

Chapter XII

RELATED PROJECTS

A number of important projects, built or authorized, are related directly or indirectly to the Boulder Canyon project. The project itself, as previously outlined, comprises Hoover Dam, Hoover Dam power plant, and the All-American Canal. The Hoover Dam transmission lines, although privately financed, are such an integral part of the project that they are discussed, *supra*, as a part of the project.

The works more or less directly related to the Boulder Canyon project, built or authorized to date, in general order from north to south, are as follows:

- A. Davis Dam, 67 miles below Hoover Dam.
- B. Parker Dam, 88 miles below Davis Dam.
- C. Colorado River aqueduct, diverting from the reservoir impounded by Parker Dam.
- D. Alamo Dam (on the Bill Williams River), on the margin of Parker Dam Reservoir.
- E. Headgate Rock Dam (Colorado River Indian Reservation), 14 miles below Parker Dam.
- F. Colorado River front work (levees and channel control), from Headgate Rock Dam to the Mexican boundary.
- G. Palo Verde weir (Palo Verde Irrigation District), 43 miles below Headgate Rock Dam.
- H. Gila project (Imperial Dam), 90 miles below the Palo Verde weir and 22 miles above the Mexican boundary.
- I. Yuma project (Laguna Dam), 5 miles below Imperial Dam.
- J. Rockwood Gate and Hanlon Heading, immediately above the upper Mexican boundary.
- K. Morelos Dam (in Mexico and Arizona), about 1 mile below the upper Mexican boundary, in the limitrophe section of the river.

These, together with the Comprehensive Plan of Development of the Colorado River, are identified below.

A. Davis Dam

(1) *Background and name of Davis Dam.*—A dam at this site was proposed by A. P. Davis and J. B. Lippincott in the First Annual Report of the Reclamation Service (H. Doc. 79, 57th Cong.). Such a dam, for reregulation of the discharges from Hoover Dam, was con-

templated in the power studies referred to in chapter VI. The structure is appropriately named for Arthur Powell Davis, whose name frequently recurs in this volume in connection with almost every phase of the Boulder Canyon project, the Colorado River Compact and the activities of the Reclamation Service, with which he was identified as engineer and Commissioner until his retirement in 1924.

(2) *Finding of feasibility, April 26, 1941 (appendix 1214).*—Davis Dam was originally authorized by a secretarial finding of feasibility¹ under the authority of the Reclamation Project Act of 1939,² section 9. It is under construction in the main stream of the Colorado River, at Pyramid Canyon, about 67 miles downstream from Hoover Dam and 34 miles west of Kingman, Ariz. It will be an earth and rock fill structure, having a volume of approximately 3,800,000 cubic yards, a maximum height of 138 feet above normal stream bed, and a crest length of 1,600 feet. It will create a storage reservoir with a total capacity of 1,820,000 acre-feet, of which 1,600,000 acre-feet will be "live" storage. A power plant, to be located on the Arizona side of the river, will have an installed capacity of 225,000 kilowatts, furnished by five 45,000 kilovolt-ampere generating units. The estimated output will be in excess of 800,000,000 kilowatt-hours annually. The transmission system will interconnect Davis, Parker, and Hoover power plants.

Construction was initiated in 1942, suspended because of the war, and resumed April 3, 1946.

(3) *Davis transmission system.*³—With the exception of two 69,000-volt lines, one to Needles, Calif., and the other to Kingman, Ariz., all transmission circuits from Davis power plant will operate at 230,000 volts. Davis will be interconnected with both Hoover and Parker power plants and a line almost 300 miles in length will pass near Kingman and through Prescott and Mesa, east of Phoenix, to Coolidge where 115,000-volt extensions will connect with Tucson, Maricopa, Cochise, and other adjacent power markets in Arizona.

The transmission circuits from Davis power plant are tabulated in appendix 1215.

(4) *Allocation of energy.*—On June 23, 1948, Secretary Krug approved a tentative allocation of energy to be generated at Davis Dam. This appears herein as appendix 1216.

(5) *Mexican treaty provisions.*—The Mexican water treaty of February 3, 1944 (appendix 1405), obligated the United States (art. 12 (b)) to construct Davis Dam at its own expense within a period of

¹ H. Doc. 186 (77th Cong., 1st sess.), reprinted herein as appendix 1214.

² 53 Stat. 1187.

³ For a description of Davis Dam and power plant and transmission lines now under construction, see hearings, House Committee on Appropriations, Interior Department appropriation bill, fiscal year 1949, p. 1188, et seq.

5 years from the date of entry into force of the treaty (November 8, 1945; see appendix 1406), and thereafter to—

operate and maintain at its expense, the Davis storage dam and reservoir, a part of the capacity of which shall be used to make possible the regulation at the boundary of the waters to be delivered to Mexico in accordance with the provisions of Article 15 of this treaty.

