII. SPECIAL SUBJECTS

20. Multiple-purpose features.--There is no potential water-power development. There is no apparent need at this time for facilities in the plan for municipal and industrial water supply except those required to provide water control and to prevent salt water entering the aquifer. No problems relative to malaria control, fish and wildlife conservation, or general recreational developments are apparent or have been brought out during the course of the studies. There are potential public health hazards present when septic tanks, private wells, public wells, water plants, and homes are flooded. Prevention of floods would remove the critical health hazards existing during and after floods. Recreational boating is generally restricted by channel shoaling. Improvement of Phillippi Creek would enhance recreational boating and reduce boating damage in the area.

VIII. COSTS AND BENEFITS

21. Estimates of initial costs.--The total initial costs of primary works in the plan of improvement are estimated at \$7,854,800. Initial costs of associated works would total about \$118,000. Table 5 presents a summary of initial costs (Federal and non-Federal) at current prices for the plan of improvement (primary works and associated works). Detailed estimates of costs are given in appendix A. No costs are included for boating-terminal facilities since these costs would be largely self-liquidating.

22. Estimates of annual costs.--The total annual costs (financial) of primary works in the plan of improvement are estimated at \$352,100. Total annual costs of associated works would be about \$8,400. A summary of those costs is presented in table 5. The financial costs for the plan are the estimated annual costs to build, maintain, and operate the project. The "economic costs" used in the comparison of benefits and costs are financial costs plus estimated charges representing the loss in productive value of lands acquired for the project over and above the costs of acquiring the lands. Detailed estimates of annual costs are given in appendix A.

TABLE 5

Phillippi Creek Basin

Plan of improvement

Summary of Federal and non-Federal initial and annual financial costs
(Date of estimate: July 1963)

(All costs are in thousands of dollars)

Item	Contract price (1)	Supervision, inspection, and overhead (8 pct. of (1)) (2)	Construction costs ((1)&(2)) (3)	Federal initial costs			Federal annual costs	Non-Federal initial costs			Non-Federal annual costs			Total primary costs (Federal and non-Federal)		Total associated costs (non-Federal)		
				Federal share of construction costs (78 pct. of (3)) (4)	Engineering (7 pct. of (1)) (5)	Total ((4) & (5)) (6)	Interest and amortization (0.03887x(6)) (7)	Non-Federal share of construction costs (22 pct. of (3)) (8)	Lands and private relocations (9)	Public relocations (10)	Total ((8),(9),&(10)) (11)	Interest and amortization (0.04265x(11)) (12)	Maintenance and operation (13)	Total ((12)&(13)) (14)	Initial ((6)&(11)) (15)	Annual financial ((7)&(14)) (16)	Initial (17)	Annual (18)
Canal improvement---	\$3,294.8	\$263.6	\$3,558.4	\$2,794.6	\$230.6	\$3,025.2	\$117.5	\$763.8	\$1,076.9	\$1,020.8	\$2,861.5	\$122.0	\$16.6	\$138.6	\$5,886.7	\$256.1		
Inlet structures----	330.0	26.4	356.4	279.9	23.2	303.1	11.7	76.5	-	-	76.5	3.2	3.4	6.6	379.6	18.3		
Structures-----	1,054.8	84.3	1,139.1	894.6	73.7	968.3	37.5	244.5	-	-	244.5	10.5	11.1	21.6	1,212.8	59.1		
Railroad bridges----	368.3	7.4*	375.7	295.0	-	295.0	11.4	80.7	-	-	80.7	3.5	3.7	7.2	375.7	18.6		
Total-----	5,047.9	381.7	5,429.6	4,264.1	327.5	4,591.6	178.1	1,165.5	1,076.9	1,020.8	3,263.2	139.2	34.8	174.0	7,854.8#	352.1#	\$118.0	\$8.4

NOTES: * 2 percent on railroad bridges.

Estimated initial costs for aids to navigation equal \$4,000 (includes three day markers at \$200 and one lighted 3-pile dolphin at \$3,000).

Estimated annual maintenance costs equal \$400. Federal responsibility (United States Coast Guard).

