PART I

THE PROJECT AND THE DEPARTMENT

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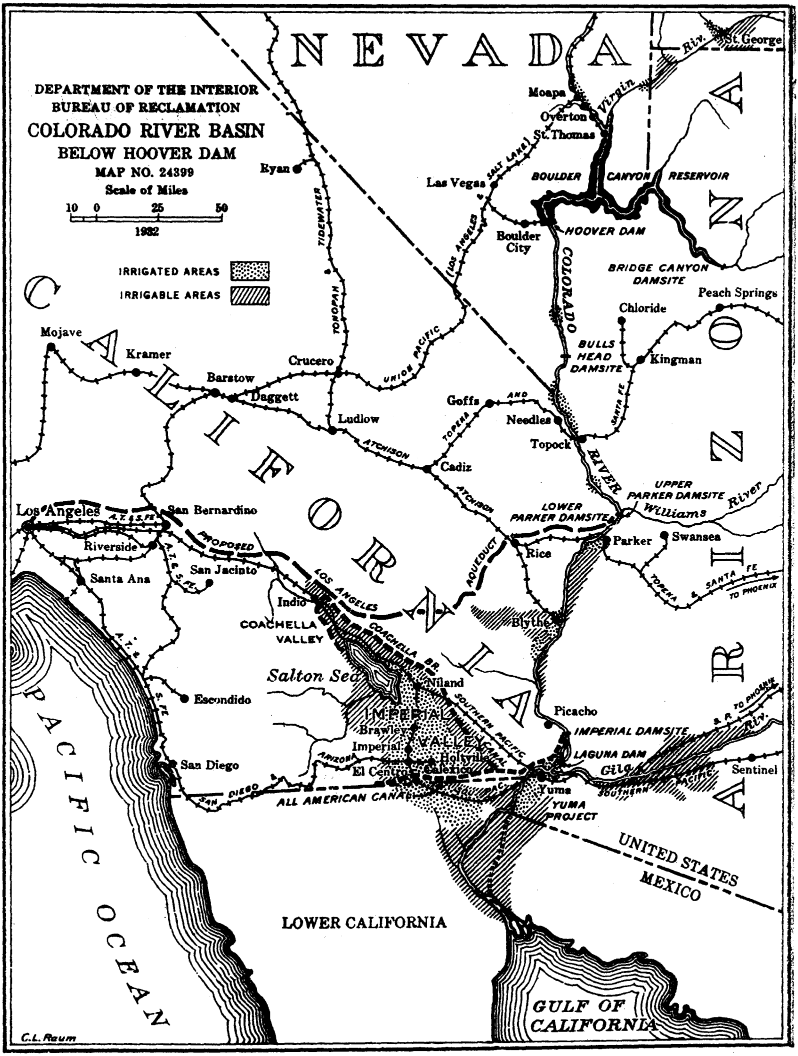

The Boulder Canyon Project and Adjacent Territory

THE PROJECT AND THE DEPARTMENT

1. THE COLORADO RIVER SYSTEM

The Colorado River system is roughly comparable to an hourglass. The main stream is 1,293 miles long. Shortly below Lee Ferry, which is about 725 miles above the river's mouth, the stream enters a bottleneck. For nearly 400 miles further it flows through a precipitous canyon country, then leaves it to enter the agricultural areas of the lower basin. Before it emerges it passes through the walls of Black Canyon, some 355 miles below Lee Ferry.

Lee Ferry constitutes the division point between the "upper basin" and the "lower basin." These two basins are separated physically and climatically. The entire river system comprises about 240,000 square miles. This area is about equally divided between the upper division, Colorado, New Mexico, Utah, and Wyoming, and the lower division, Arizona, California, and Nevada.

In litigation it has been assumed that the river and its tributaries carry annually an average of about 18,000,000 acre-feet of water, that about half of this has been put to beneficial consumptive use, and that the balance is flood water for the use of which storage facilities are necessary.

It was probably inevitable that on a river system of this size, flowing through the arid West, the seven States should fall into disagreement over their respective water rights. In 1922, when they undertook to settle these problems, it was estimated that about 2,127,000 acres of irrigable land lay in the lower basin and about 4,000,000 in the upper basin, and that of these areas, the lower basin contained about 1,165,000 acres awaiting development and the upper basin about 2,500,000.

For a number of years prior to 1922 the lower basin, growing more rapidly in population than the upper area, had pressed for development of the lower Colorado River, and the upper area had objected. Two lower-basin projects particularly were urged for action. One was the Imperial Valley, lying below the level of the river, which sought relief from floods through the erection of a flood-control dam, and sought an all-American water supply in lieu of its present canal. This passes through and is largely controlled by Mexico. The second project, presented by interests of the California Coastal Plain, called for the erection of a power dam at Black Canyon or Boulder Canyon. In 1919 a bill had been introduced in Congress for Federal assistance in building the All-American Canal [1] and a similar bill had been introduced in 1920.[2] In April, 1922, a third bill had proposed not only the building of the All-American Canal, but the building of a storage dam upon the main trunk of the river below the mouth of Green River.[2a]

Arizona was formulating projects of her own, particularly those calling for the irrigation of a large area on the Gila River and some territory in the vicinity of Parker.

It was rapidly becoming apparent that the normal flow of the river would not be adequate to supply all the uses demanded by the upper and lower basins; but the proposals for storage in the lower basin, without guaranties to the upper States, were regarded by the latter as holding the threat of establishing priorities which would preclude later use of the water in the upper division.

The crystallization of issues was a slow process. The various States approached the problem individually, and the conception of a division of water as between the two basins, instead of an apportionment among the individual States, was not an immediate development. Within each of the States there were, of course, conflicting claims by various projects. But the common desire for a solution gained headway. In 1920, at a meeting of representatives of governors of western States, Mr. Delph E. Carpenter's novel proposal for use of the treaty-making powers of the States was endorsed.[2b] As a result of the approval by the governors of the Carpenter interstate compact proposal, the legislatures of each of the seven States authorized appointment of commissioners, and the governors designated Governor Thomas E. Campbell, of Arizona, to bring their request for Federal participation to the attention of Congress.[2c] It was followed by authorization of an agreement by

[1] H. R. 4044, 66th Cong., 1st sess.

[2] H. R. 11553, 66th Cong., 2d sess.

[2a] H. R. 11449, 67th Cong., 2d sess.

[2b] Mr. Carpenter's plan was the recommendation of a subcommittee consisting of Mr. Carpenter, of Colorado, and Mr. Sims Ely, representing Gov. Thos. E. Campbell, of Arizona.

[2c] The Governors' proposal for a Federal authorizing act was drafted and presented to Congress by the same subcommittee.

the State legislatures and by Congress, and the appointment of commissioners.

The members of the original Colorado River Commission were—

Arizona: W. S. Norviel.
California: W. F. McClure.
Colorado: Delph E. Carpenter.
Nevada: J. G. Scrugham.
New Mexico: Stephen B. Davis, jr.
Utah: R. E. Caldwell.
Wyoming: Frank C. Emerson.

The commission was presided over, on behalf of the United States, by Herbert Hoover, appointed by the President.

This Colorado River commission held a series of seven executive meetings in Washington between January 26 and 30, 1922; adjourned to Phoenix, Ariz., for its eighth session on March 15; to Denver, Colo., for its ninth session on April 1, and from November 9 to 24 held its final and successful 18 executive sessions at Santa Fe, N. Mex. It had meanwhile held a series of public hearings at Phoenix, Los Angeles, Salt Lake City, Grand Junction, Denver, Cheyenne, and Santa Fe.

2. THE COLORADO RIVER COMPACT

The developments sketched in the preceding pages led to the signing, on November 24, 1922, of the Colorado River compact among the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

The compact itself is an instrument of only 8 printed pages, comprising 11 articles.

It defines the Colorado River system to include the Colorado River and all of its tributaries within the United States. It defines the Colorado River basin to include the drainage area of the system and all other territory to which its waters might be beneficially applied, thereby including the Imperial Valley, which lies below sea level.

Adopting Lee Ferry as a point of division, it divides the Colorado River system into an upper basin, comprising the drainage area above Lee Ferry, and a lower basin, comprising the drainage area below that point. Colorado, New Mexico, Utah, and Wyoming thus constituted the "upper division" and California, Arizona, and

Nevada the "lower division," although in fact the two "basins," as distinguished from "divisions," each include small areas of States assigned to the opposite division.

Abandoning the plan of dividing the water among the seven States individually, the compact in Article III (*a*) effected an allocation as between the two basins, leaving to future adjustment the division of water within each basin.

It apportioned 7,500,000 acre-feet to each basin in Article III (*a*); and in Article III (*b*), the lower basin was given the right to increase its beneficial consumptive use by 1,000,000 acre-feet per annum.

Article III (*c*) provided against the contingency of a treaty between the United States and Mexico. This paragraph states that in the event the United States shall recognize in Mexico any right to the use of Colorado River water, this water will be supplied first from surplus over and above the aggregate specified in paragraphs (*a*) and (*b*) (that is, 16,000,000 acre-feet), and that if this is not sufficient, the burden shall be borne equally by the upper basin and the lower basin. The States of the upper division covenanted to deliver at Lee Ferry water to supply one-half of that deficiency.

Article III (*d*) binds the States of the upper division to release during each 10-year period an aggregate of 75,000,000 acre-feet.

Article III (*e*) provides that the States of the upper division will not withhold water and the States of the lower division will not require the delivery of water which can not reasonably be applied to domestic and agricultural use.

Article III (*f*) provides for a further apportionment from time to time after October 1, 1963, of any water unapportioned by paragraphs (*a*), (*b*), and (*c*).

Article IV provides that the use of the river for purpose of navigation shall be subservient to uses for domestic, agricultural, and power purposes.

Article IV (*b*) provides that, subject to the compact, water of the system may be impounded and used for generation of electric power, but that such use shall be subservient to the use of water for domestic and agricultural purposes, calling these "dominant purposes."

Article IV (*c*) provides that the provisions of that article shall not interfere with the regulation by any State within its boundaries of the use of appropriation and distribution of water.

Article V constitutes the Director of the Reclamation Service, the Director of the Geological Survey, and the chief water official of each State as a commission to promote systematic determination of facts as to flow, appropriation, consumption, and use of water; to publish data on annual flow, and to perform other duties assigned by the compacting States from time to time.