Article 27 of the treaty suspended the provisions of articles 10, 11, and 15, covering the allocation and delivery of water to Mexico—

during a period of five years from the date of entry into force of this treaty, or until Davis Dam and the major Mexican diversion structure on the Colorado River are placed in operation, should these works be placed in operation prior to the expiration of said period.

The Senate reservations of April 18, 1945 (see appendix 1405), recognized specific authorization in the treaty for expenditures for eight works, including—

4. The Davis Dam and Reservoir mentioned in subparagraph (d) of article 12 of the treaty.

B. Parker Dam

Because of their close relationship to the Hoover Dam power contracts, the basic Parker Dam contracts are included in this volume.

(1) *Cooperative contract of February 10, 1933 (appendix 1201).*—As part of its plans for the Colorado River aqueduct, the Metropolitan Water District considered, in the alternate, construction of a pumping plant in the vicinity of Parker, Ariz., or construction of a dam at that point to elevate and maintain a stable water surface. The United States had need for a reservoir at that point for reregulation of the river, and development of power for utilization on the Colorado River Indian Reservation, the Gila project in Arizona, and elsewhere in that State. The district and the United States entered into a cooperative contract on February 10, 1933 (printed herein as appendix 1201), under which the United States agreed, with funds provided by the district, to construct and operate the dam. The United States was to retain title and retain control over all water passing the dam. The district was accorded the right to divert water from the reservoir created by the dam and one-half the power privilege. The United States retained one-half the power privilege and the right to divert water from the reservoir for the Colorado River Indian Reservation, and for projects built under the reclamation law. The Government also secured the right, in this contract, to utilize excess capacity in the district's transmission system from Hoover Dam to Parker Dam.

(2) *Litigation.*—The State of Arizona resisted the construction of the dam, calling out its militia. In January 1935 the United States

commenced an original action in the United States Supreme Court to enjoin the State from interfering. The decision, rendered on April 29, 1935, refused the injunction on the ground that the Secretary of the Interior did not have adequate statutory authority (*United States v. Arizona*, 295 U. S. 174 (1936), appendix 1303).

(3) *Legislation*.—The difficulty was removed by reauthorization of the project and confirmation of the 1933 contract, *supra*, in the Rivers and Harbors Act of 1935 (extracts from which are printed herein as appendix 1202).

Supplemental legislation, respecting compensation to Indians for rights-of-way, is cited in the margin.⁴

(4) *Construction*.—Construction of the dam was resumed after enactment of the Rivers and Harbors Act of 1935. The contractor and its engineer in charge, as at Hoover Dam, were Six Companies, Inc., and Frank Crowe. The dam is of the variable-radius-arch type, constructed of concrete, with a crest length of 800 feet, a base width of 100 feet, a top width of 50 feet, a maximum height above bedrock of 322 feet, and a volume of about 268,000 cubic yards. Because of the depth of the bedrock, upon completion three-fourths of the dam was below the bed of the river. The river level was raised only about 70 to 80 feet; but a reservoir, 28,000 acres in area with a capacity of 720,000 acre-feet, was created. This reservoir extends 45 miles up the Colorado and 5 miles up the Williams River.

The Parker power plant, as originally constructed, had space for four generators, with a rated capacity of 25,000 kilowatts each.

(5) *Supplemental contracts*.—FOREBAY CONTRACT (APPENDIX 1203): On September 29, 1936, the basic 1933 contract was supplemented by an agreement providing for the construction by the United States of a forebay and the power-plant substructure.

POWER-PLANT CONTRACTS (APPENDIX 1204): On April 7, 1939, the district and the United States entered into a contract providing for the construction of a power plant, and amending the contract of 1933 and

⁴ Act of July 8, 1940 (54 Stat. 744), in aid of the construction of the Parker Dam project, granted to the United States all interest of the Indians to tribal and allotted lands in the Fort Mojave Indian Reservation, Ariz., and the Chemehuevi Reservation, Calif., designated by the Secretary of the Interior, subject to determination of compensation by the Secretary, with the direction that the amount so determined should be paid to the Secretary by the Metropolitan Water District in accordance with the terms of the cooperative contract of February 10, 1933, for the construction of Parker Dam (appendix 1201). See Solicitor's opinions (unpublished), August 24, 1936, December 15, 1937, re Fort Mojave and Chemehuevi Indians, respectively. The act of October 28, 1942 (56 Stat. 1011), granted to the United States the interests of the Indians in lands acquired for construction, operation, and maintenance of transmission lines, the amounts found by the Secretary to be due to the tribes or individual allottees to be paid them from the funds available for the Parker Dam power project, or used for the acquisition of other lands.

that of 1936 (*supra*) in several respects. On July 10, 1942, by supplemental agreement, the contract of April 7, 1939, was amended. All of the operative parts of the 1939 and 1942 agreements appear in the amended text of the power plant contract of 1939 (printed herein as appendix 1204).