23. Estimates of annual benefits.--Benefits to be expected from provision of the plan of improvement would be from (1) reduction of flood damages to residential, commercial, and agricultural development, (2) increased land use, and (3) recreational boating. Benefits from reduction of flood damages are the difference between the estimated average annual damages that would occur during the ensuing period of 50 years with the plan of improvement and those that would occur under land-use conditions that would prevail without the plan. Benefits claimed from increased land use are the increases in net income that would result from changed land use because of the plan. In this case, the proposed plan would make possible the development of lands for urban use. Improvement of Phillippi Creek would also enhance recreational boating and reduce boating damage in the area. All estimates of benefits reflect current price levels. The benefits are converted to average annual equivalents for the 50-year period 1970 to 2020 by discounting, using compound interest factors at 3 percent. A detailed analysis of benefits is given in appendix B. Estimates of average annual benefits creditable to the proposed plan of improvement are summarized as follows:

<u>Type of benefit</u>	<u>Estimated average annual benefits</u>	<u>Percent</u>
Prevention of flood damages (general)-----	\$172,300	36.3
Increased land use (local)--	280,900)	63.7
Navigation, recreational boating (local)-----	22,000)	
Total-----	475,200	100.0

24. Comparison of benefits and costs.--Evaluated annual benefits and costs for the proposed plan of improvement for the Phillippi Creek Basin are summarized below. These estimates include associated works in addition to primary works. The annual costs include \$400 for maintenance of aids to navigation.

Annual benefits-----	\$475,200
Annual economic costs-----	377,400
Benefit-cost ratio-----	1.3

25. Apportionment of costs.--Under the usual requirements of existing law for flood control projects of this nature, the Federal Government would construct--at project cost--the canals, control structures, and all related works. Local interests would furnish the lands, easements, rights-of-way, and spoil-disposal areas; assume the complete cost of associated works and of relocations; and operate and maintain the project after completion.

26. Because of the local nature of the benefits from increased land use and recreational boating, a cash contribution would be required in accordance with established criteria. The procedure used is outlined in Corps of Engineers' regulations EM 1120-2-109, dated May 23, 1960, subject: "Federal Participation in Major Drainage Improvements." Under that procedure, the initial costs of the primary works are regarded as divided into general (flood damages prevented) and local (increased land use and navigation) portions according to the relative benefits (in this case 36.3 percent and 63.7 percent, respectively). The general portion is considered as not subject to cash contribution. The local portion is subject to a cash contribution to bring the total local share up to a minimum of 50 percent of the cost. Where the allocated value of the lands, relocations, etc., contributed by local interests is less than 50 percent of the cost of that portion, cash is required to make up the difference. The computation results in a cash contribution of \$1,165,500, which is 20.2 percent of the cost of the construction work to be performed by the Federal Government. This non-Federal cash contribution is equal to 22 percent (to the nearest whole number) of the total of the contract price plus supervision and administration thereof (\$5,429,600). The latter formula is the one used for authorized flood control projects in computing the actual cash amounts. Classification of initial costs by functions, as detailed in appendix A, is summarized in table 6.

TABLE 6
Phillippi Creek Basin
Plan of improvement
Classification of initial costs by functions

Item	General portion (36.3 percent)	Local portion (63.7 percent)	Total
Construction, etc. (project costs)-----	\$2,089,800	\$3,667,300	\$5,757,100*
Lands, highway bridges, etc. (local costs)-----	761,500	1,336,200	2,097,700
Total-----	2,851,300	5,003,500	7,854,800*

NOTE: *All these costs exclude preauthorization survey costs and costs of associated works.

The apportionment of initial costs between the Federal Government and local interests is given in table 7.

TABLE 7

Phillippi Creek Basin

Plan of improvement

Computation of Federal and non-Federal shares
of initial costs (1)

(Date of estimate: July 1965)

Item	Tentative apportionment		Adjustment to assign all lands, etc., to non-Federal interests		Total
	Federal	Non-Federal	Federal	Non-Federal	
<u>Flood-damage-prevention portion:</u>					
Construction-----	\$2,089,800	-	\$2,089,800	-	\$2,089,800
Lands, etc.-----	-	\$761,500	-	\$761,500	761,500
Subtotal-----	2,089,800	761,500	2,089,800	761,500	2,851,300
<u>Increased-land-use and navigation portion:</u>					
Construction-----	1,835,700	1,835,600	2,501,800	1,165,500	3,667,300
Lands, etc.-----	668,100	668,100	-	1,336,200	1,336,200
Subtotal-----	2,501,800	2,501,700	2,501,800	2,501,700	(3) 5,003,500
<u>Total initial costs:</u>					
Construction-----	3,925,500	1,835,600	4,591,600 (79.8 pct.)	(2) 1,165,500 (20.2 pct.)	5,757,100 (100 pct.)
Lands, etc.-----	668,100	1,429,600	-	2,097,700	2,097,700
Total-----	4,591,600	3,265,200	4,591,600 (58.5 pct.)	3,265,200 (41.5 pct.)	7,854,800 (100 pct.)

NOTES: (1) Excludes preauthorization survey costs and costs of associated works.
(2) Local interests' cash contribution.
(3) \$4,642,200 allocated to increased land use and \$361,300 to navigation.