Article VI provides for settlement of disputes by the appointment of commissioners as an optional alternative to litigation.

Article VII provides that the compact shall not affect the obligations of the United States to Indian tribes.

Article VIII provides that present perfected rights shall be unimpaired by the compact. It adds that when storage capacity of 5,000,000 acre-feet shall be provided in the lower basin, claims of such rights shall attach to such stored water, and that all other rights to beneficial uses shall be effected solely from water apportioned to the particular basin. The meaning of this article has been the subject of some controversy.

Article IX preserves to each State its right to maintain legal or equitable proceedings necessary to protect its rights under the compact.

Article X provides that the compact may be terminated by unanimous consent, but in that event all rights claimed under it shall continue unimpaired.

Article XI provides that the compact shall become effective upon ratification by the States and by Congress, and provides for exchange of confirmation to that effect.

The compact was in fact ratified by each of the compacting States except Arizona. Controversy between Arizona and the other States gradually crystallized upon issues turning upon the relationship of the Gila River to the apportionment affected by the compact.

Article II (*a*) of the Colorado River Compact defines the Colorado River system so as to include all of its tributaries within the United States, i. e., the Gila River, among others. Arizona objected to the inclusion of the Gila because its waters were already largely appropriated in Arizona and the result of including that river in the allocation reduced the quantity of water available from the main stream for apportionment to the lower basin. Arizona further objected on the ground that whereas the compact eliminated the prior-appropriation doctrine as between the two basins, it left it in force as between California and Arizona, leaving Arizona subject to the danger which the upper basin had escaped by the compact, i. e., the establishment of priorities on behalf of California by diversions through the proposed All-American Canal.

The compact, having been ratified by six of the seven States, was finally submitted to Congress for approval some five years after its execution, without awaiting Arizona's further action. Bills for this purpose had been introduced in 1925, but had not been pressed. This brings us to consideration of the Boulder Canyon project act.

3. THE BOULDER CANYON PROJECT ACT

Objectives.

The Swing-Johnson bill was approved December 21, 1928. It was the sixth of a series of bills. The first and second [3] had provided only for the construction of a canal connecting the Imperial Valley with the Colorado River. The next four, including the successful bill, were proposals introduced by Senator Hiram Johnson and Representative Phil D. Swing. All of these provided for the construction of a dam at Black Canyon or Boulder Canyon, as well as the building of the All-American Canal.

As finally enacted, the Boulder Canyon project act [4] accomplished three major objectives.

(1) The Colorado River compact was ratified, and provision made that in the event only six States should ratify it, the compact should become effective as a six-State compact, provided California was one of the adhering parties and provided further that California should agree to limit her use of water for the benefit of the other six States.

(2) The construction of a dam at Black Canyon or Boulder Canyon was authorized.

(3) The construction of an All-American Canal connecting the Imperial and Coachella Valleys with the Colorado River was authorized. These works would be about 270 miles below Black Canyon. For the construction of these two works expenditure of a total of $165,000,000 was authorized.

In addition, the act authorized a subordinate compact between Arizona, California, and Nevada for the division of the water appor-

[3] H. R. 6044, 66th Cong., 1st sess.; H. R. 11553, 66th Cong., 2d sess.

[4] H. R. 5773, 70th Cong., 2d sess.; Public No. 642, 70th Cong.; 45 Stat. 1057.

tioned to the lower basin by the Colorado River Compact. This three-State agreement has not been consummated.[5]

The act also authorized the investigation of the proposed Parker-Gila project in Arizona.[6]

The act further authorized future agreements among the seven basin States for a comprehensive plan of development of the river, including the construction of dams, diversion works, power houses, and other structures, and the creation of interstate commissions and corporations and other instrumentalities for these purposes.[7]

The authorization for the dam (subsequently located at Black Canyon) required that the structure be used first, for river navigation and flood control; second, for irrigation and domestic purposes and satisfaction of present perfected rights in pursuance of article 8 of the Colorado River Compact; and third, for power.[8]

The act established a unique method of financing the construction of the dam. A special fund was established, designated as the Colorado River Dam fund.[9] This fund bears somewhat the relation to the Treasury of a subsidiary to a parent corporation. The act authorizes the transfer from the Treasury to this fund of $165,000,000, to be repaid with interest at 4 per cent.[9] Appropriations to this fund from the Federal Treasury for construction of the dam were authorized.[10] Earlier bills had provided for a bond issue; the bill finally enacted looks to current appropriations.

Conditions precedent.

Appropriations from the Treasury into the fund, and expenditures therefrom for construction, were made conditional upon three contingencies:

(1) Section 4–*a* required that no steps be taken toward construction until the seven States had ratified the Colorado River Compact and the President had so declared by public proclamation, or if seven States failed to ratify the contract within six months of the passage of the act, until six of the States, including California, should ratify the agreement.

(2) Section 4–*a* required that the State of California agree with the United States irrevocably and unconditionally, for the benefit of the other six States of the basin, that annual consumptive use of Colorado

[5] Sec. 4–*a*.
[6] Sec. 15.
[7] Sec. 19.
[8] Sec. 6.
[9] Sec. 2.
[10] Sec. 3.

River water in California should not exceed 4,400,000 acre-feet of water apportioned to the lower basin States by Article III(*a*) of the compact, plus one-half of any excess.

(3) The Secretary was required to make provision for revenues by contract adequate in his judgment to insure payment of all expenses of operation and maintenance and the repayment within 50 years of the date of completion of the works of all amounts advanced to the fund, with interest made reimbursable under the act.

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Construction of the All-American Canal was subjected to the same three conditions, except that section 4–*b* required that the Secretary make provision for revenue by contract or otherwise adequate to insure payment of expenses of construction, operation, and maintenance of the canal and appurtenant works "in the manner provided by the reclamation law." As the reclamation law does not require the repayment of interest, the two classes of expenditures from the fund are on separate bases as to interest, as well as the source of income. Revenues from operation of the dam are required to repay the cost of the dam, with interest, and contracts made as under the reclamation law (i. e., contracts with water users, districts, or associations) are required to repay the cost of the canal, without interest.

The act made a series of provisions governing the revenues for the two classes of structures.

Provisions governing Boulder Canyon revenue contracts.

Section 5 authorized the execution of two classes of contracts relating to the use of the Boulder Canyon Dam—contracts for electrical energy, and for the storage and delivery of water.

Among other provisions relating to these Boulder Canyon contracts appear the following:

(1) The contracts together must yield revenues which in addition to other revenues under the act (i. e., revenue from the All-American Canal) will in the Secretary's judgment cover all expenses of operation and maintenance and the repayments required by section 4–*b*.[11]

(2) Contracts for water, irrigation, and domestic uses must be for permanent service and conform to section 4–*a*. It is provided that no person shall have the use, for any purpose, of water stored by the dam except by contract made by the Secretary.[11]

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[11] Sec. 5.

(3) The Secretary is required to prescribe general and uniform regulations for the award of contracts for the sale and delivery of electrical energy.

(4) No contract for electrical energy may be for a longer period than 50 years from the date on which energy is ready for delivery.[12]

(5) Contracts for electrical energy are required to be made with a view to obtaining reasonable rates and are required to contain provisions whereby at the end of 15 years from the date of their execution and every 10 years thereafter, the contract price will be subject, on the demand of either party, to readjustment either upward or downward, as the Secretary may find to be justified by "competitive conditions at distributing points or competitive centers," and provision for arbitration or court proceedings is made.[12]

(6) The holder of a contract for electrical energy not in default is to be entitled to a renewal "under the then existing laws and regulations" unless his property should be purchased or acquired and the holder be compensated.[13]

(7) Contracts for electrical energy, or for the use of water for generation of electrical energy, are required to be made with responsible applicants who will pay the price fixed by the Secretary with a view to meeting revenue requirements of the act.[14]

(8) In case of conflicting applications, the conflicts are required to be resolved by the Secretary after hearing "with due regard to the public interest" and in conformity with the policy expressed in the Federal water power act as to conflicting applications; except that preference is to be granted first to a State, and that the States of Arizona, California, and Nevada shall be given equal opportunity to avail themselves of their preference within six months of notice by the Secretary. Earlier bills had unqualifiedly required the Secretary "to give preference to applications made by political subdivisions"[15] or had required "preference to applications made by political subdivisions, provided the plans are deemed by the Secretary * * * in the public interest."[16]

(9) The application of a State or political subdivision may not be denied on the ground that necessary bond issue has not been

[12] Sec. 5–a.
[13] Sec. 5–b.
[14] Sec. 5–c.
[15] H. R. 2903, 68th Cong., 1st sess.; H. R. 11499, 67th Cong., 2d sess.
[16] H. R. 6251, 59th Cong., 1st sess.

authorized or marketed, until the applicant has had an opportunity to do so.[17]

(10) Any agency receiving a contract for 100,000 firm horsepower or more may be required to carry 25,000 horsepower for any other contractor upon demand by the Secretary made within 60 days of execution of the principal contract, upon payment of a reasonable share of the cost of construction by the other agency.[18]

(11) The use of public lands for the construction, operation, and maintenance of transmission lines is authorized.[18]

(12) The Secretary is given the option of three methods of contracting for the disposition of power:

(*a*) The United States may build, control, manage, and operate the power plant;

(*b*) The Secretary may lease units of a Government power plant with the right to generate electric energy; or

(*c*) The Secretary may enter into leases for the use of water for the generation of energy, the contractor to provide the equipment.[19]

(13) The Secretary is authorized to prescribe and enforce regulations in accordance with those of the Federal Power Commission, relating to maintenance, control of rates and service in the absence of State regulation or interstate agreement, valuation, transfer of contracts, recapture, expropriation of excess profits, etc.[19]

(14) The United States, in constructing, managing, and operating the dam and other works is required to "observe and be subject to and controlled by" the Colorado River Compact, and is required to insert such provisions in all contracts.[20]

(15) The operation of the dam and other works to be constructed was also made subject to any compact that might be entered into by Arizona, California, and Nevada before January 1, 1929, or any compact among them approved by Congress after that date, provided that in the latter case the compact should be subject to all contracts made by the Secretary prior to the date of such approval.[21] No such compact has been entered into.

Disposition of Boulder Canyon revenues.

Certain provisions were made for disposition of revenues accruing to the Colorado River Dam fund from revenue contracts.