CHANGE OF SAN DIEGO DIVERSION POINT; SUPPLEMENTAL CONTRACT OF OCTOBER 1, 1946 (APPENDIX 1205): The inclusion of the San Diego County Water Authority in the district necessitated a change in the point of diversion of water for San Diego from that specified in the San Diego All-American Canal contract of October 2, 1934 (appendix 1111), to a point above Parker power plant. (See San Diego contracts of October 4, 1946 (appendix 1012), and March 14, 1947 (appendix 1014).) The effect of such added diversion was to diminish the power privilege at Parker Dam. The United States insisted that the district agree to hold the United States harmless against that reduction. This was done by contract dated October 1, 1946 (appendix 1205). To enable the district to comply with those requirements, a collateral agreement was made between the Edison Co. and the district for the replacement energy involved (omitted from this volume). The estimated present worth of the energy required to make good the depletion of the plant output was added to the amount payable to the district by the San Diego County Water Authority as a special tax.

FOUR-PARTY 1947 PARKER UNIT CONTRACT (APPENDIX 1206): The district's 1945 resale contract previously referred to (appendix 912) provided an absorption period with respect to the district's unused energy. By an agreement, dated May 20, 1947 (appendix 1206), the district agreed with the purchasers of its unused Hoover Dam energy to exercise its right to have units 3 and 4 of Parker power plant transferred to its service immediately after December 13, 1952, and thereafter to use Parker energy in preference to energy from Hoover Dam. This operation will have the effect of making more energy available for the purchasers of district unused energy at Hoover Dam. In consideration thereof the purchasers under the 1945 resale contract agreed to eliminate the advantage accruing to them by virtue of the absorption period stated in the 1945 agreement, so that, in effect, the district thereafter should suffer no loss on account of unused Hoover Dam energy.

(6) *Operations.*—Parker Dam power has proved an important source of energy for the central Arizona area, as well as Imperial Irrigation District, California. Provision is made in the Hoover Dam agency contract (appendix 902) and the energy contract with the Metropolitan Water District (appendix 905) for the integration of the various Government-owned power plants on the Colorado River, including Hoover and Parker Dams, and the utilization of the

district's transmission line between Hoover Dam and Parker Dam, in part.

7. *Parker transmission system.*—Whereas the bulk of Hoover power is at present transmitted to the western areas of southern California, most of the power from Parker and Davis power plants is being utilized in the States of Arizona and Nevada. From Parker power plant 161,000-volt transmission circuits serve the Central Arizona Light & Power Co. and the Salt River Valley Water Users Association in the Phoenix area, with a 115,000-volt extension from Phoenix to Tucson. Another line of similar voltage extends to Gila and Yuma for customers in that vicinity and thence into the Imperial Irrigation District of Southern California. In addition to these 161,000-volt circuits, a short 230,000-volt line connects the Parker plant with the Metropolitan Water District's system at Gene substation and a 69,000-volt line carries Parker power to the Bagdad Copper Co. in Arizona.

C. Colorado River Aqueduct

(1) *Historical background.*—The Colorado River aqueduct is one of the major water projects of the lower Colorado River Basin, dependent on Lake Mead for storage and Hoover Dam for power for pumping. It was constructed from 1933 to 1940 and has been operated since 1941 by the Metropolitan Water District of Southern California. This is an overlapping district composed of 16 member cities and water districts, organized in 1927, distributing wholesale municipal water supplies to 27 incorporated cities and their suburbs in Los Angeles, Orange, and San Diego Counties of southern California. The district has a present population of 3,500,000, grown from 2,350,000 since 1940 and from less than 150,000 in 1900. The project was financed by general obligation bonds which were held temporarily during the depression years by the Federal RFC, but were long ago resold to the investing public at a considerable profit to the United States.

(2) *Government contracts.*—As outlined in chapters VI and X, on April 24, 1930, the Metropolitan Water District of Southern California entered into a contract with the United States (appendix 1007) for the storage and delivery of 1,050,000 acre-feet annually and, on April 26, 1930, entered into a contract with the United States (tabulated in appendix 602; printed in full as appendix 3 to the first edition) for Hoover Dam power to pump water into and in its aqueduct. The water contract was amended on September 28, 1931 (appendix 1008), and the power contract on May 29, 1941 (appendix 905). The district's cooperative contract with the United States for the construction of Parker Dam, February 10, 1933 (appendix 1201), has been referred to, *supra*.

(3) *Federal rights-of-way.*—The district, before deciding on the Parker route, investigated several alternative routes for its aqueduct. The route having been determined, Federal legislation was sought and obtained in the act of June 18, 1932,⁵ granting a base fee to the public lands involved.

(4) *Construction of main aqueduct.*—Downstream 150 miles from Hoover Dam at the intake pumping plant, the aqueduct diverts from the right bank of the Colorado River, there widened into Lake Havasu by Parker Dam 2 miles further south. Four other successive pumping plants lift the water a total of 1,617 feet to a maximum elevation of 1,807 feet at Shaver Summit, near Desert Center. The main aqueduct terminates at Lake Mathews (107,000 acre-feet present capacity), 242 miles from the Colorado River. It includes 92 miles of 16-foot diameter tunnels, 64 miles of open canal, 83 miles of grade conduit and pressure pipes (inverted siphons), 1.2 miles of pump delivery line (steel), and 4 small regulating reservoirs and sumps. Beyond Lake Mathews, 16 miles of additional tunnel and large pressure pipes up to 12 feet 8 inches in diameter diverge to reach the various member cities, with a total present system length, including branch aqueduct lines, of 500 miles.

