

THE SIX STATES COMMITTEE

Arizona, Colorado, New Mexico, Texas,
Utah, and Wyoming

VOL. I

Brief

In Support of

Ratification of the Treaty
With Mexico Relating to the Utilization
of the Waters of Certain Rivers

THE SIX STATES COMMITTEE

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Utah, and Wyoming

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FOREWORD

The Treaty between the United States and Mexico relating to the utilization of the waters of the Rio Grande below Fort Quitman, Texas, and of the Colorado and Tijuana Rivers directly affects the eight states of Arizona, California, Colorado, New Mexico, Nevada, Texas, Utah, and Wyoming. The water officials and affected water users of these states, except California and Nevada, have joined to form the Six States Committee for the purpose of studying the Treaty and presenting its conclusions to the Committee on Foreign Relations of the United States Senate.

The Six States Committee believes that prompt ratification of the pending Treaty is desirable. The division of water made between the two nations is fair and equitable to each. The administrative provisions are sound and are in harmony with the accepted and traditional policies of our constitutional form of government. There is no interference with the rights of any states to control local water uses.

The opportunities for development of the resources of the Colorado River and the Rio Grande are well known, but they cannot proceed upon a firm basis unless there is a definition of the Mexican rights to the waters of these streams. The ratification of the pending Treaty will permit planning for the basins of the Rio Grande and Colorado River to proceed upon a firm basis so that projects will be ready when construction is needed.

In support of its position the Six States Committee presents the following:

Volume I. A brief containing reasons for the ratification of the Treaty and answers to the more important criticisms made by those opposing ratification.

Volume II. An engineering report prepared by R. J.

Tipton analyzing and discussing the water supply of the streams and the effect of the Treaty on water uses.

Volume III. An appendix containing the text of the Treaty and pertinent statutes, compacts, contracts, and other documents, and an index.

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PRELIMINARY STATEMENT

1. INTRODUCTION

This brief is presented by the Six States Committee in support of the ratification of the Treaty between the United States and Mexico for the utilization of the waters of the Rio Grande below Fort Quitman, Texas, and the Colorado and Tijuana Rivers. The Committee represents the responsible water officials and the great majority of the affected water users in the States of Arizona, Colorado, New Mexico, Texas, Utah, and Wyoming, six of the eight states directly affected by the Treaty.

The Committee firmly believes that the Treaty is fair and equitable to each nation and should be promptly ratified in order that there may be a firm basis for development of water projects dependent upon the flow of these streams.

The purpose of this brief is to present as concisely as is possible the factual and legal situations involved, and the reasons why the Six States Committee believes prompt Treaty ratification to be desirable and advantageous.

2. SUMMARY STATEMENT AND POSITION

The Six States Committee believes:

(1) The controversy with Mexico over the use of the border streams should be settled amicably by treaty.

(2) Since the fair and proper rule for the division of the waters of an international stream is that there should be an equitable apportionment between nations affected, and since the United States has recognized this principle in making a treaty with Mexico over the water of the Upper Rio Grande and with Great Britain over the waters along the Canadian boundary, it is but right that the same principle should be applied here.

(3) It is desirable to make a treaty at this time so that there may be a firm basis for development of water-use projects in the United States.

(4) The effect of the Treaty is to define the rights of each nation in the utilization of the waters of the border streams and thereby make certain the amount of water on which the domestic laws of each nation will operate.

(5) The permanence of the Treaty, unless it is mutually agreed otherwise, is necessary and desirable because any provision for termination must be mutual and because future development of water-use projects in the affected basins cannot progress with security if the water allocations are subject to change or revision at the instance of but one of the two nations.

(6) The Treaty does not constitute any infringement upon states' rights because the jurisdiction of the International Boundary and Water Commission is limited to the limitrophe sections of the streams, the land boundary and the works located on the common boundary, and the jurisdiction of the United States Section is limited to works exclusively used in the fulfillment of Treaty functions.

(7) The International Boundary and Water Commission, with its two Sections, has established by its fifty-five years of operation that it is an appropriate agency to administer the Treaty, and its authority is adequately circumscribed with provisions for executive, legislative, and judicial control.

3. TREATIES AFFECTING THE RIVERS

Treaties between the United States and Mexico affecting one or more of the rivers under consideration are as follows:

Treaty of Guadalupe-Hidalgo, February 2, 1848.

Gadsden Treaty, December 30, 1853.

The Boundary Convention, November 12, 1884.

The Convention of March 1, 1889.

The Convention for the Equitable Distribution of Waters of the Rio Grande, May 21, 1906.

Pan American Arbitration Treaty of 1929.

The Convention of February 1, 1933.

The Treaty of Guadalupe-Hidalgo established the boundary between the United States and Mexico. Article VI provides that the vessels and citizens of the United States shall have a free and uninterrupted passage through the Gulf of California and the River Colorado. This Article imposes on the United States no duty with respect to navigation.

Article VII gives both countries "free and common" rights of navigation on the Gila and on that part of the Rio Grande lying below the southern boundary of New Mexico and provides that "neither shall, without the consent of the other, construct any work that may impede or interrupt, in whole or in part, the exercise of this right; not even for the purpose of favoring new methods of navigation."

The Gadsden Treaty established a new boundary south of the Gila which followed the 111th Meridian to a point on the Colorado River twenty English miles below the junction of the Gila and the Colorado, thence up the middle of the Colorado to the boundary line established by the Treaty of Guadalupe-Hidalgo.

Article VI of the Treaty abrogated and annulled Articles VI and VII of the Treaty of Guadalupe-Hidalgo insofar as they affect the water of the Colorado River and substituted new navigation provisions giving the citizens and vessels of the United States free and uninterrupted passage through the Gulf of California and the River Colorado to and from their possessions situated north of the boundary line. By express provision, the parts of Article VII of the Treaty of Guadalupe-Hidalgo relating to the Rio Grande were reaffirmed.

The Boundary Convention of 1884 provided that lands which may have become separated by reason of creation of new channels shall continue to be under the jurisdiction of the country to which they previously belonged and that in no case shall the retained jurisdiction affect or control the right of navigation common to the two countries
" * * * * * and such common right shall continue with-

out prejudice throughout the actually navigable main channels of the said rivers from the mouth of the Rio Grande to the point where the Rio Grande ceases to be the international boundary * * * * * .” This provision modified all former treaty provisions relating to navigation by confining the common navigation rights to the “actually navigable main channels.”

The International Boundary Commission — United States and Mexico — was created by the Convention of March 1, 1889. The Commission was given jurisdiction of matters affecting the water boundaries between the two countries. Its authority was extended by the Convention of March 20, 1905.

The Convention of May 21, 1906, allocates all of the water of the Rio Grande above Fort Quitman between the two countries. The Colorado River was not involved. This Treaty is discussed further on pages 26 and 27 of this brief.

The Pan-American Arbitration Treaty of 1929 provides in general for the arbitration of differences of an international character which have arisen or may arise between the contracting parties. The United States, Mexico and eighteen other Pan-American countries have ratified the treaty.

Article I provides:

The High Contracting Parties bind themselves to submit to arbitration all differences of an international character which have arisen or may arise between them by virtue of a claim of right made by one against the other under treaty or otherwise, which it has not been possible to adjust by diplomacy and which are juridical in their nature by reason of being susceptible of decision by the application of the principles of law.

Article II excepts from the terms of the Treaty controversies “which are within the domestic jurisdiction of any of the parties to the dispute and are not controlled by international law.” Other Articles provide for the compo-

sition of the arbitration board;¹ for the formulation of agreements defining the subject matter of the controversy;² for the procedure before the Board;³ for the reservation by parties and the effect thereof;⁴ and for the duration of the treaty.⁵ The United States made a reservation which relates to special agreements defining the controversy as follows:

That the special agreement in each case shall be made only by the President, and then only by and with the advice and consent of the Senate, provided two-thirds of the Senators present concur.

Mexico made a general reservation as follows:

Mexico makes the reservation that differences which fall under the jurisdiction of the courts shall not form a subject of the procedure provided for by the Convention, except in case of denial of justice, and until after the judgment passed by the competent national authority has been placed in the class of *res judicata*.

The Convention of February 1, 1933, authorized the International Boundary Commission to rectify the channel of the Rio Grande between El Paso-Juarez and Box Canyon in the vicinity of Fort Quitman, Texas, and to operate and maintain the required works.

4. NEGOTIATIONS PRIOR TO THE PRESENT TREATY

As development of the rich agricultural land in the lower Rio Grande Valley increased, it became apparent that in drought years the low flow of the river would not be adequate to supply existing uses. Recurring floods added a serious hazard to farming and community development. An average of 4,000,000 acre-feet annually discharges into

¹ Article III.

² Article IV.

³ Articles V, VI and VII.

⁴ Article VIII.

⁵ Article IX.

the Gulf of Mexico during the flood period, and during periods of low run-off large areas of land are threatened with serious shortage. It was recognized that conservation of water and flood control could best be accomplished by main stream storage. The necessary works could not be constructed without a treaty with Mexico.

In 1924 the Congress passed a law which authorized the President to appoint three commissioners to cooperate with Mexican representatives, “ * * * in a study regarding the equitable use of the waters of the Rio Grande below Fort Quitman, Texas, with a view of their proper utilization for irrigation and other beneficial uses.”⁶

Mexico refused to proceed with the study unless the Colorado River was to be considered. Accordingly, Congress, by an act approved March 3, 1927, amended the law to include the Lower Colorado River.⁷

The commissioners were authorized, with the concurrence of Mexico, to study the Tijuana River. It was specifically provided that the commissioners were to obtain information “upon which to base a treaty with the government of Mexico, relative to the use of the waters of these rivers.”

The President appointed the following commissioners:

Dr. Elwood Mead, Director of the Bureau of Reclamation; Gen. John Lansing H. Beach, U. S. Army, ret., and W. E. Anderson, a Civil Engineer of San Benito, Texas.

Representatives of Mexico were appointed, and the first session of the Commission was held at El Paso, Texas, beginning February 27, 1928. The second session was held in Mexico City on August 20, 1929, and the third and concluding session was held at Washington, D. C., on October 22, 1929. An exhaustive study was made of all pertinent data available, including stream flow records of the Rio Grande and the Colorado and Tijuana Rivers and tributaries, the areas irrigated in both countries, power and industrial use; the possibilities of storage and of utilization for power, domestic and other uses and power produc-

⁶ S. 2998 Public 118, 68th Congress, 43 Stat. 118.

⁷ Public Resolution No. 62, 69th Congress, 44 Stat. 1043.

tion works. The commissioners' functions were limited to fact finding and study. The report indicates that some effort was made to reach an informal agreement for division of the waters of the three rivers. The following proposals and counter proposals were made with reference to the Colorado River:

Mexican representatives claimed that Mexico has 1,500,000 acres of land which can be irrigated from the river; that the duty of water was 3 acre-feet and that it reasonably requires 4,500,000 acre-feet of water annually.

The American Section made the following proposal at the meeting of August 29, 1929:

It proposes, therefore, as an equitable division the waters of the river for irrigation and domestic purposes, the delivery by the United States to Mexico, each year, at the international boundary, of an amount of water equal to that delivered for irrigation and domestic purposes, in Mexico, from the Colorado, during the year 1928, which is the maximum delivered in any one year (as determined by the technical advisers) and which is understood to be 750,000 acre-feet. To this amount, the American Section proposes, if this seems warranted, to add an additional amount to compensate for losses in the main canal.

The delivery of water by the United States as here proposed will be conditioned on the construction of Boulder Dam, until which time the present unregulated delivery must continue. The regulated delivery, when it begins, shall be in accordance with a schedule to be hereafter agreed upon, with the understanding that in case of extraordinary drought or serious accident to the storage or diversion works in the United States, the amount of water to be delivered to Mexico will be diminished in the same proportion as deliveries in the United States.

The quantity of water to be delivered to Mexico by the United States under this proposal does not, however, represent all the water Mexico will receive, because whatever flows down the Colorado

in excess of the consumptive uses in the United States must in the future, as in the past, cross the boundary into Mexico and be available for use there. It will undoubtedly be an important factor in further irrigation development in Mexico, but the use of this surplus water in Mexico cannot be regarded as establishing a right to such water as against the United States.

On September 2, 1929, Mexico made the following comments and suggestions:

While demanding waters from the Colorado River for Mexican lands, the Mexican Section has taken into consideration the area of these lands, the exercise of the rights of Mexico to the present time, and the flow of the Colorado River.

The Mexican Section considers that there are about 6,000,000 acres of American lands requiring improvements at low cost or pumping under 80-foot lift, and that the Mexican lands under similar conditions amount to about 1,500,000 acres. If the annual run-off of the Colorado River at Yuma is about 17,400,000 acre-feet, and following the criterion of distributing the waters of the river in proportion to lands in both countries, which are under above-mentioned conditions, 3,480,000 acre-feet would correspond to Mexico and 13,920,000 acre-feet to the United States land.

Mexico has a right to 3,600,000 acre-feet under the concession of the Compania de Tierras y Aguas de la Baja California. The amount of 750,000 acre-feet which the American Section considers as just and generous for the lands in Mexico notoriously results out of proportion with the figures above analyzed, and so Mexico cannot accept as her share on the equitable distribution of the waters of the Colorado River the above-mentioned amount of 750,000 acre-feet.

Conclusions: In the above statement the Mexican Section has just developed her criterion, as stated during past meetings and statements, and respectfully expects from the American Section:

I. That the latter will reconsider its offer in regard to volumes of water for the Mexican lands.

II. That the latter will please state its position regarding power developments and flood-control works.

Neither country changed its position with respect to the division of Colorado River water. It was suggested by the Commission :

It is already apparent that the needs in the United States for Colorado River waters are destined to be much greater than has been realized in the past, and probably greater than can be fully estimated or appreciated at present. Stability in development and peaceful relations on both sides of the boundary require further efforts to reach an agreement as to policies, and as to the limits which will govern the recognition of rights to water across the boundary.

At the conclusion of the sessions the American Section submitted an exhaustive report to the President. It was transmitted to Congress on April 21, 1930, and is known as House Document No. 359, 71st Congress, Second Session.

The American Section of the International Water Commission was abolished by the Act of June 30, 1932 (The Economy Act), 47 Stat. 417, and its future duties and functions were transferred to the American Section of the International Boundary Commission, United States and Mexico.

The period from 1930 to 1940 was one of great development on the Colorado River. Boulder Dam, Parker Dam, and Imperial Dam were constructed and the All-American Canal and the Los Angeles Aqueduct in the Lower Basin, and the Colorado River-Big Thompson Project in the Upper Basin were in progress. Representatives of the Basin States met frequently to discuss water and power problems. Important among such problems was that of a treaty with Mexico for division of the water. Engineers and lawyers were employed and committees were appointed to make

technical studies of water supply, water use, and related subjects.

In 1938 permanent organizations known as The Committees of Fourteen and Sixteen were effected for purposes of study and discussion of Colorado River problems. The Committee of Fourteen consisted of two representatives from each of the seven Basin States appointed by their respective governors and the Committee of Sixteen included the same with the addition of two representatives of the Boulder Canyon Project Power allottees. These committees, which have met regularly to discuss Colorado River Basin matters, have always realized the importance of a treaty with Mexico and to that end have always kept in touch with the International Boundary Commission and have appointed sub-committees to investigate and report on the problem. The International Boundary Commission has kept the committees advised as to negotiations with Mexico, looking toward the negotiation of a treaty, and has sought the advice and support not only of the committee members but of the many interested water users who always attend the meetings of the committees. Finally, in April 1943, representatives of the State Department and of the International Boundary Commission met with the Committees of Fourteen and Sixteen and proposed a formula to be used in the negotiation of the Treaty. This formula was carefully analyzed and arguments were made both for it and against it. Five of the seven states approved the formula and went on record as favoring negotiations with Mexico of a treaty which would make no allotment of Colorado River water to Mexico in excess of that stated in the formula.

Negotiations with Mexico were reopened by the Department of State of the United States, representatives of the Ministry of Foreign Relations of Mexico, and of both Sections of the International Boundary Commission, United States and Mexico. The present Treaty resulted. The provisions of the Treaty relative to the allotment of Colorado River water to Mexico are well within the formula which was approved by five of the states at the April

1943 meeting. It was signed in Washington, D. C., February 3, 1944.

5. GENERAL ANALYSIS OF TREATY PROVISIONS

The introductory paragraph of the Treaty recites that the two nations "animated by the sincere spirit of cordiality and friendly cooperation which governs the relations between them," and taking into account that the treaties of 1848 and 1853 regulate the use of the waters of the Rio Grande and Colorado River for the purposes of navigation only, and desiring to fix and delimit the rights of the two countries with respect to the waters of the Colorado and Tijuana Rivers, and of the Rio Grande below Fort Quitman, Texas, "in order to obtain the most complete and satisfactory utilization thereof" have resolved to conclude a treaty.

The plenipotentiaries representing the United States are named as Secretary of State, Cordell Hull; Ambassador to Mexico, James S. Messersmith; and United States International Boundary Commissioner, Lawrence M. Lawson.

The Treaty is divided into seven parts. Part I, containing Articles 1 to 3 inclusive, covers preliminary provisions including among other things the definition of terms and a statement of the order of preferences for the joint use of international waters.

Article 2 entrusts the duty and responsibility of administering the treaty to the International Boundary Commission, created by the 1889 Convention, the name of which is changed to the "International Boundary and Water Commission, United States and Mexico." The Commission is, as previously, comprised of a United States Section and a Mexican Section, at the head of each of which is an engineer commissioner.

The fifth paragraph of Article 2 defines the jurisdiction of the Commission and specifically limits it to the limitrophe sections of the rivers, the land boundary, and

the works located upon the common boundary. Each Section has jurisdiction and control over works which are located wholly within the territorial limits of its country and are used exclusively for the fulfillment of treaty functions. Works which are used only partly in treaty performance remain under the domestic agencies of each nation, which by its law have jurisdiction and control. Any doubt which may have existed as to the jurisdiction and authority of the two Sections was clarified by the Protocol which was signed on November 14, 1944.

Part II, consisting of Articles 4 to 9 inclusive, relates to the Rio Grande. Article 4 makes an allotment between the two countries of the waters of the Rio Grande between Fort Quitman, Texas, and the Gulf of Mexico. The United States is allotted all the water of its major tributaries, one-third of the waters of certain Mexican tributaries (with a minimum guarantee of 350,000 acre-feet per year from this source), and one-half of all other waters appearing in the main stream. The effect of this allocation is to give to the United States the use of approximately one-half of the waters of the stream and sixty percent of those waters which may feasibly be impounded in the international reservoirs.

Article 5 provides for the joint construction of storage dams and diversionary works in the main channel. The Commission is required to determine feasible sites and reservoir capacities. Storage dams are to be built "as may be determined by the Commission subject to the approval of the two governments." Cost of construction, operation and maintenance of storage dams are to be pro-rated on the basis of the conservation capacity allotted to each country and similar costs of diversionary works are to be pro-rated upon the basis of the benefits which the respective countries receive. Approval of the two governments is required upon all construction except the three international reservoirs which are specified in the Treaty, and which must be built under the terms of the Treaty unless the two governments by mutual agreement eliminate one or more or cause others to be added.

Article 6 refers to flood control works which are to be constructed only after recommendation by the Commission and approval by the two governments.

Article 7 relates to hydro-electric plants at the international storage dams which may be constructed upon the recommendation of the Commission and the approval by the two governments.

Articles 8 and 9 contain rules and regulations to assure the maximum beneficial use of water.

Part III, made up of Articles 10 to 15 inclusive, concerns the Colorado River. Under the terms of Article 10 Mexico is allotted a guaranteed annual quantity of 1,500,000 acre-feet of water of the Colorado, from any and all sources, with delivery to be made in accordance with Article 15. When, as determined by the United States Section of the Commission, there is a surplus of water in the river, the United States undertakes to deliver 1,700,000 acre-feet annually, but Mexico has no right to any annual quantity in excess of 1,500,000 acre-feet.

In the event of extraordinary drought or serious accident to the irrigation system in the United States, making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet a year, the water allotted to Mexico shall be reduced in the same proportion that consumptive uses in the United States are reduced.