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[17] Sec. 5–*c*.
[18] Sec. 5–*d*.
[19] Sec. 6.
[20] Secs. 8–*a*, 13–*b*, 13–*c*.
[21] Sec. 8–*b*.

The act contemplated two classes of revenues—those required to amortize advances by the Treasury, and surplus revenues.

Sections 2 and 4–*b*, read together, apparently require revenues adequate to meet periodical payments to the Treasury sufficient to amortize with interest within 50 years $140,000,000, less expenditures for the All-American Canal. Twenty-five million of the one hundred and sixty-five million dollars is "allocated to flood control," and apparently its payment may, if necessary, be deferred and paid out of "surplus revenues." See the attorney general's opinion of December 26, 1929, printed as Appendix 47.

Surplus revenues are earmarked for two accounts: 62½ per cent is dedicated to repayment of $25,000,000 allocated to flood control,[22] and 37½ per cent of surplus revenues is allocated to the two States of Arizona and Nevada, one-half to each.[23]

Provisions controlling the All-American Canal contract.

The provisions specifically relating to the All-American Canal lay down seven principal requirements on the Secretary's negotiation of contracts:

(1) Provisions must be made in advance for revenue adequate to insure repayment of construction costs "in the manner provided by the reclamation law," i. e., without interest.[22]

(2) The works authorized to be constructed include a canal connecting the Imperial and Coachella Valleys with the Laguna Dam or other suitable diversion dam in the Colorado River and lying entirely within American territory.[24]

(3) No charge may be made for water or for the use, storage, or delivery of water for irrigation or potable purposes in Imperial and Coachella Valleys.[24]

(4) The Secretary may, in his discretion, after repayment of all moneys advanced, transfer title to the canal and appurtenant structures, except Laguna Dam and the main canal down to Syphon Drop (the point at which the Yuma project diverts water from the main works) to the districts contracting with the United States.[29]

(5) The contracting districts are given the privilege of utilizing any power possibilities on the canal and the net proceeds are required to be paid into the fund and credited to them until their indebtedness shall be paid.[29]

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[22] Sec. 2–*b*. [23] Sec. 4–*b*. [24] Sec. 1. [29] Sec. 7.

(6) All lands found by the Secretary to be practicable of irrigation are directed to be withdrawn from entry in accordance with the provisions of the reclamation law, subject to preference in favor of ex-service men.[30]

(7) The 1918 contract between the Imperial Irrigation District and the United States whereby the district undertook to repay part of the cost of Laguna Dam is left unaffected.[31]

The construction of the All-American Canal, like that of the Black Canyon Dam, is made subject to the Colorado River compact.[32]

General provisions of the act, in addition to those outlined, required that claims of the United States should have priority over all others, secured or unsecured.[33] The rights of the States to control the use of water within their borders were preserved.[34] The act was made a supplement to the reclamation law.[35] The commissioners of the States were given the right to act with the Secretary in an advisory capacity,[36] and the Federal Power Commission was directed not to issue or approve any permits or licenses until the act should become effective.[37]

The entire act was made ineffective until the 6-State ratification required by section 4–a, and enactment by California of a statute limiting her use of water should become effective and the President should so proclaim.[38]

The proclamation was issued on June 25, 1929.

End

4. NEGOTIATIONS AMONG THE STATES FOLLOWING THE PROJECT ACT

California, Nevada, New Mexico, Colorado, Utah, and Wyoming enacted statutes accepting the conversion of the Colorado River compact from a seven-State into a six-State agreement. Arizona did not.

The Boulder Canyon project act held out an invitation to the States of Arizona, California, and Nevada to enter into a compact for division of the water allocated to the lower basin by the Colorado River Compact,[5] and they were further given the opportunity to control the "division of the benefits, including power," but their agreement was to be subject to any contracts made by the Secretary before ratification by Congress.

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[30] Sec. 9.
[31] Sec. 10.
[32] Secs. 8–a, 13–b, 13–c, 13–d.
[33] Sec. 17.
[34] Sec. 18.
[35] Sec. 14.
[36] Sec. 16.
[37] Sec. 6.
[38] Sec. 4–a.

While plans for the construction of the dam went forward the Interior Department made an effort to bring the three States into an accord. Conferences were held in March and June, 1929, under the chairmanship of Col. William J. Donovan, but the States failed to agree. The Secretary proceeded with the revenue contracts in October, 1929, but announced at a hearing on power applications on November 12, 1929, that no final action would be taken until the States had met again in January. They did so, and again failed to agree.[39] Active negotiation of the power contracts began during the latter part of February, 1930, as outlined below.

5. THE POWER CONTRACTS

The negotiation of the power-revenue contracts required by section 4–*b* of the Boulder Canyon project act required three preliminary determinations:

(1) Since these contracts must provide revenue to amortize the cost of the dam, the first undertaking was to verify the estimates of the dam's costs and to set up a definite goal for revenues. The exhaustive studies made under the Commissioner of Reclamation, Dr. Elwood Mead, Chief Engineer R. F. Walter, and their predecessors, Arthur P. Davis and F. E. Weymouth, had been supplemented

[39] The commissioners on behalf of Arizona, California, and Nevada, which undertook the 1929 and 1930 negotiations following enactment of the Boulder Canyon project act, were—

Arizona: C. B. Ward, John Mason Ross, A. H. Favour.
California: John T. Bacon, W. B. Mathews, Earl C. Pound.
Nevada: F. B. Balzar, George W. Malone, E. W. Clark.

In addition, representatives of the four upper basin States participated in an effort to bring the lower basin States together. They were—

Colorado: Delph E. Carpenter.
New Mexico: Francis C. Wilson.
Utah: William R. Wallace, W. D. Beers, William W. Ray.
Wyoming: J. A. Whiting.

Colorado was further represented by L. Ward Bannister, special counsel to the City of Denver, and Robert E. Winbourn, Attorney General of Colorado.

California's delegation was supplemented by W. B. Mathews, Harry L. Heffner, Mark Rose, and Charles L. Childers.

At the request of Secretary Wilbur, the Governors of Arizona, California, and Nevada each appointed an additional special member to assist in the January, 1930, negotiations. The three special representatives were—

Arizona: Senator Carl Hayden.
Nevada: Senator Key Pittman.
California: Hon. William J. Carr.

by the review of the so-called Sibert board.[39a] The latter was a commission of engineers appointed pursuant to an act of Congress, whose principal function was to pass upon safety features of the proposed works. The result of all these studies, as reported by Commissioner Mead, fixed the estimated cost of the Boulder Canyon Dam and power plants at $109,446,000. Interest upon this sum during construction was estimated to amount to $11,554,000, or a total estimated cost of $121,000,000. During the negotiation of the contracts the Sibert board authorized an increase in the height of the dam, to raise the water level 25 feet; and, while that board estimated that the higher dam could be built within the original estimate, the Bureau of Reclamation added for safety another $4,392,000 to the estimate, making an aggregate investment of $125,392,000. But as the project act provided that $25,000,000 of this cost might be allocated to flood control, to be repaid out of surplus revenues, the amount remaining to be met by firm power sales became fixed at $100,392,000. But of this sum, $17,717,000 was estimated to be the cost of power machinery, which it was contemplated would be financed by the lessees of the power plant. This reduced the net investment, exclusive of flood control and the cost of machinery, to $82,675,000. Computed against an amortization period of 50 years, interest at 4 per cent on this investment (required by the project act to be paid to the Treasury) was estimated at $108,107,007. The total which the Secretary was required to recover from sale of power during a 50-year period thus became $206,920,024.

(2) Preliminary studies of the quantity of water available for generation of power had been carried forward under the direction of Mr. E. B. Debler, hydraulic engineer of the Bureau of Reclamation. Revised to January 31, 1930, these computations showed that with a dam 557 feet high, we would have available on completion 3,600,000,000 kilowatt-hours of firm energy per year; with a dam 575 feet high, 4,240,000,000; and with a dam 582 feet high, 4,330,000,000. During the negotiation of the contracts the figure 4,240,000,000 was assumed. During negotiations the decision of the Sibert board, permitting an increase in the water level to 582 feet, raised this output by 90,000,000 kilowatt-hours, and this increment was separately disposed of.

[39a] This preliminary commission, "The Colorado River Board," reviewed the plans and specifications with particular reference to safety items. It consisted of Maj. Gen. Wm. L. Sibert and Messrs. Charles F. Berkey, Warren J. Mead, Daniel W. Mead, and Robert Ridgway.

(3) The third basic element of information required before undertaking negotiations was the price which could be realized for this power. That price was subject to control by two factors:

(*a*) The Secretary was required by the project act to obtain a sufficient rate to amortize the cost of the dam, but (*b*) the act required that the amount be determined by "competitive conditions at distributing points or competitive centers"; and this latter would have been a determining factor even in the absence of statutory direction. As the only market large enough to absorb sufficient energy to yield the required revenues lay in southern California, and was located over large oil and gas deposits, the cost of energy provided by oil and gas necessarily fixed the comparative value of Boulder Canyon power. A study was accordingly undertaken by R. F. Walter, Chief Engineer, L. N. McClellan, chief electrical engineer for the bureau, Prof. W. F. Durand, of Stanford University, and others. Their report, rendered on September 10, 1929, computed the value of Boulder Canyon power at the switchboard on a series of assumptions as to costs of private and public development, all of which reckoned back to a value for the use of falling water, amounting to about 1.63 mills per kilowatt-hour.

The amount of money to be brought in by sale of power at the rate stated would, of course, be subject to certain assumptions. First, the project act required the readjustment of rates to accord with competitive conditions at competitive centers 15 years after the date of the contract, and every 10 years thereafter. Second, the amount of water available for generation of power would decrease by virtue of upstream use and gradual silting of the reservoir. Third, the amount would be affected by the number of years covered by each power contract. (The contracts ultimately negotiated disposed of 4,330,000,000 kilowatt-hours of firm energy on the completion of the dam, decreasing at the rate of 8,760,000 kilowatt-hours per year thereafter; and the three groups of contracts will run for 50, 49, and 47 years, respectively, as described below. They will yield a total from the sale of firm power amounting to $327,866,350, and are so distributed that performance by any two of the three principal contractors will provide the minimum of $207,000,000 required for amortization.)