The main aqueduct is constructed to full capacity to carry the district's contractual water right of 1,212,000 acre-feet annually, or an average of 1,675 second feet, except for the postponed second barrel of several long inverted siphons. The pumping plants include at present but three of the ultimate nine pumps of 200 second feet rated unit capacity, with new units to be added gradually as required. The aqueduct was constructed for 10 percent less than its original estimated cost and bond issue of \$220,000,000. Extensions and betterments to date have increased this original cost to a present total of \$205,000,000.⁶

(5) *San Diego aqueduct.*—On February 15, 1933, the City of San Diego executed a Hoover Dam water-storage contract (appendix 1009). Prior to that time the formation of a county-wide water district had been under preparation and, on February 9, 1933, in transmitting the above contract to the City of San Diego, Secretary Wilbur took note of those proposals, pointing out that the contract submitted—

protects the outlying towns of San Diego County by providing for allocation between them and the City as the City and County may agree, or as the State may allocate. If they later choose to form a metropolitan water district, that district may either contract with the City, or enter into a new contract with the United States in substitution for the City, upon the State's recommendation.

⁵ Act of June 18, 1932 (40 Stat. 324, ch. 270).

⁶ For a review of this project, see History and First Annual Report, The Metropolitan Water District of Southern California (1939).

On October 2, 1934, the city of San Diego contracted with the United States for 155 second feet of capacity in the All-American Canal (appendix 1111).

On June 9, 1944, the San Diego County Water Authority, comprising San Diego and four other cities, three irrigation districts, and one public utility district, was organized under the County Water Authority Act,⁷ for the primary purpose of importing Colorado River water into San Diego County.

However, because of the critical situation in San Diego's water supply during the war, President Roosevelt, on October 3, 1944, appointed an interdepartmental committee to recommend methods for constructing and financing the needed facilities for increasing the water supply. This committee reported to the President on October 21, 1944, recommending the immediate construction at Federal expense of an aqueduct connecting with the Colorado River aqueduct of the Metropolitan Water District near San Jacinto, and extending therefrom to the San Vicente Reservoir of the San Diego city water system.⁸

By Executive Order dated November 29, 1944, the United States Bureau of Reclamation was directed to prepare plans and specifications for such an aqueduct. An agreement was entered into between the Navy Department and the City of San Diego, October 17, 1945 (appendix 1010), supplemented September 23, 1946 (appendix 1011), and October 29, 1946 (appendix 1013), under which the Navy agreed to build the structure, on plans and specifications prepared by the Reclamation Bureau, and the city agreed to repay \$15,000,000 of its cost in annual installments. Actual construction began on November 15, 1945, and the aqueduct was completed to a capacity of 75 feet per second on November 26, 1947.⁹ This capacity will deliver approximately one-half of the 112,000 acre-feet of water covered by San Diego's basic contract of February 15, 1933 (appendix 1009).

On January 27, 1947, the Comptroller General rendered an opinion¹⁰ questioning the authority of the Navy to enter into the agreement with the city. The difficulty was solved by the act of April 15, 1948 (appendix 1208), which ratified the agreement.

D. Alamo Dam

The Flood Control Act of 1944¹¹ authorized construction by the War Department of a flood-control dam on the Bill Williams River,

⁷ California Statutes, 1943, ch. 545, p. 2090.

⁸ First Annual Report of the San Diego County Water Authority (1946), p. 32.

⁹ Press release, U. S. Department of the Interior, December 9, 1947.

¹⁰ See review of this controversy in H. Rept. No. 1548 (80th Cong., 2d sess.), report of House Committee on Public Works on S. 1306 (80th Cong.).

¹¹ 58 Stat. 887, sec. 10.

which empties into Parker Dam Reservoir (Lake Havasu). The dam, as planned, will be located about 5 miles above the mouth of the Bill Williams River, or slightly above the margin of Lake Havasu, and will be 271 feet high and 545 feet long. It will create a reservoir with an area of about 13,000 acres.¹²

E. Headgate Rock Dam (Appendix 1202)

Headgate Rock Dam on the Colorado River serves the Colorado River Indian Reservation, which was established by an act of Congress approved March 4, 1865.¹³ The boundaries of the reservation were changed from time to time after its original establishment, by Executive orders. The irrigable area within the reservation is currently estimated at about 100,000 acres.

Headgate Rock Dam was authorized by the Rivers and Harbors Act of 1935 (appendix 1202). Construction was initiated by contract entered into June 15, 1938, and was completed in August 1941, at a total cost of \$4,867,521. Construction of main canals is under way.