Article 11 defines the places of delivery of water allotted to Mexico. From the time Davis Dam is put in operation until 1980 the United States shall deliver "wherever such waters may arrive in the limitrophe section of the river" 1,000,000 acre-feet annually, and thereafter 1,125,000 acre-feet annually, provided that if the main Mexican diversion structure is located entirely in Mexico not to exceed 25,000 acre-feet annually may be delivered at a mutually agreed point near San Luis, Sonora, and the quantities deliverable in the limitrophe section reduced by that amount. Also from the time Davis Dam is put into operation and until 1980, the United States shall deliver 500,000

acre-feet annually and thereafter 375,000 acre-feet annually by means of the All-American Canal and the Pilot Knob Wasteway.

Article 12 relates to construction of certain works. Mexico shall construct at its expense a main diversion dam and such protective works as are necessary in the opinion of the Commission to protect United States lands from flood and seepage damage. The United States agrees to construct the Davis Dam, a part of the capacity of which is to be used for the fulfillment of the Treaty provisions. It should be noted that Congress has heretofore authorized the construction of Davis Dam⁸ and it would be well on the way to completion had it not been for the war emergency and the consequent work stoppage. Davis Dam will be built regardless of the Treaty. The United States further agrees to construct or acquire and operate and maintain at Mexico's expense the works necessary for the conveyance of water allotted to Mexico to the international boundary. These include the works necessary to convey water from the Pilot Knob wasteway to the boundary and those necessary to carry water to the boundary near San Luis, Sonora, if such delivery is mutually agreed upon. The Commission in the limitrophe section of the river and each Section within its own country are required to construct, operate and maintain appropriate stream gauging stations.

Article 13 concerns flood control between Imperial Dam and the Gulf of California with provision made for the construction of such works as may be recommended by the Commission and approved by the two governments.

Article 14 requires Mexico to pay such proportion of the actual construction cost of Imperial Dam and the Imperial Dam-Pilot Knob Section of the All-American Canal as may be determined by the two governments and a portion of the annual cost of operation and maintenance based on a proportionate amount of water delivered annually through such facilities for use in each of the two countries.

⁸ See House Document No. 186, 77th Congress, 1st Session.

In the event a power plant is constructed at Pilot Knob, and revenues from electric power generation after the full amortization therefrom of the cost of the plant become available for the amortization of part or all of the cost of Imperial Dam and the Imperial Dam-Pilot Knob Section of the All-American Canal, the Mexican obligation to pay part of the cost of such facilities shall be reduced proportionately.

Article 15 relates to technical details governing water deliveries to Mexico.

Part IV, which includes only Article 16, relates to the Tijuana River. The Commission is required to study and investigate and submit to the two governments for their approval, (1) recommendations for equitable distribution of the waters of the stream between the two countries; (2) plans for storage and flood control; and (3) recommendations regarding operation and maintenance of works. The governments through their respective Sections shall construct such of the proposed works as they approve, and shall distribute the waters in the proportions which they approve. Provision is made for sharing the expense of operation and maintenance.

Part V, which is made up of Articles 17 to 25 inclusive, contains general provisions. Article 17 governs the use of the channels for the discharge of flood flows. Article 18 controls the public use of the water surfaces of lakes formed by international dams. Article 19 provides that the two governments shall make the necessary special agreements to regulate electric power generation at international plants, including the necessary provisions for the export of electric current. Article 20 relates to the construction of works. Articles 21 and 22 refer to boundaries. Article 23 provides for each government to own and control the works required for the performance of the Treaty, such property to be acquired in accordance with domestic law of the nation in which it is located.

Article 24 confers upon the Commission certain powers and duties relating to the investigation, planning, construc-

tion, maintenance and operation of works provided for in the treaty. The Commission is directed to exercise the specific powers and duties entrusted to it and to prevent Treaty violations. Each Commissioner shall when necessary invoke the jurisdiction of the courts of his country to aid in the enforcement of the delegated powers and duties. The Commission is authorized to settle differences between the two countries with respect to the interpretation or application of the Treaty, subject to the approval of the two governments. In the event of disagreement the differences may be adjusted through the usual diplomatic channels or by the application of such special agreements as the governments may have made. The Commission is further required to furnish information jointly requested by the two governments and to make a joint annual report and such other reports as may be requested or deemed necessary.

Article 25 relates to procedure. Among other things it provides that except where the specific approval of the two governments is required decisions of the Commission become effective within thirty days, unless one of the two governments disapproves.

Part VI, including Articles 26 and 27, contains transitory provisions. Article 26 has reference to conditions along the Rio Grande. During a period of eight years from the effective date of the Treaty, or until the lowest major reservoir on the Rio Grande goes into operation, Mexico agrees to cooperate with the United States in times of drought to supply water for irrigation in the Lower Rio Grande Valley and to that end agrees under certain conditions to release a total of 160,000 acre-feet (not more than 40,000 acre-feet in any one year) from the El Azucar Reservoir, plus such excess water, as in the opinion of the Mexican Section, does not have to be stored. Such water so released by Mexico is to be for the irrigation of lands which were under irrigation in 1943 in the Lower Rio Grande Valley.

Article 27 relates to the transition period on the Colorado River. For five years, or until Davis Dam and the

main Mexican diversion structure are completed, the United States permits Mexico to construct and operate within the United States a diversion structure to take water into the Alamo Canal provided that the construction and operation of this facility shall be approved by the United States Section. Also during this period the United States will make available in the river at such structure water not currently needed in the United States, and the United States will cooperate to satisfy the irrigation requirements of Mexican lands irrigated from the Colorado River in 1943.

Part VII, which is made up of only Article 28, provides that the Treaty "shall continue in force until terminated by another treaty concluded for that purpose by the two governments."

On November 14, 1944, a Protocol was signed for the purpose of clarifying whatever doubt may have existed under Articles 2 and 23 of the Treaty with reference to the jurisdiction of either Section over works located wholly within the interior of a country and used but partly for the fulfillment of Treaty functions. (See Senate Document, Executive H, 78th Congress, 2nd Session.) The Protocol provides that works located wholly within a country and used only partly for the performance of Treaty functions shall be under the jurisdiction and control of the agencies, which now or hereafter may be authorized by domestic law to construct, operate, and maintain such works. These functions or jurisdiction shall be exercised in conformity with the provisions of the Treaty and in cooperation with the respective Sections of the Commission to the end that international obligations may be coordinated and fulfilled. Works constructed or used along the boundary, and those constructed or used exclusively for the discharge of Treaty stipulations, shall be under the jurisdiction of the Commission or of the respective Section in accordance with Treaty provisions.

II.

GENERAL MATTERS AFFECTING ALL STREAMS

1. INTERNATIONAL LAW AND PRECEDENT RELATING TO RIGHTS IN THE WATERS OF INTERNATIONAL STREAMS

In these times of international strife it is somewhat presumptuous to discuss international law. There is no body of precepts universally accepted by all nations as having the force of law. Each nation accepts or rejects for its own guidance particular doctrines which some may call international law.

The number of treaties wherein divisions of water have been made for irrigation purposes is so small that no generalizations can be made therefrom as to guiding principles of international law or comity. Whatever development there has been on this subject has occurred within this century. In the early history of the country, when the waters of the international streams were sufficient for all uses to which they were put, very little attention was paid to how much or how little was diverted by the citizens of the nations affected.

International controversies over the use of such waters may be settled peacefully by treaty or forcibly by war. The established policy of the United States is to settle international disputes by treaty whenever possible. Until this policy is changed, and it is submitted that it never should be changed, it is not fitting to assert arbitrarily that the greater military potential of the United States justifies a denial of any right in Mexico to the use of the waters in the border streams which are produced in the United States.

Accepting then the principle that controversies should be settled peacefully, the query is, what rule should govern. In discussing this matter Kinney in his work on Irrigation and Water Rights says (2nd edition, Volume 3, page 2196):

The usual method, however, in settling these controversies as to the rights of the respective countries in and to the waters of international streams, both with our neighbors on the north and on the south, has been, and, as we hope will long continue to be, by negotiations by those in authority leading up to treaties between the countries. It is against all principles of good morals, equity and justice that there should be an unregulated scramble between the citizens of one nation to appropriate for themselves the greatest possible portion of the waters of international streams to the complete exclusion of the rights in and to those waters of the citizens of the adjoining nation. Each country must concede the rights of the other and of its citizens. These rights can be and should be determined by careful investigation, and should be finally fixed by treaties.

The United States has heretofore on two occasions entered into treaties for the division of water used for irrigation purposes. The first of these concerned the Upper Rio Grande. This stream rises in Colorado, flows across New Mexico, and, from the southern boundary of New Mexico to its mouth in the Gulf of Mexico, forms the boundary between the United States and Mexico. Irrigation in the Juarez Valley in Mexico, lying opposite the El Paso Valley in the United States, commenced many years ago. During the closing years of the nineteenth century a severe drought seriously affected irrigation in the Juarez Valley. Mexico then alleged that the inadequate water supply in the Juarez Valley was the result of irrigation depletions along the Upper Rio Grande in New Mexico and Colorado. Complaints were made by Mexico to the Department of State. An opinion of the Attorney General was requested, and on December 12, 1895, Judson Harmon, the United States Attorney General, rendered an opinion which has since been the subject of much argument. He held that Mexico had no legal right, as a matter of international law, to the continuance of the flow of the Upper Rio Grande for the Juarez Valley, and that the United States had, as a

part of its territorial sovereignty, the supreme right to use the river as it saw fit (21 Ops. Attorney General 274). This pronouncement of the United States Attorney General of what he believed to be the international law applicable to the controversy was not accepted by Mexico and the complaints from that nation continued. A plan was then developed for the construction of the Elephant Butte Dam in New Mexico for conservation of the waters of the Upper Rio Grande, principally to increase the irrigated and irrigable land in the United States, but also to provide a safe yield of water for the existing needs of the Juarez Valley.

In 1906 the two nations signed a Convention for the equitable division of the waters of the Upper Rio Grande (34 Stat. 2493, Treaty Series 455). The preamble recites that it is a Convention "providing for an equitable distribution of the waters of the Rio Grande for irrigation purposes." Article 1 provides that:

After the completion of the proposed storage dam near Engle, New Mexico, and the distributing system auxiliary thereto, and as soon as water shall be available in said system for the purpose the United States shall deliver to Mexico a total of 60,000 acre-feet of water annually, in the bed of the Rio Grande at the point where the head works of the Acequia Madre, known as the Old Mexican Canal, now exists above the City of Juarez, Mexico.

Article 2 sets forth a delivery schedule and provides:

In case, however, of extraordinary drought or serious accident to the irrigation system in the United States, the amount delivered to the Mexican canal shall be diminished in the same proportion as the water delivered to lands under said irrigation system in the United States.

By the terms of Article 3 it is agreed that the delivery shall be made without cost to Mexico and that the United States shall pay the whole cost of storing, conveying, measuring and delivering the water to the head of the Mexican canal.

In Article 4 it is provided that, in consideration of the delivery of the water, Mexico waives claims to the waters of the Rio Grande for any purpose whatever between the Mexican canal and Fort Quitman, Texas, and waives all claims for damages which had been asserted because of diversions by the United States.

This settlement with Mexico over the waters of the Upper Rio Grande constitutes a situation directly comparable to that involving the Colorado River. The waters of the Upper Rio Grande, like the waters of the Colorado, are produced entirely in the United States. The deliveries of water to Mexico under the Convention of 1906 are made possible by the use of storage facilities constructed in, and paid for by, the United States. In making the treaty on the Upper Rio Grande the United States declined to follow the advice of its Attorney General that there was no precept of international law obligating the United States to recognize a right in Mexico to any of the water of the stream. By its action at that time the United States conceded a right in Mexico to an equitable share of waters produced in the United States, and it agreed that facilities constructed in the United States could and should be used in the performance of this country's obligation to deliver water to Mexico. The 1906 Convention was seriously defective in failing to provide for adequate administration. Diversions to the Mexican canal were made at the same point as diversions of water for use in the United States. As a result Mexico was afforded an opportunity to take more than the 60,000 acre-feet of water allotted to it. To remedy the situation it was necessary to put in diversion facilities upstream which would meter out the required amounts to Mexico and permit the United States area to have full use of the remainder of the stream. The experience with the practical operation of the Convention of 1906 makes it clear that the administrative provisions of the pending Treaty are necessary and wise.

The second instance of a treaty made by the United States involving an international stream, the waters of which are used for irrigation, is the treaty between the

United States and Great Britain relating to the boundary waters between the United States and Canada, which was signed March 3, 1909 (36 Stat. 2448, Treaty Series 458). This treaty contained provisions relating to the St. Mary and Milk Rivers, which rise in Montana and flow across the Canadian boundary into Alberta. The St. Mary flows into the Saskatchewan and thence to Lake Winnipeg. The Milk, after flowing about 100 miles in Canada, returns to Montana and then joins the Missouri.

Article 6 of that treaty contains special provisions as to the use for irrigation of the St. Mary and Milk Rivers. It is agreed that the waters are apportioned equally between the two countries but that more than half may be taken from one river and less than half from the other by either country so as to afford a more beneficial use. It is specifically provided that during the irrigation season the United States is entitled to a prior appropriation of 500 second-feet, or so much thereof as constitutes three-fourths of the natural flow of the Milk River, and Canada is entitled to a prior appropriation of 500 second-feet or so much thereof as constitutes three-fourths of the natural flow of the St. Mary River. The treaty created an International Joint Commission with enumerated powers. The Commission has interpreted the treaty as applying only to waters which naturally cross the boundary (see C. J. Chacko, "The International Joint Commission," p. 223). This decision of the Commission sustained the contention of the United States that it did not, by the terms of the treaty, cede any rights in certain tributaries.

Article 5 of the same treaty refers to the diversion of water from the Niagara River for power generation, Canada being permitted to divert for this purpose 36,000 second-feet, and the United States 20,000 second-feet. These disproportionate allocations resulted from the fact that the two nations already had power installations at Niagara Falls of the above aggregate capacity and that Canada had the larger share.

Article 2 provides that each nation retains jurisdiction

over the control and use of water within its territory, it being stated that:

Each of the High Contracting Parties reserves to itself or to the several State Governments on the one side and the Dominion or Provincial Governments on the other as the case may be, subject to any treaty provisions now existing with respect thereto, the exclusive jurisdiction and control over the use and diversion, whether temporary or permanent, of all waters on its own side of the line which in their natural channels would flow across the boundary or into boundary waters.

There appear to be no other treaties for the division of the waters of an international stream to which the United States is a party. Two instances of an expression of national policy, one along the northern boundary and one along the southern boundary, certainly afford some guide to the principles which the United States should follow in dealing with Mexico for the division of the waters of the Lower Rio Grande, Colorado River, and Tijuana River. The United States has twice recognized the right of a downstream nation to receive benefits of the flow of a stream which arises in the United States and in one case has permitted the lower nation to benefit from the storage of water within the United States. No reason exists why the United States should now depart from this practice and adopt different principles to control its course of action.

2. IT IS DESIRABLE TO MAKE AT THIS TIME A
TREATY WITH MEXICO COVERING THE
USE OF THE WATERS OF THE
BORDER STREAMS

A. THE THREATENED INCREASE IN THE AMOUNT OF MEXICAN USES OF COLORADO RIVER WATER CONSTITUTES A SERIOUS DANGER TO PROSPECTIVE WATER DEVELOPMENTS IN THE UNITED STATES.

It is estimated that there are about 1,000,000 acres of land in Mexico which can be irrigated by the use of Colorado

River water. Prior to the construction of Boulder Dam varying amounts to a maximum of 216,000 acres were irrigated by the use of about 1,000,000 acre-feet of water annually.⁹ The operation of Boulder Dam in conserving flood flows and metering out a more or less constant flow of water for the generation of hydro-electric energy has so regulated the stream that it has been possible for Mexico to increase its irrigated acreage and its use of water. The total water uses in Mexico by diversions and pumping during the past five years have been the following:

1940	.....	1,604,255	acre-feet
1941	.....	1,559,059	acre-feet
1942	.....	1,498,667	acre-feet
1943	.....	1,837,138	acre-feet
1944	.....	1,811,000	acre-feet (estimated)

The acreage irrigated in Mexico from the Colorado River for the year 1944 as estimated by the Mexican National Irrigation Commission was 326,900 acres. Because there is a large amount of good delta land which can be irrigated in Mexico, now that the flood menace is controlled by the dams in the United States and the flow of the stream regulated, it is but reasonable to conclude that the use of water in Mexico for irrigation will increase rather than decrease.

Although the major portion of the Mexican diversions are made by use of the Rockwood Heading of the Alamo Canal located in the United States, the mere fact of the location of this diversion point within the United States does not furnish any assurance that the United States, by denying the right to use such diversion point, could prevent the expansion of irrigation in the delta region of Mexico. With a regulated water supply and good land available it is but common sense to conclude that the ingenuity of the engineers will work out some means of diverting the water within Mexico. It is a certainty that

⁹ The delivery of 750,000 acre-feet at the laterals plus an estimated 250,000 acre-feet for main canal losses.

in other regions diversions are made under much more adverse circumstances.

The increase in Mexican water uses will result in the establishment of an economic development which in all probability will receive protection from any arbitration tribunal or international court that might determine a future controversy between the two nations over the division of Colorado River water. Ample precedent for such action is found in our own jurisprudence. The Supreme Court of the United States has announced and consistently followed the rule that existing economic development will be protected and preserved whenever possible (see *Washington v. Oregon*, 297 U. S. 529; *Wyoming v. Colorado*, 259 U. S. 419; *Colorado v. Kansas*, 320 U. S. 383). In the Convention of 1906 relating to the Upper Rio Grande and the Treaty of 1909 relating to the waters along the Canadian border existing uses were recognized and protected. This is a reasonable rule and it can be anticipated with assurance that it will be followed and applied. Consequently the hazard of delaying a definition of the right of Mexico is a real one and cannot be ignored.

Considerable time will necessarily elapse before it is possible for the United States to reach a stage of ultimate development in the Colorado River Basin. Of the 7,500,000 acre-feet allotted to the Upper Basin it is estimated that present stream depletion amounts to 2,129,000 acre-feet annually. In the Lower Basin the Compact by paragraphs III (a) and (b) allots 8,500,000 acre-feet per annum and present effective stream depletion is about 4,497,100 acre-feet per annum. During the five-year period, 1939 to 1943 inclusive, the releases from Boulder Dam for power generation averaged about 12,000,000 acre-feet a year, and the average flow of the stream past the Yuma gauging station was 8,300,000 acre-feet a year. During the same period diversions through the Los Angeles aqueduct, which is designed to carry 1,100,000 acre-feet a year, amounted to only an average of 78,300 acre-feet. Thus it is apparent that enormous amounts of water are now passing, and for many years in the future will continue to pass, into Mexico. Un-

less the treaty is ratified there is a possibility that a race may start between the United States and Mexico to see which can first put the greatest amount of water to use. There is no reason to expect that the United States would be the winner in such a race. In Mexico there is a large area of flat and fertile delta land which can be irrigated with comparative ease. Hence, it is a rather simple matter for Mexico to increase its irrigated acreage. In the United States the beneficial use of Colorado River water requires the construction of dams, tunnels, and aqueducts. These are costly and require years for their building. The difference in the physical situation is such that Mexico can enlarge its uses of Colorado River water much more easily and quickly than can the United States. It is important not to lose sight of this physical situation.

The Colorado River Compact requires that any water necessary to satisfy a right recognized in Mexico must come first out of surplus¹⁰ and then one-half out of the share of each basin. If the surplus should be deficient then obviously the amounts of water available to each basin will be reduced.

B. THE THREATENED INCREASE IN THE AMOUNT OF MEXICAN USES OF RIO GRANDE WATER CONSTITUTES A SERIOUS DANGER TO PROSPECTIVE WATER DEVELOPMENTS IN THE UNITED STATES.

The situation along the Rio Grande is not entirely comparable to that along the Colorado River. Nevertheless conditions on that stream indicate the importance of an agreement between the two countries for the utilization of its flow. The Rio Grande forms the international boundary for over 1,200 miles. In its lower reaches there are presently uncontrollable floods which waste some 4,000,000 acre-feet of water annually into the Gulf of Mexico. The construction of dams is not possible without agreement between the two nations because the river is the boundary.

¹⁰ As defined by Article III (c) of the Colorado River Compact, surplus is water over and above the aggregate of the quantities specified in paragraphs III (a) and III (b).

It is without argument a matter of tremendous importance to each nation to have dams constructed both to conserve water and to prevent flood damage.

Along the lower Rio Grande the major contributions come from the Mexican side. There is a possibility of Mexico constructing works for such utilization of the flow of these tributaries that the flows available for use in the United States will be substantially depleted. Patently it is advantageous to the United States to make a treaty now to recognize a right in the United States to a portion of the flow of these tributaries.