Invitations for applications for the purchase of power were published on September 10, 1929. October 1 was fixed as the application date. Upon that date the Secretary had at hand applications from 27 parties. Some of these applications were conditional and others were indefinite; but the three principal applicants were the City of Los Angeles, the Southern California Edison Co., and the Metropolitan Water District of Southern California. Each of the first two asked for the entire power output, which was assumed at that date, prior to decision on the final height of the dam, to be 3,600,000,000 kilowatt-hours. The Metropolitan Water District asked for about half that amount of energy and the State of Nevada asked for a third of it. The total of the applications was thus well over three times the amount of power available.

The Secretary was accordingly faced with the problem of allocating the energy available among the conflicting applicants.

The allocation of the energy was undertaken on the premise that the project act required that the public interest be the governing factor, and that the first requisite in protecting the public interest was to provide adequate security for the taxpayers' money. It was recognized that the absorption of this quantity of power represented a serious problem and that adequate security for the Government required that the risk be spread among several agencies. It was recognized also that it was desirable that as broad a regional benefit be obtained from this power as was consistent with financial soundness. The dam would rest on the border between Arizona and Nevada, and it was desired to give them an opportunity to use its energy; but neither of them was in a position to make a firm contract for use of any power within its borders. The California applicants included agencies serving cities, great rural areas, and the Metropolitan Water District, which proposed to construct an aqueduct from the Colorado River to the Coastal Plain. It was recognized that the water needs of this area were the great motive force behind the financing of the dam.

On October 21 the Secretary announced a tentative allocation of power, as follows:

"The power to be developed at the Boulder Dam subject to certain deductions is to be contracted for as follows:

"To the Metropolitan Water District of Southern California, 50 per cent, or so much thereof as may be needed and used for the pumping of Colorado River water.

"To the City of Los Angeles 25 per cent; and

"To the Southern California Edison and associated companies, 25 per cent.

"These allotments are to be subject to certain deductions which may arise through the exercise of preference rights, i. e.,

"(*a*) not exceeding 18 per cent of the total power developed for the State of Nevada for use in Nevada;

"(*b*) not exceeding 18 per cent of the total power for the State of Arizona, for use in Arizona, as above; and should either of the States not exercise its preference rights the other may absorb them up to 4 per cent;

"(*c*) not exceeding 4 per cent for municipalities which have heretofore filed applications.

"All such preference rights in whole or in part are to be exercised by the execution of valid contracts with the respective States and municipalities satisfactory to the Secretary and the exercise of such preference rights is to reduce proportionately the above allotments to the district, the city, and the company.

"Any State desiring to withdraw power within the limitations above stated must serve on the Secretary of the Interior written notice within not less than 12 months of the amount of power desired, and for the purchase of which valid contracts satisfactory to the Secretary must be executed.

"Power contracted for but not required within a State shall be allocated to the city and the company on a 50-50 basis, with the reservation that it can again be called for within a reasonable time for use within the State. All power provided a State shall be at actual cost.

"Should the 50 per cent allocated to the Metropolitan Water District be not required for pumping, this shall become available to the City of Los Angeles, 66⅔ per cent; to the Southern California Edison and associated companies, 33⅓ per cent.

"Any municipalities desiring power within the limitation prescribed must execute the necessary contract therefor within 12 months from the date the contracts are made with the district and the city.

"Any firm power available at the Boulder Canyon Dam for the payment of which other contractors do not become and remain liable, aside from that allocated to the Metropolitan District, shall be taken and paid for by the City of Los Angeles and the Edison Co. on a 50-50 basis.

"The contract for the available power is to be made with the City of Los Angeles and the Metropolitan Water District, with various subcontracts assuring the above, and providing for a board of control made up of two members nominated by the City of Los Angeles and the Metropolitan Water District, two by the Southern California Edison and associated companies, and one by the Secretary of the Interior, to act with the City of Los Angeles in the operation of the plant.

"The Federal Government will install the dam, tunnels, power house, and penstocks. The machinery for the generation and distribution of power is to be provided and installed by the lessees. The costs of installation and operation are to be borne by those contracting for the power in proportion to the amounts received. When the dam and power house are actually in operation the lessees may have the right to ask for a review of the actual cost of units of power and be entitled to deductions which will still permit the charge made to return to the Government all advances and interest in accordance with the Boulder Dam act, and provided further that if such review indicates that a higher rate should be paid for power to meet the obligation to the Federal Government such an advance in rate will be put into effect.

"There will be a clause inserted in all of the contracts which will insure the distribution of all power developed at the Boulder Dam at such a price as in the opinion of the Federal Power Commission is fair to all consumers. Should certain municipalities operating their own power plants desire to make separate agreements with the City of Los Angeles and the Metropolitan Water District they shall be supplied with power at cost price.

"The charge for storing water for the Metropolitan Water District will be 25 cents per acre-foot."

November 12, 1929, was set as a date for a hearing in the event of any protests against this allocation as provided in the Boulder Canyon project act. On that date an extensive hearing was held. An attempt was made thereafter to reconcile the conflicting applications on their points of disagreement; it was recognized that the size of the undertaking required that the various contractors present a unified front for the protection of the financial stability of the project.

Negotiations among the conflicting applicants having failed to crystallize in an agreement, Northcutt Ely, assistant to the Secretary, was sent to Los Angeles in the latter part of February, 1930, and negotiations with the applicants were resumed there. On March 20, after negotiations participated in on behalf of the United States by Mr. Ely and Mr. L. N. McClellan; for the City of Los Angeles by Mr. E. F. Scattergood, Dr. John R. Haynes, and members of the

Board of Water and Power Commissioners,[40] for the Metropolitan Water District by Mr. W. B. Mathews, Mr. F. E. Weymouth, Mr. C. C. Elder, Mr. Barry Dibble, and all the directors of the district;[41] and for the Southern California Edison Co. by Mr. R. J. Ballard, Mr. W. C. Mullendore, Mr. Roy V. Reppy, and Mr. F. G. Trowbridge, the following preliminary agreement was reached, on the motion of Mr. John G. Bullock, director of the District:

"*Resolved*, that we recommend to the Secretary of the Interior that the 64 per cent of total firm power from the Boulder Canyon project available to California interests under his allocation be divided, upon terms hereinafter set forth, as follows:

	Per cent of total firm power
To the Metropolitan Water District	36
To the City of Los Angeles and other municipalities which have filed application	19
To the Southern California Edison Co	9
Total (exclusive of unused firm power)	64

and

"*Further resolved*, that we recommend to the Secretary that the Metropolitan Water District be given the first call upon all unused firm power and all unused secondary power up to their total requirements for pumping into and in the aqueduct, and that any unused power of the municipalities be allocated to the City of Los Angeles, and that any remaining unused firm power or unused secondary power be divided one half to the City of Los Angeles and one half to the Southern California Edison Co.; and,

"*Further resolved*, that all parties hereto agree to cooperate to the fullest extent to make the Boulder Canyon project a success in all its phases; and,

"*Further resolved*, that this agreement is based upon the resolution already passed by the Metropolitan Water District of Southern California and accepted by the board of water and power commissioners

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[40] The members of the Board of Water and Power Commissioners of Los Angeles for 1930 were Dr. John R. Haynes, president; P. D. Schofield, Frank H. Brooks, and A. B. Prior. H. A. Van Norman was general manager and chief engineer. The city was represented in negotiations by E. F. Scattergood, chief electrical engineer, assisted by W. Turney Fox, special counsel, Attorney F. M. Bottorff, Engineer Panter. The contracts were reviewed for the city by Erwin P. Werner, city attorney, and his staff.

[41] The membership of the board of directors of the Metropolitan Water District of Southern California in 1930 consisted of: Anaheim, O. E. Steward; Beverly Hills, Paul E. Schwab; Burbank, Harvey E. Bruce; Colton, Charles A. Hutchinson; Glendale, W. Turney Fox; Los Angeles, John G. Bullock, W. L. Honnold, John R. Richards, W. P. Whitsett, O. T. Johnson, jr.; Pasadena, Franklin Thomas; San Bernardino, R. C. Harbison; San Marino, Harry L. Heffner; Santa Ana, S. H. Finley; Santa Monica, George H. Hutton.

of the City of Los Angeles whereby that district requests the City of Los Angeles at cost to generate its power requirements and to operate its transmission lines, which lines are to be paid for and owned by the Metropolitan Water District.

"The above resolution was approved March 20, 1930, by representatives of—

"The Metropolitan Water District of Southern California;

"The board of water and power commissioners of the City of Los Angeles;

"The Southern California Edison Co.

This allocation may be compared with the original proposal of the Secretary as follows:

While the allocation of October 21 was stated in terms of maximum use, subject to deductions in favor of the States, the agreement of March 20 was expressed in terms of minimum use, with provisions for use of additional power in event that the States should not require the energy. The final result accords closely with that originally proposed by the Secretary. Thus, depending on the quantities used by the States of Arizona and Nevada:

The City of Los Angeles under the original allocation would have received a minimum of 15 per cent and a maximum of 25 per cent. Under the agreed allocation the city will receive a minimum of 15 per cent and a maximum of about 33 per cent (the municipalities having finally contracted for only about 4 per cent of the 6 per cent allocated to them and the city having absorbed the balance).

The Edison and associated companies would originally have received a minimum of 15 per cent and a maximum of 25 per cent. Under the agreed allocation these companies take a minimum of 9 per cent and a maximum of 27 per cent.

The smaller municipalities would have originally received 4 per cent; as finally contracted for they received that amount plus a decimal fraction.

The Metropolitan Water District would have taken a minimum of 30 per cent and a maximum of 50 per cent. Under the agreed allocation the district will take a minimum of 36 per cent, plus an option on all unused State energy and all secondary energy.

Arizona and Nevada would each originally have received 18 per cent, and each received that proportion in the final allocation.

Following the allocation agreement of March 20, 1930, the negotiation of the contracts was immediately undertaken for the Department in Los Angeles, under the supervision of Secretary Wilbur and Commissioner Mead, by Messrs. Ely, McClellan, Richard J. Coffey, and Louis C. Hill. While this work was going forward an agreement was secured in Los Angeles on April 27, 1930, among the 11 smaller municipalities that had been allocated an option on 6 per cent of the firm energy.[41a] They agreed to divide the allocation in proportion to their consumption of energy in 1929. Ultimately, however, only Burbank,[41b] Pasadena,[41c] and Glendale[41d] elected to contract. The balance of the municipalities' allocation, as stated above, was absorbed by Los Angeles.