The dam is essentially a diversion dam, described as—

a nonoverflowing, impervious core type, earth-fill, rip-rap faced, dam with an overflow type spillway having a hollow ogee weir ending in a circular bucket section as an energy dissipator for river flow.¹⁴

F. Colorado River Front Work

The construction of Laguna Dam for the Yuma project, and subsequently of other dams on the river, effected changes in the deposition of silt, and extensive levee and dredging operations have been required.

By the act of March 3, 1925,¹⁵ an appropriation of not to exceed \$35,000 annually was authorized—

as the share of the Government of the United States of the cost of operating and maintaining said Colorado River front work and levee system—

and \$650,000 was authorized to be appropriated to the reclamation fund for the benefit of the Yuma project for previous cost of operation and maintenance of the front work and levee system.

¹² For references to floods and silt originating in the Bill Williams River, see Sykes, "The Colorado Delta" (1937), p. 97 et seq.

¹³ Act of March 4, 1865 (13 Stat. 559). Among other statutes relating to the Colorado River Indian Reservation are the act of April 21, 1904 (33 Stat. 189), authorizing diversion of water from the Colorado River; act of May 25, 1918 (40 Stat. 568), appropriating funds for "continuing the purpose of securing an appropriation of water"; and various appropriation acts for Headgate Rock Dam.

¹⁴ Communication from Office of Indian Affairs, February 12, 1948.

¹⁵ 43 Stat. 1198.

The act of July 1, 1940,¹⁶ increased this authorization to \$100,000 annually and enlarged the authorization to include—

the cost of other necessary protective works and systems along the Colorado River between said Yuma project and Boulder Dam.

The act of June 28, 1946¹⁷ (appendix 1209), substantially enlarged this authorization to include (a) operation and maintenance of the front work and levee system in Arizona, Nevada, and California; (b) construction of protection and drainage works along the river; (c) controlling the river, and modifying, straightening, and rectifying its channel; (d) conducting investigations. A series of provisos stipulated that the expenditure of money for these purposes should not be deemed a recognition of any obligation or liability on the part of the United States; local communities might be required to furnish rights-of-way; etc. The Secretary was granted the same authority with respect to acquisition and disposition of land, utilization thereof, construction-supply contracts, performance of necessary acts, and the making of regulations, etc., which he has under the reclamation laws.

Work has been undertaken under this authorization in the Needles area, where the river bed aggraded about 11 feet between 1902 and 1935, and an additional 6 feet from 1935 to 1940, causing serious flood danger to the city of Needles, Calif.

Some rectification has been undertaken in the Palo Verde area, and repairs on Laguna Dam and levees have been made. A dredging program is currently under way, by force account.¹⁸

G. Palo Verde Diversion Works

The intake to the Palo Verde irrigation canal, about 43 miles below Headgate Rock Dam, which had been constructed at the expense of the Palo Verde Irrigation District, gradually became inoperative as a result of the degrading of the river after the completion of Parker Dam.

In the First Deficiency Appropriation Act of 1944¹⁹ funds were appropriated for the Colorado River front work and levee system, to be available—

for the construction, operation, and maintenance of a temporary weir in the Colorado River below the heading of the diversion canal for the Palo Verde Irrigation District—

with a proviso that construction, operation, and maintenance thereof should not be deemed a recognition of any obligation or liability on the part of the United States, and providing that no part of the amount

¹⁶ 54 Stat. 708.

¹⁷ 60 Stat. 338.

¹⁸ Hearings, House Committee on Appropriations, Interior Department appropriation bill for the fiscal year 1949, p. 1617 et seq.

¹⁹ Act of April 1, 1944 (58 Stat. 157).

appropriated should be expended for construction, operation, and maintenance of the weir after 6 months from the date of the termination of the war, as determined by proclamation of the President.

A temporary rock weir was constructed in 1944, restoring gravity diversion in 1945, and maintenance has been required since that time.²⁰

The act of June 28, 1946²¹ (appendix 1209), authorizing annual appropriations for Colorado River front work and levee systems, repeated this disclaimer of liability and provided that the act should not affect the provisions of the Deficiency Act of 1944, referred to above.

Some 40 miles downstream, aggradation of the river bed resulted in the virtual plugging of the Palo Verde Irrigation District's outlet drain. A Federal dredging program now under way contemplates the ultimate excavation of a new channel for the river about 12 miles in length, through the Cibola Valley in Arizona, which will reduce the length of the waterway and deposit the suspended silt farther downstream, in the lake formed by Imperial Dam.²²

The Interior Department Appropriation Act for the fiscal year 1949²³ included funds in the Colorado River front work and levee system item for maintenance work on the temporary weir.