IX. LOCAL COOPERATION

27. Proposed local cooperation. --For the proposed plan of improvement in Phillippi Creek Basin, local interests would be required to:

a. Contribute in cash 22 percent of the contract price plus supervision and administration thereof for all items of work to be provided by the Corps of Engineers, an amount now estimated at \$1,165,500, to be paid in a lump sum prior to start of construction, or in installments prior to start of pertinent work items in accordance with construction schedules as required by the Chief of Engineers, the final allocation of costs to be made after the actual costs have been determined.

b. With appropriate jurisdiction, construct and thereafter maintain such lateral drainage facilities as are necessary to realize the benefits made available by the improvements in Phillippi Creek Basin (this requirement would not prohibit the assistance of other Federal and local conservation programs in constructing and/or maintaining lateral drainage works under authorizations not connected with this project); and

c. Furnish assurances satisfactory to the Secretary of the Army that they will:

(1) Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction of the project, when and as required;

(2) Assume the cost of (a) construction of all new highway bridges and relocations of existing highway bridges and (b) alterations to miscellaneous utilities and other existing improvements (except railroad facilities) incident to construction of the project;

(3) Hold and save the United States free from damages due to the construction works;

(4) Prohibit encroachment on the flood-carrying capacity of the improved channels; and

(5) Except for the aids to navigation, which would be maintained by the United States Coast Guard, operate and maintain the improved channels and appurtenant works after completion in accordance with regulations prescribed by the Secretary of the Army.

28. Assurances of local cooperation. --The public hearing was witness to the statement that the Board of County Commissioners, Sarasota County, stood ready to perform its share, under applicable Federal laws. The County representatives have long recognized the

flood problem and have initiated and expedited actions toward a final solution, including the engagement of consulting engineers to make plans and to determine rights-of-way requirements. On July 10, 1963, representatives of this office met with representatives of the Board of County Commissioners and the consulting engineers retained by the County to review all details of the proposed plan and the approximate local cooperation requirements. The County lacks the financial ability to meet the terms of local cooperation at this time. However, a proposal is to be placed before the voters this fall on formation of a flood control district which would have responsibility for complying with the local requirements for the plan for Phillippi Creek Basin. The District Engineer believes there is no doubt that either the Board of County Commissioners or the flood control district currently under consideration would be able and willing to meet the requirements outlined above.

X. COORDINATION WITH OTHER AGENCIES

29. General.--The District Engineer outlined the improvements proposed in this report and the functions those works were designed to perform in letters dated April 11, 1963, to the United States Fish and Wildlife Service, the State Game and Fresh Water Fish Commission, the State Conservationist of the United States Soil Conservation Service, and the Director, Florida Board of Conservation; and letters dated July 16, 1963, to the Regional Engineer, United States Bureau of Public Roads, and the Chairman, State Road Department. Those agencies were asked to comment on the flood control plans considered for the Phillippi Creek watershed. Replies which have been received to date are presented in appendix C and summarized in the following paragraphs.

30. Fish and wildlife agencies.--Views of the Bureau of Sport Fisheries and Wildlife, United States Fish and Wildlife Service, are presented in a letter dated June 26, 1963. The United States Bureau of Commercial Fisheries, the Florida Game and Fresh Water Fish Commission, and the Florida Board of Conservation concur in these views. Urbanization has displaced most game populations from the watershed area considered for improvement and the natural stream has already been channelized, so that project construction would not be expected to have significant effects on fresh-water fish. It was pointed out that the project should be designed to minimize sedimentation in the estuary.

31. Florida Board of Conservation.--In letter dated May 3, 1963, the Director intimated that silt-removal works should be provided to reduce adverse effects to estuarine plants and animals. He also stated that the proposed realignment of the main channel at United States Highway 41 is badly needed.

32. United States Soil Conservation Service.--Several conferences were held with agency representatives during the investigation. In letter dated April 18, 1963, the State Conservationist expressed the opinion that the proposals generally as outlined in letter of April 11, 1963, were compatible with the Sarasota West Coast Watershed Work Plan developed under Public Law 566. The plan proposed herein does not conflict with nor duplicate the authorized Soil Conservation Service project.

33. United States Bureau of Public Roads.--Replies of the Federal agency's Regional and Division Engineers, dated July 24 and 26, 1963, respectively, are included in appendix C.

Federal-aid highway funds will not be available to defray any part of the cost of relocating highways that local interests are required or agree to assume as a condition to the undertaking of the flood control project.

34. Florida State Road Department.--In letter dated October 14, 1963 (appendix C), the Chairman indicated that bridge plans would be prepared soon to comply with proposed channel requirements at United States Highway 41. The Chairman stated that any improvements beyond the limits of the highway right-of-way would have to be financed with funds other than Primary Highway funds.