C. THERE IS NO REASONABLE BASIS FOR ANTICIPATION THAT A MORE ADVANTAGEOUS TREATY CAN BE MADE WITH MEXICO AT SOME FUTURE DATE.

The only reason for postponing a definition of the rights of the two countries in the use of the waters of the border streams is that at some future date it may be possible to consummate an arrangement more satisfactory to the United States. Surely every thinking person will agree that unless there is a real and substantial advantage to be gained by delay the definition of the rights of the two nations should be made now so that there will be a firm basis for future development.

The United States is most definitely committed to the policy of the settlement of international controversies in an orderly and peaceful method without necessity for resort to the arbitrament of war. Unless such a policy is to be discarded the United States cannot disdainfully point to its greater military potential as a reason for not treating with Mexico. Since this international controversy must be settled peacefully it is well to appraise the future situation to determine if there is any likelihood of such a change of conditions that would justify a reduction in the Mexican share if Treaty negotiations were postponed.

If there are any such reasons they have not as yet been made apparent. In fact the evidence is all to the contrary. A delay will give Mexico an opportunity to increase

its water diversions. Certainly no one can expect that Mexico will relinquish its right to any amount of water which it has placed to a beneficial use. Indeed it would seem that the only reason for delay rests upon the theory that the United States will change its foreign policy. Such a thought is not tenable.

3. THE TREATY PROVISIONS RELATIVE TO NAVIGATION

By the Treaty of Guadalupe-Hidalgo (9 Stat. 948), the Gadsden Treaty (10 Stat. 1034) and the Boundary Convention of 1886 (Treaties and Conventions 1889, p. 721), there are provisions concerning the protection and jurisdiction of navigation. It has been urged that such Treaty provisions will prevent the construction by Mexico of the necessary diversion structures to permit her to utilize the flows of the Colorado River for irrigation of additional land and hence there is no reason to fear future expansion of irrigation in Mexico. This is a specious and unfair argument. Navigation on the Colorado has never been practicable except during flood periods. The United States by the construction of Boulder Dam and by the diversions for the Imperial Irrigation District has cut off these peak flood flows and thereby substantially impaired all possibility of navigation. Having done so, it is in no position to ask now for the strict enforcement of the Treaty provisions relative to navigation.

Attention is directed to Article IV (a) of the Colorado River Compact, which expressly states that the Colorado River has ceased to be navigable for commerce. In view of this express provision of the Compact it would seem utterly illogical for the United States now to raise any objection of the impairment of navigable capacity by the construction by Mexico of a channel dam. This would be stretching the fiction of navigability to the breaking point.

It goes without saying that, if the United States is required to pass below the border sufficient water to maintain the navigability capacity of the stream, the amount

of water available for domestic and irrigation uses in the Lower Basin will be greatly reduced and the effect will be the same as if the water is permitted to flow to Mexico for beneficial consumptive use. Under the circumstances the United States may not consistently require the strict observance by Mexico of the Treaty provisions relative to navigation.

4. IF THE MATTER OF THE UTILIZATION OF THE
WATERS OF THE BORDER STREAMS IS NOT
DETERMINED BY TREATY, IT WILL BE
SUBJECT TO ARBITRATION UNDER
THE PROVISIONS OF THE 1929 PAN
AMERICAN ARBITRATION
TREATY

A. INTRODUCTORY STATEMENT

Discussions as to the desirability of ratification of the proposed Treaty with Mexico by the United States invariably involve consideration of the applicability and effect of the 1929 Pan American Arbitration Treaty. Those who favor ratification of the Treaty insist that the Arbitration Treaty is applicable to the existing disputes between the two nations relative to the utilization of the waters of the border streams, and that the terms of the proposed Treaty are more favorable to the United States than can be reasonably expected from any arbitration. Those opposed to the Treaty deny the applicability of the Arbitration Treaty to such disputes as those arising from the use of the waters of the streams flowing between and along the boundaries of the two countries.

The Arbitration Treaty was in large measure the result of a prolonged and insistent effort on the part of the United States to establish a basis for settlement of disputes between the Pan American nations by means of obligatory arbitration rather than by war. The Treaty was ratified by the United States, Mexico and eighteen other Pan American nations.

The pertinent provisions of the Arbitration Treaty appear elsewhere in this brief and will not be repeated here.

B. POINTS RAISED BY THOSE ASSERTING THAT THE ARBITRATION TREATY AFFORDS NO BASIS FOR GIVING SUPPORT TO THE PROPOSED TREATY, RELATING TO THE USE OF THE WATERS OF THE BORDER STREAMS.

Those opposing ratification of the Treaty now before the Senate make the following contentions to sustain their argument that the United States need not fear the loss of Colorado River water if Mexico appeals for arbitration under the 1929 Treaty:

1. The Arbitration Treaty, by its own terms, so limits the class of controversies covered by it that little of substance on the Colorado River of benefit to Mexico could be taken before an Arbitration Board;

2. The class of controversies which the United States must submit to arbitration is further restricted by the Mexican reservation in the Treaty of 1929;

3. Control of the specific issues to be submitted in each case to the Board of Arbitrators is retained by the United States Senate under its reservation to the Treaty of 1929;

4. The physical factors surrounding the Colorado River make it impossible for Mexico to get any advantage from arbitration under existing Treaty and international law.

Examination of the arguments made and conclusions reached on each of these points, rather than dispelling the fear of arbitration, must convince every reasonable person that the wise procedure for the United States to follow is ratification of the proposed water Treaty with Mexico and not arbitration at some future date.

C. THE TERMS OF THE ARBITRATION TREATY COVER THE EXISTING CONTROVERSIES OVER THE WATERS OF THE BORDER STREAMS.

The first point raised by the opponents to the Treaty is that a controversy such as that existing over the use of the water of the Colorado River would not be subject to arbitration under the 1929 Treaty. This argument is based

upon the exemption contained in Article 2, excluding from arbitration those controversies which are within the domestic jurisdiction of the parties and not controlled by international law. It is argued that the term "domestic jurisdiction" is used to include "all internal jurisdiction of the nation, judicial, legislative, and executive, or administrative," and it is pointed out that the use of, and the right to benefit from, such structures and facilities as Boulder Dam, Imperial Dam, and All-American Canal, are subject to control by courts of the United States. In other words, it is urged that these are matters within the domestic jurisdiction of the United States and are not controlled by international law. In support of this argument reference is made to the alleged interpretation placed upon the Treaty by Mexico at the time of expropriation of the Mexican oil lands and upon the heretofore mentioned opinion of Judson Harmon (21 Ops. Atty. Gen. 274).

With reference to the first of the alleged supporting arguments, that is, the asserted interpretation of the Treaty by Mexico at the time of the expropriation of the oil lands, it is apparent that those advancing such argument do not understand the situation which then existed. The question of the expropriation of the oil lands was a dispute between private American interests and Mexico. The legality of the expropriation was the subject of litigation in the Mexican courts and had not been finally determined by such courts so as to constitute *res judicata* within the purview of the Mexican reservation. Consequently, under the plain terms of the Treaty and the Mexican reservation, the dispute had not reached the stage where arbitration would apply. It is noteworthy that, while the controversy was being litigated in Mexican courts the matter was settled by agreement. The existing controversy, which the proposed Treaty seeks to terminate, is between the two sovereign nations. Such a question is of a different character and stands on a different plane from a disagreement with a sovereign nation on one hand and a private interest on the other hand.

The second argument made by the opponents to the

Treaty in connection with their contention that the existing controversy is not subject to arbitration is based upon the so-called Harmon Opinion. This opinion was rendered by Mr. Harmon, as the Attorney General of the United States, at the time of the discussion between the United States and Mexico over the use of the waters of the upper Rio Grande. Mr. Harmon's conclusion was that in a difference between two sovereign nations over the use of the waters of an international stream, the upstream nation is under no obligation, by reason of any international law, to deliver any amount of water to the lower nation. In other words, the upper nation could use and dispose of all water flowing within its borders as it saw fit. It is an apt comment that in rendering this opinion, Mr. Harmon was giving advice to his client, the United States, to guide it in negotiations for the settlement of an existing controversy with Mexico. An expression of an opinion by the chief law officer of a sovereign nation does not of itself create a principle of international law. This is adequately shown by the fact that the United States did not follow the advice of Mr. Harmon but did resolve its then difference with Mexico by the Convention of 1906, under the terms of which Mexico was recognized to have the right to receive a certain amount of water each year.

Moreover, in dealings with Canada, relative to the Milk, St. Mary, and Niagara Rivers, the United States did not follow the principle set forth in the Harmon Opinion, but recognized the right of each country to an equitable share of the use of the waters of these international streams.

In addition, the Supreme Court of the United States has expressly repudiated the Harmon Opinion in controversies between states over the use of waters of interstate streams. Colorado has urged the principle of the Harmon Opinion in litigation with Wyoming over the Laramie River and in litigation with Kansas over the Arkansas River. In each instance the court has rejected such contention and has ruled that each state is entitled to receive an equitable apportionment of the benefits arising from

the flow of interstate streams (See *Kansas v. Colorado*, 206 U. S. 46; *Wyoming v. Colorado*, 251 U. S. 419).

One further comment should be made in connection with the contention that the existing controversy with Mexico over the use of Colorado River water is within the domestic jurisdiction of the United States. Those asserting this argument are careful to avoid any statement as to the tribunal of the United States from which Mexico could obtain relief. It is too plain to require argument that an international dispute of this nature cannot be finally determined in the courts of either party any more than differences between sister states of our Federal Union can be conclusively determined by a decision of the courts of one of those states (See *Hinderlider v. La Plata River and Cherry Creek Ditch Co.*, 304 U. S. 92, 110).

Those objecting to the proposed Treaty make much of the assertion that there is no rule of international law under which one nation is entitled to use the property and facilities of another nation located wholly within the territory of that other nation. This statement loses sight of the point here involved. Mexico is demanding water. This whole difference centers around the amount of water to which Mexico is entitled. Any advantage or benefit which may accrue to either nation by reason of constructed facilities is a mere incident. Common sense dictates that the United States make use of all facilities which are available to minimize its obligation. This does not mean that Mexico obtains any title or preferential right to the use of any facilities, constructed or to be constructed.

D. THE MEXICAN RESERVATION TO THE ARBITRATION TREATY DOES NOT MAKE THIS CONTROVERSY JUSTICIABLE IN THE COURTS OF THE UNITED STATES.

Those opposing ratification of the Treaty state that the Mexican reservation which has been referred to above excepts from arbitration cases "under the jurisdiction of the courts" and, therefore, further enlarges the scope of the cases which are not arbitrable under Article 2 (a).

This is but another method of stating the argument which has already been considered. It must be agreed that private rights and the rights of states to water of the Colorado River are within the jurisdiction of courts of the United States, so long as they concern disputes arising within the territorial limits of the United States; but this does not mean that controversies between two sovereign nations can be finally and conclusively determined in the courts of either nation. Here, again, the Treaty opponents designate no tribunal to which Mexico could go for a judicial determination of rights; and, indeed, it would seem rather elementary that Mexico would never accede to any decision of a United States court on the matter of the apportionment of Colorado River water between Mexico and the United States.

E. THE UNITED STATES RESERVATION TO THE ARBITRATION TREATY CANNOT BE RELIED UPON AS A RELEASE FROM THE OBLIGATION TO ARBITRATE.

The United States in ratifying the Arbitration Treaty made a reservation to the effect that the special agreement referred to in Article 4 should be made *only* by the President and then *only* by and with the advice and consent of the Senate, provided two-thirds of the Senators present concur. It is insisted that under this reservation the United States could nullify the treaty by refusing to make the special agreement. In support of such position, references are made to statements made during the Senate debate at the time of the ratification of the Arbitration Treaty. A full reading of the Congressional Record reveals that the Senators realized that there would be, in any event, an obligation to arbitrate, and that the United States could not avoid or evade such obligation by a refusal to make the requisite special agreement.

Those opposing the Treaty contend with vigor that no special agreement made by the President of the United States with the advice and consent of two-thirds of the Senate would submit to arbitration any questions which

would involve Mexico's right to use, or share in the benefits of, water conservation and water utilization works located wholly within the United States. As a supporting reason, it is said that the submission of any such question to arbitration would be tantamount to the creation of an easement upon property within the United States in favor of a foreign country in violation of the supreme and exclusive sovereignty of the United States within its borders.

Here again the opponents to the Treaty confuse the question of the right of Mexico to water with the question of the ownership and control of water-use facilities in the United States. Mexico is demanding water. The proposed Treaty is concerned with the allocation of specific amounts of water to Mexico. Surely, no one would argue that in supplying Mexico with water full use should not be made of facilities existing in the United States in order that thereby the burden upon the United States be minimized. To utilize these facilities for this purpose is not to grant an easement. The sovereignty of the United States remains exclusive and supreme. The objectors can point to no provision of the proposed Treaty which gives to Mexico any power to control any water-use facilities located within the territorial boundaries of the United States.

F. A CONSIDERATION OF THE COLORADO RIVER SITUATION, INCLUDING ALL ITS PHYSICAL FACTORS, REQUIRES THE CONCLUSION THAT MEXICO WOULD RECEIVE GREATER AMOUNTS OF WATER THROUGH ARBITRATION THAN IT WOULD RECEIVE UNDER THE PROPOSED TREATY.

Those opposing the Treaty deprecate the fear of arbitration by emphasizing the physical conditions which are claimed to restrict possibilities of the use of Colorado River water in Mexico. Their basic argument is that Mexico is dependent on the works located within the United States and owned entirely by American interests; hence, they say, the fear that Mexico may expand her acreage under irrigation without the consent and the cooperation of the United States is without foundation.

In making their argument on this point, those objecting to the proposed Treaty ignore the fact that the facilities constructed in the United States do so change the regimen of the stream as to enable Mexico to divert more water and irrigate more land. The situation as existing at the present, and as it will exist for many years, is that water is released from Boulder Dam for generation of power in accordance with a more-or-less regular schedule. Such releases far exceed the amount of water which is now being used for irrigation and domestic purposes by the Lower Basin. Until additional works are constructed in the United States to utilize such releases the waters will pass on into Mexico. This fact must not be ignored.

To accept the argument of the opponents to the Treaty is to say that an Arbitration Board would make an award having the effect of curtailing Mexico uses, and, thereby, destroying existing economic development and the civilization based thereon. It is believed that no thinking person can accept such a conclusion. The United States Supreme Court in many interstate controversies over water has uniformly and repeatedly adhered to the principle that existing economic development will be preserved and protected whenever possible (See *Colorado v. Kansas*, 320 U. S. 383; *Washington v. Oregon*, 297 U. S. 517; *Wyoming v. Colorado*, 259 U. S. 419; *Wisconsin v. Illinois*, 278 U. S. 367; *Missouri v. Illinois*, 200 U. S. 496; *New York v. New Jersey*, 249 U. S. 202).

It seems only reasonable to anticipate that a Board of Arbitration would be as sympathetic to the protection of existing economic development as has been the Supreme Court of the United States.

It has also been suggested that Mexico would not construct a dam within its territory because such a dam would have the effect of backing up water into territory of the United States, and it is asserted that Mexico has no right to do this for the reason that no nation may use its property to cause injury to the property of another nation. Conceding that the United States would have just cause of complaint if Mexico, by the construction of a dam within

its country, flooded areas in the United States, nevertheless, it seems clear that the reason assigned applies to the United States as well as to Mexico. For the United States to cut off all Colorado River water from Mexico would be just as much an injury to Mexico as the flooding of the lands would be an injury to the United States. In other words, the very reason which the objectors to the Treaty urge is a most persuasive reason for a prompt, fair, and ment of Colorado River water between Mexico and the United States.

5. THE EFFECT OF THE DIVISION OF WATER MADE BY THE TREATY

The Treaty, by defining the rights of the two nations, has the effect of determining the share of each, upon which the domestic laws of the particular nation will apply for purposes of administration and water distribution. The Treaty does not in and of itself have any application to the administration within the interior of either country of the water which is within the share of that country. The Treaty does not repeal, amend, or modify any local law of Mexico, of the United States, or of any state of the United States. These, and the rights and contracts depending upon them for validity, remain in full force and effect. The only thing that is done is to make certain the amount of stream flow that is subject to the applicability of these local laws. Without the Treaty there can be no certainty as to how much water is available in each nation for distribution among its water users under local law. The removal of that uncertainty provides a firm basis for evaluating rights under the domestic law of each country.

The Treaty does not of itself deprive any United States water user of water for his right. It is impossible to acquire by proceedings under the domestic law of the United States a right to any water which in fact belongs to Mexico. If the rule were otherwise, it would be possible to prevent the fulfillment of an international treaty dividing the waters of the stream by the acquirement of rights under the law of the upstream nation to the complete flow of the stream.

The situation is comparable to that involved in the division of the flow of interstate streams between states of our Union. It is well established that each state is entitled to an equitable apportionment of the benefits arising from the flow of an interstate stream. Such apportionment may be made either by interstate compact with the consent of the Congress or by decision of the United States Supreme Court.¹¹ When such division is made by either method, then the laws of each state apply to administer the use and distribution of the flow determined to be within the share of that state. This point was decided by the United States Supreme Court in the case of *Hinderlider v. La Plata, etc.*, 304 U. S. 92, wherein that court considered the application and effect of a compact between Colorado and New Mexico apportioning waters of the La Plata River. At a time of low water the Colorado officials, as permitted by the compact, entered into an agreement with the New Mexico officials for rotation of the entire stream flow between the two states for specified periods. A Colorado ditch company demanded water when there was sufficient flow in the stream to satisfy its right except for the Compact and the rotation agreement between the two state engineers. Upon rejection of its demand it brought a suit which ultimately came before the Supreme Court of the United States. The question for determination was whether or not the Colorado ditch company had a vested right under Colorado law to this water which would entitle it to enforce recognition of the right by the Colorado water administration officials. The court held against the ditch company and sustained the water officials in their actions. The decision said that the ditch company could acquire under Colorado law no right to water which by the terms of the Compact came within the share of New Mexico. It was held that the effect of the Compact was to divide the flow of the stream and that after such division was made the local law of each state applied to administer its share.

¹¹ *Kansas v. Colorado*, 206 U. S. 46; *Wyoming v. Colorado*, 259 U. S. 419; *Connecticut v. Massachusetts*, 282 U. S. 660; *New Jersey v. New York*, 283 U. S. 336.

The principles of the La Plata River case are directly applicable to the situation presented by the pending Mexican Treaty. If the flow of the stream is so deficient that any United States user will be deprived of water to satisfy the Mexican right, that result will be brought about solely by an infirmity of his right. That is, it will result from the application of domestic law upon rights acquired under domestic law to the use of the United States share of the flow of the stream.

The relationship between water allotted to Mexico by Treaty and the apportionment made by the Colorado River Compact is fixed by that Compact. Article III (c) thereof provides that water necessary to supply a right recognized in Mexico shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs III (a) and III (b) of the Compact and if such surplus is insufficient then the deficiency shall be borne equally by the Upper and Lower Basins. In other words, the Compact specifically provides that water necessary to supply the Mexican right shall be satisfied out of surplus before any rights in the United States are served from the surplus, and if the surplus does not furnish enough water for Mexico then each basin makes up half of the needed amount. This position of the Mexican right in relation to rights in the United States was fixed by voluntary agreement of the Colorado River Basin states, not by the pending Treaty.

6. THE TREATY DOES NOT INFRINGE UPON THE RIGHTS OF ANY STATE

The Treaty contains nothing which has the purpose or effect of nationalizing any portion of the affected streams or their tributaries located within the interior of the United States. As to all these, state and federal laws will continue to apply in the same manner, to the same extent, and to the same effect as in the past.

The Treaty by the fifth paragraph of Article 2 specifically defines the jurisdiction of the International Boundary

and Water Commission as extending only to the limitrophe parts of the streams, the land boundary, and the works located upon the common boundary. The Commission as such has no jurisdiction whatsoever within the interior of either country.

The United States Section of the Commission has jurisdiction and control only over works located wholly within the territorial limits of the United States and used exclusively in the fulfillment of the provisions of the Treaty. The Protocol, signed on November 14, 1944,¹² specifically provides that works situated wholly within the interior of this nation and used only partly for the performance of Treaty functions, shall remain under the control of the agencies now or hereafter authorized by law to construct, operate, and maintain those works. This means that upon the Colorado River the Colorado River Compact, the Boulder Canyon Project Act, the California Self-Limitation Statute, the Boulder Canyon Project Adjustment Act, and the contracts of the Secretary of the Interior for the use of water impounded by Boulder Dam, all remain in full force and effect, and the relative rights of all water users remain unchanged. The only thing which the Treaty does is, by making certain the amount of water which must be passed to Mexico, to determine the stream flows which are available for use in accordance with the domestic law of the United States.