H. Gila Project

The Gila project, now under construction, adjoining portions of the Yuma project, will divert water on the Arizona side of Imperial Dam. (22 miles above the upper Mexican boundary), to irrigate 25,000 acres on the Yuma Mesa, 15,000 acres on the north and south Gila Valleys, and 75,000 acres in the Wellton-Mohawk division.²⁴

(1) *Finding of feasibility, 1937*.—The project, with different boundaries, was originally authorized by the President June 21, 1937 (appendix 1211), pursuant to findings made under section 4 of the act of June 25, 1910,²⁵ and subsection 4 (b) of the act of December 5, 1924.²⁶ The statute last cited required findings by the Secretary of the Interior, including one "concerning the water supply." On that subject, the Secretary's finding was:

While an agreement has not been concluded by the States, there is no doubt that such an agreement when reached will insure a full water supply for at least

²⁰ Hearings, House Committee on Appropriations, Interior Department appropriation bill for fiscal year 1949, p. 1618.

²¹ 60 Stat. 338.

²² Hearings, Interior Department appropriation bill, fiscal year 1949, *supra*, p. 1618.

²³ Public Law 841 (80th Cong., 2d sess.).

²⁴ Hearings of House Committee on Appropriations on Interior Department appropriation bill for fiscal year 1949, p. 1156, et seq.

²⁵ 36 Stat. 835.

²⁶ 43 Stat. 702.

the initial division of the project. In all sales of water rights it will be necessary to prescribe that the water supply of the project is subject to the Colorado River Compact, and to the Boulder Canyon Project Act and to the sales of water under the Compact and said Act and to the treaty which it is anticipated will be made with Mexico fixing that country's rights in the flow of the Colorado River.

The finding of feasibility was preceded by a report to the Secretary of the Interior, February 15, 1936, by the Committee on the Agricultural and Economic Feasibility of the Gila Valley Project, and by a report by Senior Engineer Porter J. Preston, September 10, 1934.

The area of the proposed project was approximately 150,000 acres, and the anticipated consumptive use was approximately 600,000 acre-feet.²⁷ The greatest part of the land would have been located on the Yuma Mesa.

(2) *Authorization: Act of July 30, 1947.*—Subsequent experience, however, demonstrated a duty of water in excess of 11 acre-feet per acre²⁸ and it was determined to relocate the boundaries to exclude a part of the Yuma Mesa area, and substitute 75,000 acres in the Wellton-Mohawk area.

Legislation to that end was introduced in the Seventy-ninth Congress²⁹ and extensive hearings were held.³⁰ The bill was not reported out.

By the act of July 30, 1947³¹ (appendix 1212), the project was reauthorized, with limitations reducing the area of the original Gila project to 40,000 acres (25,000 acres thereof on the Yuma Mesa and 15,000 acres within the north and south Gila Valleys)—

or such number of acres as can be adequately irrigated by the beneficial consumptive use of no more than 300,000 acre-feet of water per annum diverted from the Colorado River, and as thus reduced is hereby reauthorized and redesignated the Yuma Mesa division, Gila project—

plus the Wellton-Mohawk division, comprising approximately 75,000 irrigable acres—

or such number of acres as can be adequately irrigated by the beneficial consumptive use of no more than 300,000 acre-feet of water per annum diverted from the Colorado River—

²⁷ The Interior Department Appropriation Act for the fiscal year 1938 (50 Stat. 564, 592), contained the following:

GILA PROJECT, Arizona, \$700,000.00; said Gila Project, including the waters to be diverted and used thereby and the lands and structures for diversion and storage thereof, to be subject to the provisions of the Boulder Canyon Project Act of December 21, 1928, and subject to and controlled by the provisions of the Colorado River Compact signed at Santa Fe, New Mexico, November 24, 1922.

²⁸ Hearings, House Committee on Irrigation and Reclamation, H. R. 5434 (79th Cong., 2d sess.), p. 68, et seq.

²⁹ H. R. 5434 (79th Cong.).

³⁰ Hearings, House Committee on Irrigation and Reclamation, on H. R. 5434 (79th Cong., 2d sess.).

³¹ Public Law 272 (80th Cong.).

the Wellton-Mohawk unit being substituted for the land eliminated from the Yuma Mesa division. Other provisions of the act subjected the lands and structures for the diversion, transportation, delivery, and storage of water to the provisions of the Project Act and the Colorado River compact and stipulated that the acreage limitations—
are for the sole purpose of fixing the maximum acreage of the project and shall not be construed as interpreting, affecting, or modifying any interstate compact or contract with the United States for the use of Colorado River water or any Federal or State statute limiting or defining the right to use Colorado River water of or in any State.³³

The Gila project shares in the cost of Imperial Dam and appurtenant works. As yet no allocation of costs of those works has been announced by the Bureau of Reclamation.

I. Yuma Project

The Yuma project comprises 69,000 irrigable acres located in southwestern Arizona and southeastern California. It was initially authorized by the Secretary of the Interior.³³ By the act of April 21, 1904,³⁴ a diversion was authorized for the irrigation of Indian and other lands, and under this authorization Laguna Dam was constructed in 1909.³⁵ The project area at present is distributed: Reservation division, California, 14,625 acres; valley division, Arizona, 50,390 acres; Yuma auxiliary or mesa division, Arizona, 4,025 acres. By contract of October 23, 1918 (appendix 1103), Imperial Irrigation District assumed the obligation to pay \$1,600,000 of the cost of Laguna dam.