XI. DISCUSSION AND CONCLUSIONS

35. Discussion.--The flood problem in Phillippi Creek Basin is one of mounting severity. A stream that at one time drained agricultural and undeveloped lands now serves an area which is in part highly urban and may ultimately be entirely urban. Changing land use and canalization have intensified runoff to a stream already taxed to the limit of its capacity. The creek's lack of capacity to carry off the floodwaters results in flood damages and in restriction of development. During the span of the last few years, severe and damaging floods occurred in April 1957, March 1958, September 1959, and September 1962. Hydrologic and economic studies show that improvement of Phillippi Creek and two of its major canal tributaries to accommodate the 30-year flood would provide the maximum excess of benefits over costs. That degree of protection--with adequate associated works--would also substantially reduce stages of larger floods. In addition to prevention of flood damage, reduction of flooding to minor extent and infrequent occurrence would permit full utilization of land for expected urban needs. The costs of any additional protection would be considerably more than the benefits to be expected.

36. Additional information on alternative considerations called for by Senate Resolution 148, 85th Congress, adopted January 28, 1958, is contained in supplement I which follows appendix C of this report.

37. Conclusions.--It is concluded that the plan of improvement presented in this report is the most feasible and economical solution to the drainage problem in the Phillippi Creek Basin. The plan would provide the primary flood control works required to remove without

damaging ponding the 30-year-flood runoff from the area contributing to the canal; reduce the depth and duration of floods of greater magnitude; prevent erosion and siltation in project canals; and greatly improve water control in the subject area. Comparison of annual benefits with annual costs results in a benefit-cost ratio of 1.3. Therefore, the plan is economically justified and Federal participation to the extent outlined herein is believed warranted.

XII. RECOMMENDATIONS

38. Recommendations.--It is recommended that the plan of improvement described in chapter VI above, and shown on plate 1, be constructed. The estimated initial cost to the United States for the plan of improvement is \$4,595,600 (including \$4,000 for aids to navigation). It is further recommended that local interests:

a. Contribute in cash 22 percent of the contract price plus supervision and administration thereof for all items of work to be provided by the Corps of Engineers, an amount now estimated at \$1,165,500, to be paid in a lump sum prior to start of construction, or in installments prior to start of pertinent work items in accordance with construction schedules as required by the Chief of Engineers, the final allocation of costs to be made after the actual costs have been determined.

b. With appropriate jurisdiction, construct and thereafter maintain such lateral drainage facilities as are necessary to realize the benefits made available by the improvements in Phillippi Creek Basin (this requirement would not prohibit the assistance of other Federal and local conservation programs in constructing and/or maintaining lateral drainage works under authorizations not connected with this project); and

c. Furnish assurances satisfactory to the Secretary of the Army that they will:

(1) Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction of the project, when and as required;

(2) Assume the cost of (a) construction of all new highway bridges and relocations of existing highway bridges and (b) alterations to miscellaneous utilities and other existing improvements (except railroad facilities) incident to construction of the project;

(3) Hold and save the United States free from damages due to the construction works;

(4) Prohibit encroachment on the flood-carrying capacity of the improved channels; and

(5) Except for the aids to navigation, which would be maintained by the United States Coast Guard, operate and maintain the improved channels and appurtenant works after completion in accordance with regulations prescribed by the Secretary of the Army.

H. R. PARFITT
Colonel, Corps of Engineers
District Engineer

[First endorsement]

SADER (31 Oct 63)

SUBJECT: Survey Report on Phillippi Creek Basin, Florida

U. S. Army Engr Div, South Atlantic, Atlanta, Ga., 15 November 1963

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

Concur in the recommendation of the District Engineer.

**A. C. WELLING
Major General, USA
Division Engineer**

SUPPLEMENT ISURVEY REPORT ON
PHILLIPPI CREEK BASIN, FLA.

Information called for by
Senate Resolution 148, 85th Congress
Adopted January 28, 1958

1. Project description and economic life.--The Phillippi Creek Basin covers about 58 square miles of coastal lowlands, all in northwest Sarasota County, Fla., except a small headwater area in southern Manatee County. Two principal tributaries--Main A and Main B, draining predominantly agricultural areas, converge and form Phillippi Creek which flows about 5.3 miles through urban areas of Sarasota, Fla. In 2020, development in the area is expected to be predominantly urban. The proposed plan of improvement includes enlargement and straightening the existing channels to provide gravity removal of about 60 percent of the standard project flood runoff from the area. The plan includes a cutoff near United States Highway 41 and the necessary control structures and highway and railroad bridge crossings. The plan presumes the existence of the authorized Sarasota West Coast Watershed Work Plan of the Soil Conservation Service which would provide flood protection for 20.5 square miles of the upper Phillippi Creek drainage area. Estimated economic life is 50 years.