On the Rio Grande attention is directed to the fact that the Treaty contains no guarantee that the United States will supply any certain quantity of water into the main stream from the tributaries rising in the United States. These tributary waters may be utilized on United States lands in accordance with local law. One of the tributaries, the Pecos, is an interstate stream flowing in both New Mexico and Texas. Development in New Mexico may proceed under the law of that state and in Texas under the law of Texas. So far as the apportionment of the stream-flow between the two states is concerned, that may be made

¹² Senate Document Executive H, 78th Congress, 2nd Session.

by an interstate compact if the two states can agree upon terms.

Existing diversions from the main Rio Grande are permitted. By Article 5 the two governments agree to construct dams "to ensure the continuance of existing uses and the development of the greatest number of feasible projects." Article 9 of the Treaty requires that new diversions which are projected after the effective date of the Treaty shall not be made until the Section of the Commission in whose country the diversion or use is proposed has made a finding that the water necessary for such diversion or use is available from the share of that country. This does not mean that the United States Section determines the places in Texas where the water is to be used or the amount of water to be used in any particular locality. All it does is to pass on the question of whether the water is actually there and is within the allocated share of the United States. This is a matter of precise and instant determination and nothing is left to discretion. It is for the Texas authorities under the Texas laws to determine who is entitled to the use of this water, where it is to be used, and in what quantities. The Texas legislature has plenary power to deal with these matters as it may see fit. Thus the Treaty has no effect upon the use of the waters in Texas except to ensure existing uses and to protect them from the danger of floods and from the uncertainties attendant upon uncontrolled diversions in Mexico.

7. THE ADMINISTRATIVE PROVISIONS OF THE TREATY

The purpose of the Treaty is to define the share of each nation and to provide a means of assuring each nation that the amounts of water within its share are made available for use. It is obvious that to accomplish this purpose some method of administration must be established. Reliance cannot be placed upon nature to distribute these waters in accordance with Treaty provisions.

Since the Rio Grande is the international boundary for 1,200 miles and the Colorado for 20 miles, some method

of joint administration must be provided for these stream sections and the works which are located thereon. Under the terms of the proposed Treaty the United States is obligated to deliver to Mexico Colorado River water which has its source in the United States. Mexico is obligated to deliver to the United States Rio Grande water which has its source in Mexico. Some national agency must be established in each country to assure fulfillment of the Treaty obligations. The pattern for an administrative set-up to handle such matters was established by the Convention of 1889 between the United States and Mexico creating the International Boundary Commission, which is made up of a United States Section and a Mexican Section, at the head of each of which is an engineer Commissioner. The International Commission is charged with the responsibility of handling border matters which require joint action. Each Section operates within the interior of its country to carry out Treaty provisions. This International Commission, with its two Sections, has served to the satisfaction of each nation. Among other things it has administered the Convention of 1906 apportioning the waters of the Upper Rio Grande. It was but wise and natural that those negotiating the pending Treaty should adopt this time-tested method of administration. The name of the Commission is changed to the International Boundary and Water Commission and the powers and duties of the Commission, and of the two Sections, are enlarged to permit the effective enforcement of Treaty provisions.

It is necessary to differentiate between the jurisdiction and powers of the International Commission and the jurisdiction and powers of the United States Section. The Commission is entirely a creature of Treaty. The powers of each Section may be amplified by national legislation as has been done in the past. The Commission has no general powers. It has only those powers that are specifically delegated to it. The United States Commissioner receives and holds his office in accordance with the laws of the United States. The same is true of each member of the United States Section.

The fifth paragraph of Article 2 of the Treaty specifically defines the jurisdiction of the Commission as extending only to the limitrophe parts of the streams, the land boundary, and the works located upon the common boundary. The Commission as such has no jurisdiction whatsoever within the interior of either country. The works which fall within the jurisdiction of the Commission are enumerated in the Treaty.

Each Section has jurisdiction over works constructed, acquired or used *exclusively* in fulfillment of the provisions of the Treaty and located wholly within the territorial limits of its country. Works located within either country and used only partly for the performance of Treaty provisions remain under the jurisdiction and control of the agencies of that country now or hereafter authorized by domestic law to construct, operate, and maintain such works. Whatever doubt there may have been on this point because of the wording of Articles 2 and 23 of the Treaty was clarified by the Protocol signed on November 14, 1944.

The Commission and each Section are given power to investigate, plan, recommend and construct works necessary for Treaty performance, but on all international or joint works approval of the two governments is required and before there may be any construction requiring expenditures by the United States appropriations must be obtained from Congress. Decisions of the Commission are subject to the veto power which may be exercised by either of the two governments. The Commission is authorized to settle differences arising between the two governments with respect to the interpretation or application of the Treaty, but here again its decisions are by Article 25 subject to the approval or disapproval of each of the two governments.

Such being the background of the Treaty and the general situation with regard to the composition and jurisdiction of the administrative agencies created to enforce it, let us examine the charges made by those who condemn its administrative provisions. It is said that there is no legislative control. All funds to maintain the United States

Commissioner and the United States Section must be furnished by Congress. All funds for the investigation, planning, construction, operation and maintenance of works, to the extent that by the Treaty the United States is required to contribute for such purposes, must be obtained from the Congress. If the Congress fails to approve the projects for which such funds are required, all it has to do is to deny the requested appropriation.

Those condemning the Treaty assert that there is no provision for judicial review. In analyzing this charge it is necessary to differentiate between decisions and actions of the Commission as an international body and decisions and actions of the United States Section as a national agency. Assuredly there is no judicial tribunal, national or international, which has jurisdiction over the decisions and acts of the International Commission as such. There is no international tribunal set up for the settlement of controversies between nations. Likewise it is elementary that the courts of one nation cannot decide an international controversy so as to bind another nation. Thus it is true that there is no judicial method of review of the acts and decisions of the Commission as an international agency within its defined jurisdiction. The control over these is confined to the veto power given by Article 25 to the two governments. However, this does not mean that the Commission may determine controversies involving private rights within the interior of either country. By the express terms of the Treaty the jurisdiction of the Commission is confined to the International Boundary. Since the Commission has no power to determine private rights within the interior of either country, there is obviously no reason for a judicial review of its acts by the courts of either country. It goes without saying that if the Commission, or either Commissioner, exceeds the jurisdiction given by the Treaty, appropriate relief could be obtained from the courts just as in a case of any officer or any Commission which exceeds its jurisdiction. It cannot be presumed that the Commission or either Commissioner will exceed authority.

Considering next the United States Section and the charge that there is no method for the judicial review of its acts, attention is first directed to the fact that the Treaty expressly requires that all property located within the interior of a country and needed for the fulfillment of Treaty provisions must be acquired in conformity with the laws of that country. Thus, the usual constitutional and statutory safeguards will apply. Nowhere in the Treaty is the United States Section given any power to determine any disputes over private water rights in the United States. Since such power is not given there is no necessity to provide for judicial review. Acts in excess of jurisdiction by the United States Section, or any member thereof, would be subject to court control. Until the ingenuity of those opposing the Treaty can produce at least one hypothetical case which under the terms of the Treaty may be settled by the United States Section, it is impossible to say more in regard to the question of judicial review of acts of the United States Section.

It is highly important to bear in mind the fact that the International Commission, the United States Commissioner, and the United States Section, have no powers whatsoever over the administration within the interior of the United States of stream flow within the defined share of the United States. This is a matter which is handled under domestic law by the domestic agencies which are now or may hereafter be created by state or federal law for this purpose.

Summarizing, executive control is afforded by the supervisory authority of the Department of State. Legislative control is provided by Congressional authority over the granting of necessary funds and by the retention of jurisdiction of local authorities over the distribution of the defined share of the United States. Judicial control over acts of the International Commission within its granted authority is impossible because of the non-existence of an appropriate international tribunal. Acts of the United States Commissioner and the United States Section in excess of jurisdiction are reviewable and controll-

able by the courts. Vested property rights can be condemned only in the usual manner. Water rights within the interior of the United States remain under the jurisdiction of the local authorities whose actions are subject to the customary judicial controls.

8. TREATY PROVISIONS RELATIVE TO ELECTRICAL POWER GENERATION

Provision is made for the generation of hydro-electric power at the international storage dams on the Rio Grande (see Article 7). The Commission is required to study this problem, prepare plans, and report to the two governments. It is stated that "each government agrees to construct, through its Section of the Commission, such works as may be recommended by the Commission and approved by the two governments." Each government pays half of the cost of the construction, operation, and maintenance, and shall be entitled to receive the generated power in the same proportion.

The Treaty contains no provision for the regulation, disposal, and distribution of electrical energy. In the United States, the Congress has the undoubted right to provide by appropriate legislation for the method to be used in disposing and distributing the power which may be generated at the international dams and which comes within the share of the United States. Congress can permit the Bureau of Reclamation to handle the distribution of this power, as is done in connection with a great number of water projects, or it can give control to some other federal agency.

Article 19 permits the exportation of electric current from one country to the other. This is to the advantage of the United States since the market for electrical power on the United States side of the Rio Grande is at this time greater than it is on the Mexican side. In other words, the probabilities are that whatever exportation occurs will be from Mexico to the United States and will enhance the

possibilities of cheap power for areas of the United States which may receive power from such sources.

The Treaty contains absolutely no provision for the generation of electric power along the Colorado River. The existing plants along that stream in the United States will continue to function as they have in the past and power will be generated and distributed in accordance with the domestic law of the United States. While Article 14 provides for a possible credit to Mexico from the revenues of power generation at Pilot Knob, there is absolutely nothing which binds the United States to construct this plant, and since it is wholly located within the United States its operation would be entirely under the control of the laws of the United States.

9. PERPETUAL DURATION OF THE TREATY

Article 28 of the Treaty provides that it shall continue in force until terminated by another treaty. This has been urged as a serious objection to the Treaty. The argument can have appeal to only those who are unfamiliar with the situation.

Any provision for the termination of the Treaty must be mutual. The United States cannot expect to have a treaty with another sovereign nation covering a subject such as this which would be terminable at the option of the United States alone. It is most certain that the United States would never ratify this Treaty if Mexico could nullify it at will, and it must be recognized that Mexico would never ratify the Treaty if the United States at its sole discretion could elect to be no longer bound thereby.

The whole purpose of the Treaty is to set at rest once and for all the conflicting claims of the two countries in respect of the waters of the boundary streams. This can be done only by a permanent agreement. No good purpose whatsoever would be served by a temporary arrangement. Take, for example, the situation along the Colorado River. The threat of an undefined Mexican right has long hung over any development dependent upon the use of

Colorado River water. That threat would continue if the Treaty were of such a nature that Mexico upon its own volition could reopen the subject for future determination. As the upstream country, the United States requires for its protection a precise definition of the Mexican right for all time.

It is reasonable to expect that with regulated stream flows Mexico uses will increase rather than decrease. A determination of the Mexican right five, ten, twenty, or more years from now will in all probability require a recognition and protection of an economic development in Mexico based upon the use of a regulated stream flow in amounts in excess of the current diversions. To even the most gullible, it should be plain that there is no advantage to the United States in having a temporary definition of the Mexican right when every probability is that for the next several decades the Mexican use is bound to increase.

The 1906 Convention between the United States and Mexico, providing for the equitable distribution of the water of the Upper Rio Grande, is perpetual. Affected water users in the United States have a full recognition of the advantage which they have derived therefrom. No risk is involved in the assertion that with the passage of time the United States will derive a similar advantage from the division of the waters of the Lower Rio Grande and of the Colorado River in perpetuity by the pending Treaty.

The division of the waters of the streams on a perpetual basis has strong supporting precedent. This is true of many interstate compacts, as for example, the Colorado River Compact, the La Plata River Compact, the South Platte Compact, and the Republican River Compact. These are all subject to change only by mutual consent of the compacting states. The principle is recognized that to protect both existing and future developments water apportionment must be made on a permanent basis.

It is, of course, apparent that since the water apportionment is on a perpetual basis, the administrative agency set up to effectuate apportionment must be upon the same

basis. There will always be the need for some agency to administer the operation of the international works and effect deliveries of water. Precedence for the formation of such a Commission exists both in international treaties and in interstate compacts. Among such treaties may be mentioned the 1915 Treaty between Great Britain and Italy relative to the River Juba; the treaties between France and Spain relating to boundary waters; the treaty between France and Italy affecting the River Roya; the treaty between Spain and Portugal relating to the River Duro; the Central Commission of the Rhine, set up in 1815; and the European Commission of the lower Danube, set up in 1856. Among the interstate compacts which operate in perpetuity and which provide for commission administration are the Rio Grande Compact (53 Stat. 785); the Red River Compact (52 Stat. 150); and the Tri-State Compact (49 Stat. 932).

A permanent treaty administered by a permanent commission is neither new nor untried. The substantive provisions of the Treaty being sound and equitable, and the method of administration being adequate and proper, there can be no fears based upon the permanency of these provisions.

10. FACILITIES USED IN THE DISCHARGE OF
TREATY FUNCTIONS MUST BE OWNED
AND OPERATED BY THE CENTRAL
GOVERNMENT

The obligation of Treaty performance lies with the responsible national government of each country. The two nations deal with each other as sovereigns. The responsibility being that of a sovereign, the sovereign must control the means of performing. This fundamental proposition is recognized by Article 23 whereby the two governments, asserting the public interest attached to the works required for Treaty performance, agree to acquire in accordance with their domestic laws private property required for the construction, operation, and maintenance of works neces-

sary to Treaty fulfillment and to retain direct ownership, control, and jurisdiction of all real property that may be necessary for the construction, operation, or maintenance of all works constructed, acquired, or used pursuant to this Treaty.

The practical effect of this is that water delivery obligations may not be satisfied by using facilities which are under the control of private interests or any municipal or quasi-municipal corporation or any state. The United States would not make a treaty with Mexico if its enforcement depended upon any agency other than the national government itself. It is but reasonable to recognize a similar attitude on the part of Mexico. Consequently, it is impossible to have the performance of the Treaty dependent upon water deliveries made by any subordinate state, corporation, or agency such as the Imperial District in California. A failure or refusal to recognize this fundamental point has been the cause of some opposition to the Treaty. The Imperial Irrigation District has in the past delivered water to Mexico through the Rockwool Heading of the Alamo Canal and has made a charge therefor. This arrangement will be discontinued by the Treaty. Whatever vested property rights of the Imperial District are acquired by the United States to fulfill the Treaty obligations will have to be condemned in the usual manner unless some voluntary agreement on price is reached. Property of the district can only be taken by the payment of compensation in accordance with the accepted constitutional and statutory safeguards. There is no disposition on the part of anyone to deprive the Imperial District of its property without giving value received. On the other hand, the making of a private profit out of the delivery of water in satisfaction of an international obligation may not be condoned. The water delivered to Mexico does not belong to the district and it may not sell it. If its facilities have been enlarged or extended to permit the delivery of water to Mexico, then the reasonable value of all canal enlargements and extensions above that necessary for the carriage of water used by the Imperial District and all facilities

which serve only to deliver water into Mexico must be acquired and paid for by the United States. There will be no loss to the Imperial District.

The States of the Upper Basin have long protested that until the right of Mexico to Colorado River water is determined it was not proper to use facilities located within the interior of the United States to carry water to Mexico because such a practice would enable Mexico to expand its uses and thus create a substantial basis for its demands for Colorado River water. About ninety percent of the virgin flow of the Colorado River at the Mexican border is produced in the Upper Basin. None of it is produced in the State of California. To the Upper Basin States it seems inequitable and unwise for the United States to assist in the creation of the development of rights in Mexico to the waters of the Colorado River before a treaty is made to define the Mexican rights.

III.

COLORADO RIVER

1. GENERAL DESCRIPTION

The Colorado River rises in the United States, its drainage area embracing parts of the States of Arizona, California, Nevada, New Mexico, Utah, Colorado and Wyoming. It flows across the international boundary six miles west of Yuma, Arizona, and for a distance of about twenty miles is a boundary stream. It then passes into Mexico and flows in a southerly direction for about 100 miles to the Gulf of California. Principal tributaries include the Green, which rises in Wyoming and flows southerly through Utah to meet the Colorado in the southeastern part of the state; the Gunnison, which rises in south central Colorado and flows west and then north, joining the Colorado at Grand Junction; the San Juan, which rises in southern Colorado and northern New Mexico and flows westerly, emptying into the Colorado a short distance north of the Utah-Arizona boundary line; the Little Colorado, which rises in Western New Mexico and Eastern Arizona and meets the Colorado just above the Grand Canyon; the Virgin River, which rises in southwestern Utah and southeastern Nevada and empties into Lake Mead; the Bill Williams River, which rises in central Arizona and joins the Colorado River at Parker Dam, and the Gila River which rises in southwestern New Mexico and southeastern Arizona and flows westerly across Arizona, meeting the Colorado River at Yuma. There are no tributaries in Mexico. The drainage areas by States and by stream basins are given in the following tables:¹³

¹³ House Document No. 359, page 17, 71st Congress, 2nd Session.

DRAINAGE AREA BY STATES:

	Square Miles
Wyoming	19,000
Colorado	39,000
New Mexico	23,000
Utah	40,000
Arizona	103,000
Nevada	12,000
California	6,000
<hr/>	
In United States.....	242,000
Mexico	2,000
<hr/>	
Total	244,000

DRAINAGE AREA BY STREAM BASINS:

Green	44,000
Upper Colorado	26,000
San Juan	26,000
Other areas except Gila.....	91,000
Gila	57,000
<hr/>	
Total	244,000

Contributions of water from the various states in percentages of the average annual virgin run-off at the Mexican boundary are as follows:

Arizona	7.8%
California	0.0%
Colorado	64.5%
Nevada	1.1%
New Mexico	1.7%
Utah	13.3%
Wyoming	11.6%

The portion of the drainage basin above Lee Ferry is the Upper Basin and that below is the Lower Basin. In the Upper Basin the river runs for some distance through

a high plateau where the winters are severe and the growing season is comparatively short. Forage crops and grain predominate. In the Lower Basin winter vegetables, cotton, flax, and tropical and semi-tropical fruits are grown.

2. WATER USE IN THE UNITED STATES

A study of water use in the United States should include not only the present use, but also uses which may reasonably be expected to be made in the future.

Modern irrigation in the Colorado River Basin began about 1732, near the early Spanish Missions in Arizona. It was not, however, until the middle of the Nineteenth Century that irrigation projects of any considerable size were undertaken. It was about 1856 that construction of canal systems began for the irrigation of land in the Palo Verde Valley in California, in the Blacks Fork area in Wyoming, and in the valleys of tributaries of the Green in Utah and of the Grand in Colorado.¹⁴ The following table shows the irrigated acreage in the Colorado River Basin by states in 1902, 1909, and every ten years since the latter date:

IRRIGATED AREAS COLORADO RIVER BASIN
As reported by U. S. Bureau of Census

	Values in Acres				
	1902	1909	1919	1929	1939
Arizona ..	246,866	317,661	461,694	572,289	640,110
California .	10,000	213,611	447,384	464,653	454,768
Colorado ..	417,839	617,242	766,532	856,413	844,494
Nevada ..	11,481	13,850	8,546	12,308	13,880
New Mexico	29,809	37,300	53,808	55,310	49,841
Utah	92,622	167,287	362,576	347,452	324,899
Wyoming .	118,566	183,595	211,507	228,699	273,971
Sums—					
State Totals	927,183	1,550,546	2,312,047	2,537,124	2,601,963

¹⁴ U. S. Geological Survey, Water Supply Paper 395 by E. C. LaRue, page 114.