The contracts with the City of Los Angeles, the Southern California Edison Co., and the Metropolitan Water District were finally closed on April 26, 1930, by Dr. John R. Haynes for the city, W. P. Whitsett for the district, John B. Miller for the company, and Northcutt Ely for the Department. General regulations, embodying the principal features agreed on, were promulgated April 24. Under these

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[41a] In attendance were the following representatives:

H. H. Coffman, supervisor, Burbank.
J. H. McCambridge, superintendent public service, Burbank.
A. H. Lowe, city engineer, San Bernardino.
M. W. Edwards, director eletrical engineering, Pasadena.
Paul E. Schwab, mayor, Beverly Hills.
Arthur Taylor, construction engineer, Beverly Hills.
J. W. Price, city manager, Anaheim.
Grover L. Walters, superintendent water and lighting, Fullerton.
L. E. Miller, mayor, Santa Ana.
C. A. Hutchinson, city engineer, Colton.
J. W. Charleville, city manager, Glendale.
C. E. Kinlin, mayor, Glendale.
P. Diederich, superintendent light and water, Glendale.
R. L. Boulden, superintendent electrical department, Riverside.
Joseph S. Long, mayor, Riverside.
B. F. DeLanty, general manager, light and power department, Pasadena.
John L. Bacon, chairman, Colorado River Commission, San Diego.
E. F. Scattergood, chief electrical engineer, Los Angeles.
W. C. Mullendore, vice president, Southern California Edison Co.
W. B. Mathews, attorney, Los Angeles.
S. H. Finley, director, Metropolitan Water District, Santa Ana.

[41b] Burbank was represented by H. H. Coffman, supervisor; J. H. McCambridge, superintendent of public service, and James H. Mitchell, city attorney. The contract was signed by J. L. Norwood, president of the council.

[41c] Pasadena was represented by B. F. DeLanty, general manager, Light and Power Department, who also acted as chairman of the allocation committee for the municipalities, and by Harold P. Huls, city attorney.

[41d] Glendale was represented by J. W. Charleville, city manager, C. E. Kinlin, mayor, and P. Diederich, and later by Mayor Frank G. Taggart and City Attorney Bernard Brennan.

contracts 100 per cent of the firm energy was firmly contracted for by these three agencies, subject however to certain privileges in favor of the municipalities and the States. Thus, the city agreed to take and pay for 37 per cent of the firm energy, but undertook to yield 18 per cent for use by the States at any time within 50 years and to yield 6 per cent to the municipalities if they should contract before specified dates. The Edison Co. undertook a firm commitment for 27 per cent, but undertook to yield 18 per cent to the States at any time within 50 years and to yield energy to three associated companies as the four companies might agree. Thus provision was made for the future needs of Nevada and Arizona under a "drawback" arrangement which enables 100 per cent of the firm power to be sold immediately. The Metropolitan Water District undertook to take and pay for 36 per cent.

Ultimately (on November 12, 1931) the Los Angeles Gas & Electric Corporation [41e] and the Southern Sierras Power Co.[41f] contracted.

The municipalities, on the one hand, and the utilities on the other hand, divided their respective allocations on somewhat different bases as to secondary energy and unused State energy.

The ultimate disposition of Hoover Dam power by virtue of these contracts is shown on Table 1.

The contracts with Los Angeles, the Southern California Edison Co., and the Metropolitan Water District, carrying about $327,000,000 in revenues, represented probably the largest power transaction to date. Completed on April 26, 1930, they were brought to Washington by air and submitted to Congress immediately in support of the first appropriation; Congress was nearing adjournment.

[41e] The Los Angeles Gas & Electric Corporation was represented by Addison B. Day, president, and Paul Overton, general counsel.

[41f] The Southern Sierras Power Co. was represented by A. B. West, president, and General Counsel Coil.

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TABLE 1. *Ultimate disposition of Hoover Dam energy*

	Firm energy			Secondary energy
	Minimum which United States must supply	Contractor's obligations if energy is available	Maximum which contractor can demand under various conditions	
	Per cent	*Per cent*	*Per cent*	
Arizona [1]	18		22	None.
Nevada [1]	18		22 (18 per cent plus 4 per cent if not used by other State).	None.
Metropolitan Water District.	36	36	72 per cent (its own minimum plus first call on unused State energy).	First call on all secondary energy.
Los Angeles	14.9054 (13 per cent plus uncontracted municipality energy).	32.9054 (its minimum, plus ½ unused State energy, subject to Metropolitan's first call).	32.9054	Call on ½ secondary energy subject to Metropolitan's first call.
Pasadena	1.6183	1.6183	1.6183	None.
Glendale	1.8867	1.8867	1.8867	None.
Burbank	0.5896	0.5896	0.5896	None.
Southern California Edison Co.	7.2	21.6 (7.2 per cent plus 80 per cent of ½ unused State energy).	21.6	Call on 80 per cent of ½ of secondary energy, subject to Metropolitan's first call.
Los Angeles Gas & Electric Corpn.	0.9	2.7 (0.9 per cent plus 10 per cent of ½ unused State energy).	2.7	Call on 10 per cent of ½ of secondary energy, subject to Metropolitan's first call.
Southern Sierras Power Co.	0.9	2.7 (0.9 per cent plus 10 per cent of ½ unused State energy).	2.7	Call on 10 per cent of ½ of secondary energy, subject to Metropolitan's first call.
Total	100	100		

[1] To be contracted for as needed.

6. THE FIRST APPROPRIATION

The second deficiency bill for 1930 (71st Cong., 2d sess.) carried the first appropriation for the construction of Hoover Dam, in the amount of $10,660,000. In support of the estimate the Secretary reported compliance with the five conditions precedent established by the Boulder Canyon project act and other legislation:

(1) The ratification of the six-State Colorado River Compact as required by section 4–A of the project act.

(2) Proclamation by the President of such ratification, including that by the State of California.

(3) An agreement by California limiting her use of water from the main stream of the Colorado River.

(4) The execution of contracts making provision for revenue adequate in the Secretary's judgment to assure payment of all expenses of operation, maintenance, and construction of the dam and appurtenant works, together with reimbursable interest.

(5) Approval of the plans by a board of engineers appointed pursuant to the statute of May 29, 1928 (45 Stat. 1011), (the Sibert board).

The presentation was made by Secretary Wilbur personally, assisted by members of the Department's staff.

The State of Arizona appeared in opposition to the appropriation, although the contracts reserved 18 per cent of firm energy for that State to be taken by it any time within 50 years, and also provided surplus revenues which were estimated to yield that State under provisions of the project act between 22 and 31 million dollars during the life of the contracts. At the hearings the opposition centered upon the contracting capacity of Los Angeles and phraseology of certain clauses of the contracts. While testimony was presented on behalf not only of the Department but of each of the contractors refuting the Arizona position, it was decided, in view of the brief time remaining before adjournment of Congress, and the possibility of a filibuster, to eliminate the Arizona objections by amendment of the contracts. The amendments were signed on May 28 and 31, 1930, and effected no change in the tenor of the instruments. The contracts were thereupon submitted to the Attorney General for opinion. He reported that "all the requirements of section 4 (*b*) of the Boulder

Dam project act which are made conditions precedent to the appropriation of money, the making of contracts, and the commencement of work for the construction of a dam and power plant in Boulder Canyon have been fully met and performed by the Secretary of the Interior in securing the contracts referred to in his letter." As the city and company contracts were found adequate, the objections made to the Metropolitan contract, principally the lack of funds to build an aqueduct, were not passed upon, but: "Even if the aqueduct financing were construed as being a prerequisite, the Secretary's reservation of energy for the district is within his authority under the second paragraph of section 5 (*c*) of the act."

Later the State of Arizona filed its objections with the Comptroller General, and he concurred with the Attorney General. Both of these decisions appear in this volume, together with an earlier opinion of the Attorney General on interest provisions and the flood-control allocation in the project act. Subsequently the State unsuccessfully sought an injunction in the Supreme Court. The case is outlined on a later page.

7. CONSTRUCTION

The scope of this volume is restricted to the revenue contracts; the construction contracts have been published individually. The plans and specifications for Hoover Dam and appurtenant works were prepared under the supervision of Commissioner Elwood Mead, Chief Engineer R. F. Walter, Assistant Chief Engineer S. O. Harper, and Chief Designing Engineer J. L. Savage, with whom Hydraulic Engineer E. B. Debler, Chief Electrical Engineer L. N. McClellan and Mechanical Engineer D. M. Day have been associated.[42] Legal features of the construction contracts have been prepared under the direction of Chief Counsel Porter W. Dent, by District Counsel J. R. Alexander, Armand Offutt, and R. J. Coffey. The following steps complete the sequence of events preceding actual construction:

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[42] A group of engineers appointed by the Secretary and Commissioner and known as the "Hoover Dam Consulting Board," consisting of Messrs. L. C. Hill, D. C. Henny, Wm. F. Durand, and F. L. Ransome, has cooperated with the Commissioner and his staff. A. J. Wiley was a member until his death.

A group known as the "Concrete Board," specialists in cement and concrete, has also been appointed. It consists of Messrs. William K. Hatt, Raymond E. Davis, Franklin R. McMillan, Herbert J. Gilkey, and P. H. Bates.

On July 3, 1930, President Hoover signed the deficiency act, carrying an appropriation of $10,660,000 for initiating construction and automatically placing the power contracts in operation. Seven and a half years before, as the Federal commissioner, he had signed the Colorado River Compact, which cleared away the major obstacles to this project.

On July 7, 1930, Order No. 436 was signed by the Secretary, directed to Commissioner Elwood Mead: "You are directed to commence construction on Boulder Dam to-day." Walker R. Young, construction engineer in charge for the Bureau of Reclamation, put his men in action the same day.[43]

On September 17, 1930, the first blow on the initial construction job—the driving of a silver spike in the first tie of the Union Pacific branch railroad—was struck by Secretary Wilbur, and the Secretary advised the Commissioner: "This is to notify you that the dam which is to be built in the Colorado River at Black Canyon is to be called The Hoover Dam."

On May 6, 1931, the United States assumed exclusive jurisdiction over an area necessary for construction activities in Nevada, in accordance with statutes of that State, and proceeded to build a modern town for the workers, complete with water supply, streets, sidewalks, municipal buildings, and police and fire protection.