2. Project costs and benefits.--Detailed estimates of costs and benefits for the proposed plan of improvement are presented in appendixes A and B of the report. Tangible benefits creditable to that plan would be derived from prevention of flood damages, from increased land use, and from recreational boating. Comparison of costs and benefits for 50-year and 100-year economic lives is given below. Benefit growth is not forecast after the initial 50-year period.

<u>Item</u>	<u>50-year economic life</u>	<u>100-year economic life</u>
<u>Initial costs</u>		
Excavation-----	\$3,907,000	\$3,907,000
Highway bridges-----	1,020,800	1,020,800
Railroad bridges-----	375,700	375,700
Relocations-----	388,100	388,100
Inlet structures-----	379,600	379,600
Control structures-----	1,212,800	1,212,800
Lands and rights-of-way-----	688,800	688,800
Aids to navigation-----	4,000	4,000
Total initial costs-----	7,976,800	7,976,800
<u>Annual costs</u>		
Interest and amortization at 3 percent and 3-1/2 percent for primary works and 6 percent for associated works-----	325,700	270,500
Operation and maintenance-----	33,100	33,100
Replacement of control-structure operating equipment every 25 years--	2,100	3,000
Economic adjustment for lands-----	16,500	16,500
Total annual costs-----	377,400	323,100
<u>Average annual benefits</u> -----	475,200	567,700
<u>Benefit-cost ratio</u> -----	1.3	1.8

3. Intangible project effects.--These effects would consist primarily of enhancement of the general health, welfare, and security of the people affected by reduction of the depth, duration, and frequency of flooding. The primary channels, their control structures, and the system of associated drainage works would permit conservation and greater use of the available water and land resources of the area.

4. Physical feasibility and cost of providing for future needs.--Design of the proposed plan of improvement is based on future needs of the area anticipated during the 50-year economic life. It is considered that the degree of protection proposed would be adequate for the urban expansion which can be reasonably expected in the study area during a 100-year economic life.

5. Allocation of costs.--No allocation of costs among water uses or purposes is involved in this report, the principal purpose being flood control and navigation being an incidental beneficiary.

6. Extent of interest in the project.--Local interests in the study area are at present represented by the Board of County Commissioners of Sarasota County, Fla. In view of the County's interest and cooperation in seeking a solution to the flood problem, and the proposed referendum for the purpose of establishing a flood control district, no difficulty is expected in securing the necessary cooperation for the works recommended herein. As evidenced by statements at the public hearing in November 1962, the project has the vigorous support of the governments of the State of Florida, Sarasota County, and the City of Sarasota; local landowners; and the members of Congress representing the area.

7. Repayment schedules.--Not involved.

8. Alternative considerations.--The relatively flat lands that make up the area contain no valley or lake areas that would provide storage reservoirs for use in reduction of flooding. Consideration was given to levees and diversions. These were considered objectionable because they would be costly and not meet project objectives. Consequently, the most practicable means of removing excess runoff would be through provision of adequate primary and associated drainage and flood control works.

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
OFFICE OF THE DISTRICT ENGINEER
CORPS OF ENGINEERS
JACKSONVILLE, FLA.

SAJWY (Phillippi Creek)

October 31, 1963

SURVEY REPORT ON
PHILLIPPI CREEK BASIN, FLORIDA

APPENDIX C

COMMENTS OF OTHER AGENCIES

This appendix presents the comments of the State Conservationist, United States Soil Conservation Service; the Acting Regional Director, Bureau of Sport Fisheries and Wildlife; the Director, Florida Game and Fresh Water Fish Commission; the Director, Florida Board of Conservation; the Regional and Division Engineers, United States Bureau of Public Roads; and the Chairman, Florida State Road Department, regarding the proposed plan of improvement as related to their spheres of interest in the Phillippi Creek Basin. Copies of the District Engineer's letters to those and other agencies requesting coordinating comments are included herein. Replies from other agencies will be appended when received.

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
OFFICE OF THE DISTRICT ENGINEER
CORPS OF ENGINEERS
JACKSONVILLE, FLA.

SAKWY

April 11, 1963

Mr. A. D. Aldrich
Director
Florida Game and Fresh Water
Fish Commission
Tallahassee, Florida

Dear Mr. Aldrich:

As you know, the survey report on Phillippi Creek is under preparation. In accordance with Corps policy and to permit review and comments by interested agencies, description of works under consideration for flood protection in the Phillippi Creek watershed is furnished. While details of design are yet to be completed, appropriate review and comments on the planning to date will help to expedite the report.