Water was originally diverted at Laguna Dam and transported on the California side to Syphon Drop, where it was carried under the

³³ The report of the House Committee on Public Lands on this legislation (H. Rept. 910, July 14, 1947, on H. R. 1597, 80th Cong.) stated:

It is the intent of the committee that nothing in this bill is to be construed as affecting the rights of the States of Arizona or California as to the use of the amount of water in the lower Colorado River Basin, that each State is entitled to under the existing compact, contracts, or law. The committee feels the dispute between these two States on the lower Colorado River Basin should be determined and settled by agreement between the two States or by court decision because the dispute between these two States jeopardizes and will delay the possibility of prompt development of any further projects for the diversion of water from the main stream of the Colorado River in the lower Colorado River Basin.

Therefore the committee recommends that immediate settlement of this dispute by compact or arbitration be made, or that the Attorney General of the United States promptly institute an action in the United States Supreme Court against the States of the lower basin, and other necessary parties, requiring them to assert and have determined their claims and rights to the use of the waters of the Colorado River system available for use in the lower Colorado River Basin.

³⁴ For a summary of Yuma project, see hearings of House Committee on Appropriations, Interior Department appropriation bill for fiscal year 1949, p. 1033 et seq.

³⁵ 33 Stat. 189.

³⁶ See Report of the All-American Canal Board (1920), p. 21.

river to Arizona. The United States installed a power plant at Syphon Drop in 1926. By the terms of the All-American Canal contract (appendix 1106), Imperial Irrigation District agreed (art. 15) to provide and pay for an additional 2,000 second-feet of capacity in the All-American Canal from Imperial Dam to Syphon Drop, free of cost to the Yuma project, on the assumption that the construction of Imperial Dam would prevent further diversions at Laguna for the Yuma project. The power head of the Syphon Drop power plant was thereby increased over 30 feet, without charge to Yuma project.

The United States has entered into a repayment contract with the Yuma County Water Users' Association³⁶ and individual water-right applicants on the Reservation and Mesa divisions are responsible for certain additional sums.

The Yuma project is operated by the Bureau of Reclamation with funds advanced annually by the water users, and power revenues.

No Hoover Dam water storage or delivery contract has been entered into with respect to this specific project.

J. Rockwood Gate and Hanlon Heading

These two structures presently control the diversions into the Alamo Canal, which originally served the Imperial Valley by a gravity route through Mexico, but which, since the construction of the All-American Canal, serves only Mexican lands. Both structures were built by Imperial Irrigation District, and title and control will pass to the International Boundary and Water Commission pursuant to the terms of the Mexican water treaty. (See appendixes 1405, 1410, 1411, 1412.)

Rockwood Gate, as described in Senate Document 142 (67th Cong., 2d sess. (1922), p. 75), located about a mile and a half above the upper Mexican boundary, is a concrete structure on the California side of the river, with its face parallel to the river bank, comprising 75 gates. It was built in 1917.

Rockwood Gate controls gravity diversions into the Alamo Canal headworks pool. Hanlon Heading, a gate structure in the Alamo Canal just above the boundary, controls the water passing therefrom into Mexico. This physical situation is described in chapter XI (G). After the construction of the Morelos Dam (*infra*), affording a new diversion into the Alamo Canal on Mexican soil, Rockwood Gate and Hanlon Heading will be used by the International Boundary and Water Commission to control and direct the outflow from Pilot Knob wasteway and Pilot Knob power plant on the All-American Canal. By closing Hanlon Heading and opening Rockwood Gate, the Com-

³⁶ House hearings on Interior Department appropriation bill for fiscal year 1949, *supra*, p. 1033.

mission may discharge into the river all of the water released from the All-American Canal at Pilot Knob, and keep all of it out of the Alamo Canal. By opening Hanlon Heading, the Commission may admit into the Alamo Canal water taken directly from the river through Rockwood Gate, or water released from the All-American Canal into the pool between Rockwood and Hanlon, as the Commission's discretion or as the treaty provisions may require, all of these operations being effected on American soil.

K. Mexican (Morelos) Diversion Dam (Appendixes 1408, 1409)

Article 12 (a) of the Mexican water treaty (appendix 1405) provides:

(a) Mexico shall construct at its expense, within a period of five years from the date of the entry into force of this Treaty, a main diversion structure below the point where the northernmost part of the international land boundary line intersects the Colorado River. If such diversion structure is located in the limitrophe section of the river, its location, design, and construction shall be subject to the approval of the Commission. The Commission shall thereafter maintain and operate the structure at the expense of Mexico. Regardless of where such diversion structure is located there shall simultaneously be constructed such levees, interior drainage facilities, and other works, or improvements to existing works, as in the opinion of the Commission shall be necessary to protect lands within the United States against damage from such floods and seepage as might result from the construction, operation, and maintenance of this diversion structure. These protective works shall be constructed, operated, and maintained at the expense of Mexico by the respective Sections of the Commission, or under their supervision, each within the territory of its own country.