As of February 1, 1933, construction of the dam was approximately 15 months ahead of schedule. Four diversion tunnels had been completed; the coffer dams were in place and the river had been successfully diverted. Excavation is now under way and it is expected that the pouring of concrete will commence in the summer of 1933, and that the dam will be completed in 1936. Six Companies (Inc.), is the contractor for construction of the dam, and Mr. Frank T. Crowe is the contractor's superintendent. A summary of operations to date appears in the margin.[44]

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[43] The Government personnel at Boulder City is headed by Walker R. Young, construction engineer. His immediate staff comprises Ralph Lowry, assistant construction engineer; John C. Page, office manager; and Sims Ely, Boulder City manager.

[44] Contracts—awarded and proposed—Boulder Canyon project.—The following is a summary prepared by the Bureau of Reclamation:

Under an appropriation of $10,660,000 made available July 3, 1930, for the first year's operations, Boulder Canyon project, Arizona-California-Nevada, the

8. THE CALIFORNIA WATER CONTRACTS

The Act.

The Boulder Canyon project act makes three principal provisions with respect to the use of the waters to be stored by Hoover Dam, in addition to the authorization for building the All-American Canal.

(1) The three States of Arizona, California, and Nevada are authorized to enter into a compact with each other for the allocation

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following work was carried on: Railroad for construction purposes from near Las Vegas, Nev., to dam site; highway from Boulder City to dam site; buildings, streets, water and sewer systems for Boulder City; purchase of power for construction purposes; starting work on the Hoover Dam, power plant, and appurtenant works, including the four diversion tunnels. For the fiscal year 1931–32, a further appropriation of $15,000,000 was made, and for the fiscal year 1932–33, an appropriation of $23,000,000 is available. The principal work during the past year has been the construction of four 50-foot diameter diversion tunnels and the building of Boulder City.

The work on the project is being done by contract rather than by Government forces.

The Los Angeles & Salt Lake Railroad Co. (Union Pacific System), of Los Angeles, Calif., built a 22.7-mile section of railroad from its main line, a few miles below Las Vegas, Nev., to Boulder City, and this branch road is in operation.

The Southern Sierras Power Co., of Riverside, Calif., has the contract for furnishing power for construction purposes. A transmission line was constructed for a distance of 235 miles from Victorville, Calif., to the dam site. The company also built a substation near the dam site. Power was available on the project June 25, 1931. Both transmission line and substation are operated and maintained by the power company.

Bids were opened on January 7, 1931, at Las Vegas, Nev., for building a highway about 7 miles long from Boulder City to the site of Hoover Dam. The General Construction Co., of Seattle, Wash., was awarded the contract, and sublet the work to R. G. LeTourneau (Inc.), of Stockton, Calif. This job was completed in June, 1931.

On January 12, 1931, bids were opened at Las Vegas, Nev., for constructing 10¼ miles (including branches) of the Government construction railroad from the end of the Los Angeles and Salt Lake sections at Boulder City to the dam site. The Lewis Construction Co., of Los Angeles, Calif., was awarded the contract. The railroad was completed in September, 1931. This Government section of railroad is being operated during the construction period by the contractor for the dam.

Bids were opened on March 4, 1931, at Denver, Colo., for construction of the Hoover Dam, power plant, and appurtenant works. The low bid of $48,890,995 was submitted by the Six Companies (Inc.), 510 Financial Center Building, San Francisco, Calif., made up of the Utah Construction Co., of Ogden, Utah; Henry J. Kaiser and W. A. Bechtel Co., of Oakland, Calif., and 206 Sansome Street, San Francisco, Calif., respectively; MacDonald & Kahn (Ltd.) of Los Angeles, Calif.; Morrison-Knudson Co., of Boise, Idaho; J. F. Shea Co., of Portland, Oreg.; and Pacific Bridge Co., of Portland, Oreg. On March 11, 1931, the Secretary of the Interior awarded the contract to the Six Companies (Inc.). These contractors have a field office at Boulder City, Nev., with F. T. Crowe as of water available to the lower basin under the Colorado River compact. No such agreement has been made.

(2) The project act also authorizes, in section 19, future compacts among the seven basin States relating to the development and use of the Colorado River. No agreement has been entered into under that section.

(3) The Secretary of the Interior is authorized by section 5 to make contracts for the delivery of waters stored by the dam, and it is provided that no person may acquire a right to the use of such waters except by such a contract.

Negotiations of 1930: The Metropolitan Water District.

Two major applications for water contracts were brought forward at an early stage. The Metropolitan Water District of Southern California and the Imperial Irrigation District each presented applications. The first proposed to build an aqueduct from the Colorado River to

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general superintendent. This is the most important job on the Boulder Canyon project, and includes the 730-foot dam, the four 50-foot diameter diversion tunnels, cofferdams, spillways, outlet works, and the power plant (but not including installation of machinery). The construction period will be about 6 years. The contractor is now over 15 months ahead of schedule.

A contract for Boulder City work including street, alley, parking area, and sidewalk grading; street paving; street and parking area surfacing; curbs and gutters; sidewalks; sanitary sewers; and water distribution system was completed by the New Mexico Construction Co., of Alburqueque, N. Mex., in April, 1932. Construction of cottages for Government employees, varying in size from 3 to 7 rooms, and administration building, dormitory and guest house, post-office building and community garages has been completed. A 10-room school building was completed and ready for occupancy in September, 1932. I. M. Bay, of Junction, Utah, was the contractor.

The Consolidated Steel Corporation, of Los Angeles, Calif., is furnishing 50 by 50 foot bulkhead and 50 by 35 foot Stoney gates, and the Hardie-Tynes Manufacturing Co., of Birmingham, Ala., and the Reading Iron Works, of Reading, Pa., are supplying gate hoists. The Babcock & Wilcox Co., of New York City, has the contract for furnishing, erecting, and painting 4 plate-steel headers, varying from 30 to 25 feet in diameter, including 13-foot diameter penstocks, for $10,908,000. The time allowed for completion of this contract is 1,975 days, and the weight of the pipe materials is about 110,000,000 pounds. A fabricating plant is being built by the contractor at Bechtel, about 1 mile from the dam site.

Bids will be opened on March 3, 1933, for furnishing the initial group of turbines, butterfly valves, and governors for the power plant. The first installation comprises five 115,000-horsepower and two 55,000-horsepower, vertical hydraulic turbines. The 115,000-horsepower wheels will be the largest in the world exceeding in size a recent installation on the Dnieper River in Russia. The power plant is laid out for an ultimate installation of fifteen 50-cycle main generating units of 82,500 kv-a. capacity each, and two 60-cylce main generating units of 40,000 kv-a. capacity each. The bureau is now advertising for bids on furnishing 8 welded plate-steel cylinder gates, 32 feet in diameter and 10 the Coastal Plain.[45] A water contract was necessary to enable the district to utilize the electric energy allocated to it.

Accordingly, a water delivery contract was executed with the Metropolitan Water District on April 24, 1930, immediately preceding the execution of its power contract. This water agreement had been preceded by a compromise among the various California claimants to Colorado River water on February 21, 1930, whereby the Metropolitan Water District had been allocated a total of 1,100,000 acre-feet. The amount fixed in the Federal contract was 1,050,000 acre-feet, to provide a margin against further demands from the California Coastal Plain on behalf of cities not members of the Metropolitan Water District.

The Metropolitan water contract was subsequently amended to accord with a further agreement among the California claimants as pointed out below.

Negotiations between the department and the Imperial Irrigation District upon the All-American Canal contract meanwhile proceeded,[46]

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feet high, for installation in the intake towers, and will ask for bids on furnishing generators for the power plant early in 1933.

In January, 1932, a contract for furnishing 380,000 barrels of cement was awarded to the Riverside Cement Co., California Portland Cement Co., Southwestern Portland Cement Co., and Monolith Portland Cement Co., all of Southern California, the four companies acting jointly. This was the first purchase of cement for the dam, power plant, and appurtenant works, which will require about 5,500,000 barrels. A second purchase of 400,000 barrels was made in September, 1932, of which amount the four California companies furnished 332,500 barrels and the Union Portland Cement Co., of Denver, Colo., 67,500 barrels.

Materials entering into the permanent works, such as cement, lumber (not including lumber for forms), reinforcing steel, pipe, gates and valves, structural steel, machinery, etc., are being purchased by the Government after appropriate advertising and competitive bidding. All major purchases are made through the Chief Engineer's Office, United States Customhouse, Denver, Colo., where the main purchasing office of the Bureau of Reclamation is located. Equipment, materials, and supplies required in the construction plant and camp and in the incidental operations of the contractors are purchased by the contractors.

Contract for 150-ton permanent cableway was awarded in October, 1932, to the Lidgerwood Manufacturing Company of Elizabeth, N. J.

[45] The proposal to build an aqueduct to the Colorado River for augmenting the water supply of the Coastal Plain was first brought forward by Chief Engineer William Mulholland, of the Los Angeles Department of Water and Power, and much of the early work was done under the supervision of Mr. Mulholland his associates, H. A. Van Norman, E. F. Scattergood, and W. B. Mathews.

[46] The present plans for the All-American Canal are based upon the surveys and report of Homer J. Gault, Engineer of the Bureau of Reclamation.

and during such negotiations the necessity for a more definite division of the California water became manifest.

The agreement of February 21, 1930, among the Metropolitan Water District, the Imperial Irrigation District, the Coachella Valley County Water District, and the Palo Verde Irrigation District had made no division individually among these agencies but had allocated the water available to California by "agricultural" and "coastal plain" groups, paralleling in this respect the Colorado River compact.

The allocation gave the first 3,850,000 acre-feet of water to the "agricultural group;" next, 550,000 acre-feet to the Metropolitan Water District; third, 550,000 acre-feet to the Metropolitan Water District; and, finally "all water in river available for California use in excess of above 4,950,000 acre-feet per annum" to the agricultural group.

In negotiating the All-American Canal contract it became apparent that, inasmuch as the Palo Verde Irrigation District would not be a party to that contract, a subdivision within the agricultural group would be necessary; meanwhile the City of San Diego had presented an application for a water contract.

The Seven-Party Water Agreement of 1931.