Existing development in Phillippi Creek watershed is principally urban in the western half and agricultural in the area east of Cattlemen Road. Development trends and population studies as well as other factors indicate that the overall area will become predominantly urban in the future. The plan of improvement under consideration would provide adequate flood protection for existing development and sufficient capacity to give protection to possible future development.

Inclosure 1 shows the major facilities which are being considered in the plan of improvement. Number and location of water-control structures are tentative. The existing water-control structure will be modified, if necessary, to accommodate design discharges. It is considered that the works of the Soil Conservation Service's watershed work plan, provided under Public Law 566, gives adequate protection to the existing agricultural area. It is also considered that the pump outlet capacity to Cow Pen Slough would be available for flood removal under design conditions.

It will be noted from examination of inclosure 1 that the primary plan of improvement would extend to the proposed water-control structure west of Cattlemen Road. Extension of improvements to the east would depend on economic justification and future needs. In any case, capacity downstream would be provided in the event the area east of Cattlemen Road should develop to urban use, requiring future protection in excess of a 1-in-10-year flood.

Designs are being prepared to provide up to standard project flood protection for urban areas. The degree of protection is usually based on that plan of improvement which would give maximum excess of benefits over costs. Based on design studies for other areas, the selected design for Phillippi Creek would give at least 60 percent standard project flood protection for the urban areas. That degree of protection would practically eliminate damages from the 1-in-30-year flood. Hydrographs for the standard project flood and 60 percent of the standard project flood at the mouth of Phillippi Creek are shown in inclosure 2. Inclosure 3 is a tabulation of the peak discharges at key locations for those floods. In addition, peak discharges of the maximum flood of record (September 1962), estimated to have a frequency of occurrence of about once in 50 years, are shown.

The report is expected to be submitted to our higher authority this fiscal year. Your comments on the plan of improvement relative to your area of interest would be appreciated.

Similar letters are being sent to other State and Federal agencies.

Sincerely yours,

- 3 Incl
1. Preliminary plan of improvement
2. Hydrographs
3. Table of discharges

H. R. PARFITT
Colonel, Corps of Engineers
District Engineer

Copy furnished (w/cy incl):
Wildlife Biologist
Florida Game and Fresh Water
Fish Commission
P. O. Box 1838
Vero Beach, Fla.

This same letter (with inclosures) sent to the following:

Mr. Warren S. Henderson
Chairman, Board of County Commissioners
Sarasota County
P. O. Box 271
Sarasota, Fla.
(w/copy to: Mr. Charles Morgan, County Engineer
Sarasota, Fla.)

Regional Director
Bureau of Sport Fisheries and Wildlife
U. S. Fish and Wildlife Service
Peachtree-Seventh Building
Atlanta 23, Ga.
(w/copy to: Biologist in Charge
U. S. Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife
1031 Miracle Mile
Vero Beach, Fla.)

Mr. J. W. Hammett, State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 162
Gainesville, Fla.

U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
OFFICE OF THE DISTRICT ENGINEER
CORPS OF ENGINEERS
JACKSONVILLE, FLA.

SAKWY

Regional Engineer
Bureau of Public Roads
50 Seventh Street, NE.
Atlanta 23, Georgia

July 18, 1963

Dear Sir:

As you may know, the Corps of Engineers' survey report on Phillippi Creek is under preparation. In accordance with Corps policy and to permit review and comments by interested agencies, description of works under consideration for flood protection in Phillippi Creek watershed is furnished.

Existing development in Phillippi Creek watershed is principally urban in the western half and agricultural in the area east of Cattlemen Road. Development trends, population studies, and other factors indicate that the overall area will become predominantly urban in the future. The Phillippi Creek area and the plan of improvement under consideration are shown on accompanying inclosure 1.

The proposed plan of improvement would provide protection from the 30-year flood for urban and urban-oriented areas of the watershed and would reduce stages and durations of larger floods. Major elements of the plan include enlargement of Phillippi Creek and portions of its main tributaries, provision of the necessary water-control structures, and realignment of the main channel at United States Highway 41. Details of the 30-year hydraulic design and a summary of corresponding minimum hydraulic requirements for bridge openings are given in inclosures 2 and 3.

The survey is expected to be submitted to our higher authority in the near future. Your comments on the plan of improvement relative to your area of interest would be appreciated.

Similar letters have been sent to other State and Federal agencies.