As the treaty went into force November 8, 1945 (appendix 1406), the time prescribed for construction expires November 8, 1950.

On May 10, 1948, a joint report and recommendation to the International Boundary and Water Commission was submitted by the principal engineers of the two commissions (annex to appendix 1411). This report recommended the Algodones site about 1 mile downstream from the upper international boundary line, in the limitrophe section of the river. The proposed structure, to be built and operated by the Commission, was described as about 1,400 feet long, from levee to levee, with a gated section 702 feet and an overflow section 602 feet long, the dam to be of the floating type, built of concrete and steel, protected by concrete aprons, steel-sheet piling and rock riprap upstream and down, and with 20 radial gates so designed that they can be raised to safely pass a flood of 350,000 second-feet. The sill of the gates is to be at elevation 96.55 feet and the floor of the superstructure at elevation 138.12 feet. The design capacity for the canal heading is 8,000 cubic feet per second. The report outlined the character of

the river-protection work contemplated above the dam. It was estimated that the dam would cause a rise in the water surface upstream from the structure of 3.8 feet with a 350,000 second-foot flood, the rise extending along the Colorado as far as the mouth of the Gila, with backwater effects on up to Laguna Dam and up the Gila for some distance. The protective works required below the dam were left to further study.

On May 12, 1948, the Commission, in minute No. 189 (appendix 1408), by resolution, approved the recommendations of the principal engineers.

On June 10, 1948, the State Department (appendix 1409) approved minute No. 189, with three "understandings," to the effect (1) that waters arriving in the limitrophe section downstream from the dam should be included in the quantity of 1,500,000 acre-feet guaranteed to Mexico under article 10 of the treaty; (2) that the rules to be adopted by the Commission would have as an objective that no rise in the river water surface of ordinary flow should result from the operation of the structure, and that the amounts of water entering the United States from the Mexican canal system be held at a minimum; and (3) that the two Governments should instruct their Commissioners to expedite the plans and report on the protection works provided for in article 13 of the treaty.

L. Comprehensive Plan of Development

Section 15 of the Boulder Canyon Project Act ³⁷ (appendix 401 herein) authorized and directed the Secretary of the Interior to make investigations and publish reports of the feasibility of projects in the seven basin States—

for the purpose of making such information available to said States and to the Congress, and of formulating a comprehensive scheme of control and the improvement and utilization of the water of the Colorado River and its tributaries—

and authorized appropriations for that purpose.

Section 2 (d) of the Boulder Canyon Project Adjustment Act ³⁸ (appendix 801), authorized transfer from the Colorado River dam fund, out of power revenues, of \$500,000 annually to the Colorado River development fund, directing that the first \$1,500,000 of its transfers—

are authorized to be appropriated only for the continuation and extension, under the direction of the Secretary, of studies and investigations by the Bureau of Reclamation for the formulation of a comprehensive plan for the utilization of waters of the Colorado River system for irrigation, electrical power, and other purposes, in the States of the upper division and the States of the lower division, including studies of quantity and quality of water and all other relevant factors.

³⁷ Act of December 21, 1928 (45 Stat. 1057).

³⁸ Act of July 19, 1940 (54 Stat. 774).

Pursuant to that authorization, the Secretary of the Interior submitted a proposed report to the seven basin States in 1947, under the provisions of section 1 of the Flood Control Act of 1944³⁹ (appendix 1217). The comments of the States, together with the proposed plan, redrafted and renamed "The Colorado River: Interim Report of the Secretary of the Interior," were transmitted to Congress by the Bureau of the Budget July 24, 1947, and printed.⁴⁰

The status of this report is indicated by Secretary J. A. Krug's letter to the President July 19, 1947, which says in part: ⁴¹

As stated in the accompanying letter from the Commissioner of Reclamation to me dated July 17, 1947, which I have approved and adopted, due to existing circumstances a comprehensive plan of development of the water resources of the Colorado River Basin cannot be formulated at this time. Accordingly, although I cannot recommend authorization of any projects at this time, I am sending the accompanying inventory report forward in order that you and the Congress may be apprized of this comprehensive inventory of potential water resource developments in the Colorado River Basin, and of the present situation regarding water rights in the Colorado River Basin.

The accompanying letter of James E. Webb, Director of the Bureau of the Budget, July 23, 1947, states in part: ⁴²

* * * Acting under authority of the President's directive of July 2, 1946, I am able to advise you that there would be no objection to submission of the proposed interim report to the Congress, but that the authorization of any of the projects inventoried in your report should not be considered to be in accord with the program of the President until a determination is made of the rights of the individual States to utilize the waters of the Colorado River system.

³⁹ Act of December 22, 1944 (58 Stat. 887).

⁴⁰ "The Colorado River," H. Doc. 419 (80th Cong., 1st sess.).

⁴¹ Id., p. 2.

⁴² Id., p. 1.