Accordingly, on November 5, 1930, the Secretary addressed the Imperial Irrigation District, and all other agencies who might contract with the United States, requesting that they ask the cooperation of the State of California in effecting an allocation which they could join in recommending to the Secretary of the Interior. From November 5, 1930, until August 18, 1931, a series of conferences was held under the chairmanship of Mr. Ed. C. Hyatt, State engineer of California. By August of 1930 the differences between the parties had been reduced to points touching on the terms of their proposed water contracts with the United States, and representatives of the Interior Department were asked to participate. Messrs. Northcutt Ely, E. B. Debler, and Richard J. Coffey attended for the United States. On August 18, 1931, an agreement was reached, and was subsequently recommended to the Secretary by Mr. Hyatt, State engineer, with the approval of the State division of water resources.[47] Its principal provisions follow:

"The waters of the Colorado River available for use within the State of California under the Colorado River compact and the Boulder Canyon project act shall be apportioned to the respective interests below named and in amounts and with priorities therein named and set forth, as follows:

"SECTION 1. A first priority to Palo Verde Irrigation District for beneficial use exclusively upon lands in said district as it now exists and upon lands between said district and the Colorado River, aggregating (within and without said district) a gross area of 104,500 acres, such waters as may be required by said lands.

"SEC. 2. A second priority to Yuma project of the United States Bureau of Reclamation for beneficial use upon not exceeding a gross area of 25,000 acres of land located in said project in California such waters as may be required by said lands.

"SEC. 3. A third priority (*a*) to Imperial Irrigation District and other lands under or that will be served from the All-American Canal in Imperial and Coachella Valleys, and (*b*) to Palo Verde Irrigation District for use exclusively on 16,000 acres in that area known as the Lower Palo Verde Mesa, adjacent to Palo Verde Irrigation District, for beneficial consumptive use, 3,850,000 acre-feet of water per annum less the beneficial consumptive use under the priorities designated in sections 1 and 2 above. The rights designated (*a*) and (*b*) in this section are equal in priority. The total beneficial consumptive use under priorities stated in sections 1, 2, and 3 of this article shall not exceed 3,850,000 acre-feet of water per annum.

"SEC. 4. A fourth priority to the Metropolitan Water District of Southern California and/or the City of Los Angeles, for beneficial consumptive use, by themselves and/or others, on the Coastal Plain of Southern California, 550,000 acre-feet of water per annum.

"SEC. 5. A fifth priority (*a*) to the Metropolitan Water District of Southern California and/or the City of Los Angeles, for beneficial consumptive use, by themselves and/or others, on the Coastal Plain of Southern California, 550,000 acre-feet of water per annum and (*b*) to the City of San Diego and/or County of San Diego, for beneficial

[47] The seven-party water agreement was executed for the Palo Verde Irrigation District by Ed. J. Williams and Arvin B. Shaw, jr.; for the Imperial Irrigation District by Mark Rose, Charles L. Childers, and M. J. Dowd; for the Coachella Valley County Water District by Thomas C. Yager and Robbins Russel; for the Metropolitan Water District of Southern California by W. B. Matthews and C. C. Elder; for the City of Los Angeles by W. W. Hurlbut and C. A. Davis; for the City of San Diego by C. L. Byers and H. N. Savage; for the County of San Diego by H. N. Savage and C. L. Byers.

State Engineer Hyatt was assisted by Mr. Conkling.

consumptive use, 112,000 acre-feet of water per annum. The rights designated (*a*) and (*b*) in this section are equal in priority.

"SEC. 6. A sixth priority (*a*) to Imperial Irrigation District and other lands under or that will be served from the All-American Canal in Imperial and Coachella Valleys, and (*b*) to Palo Verde Irrigation District for use exclusively on 16,000 acres in that area known as the Lower Palo Verde Mesa, adjacent to Palo Verde Irrigation District, for beneficial consumptive use, 300,000 acre-feet of water per annum. The rights designated (*a*) and (*b*) in this section are equal in priority.

"SEC. 7. A seventh priority of all remaining water available for use within California, for agricultural use in the Colorado River Basin in California, as said basin is designated on Map No. 23000 of the Department of the Interior, Bureau of Reclamation.

"SEC. 8. So far as the rights of the allottees named above are concerned, the Metropolitan Water District of Southern California and/or the City of Los Angeles shall have the exclusive right to withdraw and divert into its aqueduct any water in Boulder Canyon Reservoir accumulated to the individual credit of said district and/or said city (not exceeding at any one time 4,750,000 acre-feet in the aggregate) by reason of reduced diversions by said district and/or said city; *Provided*, that accumulations shall be subject to such conditions as to accumulation, retention, release, and withdrawal as the Secretary of the Interior may from time to time prescribe in his discretion, and his determination thereof shall be final; *Provided further*, that the United States of America reserves the right to make similar arrangements with users in other States without distinction in priority, and to determine the correlative relations between said district and/or said city and such users resulting therefrom.

"SEC. 9. In addition, so far as the rights of the allottees named above are concerned, the City of San Diego and/or County of San Diego shall have the exclusive right to withdraw and divert into an aqueduct any water in Boulder Canyon Reservoir accumulated to the individual credit of said city and/or said county (not exceeding at any one time 250,000 acre-feet in the aggregate) by reason of reduced diversions by said city and/or said county; *Provided*, that accumulations shall be subject to such conditions as to accumulations, retention, release, and withdrawal as the Secretary of the Interior may from time to time prescribe in his discretion, and his determination thereof shall be final; *Provided further*, that the United States of America reserves the right to make similar arrangements with users in other States without distinction in priority, and to determine the correlative relations between the said city and/or said county and such users resulting therefrom.

"SEC. 10. In no event shall the amounts allotted in this agreement to the Metropolitan Water District of Southern California and/or the City of Los Angeles be increased on account of inclusion of a supply for both said district and said city, and either or both may use said apportionments as may be agreed by and between said district and said city.

"SEC. 11. In no event shall the amounts allotted in this agreement to the City of San Diego and/or to the County of San Diego be increased on account of inclusion of a supply for both said city and said county, and either or both may use said apportionments as may be agreed by and between said city and said county.

"SEC. 12. The priorities hereinbefore set forth shall be in no wise affected by the relative dates of water contracts executed by the Secretary of the Interior with the various parties."

This agreement was ratified by all of its parties unconditionally, except the Palo Verde Irrigation District. That district attached certain conditions to its ratification which were subsequently approved by the other parties, and on September 28, 1931, the Secretary of the Interior promulgated amended regulations which incorporated the agreement, with Palo Verde's reservation. The substance of the so-called seven-party water agreement was thus adopted as a uniform water-allocation clause to be utilized in all California water contracts. Concurrently, by virtue of the State's approval, it became an allocation by the State. By this quadruple process of agreement, allocation by the State, promulgation of regulations by the Secretary, and incorporation of an identical clause in separate contracts with the United States, the claims of the various parties were placed on an assured basis.

The water contract with the Metropolitan Water District was amended on the same date and it appears in the appendix in final form.

The All-American Canal contract.

The conclusion of the seven-party water agreement made possible the completion of drafting of the All-American Canal contract. That contract, designed to carry out the third objective of the Boulder Canyon project act, was reduced to final form on October 3, 1931. In brief, its form is that of a contract between the United States and the Imperial Irrigation District, obligating the latter to repay the cost of a canal to be constructed by the United States connecting the Imperial and Coachella Valleys in California with the Colorado River. The total cost is limited to $38,500,000 to be payable in 48 annual installments.

The proposed system would start with a new diversion dam, the Imperial Dam, to be built across the Colorado River about 5 miles above the present Laguna Dam. After leaving the desilting works at the dam, the canal, with a capacity of 15,000 second-feet, would parallel the river to Syphon Drop, at which point 2,000 second-feet would be diverted for the Yuma project. With a capacity of 13,000 second-feet the canal would continue down the river to Pilot Knob, Calif., at which point it would turn westward with a capacity of 10,000 second-feet, dropping the surplus back into the river at Pilot Knob through a power plant. After passing through the sand hills the canal would branch into two parts, one branch connecting with the present Imperial Canal system and the other, over 130 miles long, passing through Coachella Valley to the north for the irrigation of that valley. The contract as drawn conforms to the provisions of the act which have been quoted above; i. e., the investment will be amortized on an interest-free basis by repayments by the district under this contract.

On October 22, 1931, a hearing was held upon objections which had been filed against execution of the contract. The Coachella Valley Land Owners Association objected to the inclusion of their lands in Imperial Irrigation District, and requested a separate contract. The Water Rights Protective Association of Imperial Valley, on the other hand, objected to the inclusion of the Coachella lands, as impairing the sufficiency of Imperial's water supply. Certain objections were filed by the Palo Verde Irrigation District and by persons interested in the Yuma project, in Arizona, and some others. On November 4, 1931, the Secretary signed an opinion disposing of these objections and approving the contract as to form. The opinion appears in the Appendix.

Thereafter the district endeavored to carry out the conditions precedent of the contract, i. e., ratification by the electors of the district, inclusion of the Coachella lands, and confirmation by a court decree. The contract was ratified overwhelmingly by the Imperial electors, but the Coachella landowners ultimately decided not to petition for inclusion. The Imperial Irrigation District thereupon undertook to negotiate a new contract with the United States eliminating the condition requiring Coachella's inclusion. The Coachella landowners, committed to the proposition of obtaining a separate contract (although the Department's opinion of November 4 had pointed out the advantages in a unified system), renewed their request for a separate instrument in which the Coachella area would assume the sole responsibility for the cost of works necessary to water the valley, but which would be physically connected with the Imperial system.

After protracted negotiations the representatives of the Imperial and Coachella Districts were invited to Washington, and negotiations proceeded here during the month of November, 1932. The United States was represented by Commissioner Elwood Mead, Assistant Commissioner Porter W. Dent, Richard J. Coffey, Solicitor E. C. Finney, and Messrs. Northcutt Ely and Charles A. Dobbel of the Secretary's staff. The Imperial Irrigation District was represented in the All-American Canal negotiations by Directors Mark Rose and John L. Dubois, Chief Engineer M. J. Dowd, and Attorney Charles L. Childers. Director Earl C. Pound participated until his retirement. The Coachella Valley County Water District was represented during the negotiations of 1931 by President R. W. Blackburn and Attorney Thomas C. Yager. During the negotiations of December, 1932, the district was represented by Directors Harry W. Forbes and S. S. M. Jennings and by Attorney Arvin B. Shaw, jr.