Sincerely yours,

- 3 Incl
1. Plan of improvement
2. Design data for channels
3. Design data for bridges

H. R. PARFITT
Colonel, Corps of Engineers
District Engineer

Copy furnished:
Bureau of Public Roads
Tallahassee, Fla. (w/incl)

This same letter sent to the following:

Chairman
State Road Department
Tallahassee, Florida

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

State Office
P.O. Box 162
Gainesville, Florida

April 18, 1963

H. R. Parfitt
Colonel, Corps of Engineers
District Engineer
575 Riverside Avenue
Jacksonville 2, Florida

Dear Colonel Parfitt:

We have reviewed with interest the planning to date of works for flood protection in the Phillippi Creek Watershed as requested in your letter of April 11th. We believe the proposals are compatible with the Sarasota West Coast Watershed Work Plan developed under Public Law 566. We agree that extension of Phillippi Creek improvements to the East through Cattlemen Road should be deferred until urban and related uses would have increased to the point that additional protection is required.

We would appreciate the opportunity of commenting on the report when it has been completed.

Sincerely yours,

J. W. Hammett
State Conservationist

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
PEACHTREE-SEVENTH BUILDING
ATLANTA 23, GEORGIA

June 26, 1963

CE-SE-gm (Phillippi Creek)

District Engineer
U. S. Army, Corps of Engineers
Jacksonville, Florida

Dear Sir:

By letter of April 11, 1963, you requested our comments on the proposed Phillippi Creek, Florida, project, for flood control and allied purposes. Authorization for your survey report on this project is contained in Section 208 of the Flood Control Act of 1960, approved July 14, 1960. These comments are furnished in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Existing canals in the project area are of inadequate capacity to control flooding. Your considered plan includes improvement of about 11 miles of these canals and provision of several water-control structures. Improvement of the remaining canals may be accomplished when future conditions warrant such action.

Urbanization has displaced most game populations from the watershed area considered for improvement. The natural stream has been channelized, so that project construction is not expected to have significant effects on fresh water fish.

Changes in runoff characteristics are not expected to have a significant effect on fish and wildlife resources. Runoff damage could result if sedimentation increases in the estuary as a result of the project. Therefore, the project should be designed to minimize sedimentation in these waters. Aside from this aspect, we have no objections to the plan.

This report has been reviewed and concurred in by the Bureau of Commercial Fisheries, St. Petersburg Beach, Florida; Florida Game and Fresh Water Fish Commission; and the Florida State Board of Conservation. Letters of concurrence from the State agencies are attached.

Sincerely yours,

James R. Fielding
Acting Regional Director

Enclosures 2

Florida Board of Conservation
DIVISION OF ADMINISTRATION • TALLAHASSEE

10 June 1963

Mr. Walter A. Gresh
Regional Director
Bureau of Sport Fisheries and Wildlife
U. S. Fish and Wildlife Service
Peachtree-Seventh Building
Atlanta 23, Georgia

Dear Mr. Gresh:

We concur with the U. S. Fish and Wildlife Service report on Phillippi Creek project, Sarasota County, Florida.

Yours very truly,

Randolph Hodges
Director

RH/Ihj

cc: Mr. Arthur Marshall
Mr. K. D. Woodburn
Col. H. J. Kelly

STATE OF FLORIDA
GAME AND FRESH WATER FISH COMMISSION
TALLAHASSEE

June 21, 1963

Regional Director
Fish and Wildlife Service
Peachtree - Seventh Building
Atlanta 23, Georgia

Dear Sir:

The Florida Game and Fresh Water Fish Commission has reviewed and concurs with your proposed report on the Phillippi Creek, Florida, project (reference letter, June 5, 1963, W. L. Towns).

Very truly yours,

GAME AND FRESH WATER FISH COMMISSION

A. D. Aldrich,
Director

ADA/rb

Florida Board of Conservation
DIVISION OF ADMINISTRATION • TALLAHASSEE

3 May 1963

Colonel H. R. Parfitt
District Engineer
U. S. Army Corps of Engineers
575 Riverside Avenue
Jacksonville 2, Florida

Dear Colonel Parfitt:

The project plans submitted to us do not specify settling basins for silt. These may be incorporated with spillway structures but this is not stated. Reducing siltation during heavy rains and resultant discharges of fresh water would mitigate damages to estuarine plants and animals in Phillippi Creek, Roberts Bay and Little Sarasota Bay.

The bridge causeway on U. S. 41 (Tamiami Trail) forms an impediment to Phillippi Creek flow. During heavy rains, the flood waters back up to the east and cover valuable real estate. A proposed canal in the Corps plans will eliminate the bottleneck at the U. S. 41 bridge. This project is badly needed as was evident when Harold Watson and K. D. Woodburn flew over the flooded areas last fall on a red tide survey.