IRRIGABLE AND IRRIGATED AREAS

Colorado River Basin

From Sixteenth U. S. Census—Irrigation: 1940*

(Units-Acres)

	Total Area Irrigated	Irrigable Area Enterprises	Excess of Irrigable Over Irrigated	Area Capable of of Being Supplied
Arizona	644,765	1,090,384	445,619	830,750
California	473,749	680,329	206,580	642,981
Colorado	844,494	1,243,116	398,622	1,049,752
Nevada	25,909	33,844	7,935	30,541
New Mexico	50,333	83,753	33,420	69,803
Utah	324,899	437,909	113,010	406,890
Wyoming	273,971	448,422	174,451	337,027
Colorado River Basin—Totals	2,638,120	4,017,757	1,379,637	3,367,744

Since 1930 several structures of great importance have been built on the main stem of the Colorado River for storage and diversion of water and for the generation of electric power. The Boulder Canyon Project Act, passed by Congress in 1928, provided for the construction of a dam and power plant on the main stream of the Colorado River at Black Canyon or Boulder Canyon and a canal connecting the Laguna Dam or other suitable diversion dam with the Imperial and Coachella Valleys in California. The dam known as Boulder Dam but constructed at Black Canyon was completed in 1935. It has capacity of over 32,000,000 acre-feet. The power plant has a capacity of 1,835,000 horsepower. The All-American Canal, as the name implies, is constructed entirely within the United States and replaces the old Imperial Canal-Alamo Canal system, which since 1902 has conveyed water from the Rockwood Heading in the United States southward into Mexico, and thence westerly for forty miles before turning north across the international border to the Imperial Valley in California. Water is now diverted from the river into the All-American Canal by the Imperial Dam, located a short distance above

*Lands irrigated in season of 1939.

Yuma, Arizona. The initial capacity of the All-American Canal is 15,155 second-feet. The capacity is reduced to 13,155 second-feet at Siphon Drop and is reduced again to 10,155 second-feet at Pilot Knob. The canal is eighty miles long, traversing ten miles of sand hills east of the Imperial Valley before turning to the west and north to irrigate the Imperial and Coachella Valleys. Construction of the main canal was completed in 1942.

3. WATER USE IN MEXICO

Most of the land in Mexico which is irrigable from the Colorado River is on the great delta formed in past ages by the deposition of soil as the river emptied into the Gulf of California. The delta has an irrigable area estimated at from 800,000 to 1,500,000¹⁵ acres located in the State of Sonora and the Territory of Baja California. The land is exceedingly rich, is almost level and lies only a few feet above sea level. The annual rainfall is about two inches and the only source of water supply is the Colorado River. With irrigation, the land will produce abundant and valuable crops including cotton, cottonseed, alfalfa, and grain. Without water artificially applied, plant growth is limited to mesquite, willow brush, and grasses. Most of the development in Mexico is under the Alamo Canal, which takes water from the Colorado River at the Rockwood Heading in California, a few hundred feet above the international boundary line, and passes south into Mexico and thence westward about 50 miles to Sharp's Heading, where, before the construction of the All-American Canal, the water was carried back into the United States through several smaller canals.

On May 17, 1904, the Mexican government made a contract with The Sociedad de Irrigacion y Terrenos de las Baja California, S. A., a Mexican subsidiary of the Imperial Irrigation District, which authorized the construction of a canal through Mexico with a capacity of 10,000

¹⁵ House Document No. 359, pp. 5, 162; Water Supply Paper 395, p. 159, 71st Congress, 2nd Session.

second-feet for the irrigation of land in Mexico and in the Imperial Valley, California. The agreement contained the following provision:

ARTICLE 2. From the water mentioned in the foregoing Article, enough shall be used to irrigate the lands susceptible of irrigation in Lower California with the water carried through the canal or canals without in any case the amount of water used exceeding one-half of the volume of water passing through said canals.

During the ten-year period from 1925 to 1934 there was an average annual diversion through the Alamo Canal in excess of 3,000,000 acre-feet. The greatest diversion before construction of Boulder Dam was in 1929 when 3,423,511 acre-feet of water was conveyed through the canal. Under the agreement of May 17, 1904, Mexico was entitled to one-half of this water or 1,711,755 acre-feet.

In 1928 750,000 acre-feet of Colorado River water was delivered to the laterals of the canals serving the Mexican lands. The total diversions from the stream were much greater, as in all probability there were conveyance losses of approximately 250,000 acre-feet. The impounding of water by Boulder Dam controlled the flow of the river, and as a result use of water in Mexico for irrigation was greatly increased. In 1943 1,800,000 acre-feet of water was used in Mexico. The following table shows the estimated areas irrigated from the Colorado River in Imperial Valley in Mexico from 1905 to the present time:

	Acres		Acres
1905	3,591	1914	39,600
1906	1,288	1915	41,000
1907	4,096	1916	67,500
1908	6,935	1917	77,500
1909	9,051	1918	118,530
1910	14,920	1919	136,580
1911	14,953	1920	190,000
1912	21,599	1921	120,000
1913	33,761	1922	150,000

	Acres		Acres
1923	180,000	1929	165,000
1924	185,022	1935	148,000
1925	215,912	1940	190,000
1926	192,555	1943 (approximate)	300,000
1927	156,168		

Various estimates have been made of the ultimate irrigated acreage in Mexico if no Treaty is made. E. C. LaRue, in his report dated 1916, concluded that 50,000 acres of land were irrigated under the Alamo Canal System in Mexico in 1913, and that the following additional land could be irrigated:

Imperial Valley in Mexico.....	200,000 acres
Lands East and South of Volcano Lake in Mexico.....	250,000 acres
Lands East of Dry Channel of Col- orado River and West of Del Rio tract, Mexico.....	150,000 acres
Del Rio tract in Mexico.....	297,000 acres
Total	897,000 acres

He stated in his report that he believed his estimates were conservative.¹⁶

Other estimates of irrigable acreage in Mexico are: Lower California, 728,000 acres; Sonora, 245,000 acres; other lands in Sonora and Lower California which can be made productive, 256,000 acres; total, 1,229,000 acres. Professor W. Nelson, former chief of the Biological Survey, Washington, estimates at 1,500,000 acres the land in Mexico which can be irrigated from the Colorado.

The Mexican Section of the International Water Commission, at the meeting of August 29, 1929, reported that there were 1,500,000 acres of good irrigable land in Mexico which could be watered from the Colorado River with pumping lifts no greater than eighty feet.¹⁷ On the basis of a three-acre foot per acre duty demand was made for an allotment of 4,500,000 acre-feet.

¹⁶ Water Supply Paper 395, p. 144.

¹⁷ House Document No. 359, p. 49.

It is apparent from a study of past use of water in Mexico and of present physical conditions that the use of water in 1943 (1,800,000 acre-feet) will be greatly increased if no limitation is imposed upon Mexico's use of water by Treaty. It is also clear that use in Mexico with the present regulated flow of the river will increase much faster in proportion than use in United States, particularly in the Upper Basin.

4. COLORADO RIVER COMPACT AND LEGISLATION

The disastrous floods and recurrent droughts in the Lower Colorado River Basin during the first two decades of the century gave impetus to the efforts of Imperial Valley interests to obtain Congressional authority for, and assistance in, the building of a large dam for regulatory flood control and storage purposes on the main stream of the Colorado River, and for the construction of an All-American Canal. Upper Basin States and Arizona objected to the development of huge projects for the benefit of California at government expense because it was feared that prior rights would be established to the prejudice of development in the other States where because of geographical and topographical conditions development would be slower.

The first Colorado River bill, known as the 1st Kettner Bill, H. R. 6044, was introduced in Congress June 17, 1919. It provided for the construction of an All-American Canal under a financial plan by which the government would guarantee the payment of the cost. The bill did not come to vote. Other bills known as the 2nd Kettner Bill and the 1st, 2nd and 3rd Swing-Johnson bills also failed.

Congress, however, passed the Kinkaid Act, approved May 18, 1920, which provided for a study and report of Colorado River development.

It was recognized that opposition to bills for construction of large projects on the Lower Colorado River would continue unless there were devised some means to protect the rights of states which would not be directly benefited

by such projects. It was finally suggested that a compact should be made allocating the water of the Colorado River among the states or between the Upper and Lower Basins. Accordingly, in 1921 all Seven Basin States and the Congress enacted laws authorizing the appointment of representatives to negotiate a compact on the Colorado River, and on August 19, 1921, the Congress authorized the States to make a compact. Herbert Hoover was appointed to represent the United States in compact negotiations. After a public hearing in each Colorado River Basin State, the Commission met at Santa Fe, New Mexico, and drafted and signed the Colorado River Compact.¹⁸ It provides for the division of the Colorado River drainage area into two basins; the Upper Basin comprising that part of the basin above Lee Ferry, and the lower basin that part drained by the river and its tributaries below Lee Ferry. The Compact allocates water to each basin. It makes no division among the various states. Article III (a) apportions to the Upper Basin and the Lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which includes all water necessary for the supply of existing rights. Article III (b) gives the Lower Basin the right to increase its beneficial consumptive use by 1,000,000 acre-feet per annum. Article III (a) states how the burden of a Treaty with Mexico shall be borne:

If, as a matter of international comity, the United States shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry

¹⁸ The compact was signed November 24, 1922.

water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).

Article III (d) provides that the states of the upper division (Colorado, New Mexico, Utah and Wyoming) will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet of water for any period of ten consecutive years, reckoned in continuous progressive series beginning with the first day of October next succeeding the ratification of the Compact. Further equitable apportionment of the beneficial uses of water unapportioned by paragraphs (a), (b), and (c) is authorized after October 1, 1963, and if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b). The full text of the Compact is set out in the Appendix, page 5.

All of the basin states except Arizona promptly ratified the Compact without qualification. When it became apparent that Arizona would not ratify, the other states modified their ratifications, and then to make possible the adoption of the Compact passed laws which made it effective upon the ratification of the other six states. In 1928 Congress passed the Boulder Canyon Project Act, which waived the requirements of the Compact that all seven states ratify it upon condition that it be ratified by California and five other states. The Boulder Canyon Project Act, by its terms, did not become effective until the Compact was ratified by six states including California. The six states had ratified the Colorado River Compact by March 6, 1929, and on June 25, 1929, President Hoover proclaimed its ratification. Arizona ratified the Compact in 1944.

5. BOULDER CANYON PROJECT ACT AND THE WATER CONTRACTS

The Boulder Canyon Project Act of December 21, 1928, authorized the construction of a dam at Black Canyon or Boulder Canyon adequate to create a storage reservoir of

a capacity of not less than 20,000,000 acre-feet, for the purpose of controlling floods, improving navigation, regulating the flow of the Colorado River, providing stored water for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy. The Act also authorized the construction of the All-American Canal and provided for the approval of the Colorado River Compact when the State of California and at least five of the other basin states ratified it.

Section 4 (a) of the Act provides that it shall not take effect, no authority shall be exercised thereunder, and no work shall be done or expenses incurred until (1) the Colorado River Compact is ratified by at least six of the basin states including California, and

(2) until the State of California, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this Act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this Act and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

The Secretary of the Interior was directed to make provisions for revenues by contract adequate in his judgment to insure payment of all expenses of operation and maintenance of the works and the repayment within fifty

years of amounts advanced to pay construction costs.¹⁹

It is specifically provided that the rights of the United States and those claiming under the United States

* * * shall be subject to and controlled by said Colorado River Compact.²⁰

Section 20 of the Boulder Canyon Project Act refers to the possibility of a recognition of a right in Mexico to the use of Colorado River water.

Sec. 20. Nothing in this Act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the waters of the Colorado River system.

California promptly enacted a law limiting the aggregate consumptive use of Colorado River water to 4,400,000 acre-feet of III (a) water and one-half of all surplus water. The States of California, Colorado, New Mexico, Nevada, Utah, and Wyoming ratified the Compact pursuant to Section 4 (a) of the Boulder Canyon Project Act and the Act became effective upon the proclamation of President Hoover on June 25, 1929.

In 1930 the Secretary of the Interior made contracts for the sale of power to be generated at Boulder Dam to the Metropolitan Water District of Southern California, City of Los Angeles, Pasadena, Glendale, Burbank, Southern California Edison Company, Los Angeles Gas & Electric Company, and the Southern Sierras Power Company.²¹

The California interests realized that it was necessary to establish the relationship between the various California contract holders. After a series of conferences held over a period of nearly a year an agreement was made on August 18, 1931, which is commonly known as the Seven Party Water Agreement of 1931. It provides for priorities among the applicants and fixes the quantity of water apportioned

¹⁹ Section 4 (b). The Secretary of the Interior is authorized by Section 5 to make contracts for delivery of water stored by the dam and it is provided that no person may acquire a right to the use of such water except by such contract.

²⁰ Section 13 (b).

²¹ The Hoover Dam Contracts by Wilbur and Ely, p. 25.

to each. The priorities are stated in the following summary in order:

1—Palo Verde Irrigation District 104,500 acres.	
2—Yuma Project — U. S. Bureau of Reclamation 25,000 acres.	
3(a)—Imperial Irrigation District and lands under the All-American Canal in the Imperial and Coachella Valleys.	
(b)—Palo Verde Irrigation District in "Lower Palo Verde Mesa" 16,000 acres.	
Total for 1st, 2nd and 3rd priorities	3,850,000 ac. ft.
4—Metropolitan Water District and City of Los Angeles.....	550,000 ac. ft.
5(a)—Metropolitan Water District and City of Los Angeles.....	550,000 ac. ft.
(b)—City and County of San Diego..	112,000 ac. ft.
6(a)—Imperial Irrigation District and lands under the All-American Canal in Imperial and Coachella Valleys.	
(b)—Palo Verde Irrigation District in Lower Palo Verde Mesa, 16,000 acres	300,000 ac. ft.
Total ²²	5,362,000 ac. ft.

The contracts were all made expressly subject to the Colorado River Compact ²³ and subject to the availability

²² The Hoover Dam Contracts, Wilbur and Ely, pp. 33-35.

²³ The language used is as follows: "(16) This contract is made upon the express condition and with the express understanding that all rights hereunder shall be subject to and controlled by the Colorado River Compact, being the compact or agreement signed at Santa Fe, New Mexico, November 24, 1922, pursuant to act of Congress approved August 19, 1921, entitled, 'An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mex-

of water under the Colorado River Compact and the Boulder Canyon Project Act. The provision in Article 6 of the contract between the United States and the Metropolitan Water District of Southern California is typical:

(6) The United States shall, from storage available in the reservoir created by Hoover Dam, deliver to the district each year at a point in the Colorado River immediately above the district's point of diversion (at or in the vicinity of the proposed Parker Dam) so much water as may be necessary to supply the district a total quantity, including all other waters diverted by the district from the Colorado River, in the amounts and with priorities in accordance with the recommendation of the chief of the division of water resources of the State of California, as follows (subject to the availability thereof for use in California under the Colorado River Compact and the Boulder Canyon Project Act):

It will be noted that the water covered by the contracts exceeds the California statutory limitation for the use of III (a) water by 962,000 acre-feet. The California priorities (5) and (6) relate to the use of surplus water unapportioned by paragraphs (a), (b), and (c) of Article III of the Colorado River Compact. By the plain language of paragraph (f) of Article III of the Compact such surplus water is subject to further equitable apportionment on or after October 1, 1963, if and when either basin shall have reached its total beneficial consumptive use of water allocated by paragraphs (a) and (b), and until such reapportionment is made no permanent right can be obtained to the use of such water.

Contracts were recently made for delivery of water stored by Boulder Dam to Arizona and Nevada. The Arizona Contract, signed February 9, 1944, provides for the beneficial consumptive use of 2,800,000 acre-feet of water

ico, Utah and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes,' which compact was approved in section 13 (a) of the Boulder Canyon Project Act."

per annum subject to the availability thereof, and subject to the Colorado River Compact and the Boulder Canyon Project Act. The Nevada Contract, containing similar conditions, is for the beneficial consumptive use of 300,000 acre-feet.

6. THE DIVISION OF THE FLOW OF THE COLORADO RIVER IS EQUITABLE

(A) THE AMOUNT OF WATER ALLOTTED BY THE TREATY TO MEXICO.

Article 10 of the Treaty allots to Mexico a guaranteed annual quantity of 1,500,000 acre-feet of water, with a provision made that in any year when, as determined by the United States Section of the International Boundary Commission, there exists a surplus of water in the river, the United States will undertake to deliver a total quantity of 1,700,000 acre-feet. It is specifically stated that Mexico shall acquire no right to any water whatsoever in excess of 1,500,000 acre-feet annually. Article 10 provides that in the event of extraordinary drought or serious accident to the irrigation system in the United States, making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet, the Mexican allotment shall be reduced in the same proportion as consumptive uses in the United States are reduced.

This water may come "from any and all sources" and, with the exceptions hereinafter noted, may be delivered wherever the water may arrive in the bed of the limitrophe section of the river. By Article II (b) it is stated that the United States will deliver to Mexico, wherever such waters may arrive in the limitrophe section, 1,000,000 acre-feet annually from the time Davis Dam is put into operation until 1980, and thereafter, 1,125,000 acre-feet annually, except that Mexico may request the delivery of 25,000 acre-feet or more, if it is mutually agreed upon at a point on the international land boundary near San Luis, Sonora, in which event the quantities deliverable in the limitrophe section shall be reduced by the amount of the deliveries near San Luis.

Article 11 (c) provides that after Davis Dam is put into operation, and until 1980, the United States shall deliver to Mexico 500,000 acre-feet annually and after January 1, 1980, 375,000 acre-feet annually at the international boundary line by means of the All-American Canal and a canal connecting the lower end of the Pilot Knob wasteway with the Alamo Canal. Article 15 permits Mexico to schedule deliveries within certain limitations.

Particular attention is directed to the fact that the allotment to Mexico of Colorado River water is "from any and all sources", and it is further provided that Mexico shall acquire no right by the use of the water of the Colorado River System "for any purpose whatsoever in excess of 1,500,000 acre-feet annually." This language is employed to make certain the right of the United States to receive credit for return flow and seepage water appearing in the river. This is to the great advantage of the United States. In view of the fact that the United States is entitled to credit for return flows, an important question is the extent to which the deliveries in the limitrophe section may be satisfied thereby. The extent of such return flows will be determined in large measure by future irrigation development, particularly in the State of Arizona. In addition to the return flow there will be available for Mexico water used for desilting purposes. Mr. R. J. Tipton, Consulting Engineer of the Colorado Water Conservation Board, estimates that under conditions of ultimate development the return flows and desilting water will be in such amounts that 600,000 acre-feet represent the maximum burden that will be placed annually on the river above Imperial Dam to satisfy the obligations of the United States to Mexico under the terms of the proposed Treaty. What this means is that under ultimate conditions the entire obligation imposed upon the United States by the Treaty will be satisfied by return flow and desilting water except in the maximum annual amount of 600,000 acre-feet. This is possible because the Treaty allots to Mexico water "from any and all sources."

(B) THE ALLOTMENT OF WATER TO MEXICO IS NOT CONTRARY TO THE PROVISIONS OF THE BOULDER CANYON PROJECT ACT.

It is recognized that the declared purpose of the Boulder Canyon Project Act relates to beneficial water uses "exclusively within the United States." From this language it has been argued that violation of the Project Act would occur if Mexico were permitted to receive any benefit from the storage of water at Boulder Dam. The argument is fallacious. The domestic law of the United States cannot affect water within the defined share of Mexico. The domestic law of this nation can apply only to water within its defined share. In *Hinderlider v. La Plata, etc.*, 304 U. S. 92, the United States Supreme Court held that Colorado law could not apply to fix rights in water of a stream flowing in Colorado which by the terms of an interstate compact belonged to New Mexico. The reasoning is sound and would doubtless be followed by an arbitration board or international tribunal. This means that there can be no storage of Mexican water within the United States without the consent of that nation. It is obvious that if the United States were required to pass through Boulder Dam, and the other dams located on the lower Colorado, a certain percentage of the natural flow, upon the theory that such percentage constitutes the equitable share of Mexico, the total amount of water which the United States would be obligated to pass downstream would be greatly increased. This result would benefit neither country and could merely increase the amount of water wasted into the Gulf of California. A sensible procedure is to utilize the storage facilities on the Lower Colorado and meter out to Mexico the minimum amount of water necessary. This procedure rather than violating the Project Act conforms with its declared policy.

(C) THE AMOUNT OF WATER USED BY MEXICO PRIOR TO THE CONSTRUCTION OF BOULDER DAM IS NOT A CONTROLLING FACTOR.

The assertion has been made that the Mexican water

uses before Boulder Dam went into operation did not exceed 750,000 acre-feet annually. No good purpose would be served by speculating as to the amount of water which Mexico could have used under natural flow conditions as they existed before the construction of Boulder Dam and before the beginning of the ten-year low-water period in 1931. What is important is that Mexico has plans that will require considerably more than 1,500,000 acre-feet a year, and actually did in 1943, and probably again in 1944 use more than 1,800,000 acre-feet. It is true that of this 1,800,000 acre-feet substantial quantities were taken through the Rockwood Heading of the Alamo Canal. It has been said that if the use of this facility, which is located in the United States, should be denied to Mexico, then Mexico could not use more than the 750,000 acre-feet annually which it used prior to the regulation of the stream by Boulder Dam. This involves an engineering question as to the ability of Mexico to divert through gravity headings or pumps within its own borders. In other places, such as along the Rio Grande, substantial diversions are made under conditions which are just as adverse.