The changes ultimately approved by the Secretary resulted in the elimination of the requirement that Coachella lands be included as a condition precedent, and substituted a promise on Imperial's part to include these lands on petition, within 30 days after the contract is confirmed by court. In return, the Coachella lands were assured against assessment for other than expenses required by this contract, until water is available for delivery within the Coachella unit, and the present Coachella District was preserved as an entity: It is given the privilege of collecting and paying obligations of its landowners to the Imperial District and is enabled thereby to utilize powers of taxation differing somewhat from Imperial's. Certain other minor changes were made in the contract, but the Department's basic plan of a unified contract was adhered to.

The instrument was executed by the Secretary on December 1, 1932, and at the present writing the confirmation proceedings are under way. The new contract has been ratified by the district electors, and the Coachella landowners may present their petition at any time up to 30 days after the decree of confirmation becomes final.

The All-American Canal contract, it will be noted, is of a dual character: It is a revenue contract required by section 4–*b* of the

Boulder Canyon project act as a condition precedent to construction of the All-American Canal, and, in addition, it is a water delivery contract, under section 5 of the act. The Metropolitan Water District contract, previously referred to, is of a similar dual character. It is a revenue contract providing funds toward the amortization of Hoover Dam, as required by another paragraph of section 4–*b*, and simultaneously is a water delivery contract pursuant to section 5.

The proposed San Diego contract.

The execution of the Metropolitan Water District and Imperial contracts disposed of the four major California claimants to the waters of the Colorado River. The City of Los Angeles and the Metropolitan Water District are provided for by the Metropolitan Water District contract, and the Imperial Irrigation District and the Coachella Valley County Water District are cared for by the Imperial contract. The remaining three parties to the seven-party agreement of August, 1931, are the Palo Verde Irrigation District, the City of San Diego, and the County of San Diego. The Yuma project requires no contract, as the United States still operates and maintains that project.

It is planned that the City and County of San Diego, acting through the City or a new Metropolitan District will ultimately take water through the All-American Canal, diverting near the end of the Imperial section of the canal, and pumping over or through the mountains to San Diego. The All-American contract provides for use of the canal by other parties upon their entering into contracts with the United States for contribution toward the cost of the works. No such revenue contract has yet been executed by San Diego. However, San Diego's relationship to the United States is not only that of a probable contributor to the revenues of the All-American Canal under section 4–*b* of the project act, but it is also eligible, under the seven-party agreement, as contractor for delivery of water under section 5 of the act, regardless of the manner in which San Diego finally elects to provide for transportation of its water. Some time will probably elapse before San Diego is in a position to contract for the use of the All-American Canal and contribute toward its cost, but in order to insure its water privileges, a separate water contract has been approved by the Secretary, and is included in the Appendix.[48]

[48] The City of San Diego has been represented in these negotiations by Hiram N. Savage, chief hydraulic engineer.

In general, this contract conforms to that of the Metropolitan Water District. The city is required to pay 25 cents per acre-foot for water delivered. In this respect this contract is a revenue agreement providing funds toward the amortization of Hoover Dam; its future agreement for the use of the All-American Canal will provide revenue toward amortization of the All-American Canal feature of the project.

The city is required to commence its diversions within 10 years after the completion of Hoover Dam, as is the Metropolitan Water District.

The contract provides for the delivery of water in accordance with the seven-party agreement, incorporated as a uniform clause in all of the water contracts, and amounting in the case of San Diego to 112,000 acre-feet classified in priority No. 5. It shares that priority with the Metropolitan Water District and the City of Los Angeles, whose joint interest therein is 550,000 acre-feet.

Palo Verde Irrigation District.

A water contract with Palo Verde Irrigation District has been approved by the Department and awaits action by that district.[49] It parallels the water contract of the Metropolitan Water District, except that no charge will be made for water delivered on the project. Palo Verde's priorities are limited to use of water within the district. However, the contract reserves to the parties the right to contract in the future, in accordance with any judicial determination which may establish in Palo Verde rights other than those provided by the seven-party agreement; i. e., rights to use of water elsewhere than within the district. The stipulation for free service does not necessarily apply to such a future contract.

Parker Dam.

A second contract with the Metropolitan Water District has been approved. This relates to the proposed Parker Dam, which will be located on the Colorado River just below the mouth of the Bill William[50] River. This contract, which is included in the Appendix, provides for the construction of a dam by the United States at the

[49] The Palo Verde Irrigation District has been represented by Ed. J. Williams and Attorney Arvin B. Shaw, jr.

[50] The Parker Dam contract was negotiated on behalf of the United States by Messrs. Elwood Mead, Porter W. Dent, E. C. Finney, Northcutt Ely, R. F. Walter, E. B. Debler, R. J. Coffey, and on behalf of the Metropolitan Water District by F. E. Weymouth, general manager, and James H. Howard, general counsel.

sole expense of the Metropolitan Water District, reserving to the United States nevertheless one-half of the power privilege for use in Arizona. The dam will be used as a point of diversion for the Metropolitan Water District and in part for river regulation by the United States. The United States retains control over water passing the dam. From the Government's viewpoint, the dam will be built in aid of ultimate reclamation of the Colorado River Indian Reservation and of the Gila project in Arizona. Statutory authority already exists for the construction of such a dam for these purposes, and the cheap power made available to the Government will expedite by many years the feasibility of reclamation of certain of these areas.

9. WATER FOR ARIZONA

The Department from time to time has endeavored to bring about an agreement between Arizona, California, and Nevada for the division of waters allocated to the lower basin by the Colorado River compact. As outlined on a previous page, the Boulder Canyon project act authorizes such a subordinate agreement, and under the auspices of the Department and the chairmanship of Col. William J. Donovan, conferences between the States were held in March and June, 1929, and again in January, 1930. The disagreement between Arizona and California has centered about the same issue which was responsible for Arizona's failure to ratify the Colorado River compact—inclusion of the Gila River in the waters to be apportioned between the States.

After the power contracts had become effective and work had been started on Hoover Dam, Arizona brought suit in the United States Supreme Court to enjoin the building of the dam, and to declare the Boulder Canyon project act and the Colorado River compact inoperative and unconstitutional. Arizona's bill of complaint filed October 13, 1930, named the Secretary of the Interior and the States of California, Nevada, Utah, New Mexico, Colorado, and Wyoming as defendants. The suit was dismissed on May 18, 1931. The court held that the construction of the dam was within the constitutional powers of Congress, and that Arizona had no basis upon which to complain of the Colorado River compact since she was not bound by it. The court said: "There is no occasion for determining now Arizona's rights to interstate or local waters which have not yet been, or which may never be, appropriated."

It has been the Secretary's policy to establish a firm and equitable basis for future use of water not only in California but also in Arizona, despite the absence of an agreement or adjudication.

The Department has undertaken in four particulars to preserve for Arizona an opportunity to use the waters which Hoover Dam will make available. The task has been complicated by the confusion left over from the days in which Arizona was bitterly opposed to the entire project.

First, 18 per cent of Hoover Dam's firm energy was reserved for use in Arizona. This amounts to the equivalent of about 117,000 continuous horsepower.

Second, the Parker Dam contract with the Metropolitan Water District reserves one-half of the power privilege, amounting to about 40,000 horsepower, for use in Arizona, without contribution by that State or the United States to the capital cost of the dam. Freed of capital investment in the dam, this power will rank among the cheapest power projects in the United States. In addition, the Metropolitan Water District has been required to undertake to transmit Arizona's Hoover Dam power at cost from Hoover Dam to Parker Dam to the extent that excess capacity of the district is available.

Third, in the All-American Canal contract the privilege has been reserved to the United States of using that dam as a pumping basin or diversion heading for irrigation of Arizona lands. The Hoover and Parker power will make feasible the irrigation of the first units of Arizona's proposed Gila project by pumping from Imperial Dam, as well as permit the reclamation of the Colorado River Indian Reservation near Parker.

Fourth, the Department has promulgated regulations designed to assure a water supply to Arizona. These regulations are included as an appendix in this volume. They outline the form of a Hoover Dam water-delivery contract which the United States will enter into with Arizona upon certain conditions. Briefly, the contract calls for the delivery of 2,800,000 acre-feet annually, in return for which Arizona undertakes to make no interference with the diversions by other Government contractors. This quantity of water is adequate for all of the Arizona projects below Hoover Dam, and is without prejudice to the power of the parties to contract in the future for delivery of additional water required. As in the case of the California water contracts, the undertaking relates simply to acre-feet of water stored

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by Hoover Dam, without earmarking the discharges under Articles III–A or III–B of the Colorado River compact, or as surplus water. The proposed contract recites the controversy between the two States over the quantity of water available to each under the various provisions of the project act, and makes no attempt to adjust priorities as between the two States. But inasmuch as an entirely new factor, i. e., the building of Hoover Dam and providing of 30,000,000 acre-feet of storage, has intervened after the execution of the Colorado River compact, there is every reasonable assurance that water adequate to supply all of Arizona's and California's needs can be supplied under these contracts, leaving to the future the settlement of a question which in practice will probably never arise: The technical classification of the water discharges under various provisions of the compact. The proposed water contract with Arizona is specifically stated to be without prejudice to the States of the upper basin, and relates solely to water present in the lower basin. Arizona is thus offered an assurance of 2,800,000 acre-feet of main-stream water, and given an opportunity to look to the United States rather than to an agreement with the other States for a delivery of that quantity of water, in return for an agreement not to interfere with diversions by her sister States.

10. SUMMARY

This concludes a brief outline of the events which have made possible the construction of Hoover Dam: The Colorado River compact of 1922, the Swing-Johnson bill of 1928, the power contracts of 1930, the water contracts, the establishment of exclusive jurisdiction and the commencement of construction, the litigation before the Supreme Court which failed to halt the building of the dam. Included in this volume are not only the instruments which have marked the accomplishment of this program to date, but certain others which have been approved as to form and which during the coming years should make possible the peaceful development of the Colorado. These include the remaining water contracts in California, and regulations assuring to Arizona a fair share of water.

The Department has executed eight power contracts, two water contracts, has approved as to form three additional water contracts, two contracts for repayment of the cost of diversion dams, and has approved an Arizona water contract in the form of regulations.

These contracts are summarized in Part II, and their texts appear in the appendixes. The construction contracts are printed separately.