Yours very truly,

Randolph Hodges
Director

RH/Inj

cc: Mr. Walter Gresh
Mr. Arthur R. Marshall
Col. H. J. Kelly
Mr. K. D. Woodburn

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION THREE
828 Peachtree-Seventh Bldg.
50 Seventh Street N. E.
Atlanta 23, Georgia

July 24, 1963

District Engineer
U.S. Army Engineer District, Jacksonville
P. O. Box 4970
Jacksonville 1, Florida

Ref: File No. SAKWY

Dear Sir:

Your letter of July 18, 1963 transmitted maps and proposed plan of improvement showing works under consideration for flood protection in Phillippi Creek watershed. Your thoughtfulness in supplying these maps to us is appreciated.

The Bureau of Public Roads cooperates with the several State Highway Departments in matters pertaining to public highways. Our operating procedure is for the State Highway Department to initiate plans for construction or improvement of such highways on the approved Federal-aid Highway Systems. These plans are reviewed in our Division offices which are located in the same cities as the State Highway Department central offices. Our Regional offices and our Washington office are advised of the findings of this review.

Information is not readily available to this office which indicate how highways on the Federal-aid network might be affected by your proposed plans. We note that a copy of your letter with enclosures was addressed to our Division Engineer in Tallahassee. If he requests us, we will assist him in his analysis of your proposed work. We are sure he will supply you with information that is available to him.

We will appreciate receiving similar plans for other projects which may affect highways that are on the Federal-aid Systems. The Bureau of Public Roads desires to strengthen interagency cooperation on water resources developments which may affect existing or proposed highway facilities.

Very truly yours,

Rex S. Anderson,
Regional Engineer

cc: Mr. J. S. Call - Florida

U. S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
REGION THREE

P. O. Box 1079
Tallahassee, Florida

July 26, 1963

Colonel H. R. Parfitt
District Engineer
U. S. Engineer Office
575 Riverside Avenue
Jacksonville 2, Florida

Dear Sir:

Subject: Florida - Phillippi Creek - Flood Control

We acknowledge receipt of a copy of your letter to the Regional Engineer of July 18, 1963, and attached data relating to the proposed plan of improvement for the captioned watercourse.

Realignment of the main channel at its intersection with U. S. Route 41 (Federal-aid Route 11) entails the construction of a new highway bridge over the new channel. The hydraulic design, live loading, design and detail of elements and geometric design should conform to the State's standard practice and AASHO standard specifications for highway bridges.

Receipt of the information concerning the proposed improvement is appreciated.

Yours very truly,

J. S. Call
Division Engineer

FLORIDA STATE ROAD DEPARTMENT

TALLAHASSEE

October 14, 19-Safety-3

District Engineer
U. S. Army Engineer District, Jacksonville
P. O. Box 4970
Jacksonville 1, Florida

Re: File SAKWY
Section 17020, Sarasota County
Phillipi Creek

Gentlemen:

At the request of the Board of County Commissioners we are soon to prepare plans for realignment of the channel of Phillipi Creek at U.S. Highway 41. Presently our plans are to provide a bridge which will accommodate the channel your preliminary report proposes, this being a 100' bottom width at elevation (-) 16.0 and with one vertical to two horizontal side slopes. We do not as yet know whether a low bulkhead will be carried under the bridge, but should such be the case no significant reduction in channel capacity will result.

I believe that Sarasota County is now in the process of securing rights-of-way for this work. I presume that any work done toward implementing your plans would be applicable to the local agency's share of any project which the Congress should authorize and finance.

We are in no way interested in the development of the channel either up or downstream of the limits of the US 41 right-of-way. Any improvements to the channel and or bridges outside that right-of-way will have to be financed with funds other than Primary Highway funds.

Very truly yours,

John R. Phillips
Chairman

JRP:CJS:om

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**PHILIPPI CREEK BASIN, FLA.
DRAINAGE AREA AND
PLAN OF IMPROVEMENT**

SURVEY REPORT
U. S. ARMY ENGINEER DISTRICT, JACKSONVILLE
CORPS OF ENGINEERS, JACKSONVILLE, FLORIDA

APPROVAL RECOMMENDED
SUBMITTED
CHIEF PLANS BRANCH
ENGINEERING DIV.
DATE: OCTOBER 1963
DRAWN BY: A.L.K.
TO ACCOMPANY REPORT
D.O. FILE NO. 59-28,401
CHECKED BY: B.J.H.

- LEGEND**
- PROPOSED SPILLWAY, TO BE REPLACED
 - EXISTING SPILLWAY, TO BE REPLACED
 - PROPOSED CANAL
 - EXISTING CANAL, TO BE IMPROVED
 - EXISTING CANAL
 - DRAINAGE AREA BOUNDARY
 - HIGHWAY
 - RAILROAD
 - PROPOSED SPOIL AREA
- SCALE IN MILES