Attention is directed to the fact that under the contract for the Alamo Canal concession Mexico had a right to use up to one-half of the water carried by the Alamo Canal. In the thirteen-year period immediately preceding the placing in operation of Boulder Dam the average annual diversions through the Alamo Canal were approximately 3,000,000 acre-feet. Under the terms of the concession Mexico was entitled to one-half, or approximately 1,500,000 acre-feet annually. No technical knowledge is required to understand that the proposed Treaty provisions, by which the United States is credited with the return flows and desilting water, impose a much less severe obligation than existed under the provisions of the Alamo Canal concession.

(D) THE 1929 TREATY NEGOTIATIONS.

Beginning about 1929 there were negotiations with Mexico in the course of which a reported offer was made to Mexico for the delivery of 750,000 acre-feet of water

per annum according to a schedule, plus an amount of water sufficient to compensate for main canal losses. It is said that the amount guaranteed by the proposed Treaty is double the 1929 offer. This is not correct. The 1929 offer would have necessitated deliveries either to the Alamo Canal by the present heading or through the All-American Canal and the Pilot Knob wasteway. In either case Mexico would have received, an addition to the 750,000 acre-feet, an estimated 200,000 or 300,000 acre-feet to compensate for canal losses, and all desilting water and all return water accruing to the river below the diversion point. The sum of these quantities in all probability would have exceeded the amount guaranteed by the pending Treaty. In any event it is clear that the 750,000 acre-feet to have been delivered through the All-American Canal far exceeds the amount that Mexico will receive from such source under the present Treaty, which requires the United States to deliver through such facility only 500,000 acre-feet annually from the time of completion of the Davis Dam until 1980 and 375,000 acre-feet annually thereafter.

(E) THE POSITION WHICH THE PROPOSED PILOT KNOB POWER PLANT HAS IN RELATION TO THE AMOUNT OF WATER DELIVERED TO MEXICO.

The Pilot Knob Power Site is one of five sites on the All-American Canal. It is located about 6,000 feet from the boundary between the United States and Mexico and the topography is such that water discharged from a power plant at this site would not again enter the canal and cannot be used in this country but instead would go to Mexico. The other four sites are at drops in the All-American Canal itself and the water is discharged back into the canal. The All-American Canal has a capacity of 15,155 second-feet of water from the intake to the Siphon Drop, a capacity of 13,155 second-feet from Siphon Drop to the Pilot Knob Power Site and the capacity is then reduced to 10,155 second-feet.

The plans for the Pilot Knob Plant submitted to the

Federal Government in 1935 in connection with a loan application proposed a capacity of 4,500 second-feet. If such a plant were constructed it would discharge into Mexico approximately 3,285,000 acre-feet of water annually. If the plant were to have a capacity of 3,000 second-feet, as the unused capacity in the All-American Canal would seem to indicate was the original plan, approximately 2,190,000 acre-feet annually would be discharged into the Alamo Canal.

If the Imperial Irrigation District proceeds with its plan to construct Pilot Knob it would discharge into Mexico a firm supply of water at a place where it would be readily available for use in Mexico through works already constructed, and undoubtedly Mexico would promptly construct the necessary works to apply the water to beneficial use. Extensive farming districts and many communities would be established in reliance upon this supply of water. It is apparent that such use would, in any future treaty negotiations or before any international tribunal, be a convincing argument for allotment of enough water to Mexico to maintain the farming areas and communities. Mexico will increase its use of unused water now going down the Colorado River without any encouragement from this country. The construction of Pilot Knob and the discharge of several million acre-feet of water annually into Mexico would greatly increase her use and would unnecessarily complicate the international problem. Moreover, by such action the United States would become a party to an arrangement which would greatly assist Mexico in the development of additional irrigated land. It will be much easier for Mexico to utilize this water when it is placed in an existing irrigation system than it will be for Mexico to use it if the same amount is merely permitted to flow down the bed of the river.

It is difficult to see how California interests, which are promoting construction of Pilot Knob, can, at the same time, in good faith, vigorously assail the provision of the Treaty which awards to Mexico from all sources, including return flow, less than one-half of the maximum quantity

which they propose to discharge into Mexico from the Pilot Knob plant. Construction of the Pilot Knob plant would indicate that the California spearhead argument of "too much water for Mexico" is merely a "smoke screen" for some other real reason not disclosed by opponents of the Treaty.

(F) THE MEXICAN ATTITUDE.

Finally, in considering the question of the amount of water which Mexico should receive, some thought must be given to the Mexican attitude. Those who are active in the negotiation of the Treaty assert that the amount of water agreed upon as representing the share of Mexico constitutes the lowest possible figure to which Mexico will agree. Unless we are to charge the representatives of the United States with either incompetence or bad faith, we must accept their report in this regard. This being true, it is a waste of time to discuss an agreement with Mexico based upon a smaller amount of water.

Passing reference is made to the fact that during the negotiations Mexico demanded 3,600,000 acre-feet of water annually and it is estimated that there are about 1,000,000 acres of land in the Mexican delta which, because of the flood protection and stream regulation now afforded by dams in the United States, can be irrigated.

7. THE PROPOSED TREATY DOES NOT VIOLATE
THE CALIFORNIA WATER CONTRACTS OR
THE SO-CALLED STATUTORY AGREEMENT
BETWEEN THE UNITED STATES AND
CALIFORNIA

The Colorado River Commission, appointed in 1921, to represent the United States in compact negotiations on the Colorado River considered the international aspects of the problem. On August 8, 1922, Herbert Hoover, the chairman, made inquiry of Charles Evans Hughes, then Secretary of State, as to the rights of Mexico under existing treaties affecting the waters of the Colorado River.

In his reply, dated August 17, 1922, Mr. Hughes referred to the treaties relating to navigation and then made the following statement:

I am not advised as to the nature of the compact which the commission is to consider negotiating for an apportionment of the waters of the river among the several States mentioned, but if it shall be proposed so to apportion the waters as to cut off the present supply of water in the river as it enters the Republic of Mexico, I may say that it would seem to me that considerations of equity and comity would require that the interests of Mexico in the matter should be taken fully into consideration.

The drafters of the Compact anticipating that a Treaty might be made recognizing in Mexico a right to the use of Colorado River water and heeding the advice of Mr. Hughes adopted Article III (c) which provides:

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).

The effect of this provision is to settle in advance among the signatory states the question as to how the burden of possible Treaty obligations to Mexico shall be borne. Further, it gives notice to such states that any contract for delivery of water by the United States is subject to future treaty commitments to Mexico in the manner ex-

pressly set out in the Compact. That such contracts are made subject to the Compact and to possible Treaty commitments is clear in view of the language of section 13 (b) of the Boulder Canyon Project Act as follows:

The rights of the United States in or to waters of the Colorado River and its tributaries howsoever claimed or acquired, as well as the rights of those claiming under the United States, shall be subject to and controlled by said Colorado River Compact.

This thought is specifically carried into all water and power contracts. The following provision in the contract dated April 24, 1930, between the United States and the Metropolitan Water District of Southern California, is typical:

This contract is made upon the express condition and with the express understanding that all rights hereunder shall be subject to and controlled by the Colorado River Compact, being the compact or agreement signed at Santa Fe, New Mexico, November 24, 1922, pursuant to act of Congress approved August 19, 1921, entitled "An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes," which compact was approved in Section 13 (a) of the Boulder Canyon Project Act.

The delivery of water under the contract is also made "Subject to the availability thereof for use in California under the Colorado River Compact and the Boulder Canyon Project Act." Implicit in all contracts is the understanding that the quantity of water contracted to be delivered may be reduced if it becomes necessary to make reductions in order to meet Treaty obligations.

The California water contracts would be subject to any treaty thereafter executed even though there were no mention of a possible treaty in the Compact. Any state or

person making a contract relating to an international stream is charged with knowledge that a treaty might be made and that if made, it would be paramount to any contracts, compacts, or state statutes. Under the express provisions of the United States Constitution, Article VI, treaties which shall be made under the authority of the United States shall be the supreme Law of the Land. The Supreme Court of the United States has held that as to private rights of citizens treaties are the supreme Law of the Land. (*Foster v. Nielson*, 2 Peters (U. S.) 253; *Maiorano v. Baltimore & Ohio Railroad Co.*, 213 U. S. 268.)

The making of a treaty for delivery of water to Mexico would not, therefore, constitute a breach of the California Water Contract because, as stated, the contracts are expressly made subject to the Colorado River Compact which in turn specifically gives notice of a possible treaty with Mexico and provides how the burden shall be borne.

Nor would the ratification of the proposed Treaty with Mexico violate the so-called statutory agreement between the United States and California by the terms of which California agreed to limit her use of Colorado River water to 4,400,000 acre-feet annually in consideration of the passage of the Boulder Canyon Project Act. Pertinent provisions of the Boulder Canyon Project Act follow:

This Act shall not take effect and no authority shall be exercised hereunder . . . , until the State of California, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this act and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the Lower Basin States

by paragraph (a) of Article III of the Colorado River Compact, plus not more than one-half of any excess or surplus waters unapportioned by said Compact, such uses always to be subject to the terms of said Compact.

The limitation in the California statute is in identical language.*

It will be noted that the last clause provides that uses of water in California shall always be subject to the terms of the Compact. Article III, paragraph (c), of the Compact, quoted above, is just as much a part thereof as Article III, paragraph (a), or any other provision. Thus there is written into the statutory agreement the provision that if the United States should make a treaty allocating water to Mexico such water would come out of surplus and if that is insufficient out of water apportioned to the two basins.

The Boulder Canyon Project Act contains in Section 1 a provision that the Secretary of the Interior is authorized to construct a dam at Black Canyon or Boulder Canyon for the storage and for the delivery of water stored thereby for reclamation of public land, “ * * * * and other beneficial uses exclusively within the United States.” It provides in Section 5 that:

Contracts respecting water for irrigation and domestic uses shall be for permanent service and shall conform to paragraph (a) of section 4 of this act. No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated.

It has been asserted that these provisions are part of the statutory agreement and that they would be breached if the proposed Treaty is ratified. The argument that the Treaty violates the provision for beneficial uses exclusively within the United States presupposes that the Treaty guarantees water to Mexico from storage in Lake Mead. There is no such provision in the Treaty, express or implied. The Treaty provides:

*Act approved March 4, 1929.

Of the waters of the Colorado River, from any and all sources, they are allotted to Mexico:

(a) A guaranteed annual quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) to be delivered in accordance with the provisions of Article 15 of this Treaty.

(b) Any other quantities arriving at the Mexican points of diversion, with the understanding that in any year in which, as determined by the United States Section, there exists a surplus of waters of the Colorado River in excess of the amount necessary to supply users in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually to Mexico, the United States undertakes to deliver to Mexico, in the manner set out in Article 15 of this Treaty, additional waters of the Colorado River system to provide a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters) a year. Mexico shall acquire no right beyond that provided by this subparagraph by the use of the waters of the Colorado River System, for any purpose whatsoever, in excess of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually.

In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) a year, the water allotted to Mexico under subparagraph (a) of this Article will be reduced in the same proportion as consumptive uses in the United States are reduced.

The United States shall deliver all waters allotted to Mexico wherever these waters may arrive in the bed of the limitrophe section of the Colorado River, with the exceptions hereinafter provided. Such waters shall be made up of the waters of the said river, whatever their origin, subject to the provisions of the following paragraphs of this Article.

The water allotted to Mexico is to be taken from the natural flow of the river. There is no provision for the release of Lake Mead water to Mexico.

The words "permanent service" used in Section 5 have no reference whatever to the Mexican burden. They have reference to the duration of the contract rights. Water is to be delivered permanently rather than for a term of years.

It will be noted that California has by statute limited her aggregate annual consumptive use of Article III (a) water to 4,400,000 acre-feet, plus not more than one-half of any excess or surplus water unapportioned by the Compact. This provision is followed by the clause providing "that such use shall always be subject to the terms of said compact." Let us see what the Compact says about rights to the use of surplus water. Article III, paragraphs (f) and (g), provides:

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c) may be made in the manner provided in paragraph (g), at any time after October first, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g) In the event of a desire for a further apportionment, as provided in paragraph (f), any two signatory States, acting through their governors, may give joint notice of such desire to the governors of the other signatory States and to the President of the United States of America, and it shall be the duty of the governors of the signatory States and of the President of the United States of America forthwith to appoint representatives, whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water of the Colorado River System, as mentioned in paragraph (f), subject to the legislative ratifica-

tion of the signatory States and the Congress of the United States of America.

It is apparent that a firm right to the surplus water can be acquired only upon the happening of the following conditions:

(1) After October 1, 1963, (2) when either basin shall have used its total beneficial consumptive use of *apportioned water*, and (3) when the states have made a compact as provided by paragraph (g). Further, by the plain language of Article III, paragraph (f), surplus water is defined as "*waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c).*" Paragraph (c) refers specifically to the water which is to go to Mexico in the event a treaty is made. Thus the water described in the Boulder Canyon Project Act as "surplus water unapportioned by the compact" means water in excess of (a) 15,000,000 acre-feet apportioned to the Upper and Lower Basins, (b) 1,000,000 acre-feet apportioned to the Lower Basin, and (c) water apportioned to Mexico by Treaty. California can claim no breach of the statutory contract right as to the surplus because the very right which she asserts is subject to the Treaty burden and also subject to the conditions enumerated above, none of which have happened. California has no firm contract right to surplus water.

The burden of the Mexican Treaty is apparent on the face of the Colorado River Compact, the Boulder Canyon Project Act, and the California Water Contracts themselves, so none of the contracting parties can, in good faith, claim any imposition or breach of contract in the event the Treaty is ratified.

8. THE MANNER IN WHICH THE REQUIRED WATER DELIVERIES TO MEXICO WILL BE MADE

The suggestion has been made that the effect of the Treaty will be that the United States Section of the International Boundary and Water Commission will take

over the administration of the Colorado River in the United States in order to satisfy the Treaty requirements for water deliveries to Mexico. This is utterly wrong. Whatever doubt there may have been, and it is submitted that there never was any basis for doubt in this regard, was clarified by the Protocol signed on November 14, 1944. By its terms functions or instrumentalities used only partly for fulfillment of Treaty provisions and located wholly within either nation remain in the jurisdiction and control of the agency authorized by domestic law for such purposes.

In the United States the Bureau of Reclamation has constructed and now operates and maintains Boulder Dam, Parker Dam, and Imperial Dam. Davis Dam is under construction by the bureau. The All-American Canal was constructed under the jurisdiction of the bureau and by the terms of the repayment contract with the Imperial Irrigation District as modified the portion of that canal beyond Syphon Drop would have been placed under the control of the district upon the completion of the payments. To comply with the Treaty it will be necessary for the United States to retain control of the Canal to Pilot Knob, thus adding the Siphon Drop-Pilot Knob section to that which the United States will retain.

The water deliveries will be effected by the action of the United States Section in placing appropriate water release orders with the operators of Davis Dam, Imperial Dam, and the Imperial Dam-Pilot Knob Section of the All-American Canal. These operators are under the jurisdiction and control of the Bureau of Reclamation until Congress legislates otherwise.

If such orders are in compliance with the Treaty, the officials of the Bureau of Reclamation will be obligated to honor them. If otherwise, they could and presumably would be ignored. The United States Commissioner would by Article 24 (b) of the Treaty be required to "invoke the jurisdiction of the courts" if his orders were disobeyed.

Any United States water user believing that the orders were not in accordance with Treaty provisions could

bring an action against the appropriate officials of the bureau to test the validity of the orders. Thus there is adequate opportunity for judicial control.

It must be remembered that the only facilities under the exclusive jurisdiction of the United States Section are those used exclusively for the performance of Treaty functions. Along the Colorado within the interior of the United States the only facilities of this nature are (1) those necessary to convey water from Pilot Knob to the border; (2) those which may be agreed upon to carry water to the border near San Luis, Sonora; and (3) the gauging stations necessary to measure the deliveries of water to Mexico.

9. THE CALIFORNIA OBJECTIONS

A. IN GENERAL.

Objection to the Treaty stems primarily from the State of California and therefore concerns the treatment of the Colorado River in the Treaty. California has no interest in the Rio Grande. Under the circumstances consideration must be given to California objections and the California situation. Since this presentation is in no sense an answer brief, it will be possible to note only those objections which have come to the attention of the writers.

B. OBJECTIONS WHICH INVOLVE THE SO-CALLED JUNIOR CONTRACTS.

It has been pointed out that the California contracts with the Secretary of Interior cover a total of 5,362,000 acre-feet of water per annum, "subject to the availability thereof for use in California under the Colorado River Compact and the Boulder Canyon Project Act" (Metropolitan Water District Contract, Par. 6). This amount is 962,000 acre-feet per annum in excess of the 4,400,000 acre-feet of III (a) water to which California limited itself by its Self-Limitation Act and is available only out of surplus. The Compact by Par. III (c) provides that any right recognized in Mexico "shall be supplied first from the waters which are surplus over and above the aggregate

of the quantities specified in paragraphs (a) and (b).” Hence, the California junior contracts, i. e., for the 962,000 acre-feet, are junior to the Mexican right, and the holders of these contracts assert that the allotment to Mexico is too great and jeopardizes their rights.

Obviously, the meat of the California argument on this score is that Mexico is awarded too much water.

Justification for the Treaty definition of the Mexican right has heretofore been given and will not be repeated. The point so far as the California junior contracts are concerned is that the contracts were made subject to the availability of the water under the Compact and the Compact specifically defined the relationship which the Mexican right should have to rights in the United States. The holders of the junior contracts are most certainly charged with notice of the Compact provisions and they either knew or should have known that their rights would be junior to the Mexican rights.

The Six States Committee has no desire to deprive California of any water covered by any of its contracts. Whatever the result may be, one thing is clear. Unless either the Colorado River Compact is discarded or negotiations with Mexico proceed on some other basis than comity, the California junior contracts are benefited by the Treaty. The extent of the right senior to them is defined for all time and it is defined at a figure which is very substantially lower than it would be if the ambitions of the Imperial Irrigation District, another California enterprise, were adopted.

C. OBJECTIONS WHICH INVOLVE THE IMPERIAL IRRIGATION DISTRICT.

The Imperial Irrigation District is the successor of the interests which constructed the Alamo Canal to convey Colorado River water for the irrigation of the Imperial Valley lands. It has been pointed out that this canal, which diverted in the United States, passed for some distance through Mexico, and then reentered the United States, was

constructed under a Mexican concession which recognized a right in Mexico to half the water carried in the canal. Under the Boulder Canyon Project Act the All-American Canal was constructed to eliminate the necessity of conveying water through Mexico.

The All-American Canal has an excess capacity of 3,000 second-feet to the point which is known as Pilot Knob. Here is a drop which may be used for power generation. The district apparently contemplated constructing a power plant at this location and utilizing the excess canal capacity for the carriage of water which would be used at the drop for power generation. Water so used could not be again used for any purpose in the United States, but it could be taken into the Alamo Canal for irrigation use in Mexico. The Imperial Irrigation District has in the past levied a charge on the Mexican irrigation interests for the use of the facilities of the Imperial District, including the Rockwood and Hanlon headings, in making water deliveries to Mexico. Obviously, the generation of power at Pilot Knob and the delivery of such water to Mexico upon payment of charges for the use of facilities are to the financial advantage of the Imperial District.

The running of 3,000 second-feet daily through a plant at Pilot Knob would amount to more than 2,000,000 acre-feet of water a year which could not thereafter be used in the United States but which would be available to Mexico in regulated amounts.

Its local situation no doubt causes California to take the position that it wants no treaty with Mexico. It wants to deal with Mexico in a way which will best serve its own interests, no matter how conflicting they may be.

The position of the Six States Committee is:

(1) The definition of the Mexican right should be held to the smallest amount of water possible to satisfy the Mexican claims fairly and equitably in order that there may be the maximum amount of water available to the United States;

(2) It is unfair and improper for any private interests in the United States to make a financial profit out of the fulfillment of an international obligation;

(3) Whatever property rights of the Imperial District are to be acquired by the United States in order to perform its obligations must be paid for by the United States.

Contrast this position with the California attitude. California apparently resents what it considers the intrusion of the United States in dealing with Mexico. California wants to deal with Mexico in its own way as it sees fit. On the one hand it desires to profit financially through the delivery of water produced in other states and on the other hand it desires to protect its junior contracts which, by the Compact that it signed voluntarily, are junior to the Mexican right. Obviously to carry out the plans of the Imperial District is to increase the regulated supply available to Mexico and thus to build up in that nation an economic development dependent upon the use of Colorado River water. This can have but one result, the establishment of a Mexican claim that will ultimately deprive the other basin states, and the California junior contract holders, of water.

D. OBJECTIONS WHICH INVOLVE THE POWER INTERESTS.

There has come to the attention of the Six States Committee no clear statement of the objection to the Treaty by contractors for power produced at Boulder Dam. They cannot be affected unless in some way the amount of water available for power generation is decreased. This is an engineering question. Thus far nothing has been presented to detract from the conclusion of the engineering advisers of the Six States Committee that the Treaty terms will not reduce the amount of energy generated at Boulder Dam by one kilowatt hour and that during low water periods the amount of firm energy might be increased by the operation of the Treaty.

E. OTHER CALIFORNIA OBJECTIONS.

California objections relating specifically to the Colorado River are discussed in the engineering memorandum submitted herewith, pp. 62-71.

General objections relating to matters which affect all streams are discussed elsewhere herein and will not be repeated.

IV.

RIO GRANDE

1. GENERAL DESCRIPTION

The Rio Grande rises in the State of Colorado and flows for a distance of 180 miles to enter New Mexico, across which it flows for about 400 miles. From the point where it leaves New Mexico the river forms the boundary between the State of Texas and Mexico for about 1,200 miles to its mouth in the Gulf of Mexico. The water shed contributing to the Rio Grande comprises 172,500 square miles, of which 53.2 percent are in the United States and 46.8 percent in Mexico.

The Rio Grande is divided naturally into two basins: the Upper, extending from the headwaters in Colorado to Fort Quitman, Texas, and the Lower, extending from Fort Quitman to the river's mouth. Those two basins are distinct and separate so far as the use of water and the problems regarding such use are concerned.

Most of the water of the upper section is consumed by irrigation in Colorado, New Mexico, Texas and Mexico. Of an original supply of some 2,000,000 acre-feet only an annual average of about 200,000 acre-feet flows into the Lower Basin.

Controversies between the United States and Mexico over the depletion of the supply by irrigation uses in upstream areas to such an extent that irrigation uses in the Juarez Valley of Mexico were seriously curtailed resulted in the Convention of 1906 whereby the United States agreed to deliver 60,000 acre-feet of water annually according to a schedule. To make such deliveries possible the United States constructed, at its expense, the 2,600,000 acre-foot capacity Elephant Butte Reservoir.

The Lower Rio Grande, below Fort Quitman, has a tributary drainage area of 140,000 square miles, of which 61,000 are in the United States and 79,000 in Mexico.

The total water supply originating in the Lower Rio Grande, including about 200,000 acre-feet which enters from the Upper Basin, is estimated at about 6,000,000 acre-feet. Of this quantity approximately seventy percent originates in Mexico. At the present between 4,000,000 and 5,000,000 acre-feet flows unused into the Gulf of Mexico.

The requirements of the area at present irrigated in the United States in the Lower Valley, around Brownsville, varies between some 700,000 acre-feet and 1,000,000 acre-feet annually. The demand fluctuates widely because of variation in rainfall. Almost every year during the early spring months little precipitation occurs and the flow of the stream falls below the irrigation requirements.

Numerous small towns in the Lower Valley are dependent upon river water for domestic and municipal supplies. During some periods of shortage it has been necessary to haul water to the towns in tank cars.

The problem on the Lower Rio Grande both from the United States and Mexican standpoint is regulation of the water supplies by the construction and operation of large storage reservoirs on the main stream. These reservoirs by capturing the flood flows will afford practically complete flood control and will regulate the water supplies so they can be effectively used for irrigation.

2. IRRIGATION DEVELOPMENT IN THE UNITED STATES

At the present about 757,200 acres of land are irrigated in the United States by the Lower Rio Grande. Of this total area about 500,000 acres are in the Lower Valley, over 200,000 acres are along the Pecos, 5,000 acres in the vicinity of Presidio, and over 6,000 acres immediately below Presidio.

The greatest potentiality for additional irrigation is in the delta region. Here the climate is semi-arid and semi-tropical and while the average rainfall is about twenty-three inches it is not properly distributed seasonally to mature the high priced cash crops that are raised there.

At present there are thirty-four irrigation districts and private systems in the valley which embrace a total of 861,600 acres, of which 715,000 acres are considered susceptible of irrigation. Irrigation facilities have been provided for 583,000 acres. Large areas of good arable land lie above the boundaries of the present irrigation districts.

All irrigation in the valley at present is dependent upon pumping plants since without a treaty it has not been possible to build diversion structures across the stream. Fourteen major pumping plants are now in use. The pumping lift at Brownsville is twelve feet and in Hidalgo County the total pump lift reaches 140 feet.

3. IRRIGATION DEVELOPMENT IN MEXICO

Irrigation along the Lower Rio Grande has been practiced in Mexico for many years. About 264,000 acres, mostly along the tributaries, was irrigated by 1900. Irrigation has increased, largely through the development of a few large projects since 1926, to a total area within the drainage basin of the Rio Grande in Mexico of about 574,000 acres. When projects now under construction or proposed for early construction are complete the irrigated area will increase to something over 1,000,000 acres.

A large irrigation project has been projected in the Lower Rio Grande Valley in Mexico which lies opposite the Brownsville area in the United States. In the United States the lands lying adjacent to the river are higher than the river, thereby making pumping necessary, but in Mexico the lands slope very rapidly away from the river, permitting the successful operation of gravity diversion with no diversion dam across the river. A gravity diversion known as the Retamal was completed on the Rio Grande at a point opposite Donna, Texas, in about 1937. Water is diverted through the intake and stored in an off-channel reservoir known as Culebron Lake. Several hundred thousand acres of fertile delta land lie south of the Rio Grande and can be served by canals leading from the Retamal heading and Culebron Lake. Flood control, irrigation and drain-

age works have been planned for a total of about 250,000 acres. At the present a canal from Culebron Reservoir can serve about 50,000 acres, but only 14,000 acres have been developed to date.

Irrigation has been practiced in Mexico along the Rio Conchos since before 1900. The completion of the La Boquilla Dam in 1914 increased the irrigated acreage in this area to nearly 100,000. The recently constructed Delicias project has increased the irrigated area along this tributary to about 170,000 acres, and plans call for a further increase to a total of 260,000 acres.

On the Rio Salado, where the Don Martin project was put in operation in 1930, there is a total irrigation acreage of about 93,000, of which 75,000 acres are under the project.

A large area, which reached 250,000 acres in 1924, is irrigated along the Rio San Juan above the new El Azucar Reservoir near the river's mouth. This area has been able to subsist on natural flow unaided by storage but in 1942 the irrigated area had decreased to about 170,000 acres. The El Azucar Dam project is designed to irrigate about 150,000 acres along the lower San Juan, but only about 14,000 acres have been developed as yet.

4. THE EFFECT OF THE TREATY

The Treaty under consideration divides the water of the river below Fort Quitman between the United States and Mexico on a fair, reasonable, and workable basis. Article 4 allots to the United States all contributions to the main stream from the Pecos and Devils rivers, Goodenough Spring, Alamito, Terlingua, San Felipe, and Pinto creeks; one-third of the contributions to the main stream from the Conchos, San Diego, San Rodrigo, Escondido and Salado rivers and the Las Vacas Arroyo, the principal Mexican tributaries above Salineno, Texas, which Mexico guarantees shall be not less than an average of 350,000 acre-feet annually in cycles of five consecutive years; and one-half of all other flows in the river except those contributed by the San Juan and Alamo rivers in Mexico.

The Treaty allots to Mexico all of the water from the San Juan and Alamo rivers including return flow from lands irrigated therefrom; two-thirds of the flow reaching the main channel from the Conchos, San Diego, San Rodrigo, Escondido, and Salado Rivers, and the Las Vacas Arroyo, subject to the guarantee of 350,000 acre-feet annually to the United States; one-half of all other flows in the river not otherwise allotted by the Treaty.

Mexico is permitted to postpone the delivery of the 350,000 acre-feet, or part thereof, from the Mexican tributaries named above in the event of "extraordinary drought or serious accident to the hydraulic system on the measured Mexican tributaries." Any deficiency in deliveries in a five-year cycle are required to be made up in the next succeeding cycle.

Although only one-third of the water below Fort Quitman originates in the United States, the Treaty divides the water equally between the two countries. It will be noted that the United States is allocated all of the water of measured tributaries in the United States, and hence there is no restriction upon her right of development.

By Article 5 the two countries agree to construct jointly through their respective sections of the Commission the following works:

1. All necessary dams required for the conservation, storage, and regulation of water in a way to ensure the continuance of existing uses in the development of feasible projects within the limits of the allotments;

2. Dams and other works for the diversion of water.

It is provided that construction of the international storage dams shall begin within two years after approval of plans by the two governments, and that construction of the lowest dam shall be completed within eight years from the effective date of the Treaty. The cost of construction, operation, and maintenance of storage dams shall be prorated upon the basis of the capacity allotted to each country for conservation purposes. The Commission is authorized to study, investigate and prepare plans

for flood control works and plants for the generation of hydro-electric energy. The two countries agree to construct such works as may be recommended by the Commission. Power plants are to be constructed on the basis of each country bearing one-half of the expense and getting one-half of the energy.

The general duties and functions of the International Boundary and Water Commission are the same with respect to the Rio Grande as the Colorado River.

The allocation of water between the two nations by the Treaty results in each nation receiving approximately one-half of the supply. However, as part of the Mexican share there is included water which will reach the river from the Alamo and San Juan rivers below the lowest international storage reservoir. This water will consist largely of spills from Azucar Reservoir and will be to a great extent unusable.

Approximately sixty per cent of the water ultimately reaching the stream above the lowest international reservoir will belong to the United States. This amount will average about 2,000,000 acre-feet per annum gross and will be sufficient to furnish the existing areas with a full water supply and will provide water for additional areas almost equal in size to the presently irrigated section. The Mexican share of the regulated supply will permit substantial increase in its development in the Matamoros region.

The construction of the storage dams in the main channel will make possible the prevention of disastrous floods and the conservation and use of some 4,000,000 acre-feet of water now wasting into the Gulf of Mexico. Present irrigation development will be stabilized. Farmers will be assured of a dependable supply of water at the times when it is needed and will not operate under a constant hazard of devastating floods. The 2,000,000 acre-feet of water to be made available for use in the United States will irrigate 400,000 acres of new land, making the total irrigated acreage 900,000.

The definite allocation of water between the two coun-

tries will effectually prevent unrestricted development on the Mexican tributaries which supply the major part of the water and will thus assure water users in the United States that their water supply will not be depleted.

Preliminary estimates indicate that power plants in the two upper dams will produce about 330,000,000 kilowatt hours of firm energy annually. The sale of this power at a switchboard price of 2.7 mills would provide \$900,000 annually. This sum should pay the cost of construction, operation, and maintenance of the power plants and a part of the cost of the dams. The electric energy to be generated at the international dams will encourage industrial development under conditions which are otherwise very unfavorable.

5. THE TREATY DOES NOT AFFECT STATES RIGHTS CONCERNING CONTROL OF THE DIVERSION AND USE OF WATER

There is no provision in the Treaty which constitutes the slightest threat to the jurisdiction and control of the State of Texas over waters of the State. Statements to the effect that under the Treaty the International Boundary and Water Commission or the United States Section can go upon the tributaries of the Rio Grande in Texas and control diversions, retard development, or otherwise usurp jurisdiction over these streams are simply untrue. Attention is directed to the fact that the United States does not guarantee that any certain quantity of water will pass into the main stream from the tributaries arising in the United States. The situation is that the United States can if it sees fit use all the water of its major tributaries before it reaches the main stream. It makes no difference in the operation of the Treaty whether these waters are utilized along the tributaries on lands in Texas and New Mexico or on lands on the main stream below the tributaries. This is a matter entirely for the decision of the duly constituted state authority under the provisions of state law and there is not a syllable in the Treaty to the contrary.

On the Pecos River, which is an interstate stream flowing in both New Mexico and Texas, the rights of the water users are unaffected. State law will still govern. Texas and New Mexico are free to make such apportionment of the waters of the Pecos by interstate compact as they desire.

There is no provision in the Treaty which in any way impairs the authority of the Texas State Board of Water Engineers. Permits heretofore issued or which may be hereafter issued by that board are of value only if the water is physically present for diversion. Article 5 of the Treaty contains an agreement by the two governments to construct dams "for the conservation, storage, and regulation of the greatest quantity of the annual flow of the river in a way to ensure the continuance of existing uses and the development of the greatest number of feasible projects."

Article 9 (b) authorizes either of the two nations to divert at any point on the main stream from Fort Quitman, Texas, to the Gulf of Mexico water belonging to it, but before any such diversion or use "not existing on the date this Treaty enters into force" shall be permitted, the Section of the Commission in whose country the diversion or use is proposed shall make a finding that the water necessary therefor is available from the share of that country. Three things are apparent from consideration of these provisions:

First, existing diversions and uses are absolutely protected. Neither the Commission, nor the United States Section, has any say whatsoever with respect to them, but they may continue as heretofore. If the permits heretofore issued by the Texas Board of Engineers have any validity they will be reinforced under the terms of the Treaty, which declares that the conservation dams are to be constructed "in a way to ensure the continuance of existing uses."

Second, so far as further diversions and uses are concerned, the Commission as such has absolutely nothing to do with it. Only the United States Section will have any voice in the matter.

Third, the only function to be performed by the United States Section in this respect is to determine that there are waters available from the United States apportionment at the places where any diversions are proposed. This does not mean that the United States Section determines the places in Texas where the water is to be used or the amount of water to be used in any particular locality, but only that the water is actually there and within the allotted share of the United States. This is a matter of precise and instant determination and nothing is left to discretion. The Treaty provides in effect that the Commission shall determine from day to day the amount of water impounded in the reservoirs and its ownership as between the two countries. Either country may order its water released whenever it is needed. It is for the Texas authorities under the Texas law to determine who is entitled to the use of the water, where it is to be used, and in what quantities.

The Treaty thus has no effect upon the use of the water in Texas except to make existing and future uses more secure by providing a more ample supply free from the danger of floods and from the uncertainties attendant upon uncontrolled diversions by the other country.

6. FEDERAL PROJECT NO. 5

The Retamal Heading is located above twenty-one of the major United States projects which water lands in the Lower Valley and above about ninety-eight small irrigation systems. The elevation of the heading is such that it can dry the river during periods of low run-off. In the face of recurring shortages and the possibility of more severe shortage due to the operation of Retamal Heading and due to the fact that no treaty had been negotiated providing for the construction of international reservoirs, the United States Section of the International Boundary Commission was authorized in 1938 to investigate means of protecting the United States area against present and potential water shortages and to determine the feasibility

and best means of effecting flood control. As a result of the investigation Federal Project No. 5 was conceived.

The proposed project was designed to divert water by gravity from a point in the river about ten miles above the Town of Zapata. From there the water would be carried in a 3,000 second-foot capacity canal for seventy-two miles to the Los Olmos Reservoir of a capacity of 315,000 acre-feet. Water would be released from this reservoir through a power plant having a capacity of 100,000,000 kilowatt hours per annum and would be conveyed thirty miles to a terminal reservoir having a capacity of 30,000 acre-feet. From here a gravity distribution canal would supply practically all of the lands irrigated in the valley, making unnecessary the operation of the present pumps. It was estimated that the project as described would permit the successful irrigation of the 583,000 acres which at present are under irrigation facilities in the valley.

Upstream storage on American tributaries has been planned which will provide a water supply for the 715,000 acres of irrigable land under organized districts and existing private systems in the valley.

The project will convert from an international to a domestic status the water required for the irrigation of lands in the United States in the Lower Valley that are located under existing districts and private projects. The project was authorized by Congress for construction and an initial appropriation of \$2,500,000 was made. Actual construction work was not commenced because of negotiations on the pending Treaty. If the Treaty is ratified, it is probable that only a part of the project will be required.

V.

TIJUANA RIVER

1. GENERAL DESCRIPTION

The Tijuana River system lies partly in the State of California and partly in the Mexican territory of Baja California. The drainage area comprises 1,679 square miles of which seventy-two percent is in Mexico and twenty-eight percent in the United States. The river crosses into the United States near the City of Tia Juana, Mexico, and flows through California six miles in a westerly direction to the Pacific Ocean. The mouth of the river is only about one and one-half miles north of the international boundary.

The mean annual discharge at the boundary line is estimated to be 26,000 acre-feet annually. In the past violent storms have caused considerable flood damage.

The principal developments in the Tijuana River system in the United States are the Barrett and Moreno reservoirs of the San Diego Municipal Water System with a capacity of 43,000 and 66,000 acre-feet annually. There is some agricultural development near San Ysidro, California. In Mexico the principal development is the Rodriguez Dam, with a capacity of 110,000 acre-feet, and agricultural use between that dam and the City of Tia Juana.

2. THE EFFECT OF THE TREATY

Part IV, Article 16, of the Treaty refers to the Tijuana River. It provides that in order to improve existing uses and assure further development the Commission shall study and investigate and submit to the two governments for approval:

1. Recommendations for the equitable distribution between the two countries of the waters of the Tijuana River system;

2. Plans for conservation, storage and flood control to develop feasible water uses;

3. Estimate of the cost of the proposed works and the division thereof between the two governments;

4. Recommendations regarding the parts or works to be operated and maintained by the Commission and by each Section. The two governments shall construct such of the recommended works as they approve and shall distribute the waters in the proportions approved.

Obviously until the Commission has made its report to the two governments no worthwhile comment can be made. Since the Tijuana is a small stream, having only local interest, and since sufficient studies have not been made at this time to justify the same treatment as was afforded the Rio Grande and the Colorado River, the Treaty negotiators were wise in adopting the general provisions which they did relative to this stream.

THE SIX STATES COMMITTEE

Arizona, Colorado, New Mexico, Texas,
Utah, and Wyoming

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Members of Six States Committee

Gentlemen:

I am transmitting herewith my analysis of the Treaty which has been negotiated with Mexico relating to the utilization of the waters of the Colorado River, the Lower Rio Grande, and the Tijuana River. The analysis is a revised and enlarged edition of the memorandum which I prepared in March, 1944, for the Colorado Water Conservation Board, entitled "MEMORANDUM ON TREATY WITH MEXICO RELATING TO THE UTILIZATION OF THE WATERS OF CERTAIN RIVERS with special reference to the portions of the Treaty relating to the Colorado River."

Respectfully submitted,

R. J. TIPTON.

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INTRODUCTION

The following is a discussion of the technical provisions of the Treaty with Mexico relating to the uses of the waters of the Colorado River, the Lower Rio Grande below Fort Quitman, and the Tijuana River, and an appraisal of their effects upon the uses of water in the United States. The discussion is divided into several sections. The first section consists of a summary and conclusions. The next section is a general discussion of the international and domestic situation existing on the border streams which makes a treaty desirable.

The provisions in the Treaty relating to the Lower Rio Grande are next discussed. Those terms of the Treaty relating to the Colorado River are then discussed, and conclusions of the writer are given concerning the effect of the provisions of the Treaty on water uses in the United States. A short discussion of the Treaty as it relates to the Tijuana River follows. California's position next is outlined in some detail. Her major technical objections to the Treaty are given together with a discussion of those objections.

Three appendices containing background material are attached. Appendix A is a description of the Lower Rio Grande Basin, and includes a discussion of the water supply and the present and prospective future development in the United States and in Mexico. Appendix B is a description of the Colorado River Basin with special emphasis on the Lower Basin. There is outlined present development, prospective future development, and the features in the vicinity of the border which are significant so far as the terms of the Treaty are concerned.

SUMMARY AND CONCLUSIONS

1. The terms of the Treaty are fair and equitable to each country. They correct for all time an intolerable condition that was developing with respect to the use of the waters of the international streams.

2. The Treaty, if ratified, will remove a cloud from future development in the United States. With the amount of water to be allocated to Mexico remaining uncertain, development of large projects in the United States for the use of substantial quantities of Lower Rio Grande and Colorado River waters is hazardous, since the water supply for such projects could be adversely affected by the terms of a treaty allocating water to Mexico negotiated in the future.

3. The terms of the Treaty in respect to the allocation of the waters of the Lower Rio Grande, together with the construction and operation of the international storage reservoirs provided for by the Treaty, will insure an adequate water supply for the present development in the United States and will permit a substantial increase in the irrigated area. The reservoirs also will afford a large degree of flood, silt and salinity control and will permit the generation of a substantial amount of hydro-electric energy.

4. The terms of the Treaty with respect to the allocation of waters of the Colorado River are in accordance with the provisions of the Colorado River Compact, agreed to by the seven Colorado River Basin States. This compact provides for the apportionment of certain water for the use of Mexico, should a treaty be negotiated providing for an allocation of water to Mexico.

5. The terms of the Treaty with respect to the Colorado River are more favorable than the formulas approved at Santa Fe in April, 1943, by the majority of the members of the Committee of Sixteen of the Colorado River Basin.

6. More than sufficient water will be available from the Colorado River System to supply all uses in the United States and Mexico for many years beyond the time that the costs of present constructed works in the Colorado River Basin, including Boulder Dam, All-American Canal, and the Los Angeles Aqueduct, are amortized. It is possible that all practicable development in the United States can be made without conflict with the uses of water by Mexico under the terms of the Treaty.

7. It is estimated that under ultimate conditions of development in the United States only from 375,000 to 600,000 acre-feet per annum will be required from water above Imperial Dam to make the scheduled deliveries to Mexico provided for by the Treaty. The balance of the delivery will be made from return flow and desilting water reaching the river below Imperial Dam.

8. The terms of the Treaty will not adversely affect the use of the water apportioned to the Upper and Lower Basins in the United States by Article III (a) and (b) of the Colorado River Compact, namely, 16,000,000 acre-feet. In addition to the 16,000,000 acre-feet some water will remain for use in the United States as indicated in the following table, which is based upon the estimated water supply for the 46-year period, 1897 to 1943, inclusive:

<i>No.</i>	<i>Item</i>	<i>Acre-feet</i>
1.	Virgin flow—Colorado River System at International Boundary.....	17,751,000
2.	Estimated salvaged water along the main stream below Boulder Dam (minimum)	380,000
3.	Total water supply.....	18,131,000
4.	Water allocated to Upper and Lower Basins by Article III (a) and (b) of the Colorado River Compact....	16,000,000
5.	Remainder to be allocated under the provisions of Article III (c) and (f) of the Compact.....	2,131,000

6. Water allocated to Mexico by the provisions of the Treaty (III (c) water under the Compact) 1,500,000
7. Remainder to be allocated after 1963 under the provisions of Article III (f) of the Compact (minimum) . . . 631,000

The III (f) water in the above table was estimated on the assumption that the Lower Basin would receive credit for return flow reaching the river below Imperial Dam. If the Lower Basin should not receive credit for such return flow, the III (f) water would be increased by at least 900,000 acre-feet. The III (f) water also would be increased by any increase in the salvage of water.

It is concluded that reservoirs which will be constructed and operated in the Colorado River Basin under ultimate conditions will have sufficient capacity to equate fully the flow of the river to the averages in the table.

9. Present contracts for the purchase of electrical energy generated at Boulder Dam will not be adversely affected by the treaty. On the other hand, the amount of firm energy that can be generated in periods of low run-off might be increased by the terms of the Treaty.

10. The State of California has contracts with the Secretary of Interior for the delivery of an aggregate of 5,362,000 acre-feet of water from Lake Mead, providing such water is available under the terms of the Colorado River Compact, and the provisions of the Boulder Canyon Project Act. Four million four hundred thousand acre-feet of the water is to be supplied from water allocated by Article III (a) of the Colorado River Compact, namely, from the 7,500,000 acre-feet allocated by that section to the Lower Basin for beneficial consumptive use. The remaining 962,000 acre-feet must come from unappropriated surplus. The contracts for the delivery of this surplus water are not firm since this type of water cannot be apportioned until each basin is consuming all of the water

allocated to it under the Colorado River Compact, and, in any event, such allocation cannot be made prior to 1963.

11. The infirmity of the contracts for the delivery of water to California under her junior priorities existed at the time those contracts were made. Regardless of the treaty, water might not be available to supply those contracts after full development is made in the basin and at the time the surplus is to be allocated under the terms of the Colorado River Compact. If the terms of the Treaty affect adversely the availability of water to satisfy these contracts it appears probable that a settlement reached by arbitration or by a treaty negotiated sometime in the future would have a greater adverse effect on availability of water to be delivered under the contracts. California set up her own system of priorities. It was by her own act that a part of the municipal water covered by some of the junior priorities was placed in the infirm status. If sufficient water is not available to satisfy all uses it would appear that again it will be California's problem to take care of her requirements in order of importance out of the water available to her.

12. The amount of water to be received by Mexico from the Colorado River under the terms of the proposed Treaty probably does not exceed the amount Mexico would have received under the offer made in 1929, which offer has frequently been interpreted to mean a delivery of 750,000 acre-feet to Mexico. Such offer included, in addition to the 750,000 acre-feet, sufficient water to take care of main canal losses, and in addition thereto Mexico would have received all drainage and other water reaching the main stream below the point of diversion of the 750,000 acre-feet.

13. It has been alleged that the maximum use of water by Mexico prior to the construction of Boulder Dam was 750,000 acre-feet. This, together with all other formerly reported uses of water by Mexico, represents the aggregate amount of water delivered to the Mexican laterals of the Alamo Canal. To arrive at the true amount of water diverted at the Rockwood Heading for the benefit of Mexico

there should be added to the reported quantities Mexico's share of the canal losses and her share of the water which tailed into Salton Sea. When these quantities are added to the amounts delivered to the Mexican laterals, in some instances it may be that the actual quantities of water diverted from the river for Mexico's benefit would not be substantially less than the 1,500,000 acre-feet allocated to Mexico by the terms of the Treaty. Mexico's use of water in the year 1943 exceeded and in the year 1944 approached 1,800,000 acre-feet.

14. It has been alleged that Mexico could not have used in excess of 750,000 acre-feet prior to the construction of Boulder Dam and that the benefits of that dam by Congressional act are all reserved for the United States.

(a) There was actually diverted from the river more than 750,000 acre-feet for Mexico's benefit prior to Boulder Dam.

(b) Mexico, under the concession granted by the Mexican Congress in 1904, which permitted the construction of the Alamo Canal through Mexican territory, could have used an annual average of about 1,500,000 acre-feet during the 13-year period prior to placing Boulder Dam in operation. Under the terms of the concession she could have used a maximum of something over 1,700,000 acre-feet.

(c) A detailed study of stream flow records from 1902 to 1940, depleted to reflect increased upstream uses during the period of the record, indicate that for most years Mexico could have used from the natural flow of the stream 1,500,000 acre-feet, in accordance with her seasonal distribution of use, after the United States' uses existing at the time that Boulder Dam went into operation were satisfied.

(d) Less than one-half of the capacity of Bull-head Reservoir, which is to be used for this and other purposes, would, under the terms of the Treaty, be required to permit Mexico to make full use of 1,500,000 acre-feet of water under pre-Boulder conditions. The

construction of Davis Dam was authorized prior to the negotiation of the Treaty. One of its stated purposes in the authorization was to meter out water to Mexico in the event that a treaty were negotiated with Mexico.

15. At present the river depletion in the United States, due to beneficial consumptive use, is about 7,200,000 acre-feet. This is only forty-five percent of the water allocated by Article III (a) and (b) of the Colorado River Compact to the Upper and Lower Basins. Mexico is utilizing about 1,800,000 acre-feet annually. Therefore, the effect of the Treaty under ultimate conditions will be to curtail the use of water in Mexico and permit a very substantial increase in the use of water in the United States. The physical situation is such that Mexico can increase her use of water easily. In the United States the utilization of all of the water allocated to the Upper and Lower Basins by Article III (a) and (b) will require works of large magnitude which will require years to construct.

16. If the Treaty is not ratified it appears probable that Mexico will continue to increase her uses with a possibility that she may provide a gravity diversion immediately below the upper boundary without a dam across the river, and that after her uses have substantially increased she will ask that the problem be arbitrated under the Pan American Republics Arbitration Treaty. If the controversy were arbitrated the results of the arbitration could well be more unfavorable to the United States' interests, including those of California, than are the terms of the Treaty. Not only would the quantity of water be involved, but the question of quality, both with respect to salt and silt, could be raised by Mexico. These questions are now resolved by the Treaty.

GENERAL

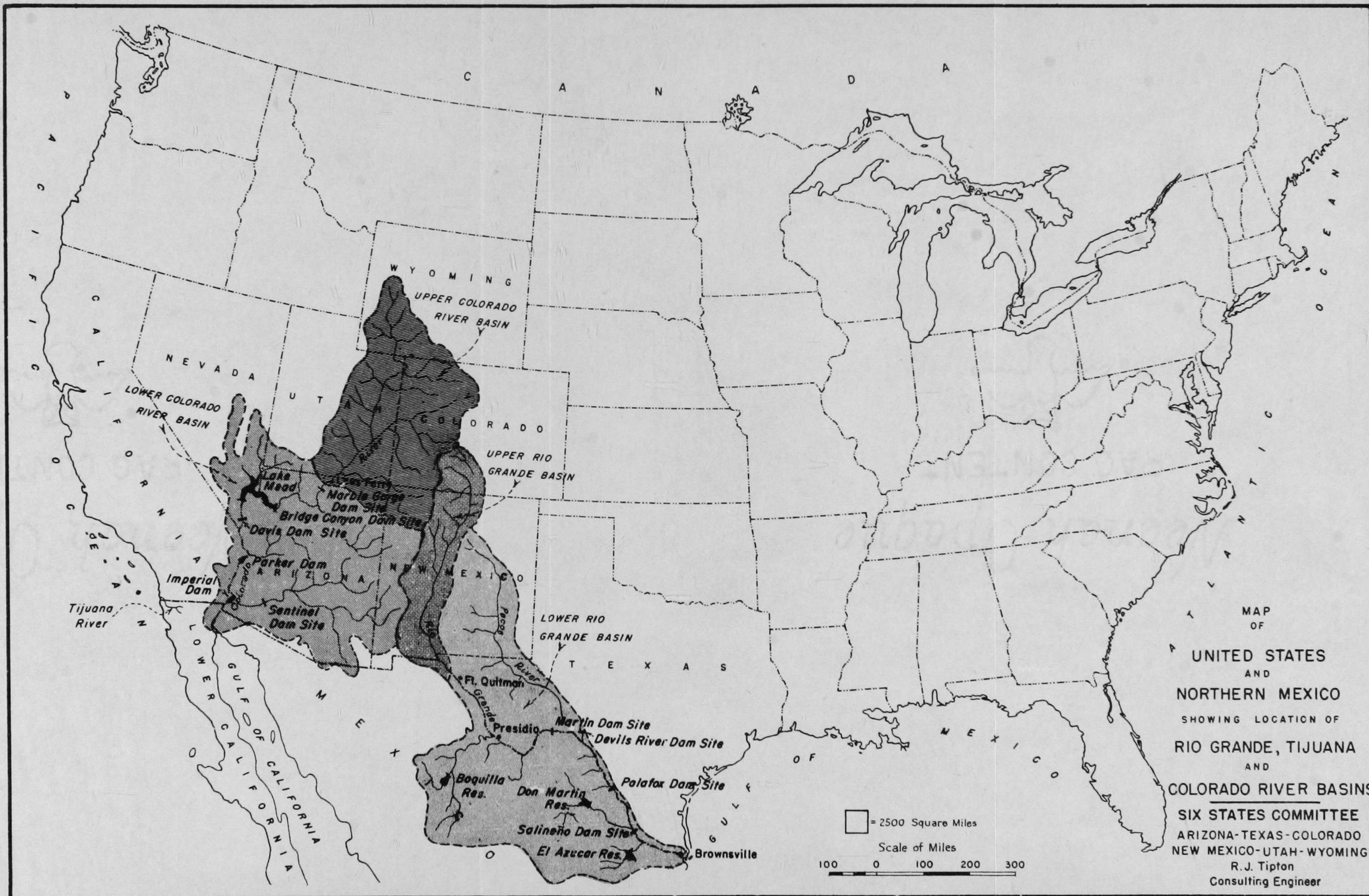
Over a period of years an intolerable situation from both a domestic and an international standpoint has gradually developed with respect to the use of the waters of the border streams by the United States and Mexico.

The drainage basins of those rivers in which both the United States and Mexico have an interest, namely, the Colorado, Rio Grande, and Tijuana, comprise a large and important area in both countries.

Drawing SSC-1 is a map of the United States and a portion of Mexico on which is delineated the drainage basins of these rivers. By symbols the Upper and Lower Basins of the Colorado River and the Upper and Lower Basins of the Rio Grande are shown.

Eight states in the United States, including Arizona, California, Colorado, Nevada, New Mexico, Texas, Utah, and Wyoming, use the waters of these streams for irrigation, municipal, and other purposes. Parts of one Territory, Baja California, and six states of the Republic of Mexico, including Sonora, Chihuahua, Durango, Nuevo Leon, Coahuila, and Tamaulipas, lie within the drainage areas of the three rivers. The waters of the rivers are used in these Mexican States and Territory for irrigation, municipal, and other purposes. The total area of the United States included in the contributing portions of drainage basins of the three rivers is 334,315 square miles, 242,000 of which are in the Colorado River Basin, 91,850 in the Rio Grande Basin, and 465 in the Tijuana Basin. Eighty-four thousand fourteen square miles of Mexico are in the contributing portions of the drainage basins of the three rivers, 80,800 of which are in the Rio Grande, 2,000 in the Colorado River, and 1,214 in the Tijuana.

Differences between the two countries over the uses of the waters of the rivers have been of long standing. The first international controversy of importance involved the uses of the waters of the Upper Rio Grande. Waters of this



MAP OF
 UNITED STATES
 AND
 NORTHERN MEXICO
 SHOWING LOCATION OF
 RIO GRANDE, TIJUANA
 AND
 COLORADO RIVER BASINS
 SIX STATES COMMITTEE
 ARIZONA-Texas-COLORADO
 NEW MEXICO-UTAH-WYOMING
 R. J. Tipton
 Consulting Engineer

river had been used for the irrigation of lands in the Juarez Valley for many years. The Mexican Government in the early 1890's alleged depletion of the water supplies of the Upper Rio Grande by increased irrigation development in the Territory of New Mexico and in the State of Colorado. The situation was materially aggravated by a severe drought which lasted from the early 1890's to 1904.

The controversy was settled by the Convention of 1906, which allocated 60,000 acre-feet of water from the Upper Rio Grande (above Fort Quitman) for use by Mexico in the Juarez Valley. Because of the allocation Mexico withdrew all claims against the United States for damages which she alleged had resulted to the Juarez Valley by increased uses of water in the United States. One of the purposes of Elephant Butte Reservoir, the construction of which was completed in 1915, was to enable the United States to carry out the terms of the Convention.

No administrative provisions were included in the Convention. It merely provided for the delivery of the 60,000 acre-feet, in accordance with a specified schedule, at the International Dam which crosses the river between El Paso and Juarez. Since water both for Mexican and United States use was carried in the river to the International Dam, and since there was no means of controlling Mexican diversions at that point, it naturally resulted that when possible Mexico diverted more than the 60,000 acre-feet provided for in the Convention.

To limit Mexico to the taking of only this amount of water, it became necessary to construct what is known as the American Canal heading in the upper Rio Grande immediately above the point where the river ceases to be the boundary between the two countries. All water normally released from Elephant Butte Reservoir for use in the United States below El Paso is diverted through this canal and the 60,000 acre-feet of water allocated to Mexico is permitted to flow down the stream to the International Dam for diversion by the Mexican canal, the Acequia Madre.

On the Lower Rio Grande below Fort Quitman about seventy percent of the water is furnished by Mexico. Devel-

opment by Mexico of the water of her tributaries of the Rio Grande for consumptive use purposes has been fairly rapid since 1926. Among the various works that have been constructed is the Azucar Dam and Reservoir near the mouth of the San Juan River, one of the principal Mexican tributaries, which enters the stream immediately above the Lower Rio Grande Valley (Brownsville area). The dam forming the Azucar Reservoir has no outlet to pass water from the San Juan to the main stream even though some of San Juan water at times was used for the irrigation of areas in the Lower Valley.

The Mexican Government then constructed a gravity heading (the Retamal) for which no dam was necessary above two-thirds of the headings which supply water to the United States area. This Mexican gravity heading during low water periods could practically dry the stream and deprive the United States water users of water formerly used by them.

The United States in the face of these conditions, and with threats of additional depletions of its water supply, conceived the so-called Federal Project No. 5, which would divert water from the Lower Rio Grande also without a dam and above a point where it would be practicable for the Mexican Government to divert. The other features of the project consisted of a long canal to carry the water from the point of the diversion to an off-channel reservoir and thence to a terminal reservoir which in turn was to supply a canal intended to furnish water by gravity to the various canals serving the Lower Valley, thereby making unnecessary the operation of major pumping plants which now serve those canals.

The intention of Project No. 5 was to convert water required for the irrigation of lands in the Lower Valley from an international to a domestic status, making this area independent of Mexico. The project was authorized for construction by the Congress and an initial appropriation was made to start work.

On the Colorado River the United States constructed the All-American Canal which made the United States in-

terests (the Imperial Irrigation District) independent of Mexico, in that further use of the Alamo Canal for the benefit of the United States was not necessary.

During the past few years Mexico has been rapidly increasing its use of water in Lower California under plans outlined and prepared by its Department of Agriculture. Approximately 1,800,000 acre-feet were diverted for use in 1943. About the same amount was used by Mexico in 1944. This use of Colorado River water was far short of that which had been visualized by the Mexican Department of Agriculture as the ultimate use. At present an average of eight to ten million acre-feet of water is flowing into Mexico annually, of which some five million acre-feet are regulated to a firm dependable flow. The firm flow represents the water released from Lake Mead for the generation of firm energy which is not later used below Lake Mead in the United States for irrigation and municipal purposes. This regulated flow will continue to enter Mexico for many years, which will permit her to increase materially her use of Colorado River water. As a part of the plans for the use of water in Mexico, investigations were under way for the construction of a diversion structure on the main river in Mexico below the lower boundary. Such structure, in the absence of a treaty, could be constructed without regard to its effect on interests in the United States.

After full development in the United States the operation of the All-American Canal, together with the storage works in the United States, ultimately could have deprived Mexico of her equitable share of the use of the waters of the Colorado River.

With the question of the use of border waters unresolved there exists a cloud over large water development in the United States on both the Lower Rio Grande and the Colorado River. Such cloud, however, in the Lower Rio Grande was largely removed by the authorization for construction of Project No. 5. With respect to the Colorado River Basin the Colorado River Compact recognizes the probability of the negotiation of a treaty with Mexico and

allocates water of a certain class to take care of the obligations of such a treaty. The possible effect of the terms of a treaty which might be negotiated sometime in the future was becoming an increasing deterrent to the planning of large projects for the use of Colorado River water. In the Upper Basin the question is continually arising as to what will happen if curtailment must be made at any time in the future in order to enable the basin to make its deliveries at Lee Ferry under the terms of the Colorado River Compact. Each time a large project is authorized for construction other interests within the basin having ambitions for the development of projects in the future wonder whether under curtailment such projects will have a junior status and must give way first in case of required curtailment to meet the terms of the Compact. The uncertainty of the Mexican situation has intensified this difficulty. It would be possible for the terms of a treaty to require delivery of water to Mexico in such amounts as would necessitate the Upper Basin making deliveries in excess of 75,000,000 acre-feet in a ten-year period.

A similar situation exists in the Lower Basin. Both California and Arizona have plans for the utilization of all the water of the Colorado River system not utilized in the Upper Basin. If the plans of these two states are feasible this might be done. However, it has been certain that at some time some of the water of the basin would be allocated by treaty for use by Mexico. The uncertainty of the amount of the allocation has made uncertain the extent to which the Lower Basin states could afford to go in the planning and financing of large water development projects.

These uncertainties and deterrents to sound planning for future development of water supplies in the basins and the financing of the projects for the use of those waters will now be removed if the Treaty is ratified. Each basin will know the amount of water available for its development and the three states in the Lower Basin will have a pretty fair knowledge of what will be available for use under their existing contracts with the Secretary of the Interior.

The unhealthy maneuvering by each country for a more favorable position will be removed by the terms of the Treaty, which terms are considered to be equitable and fair to both countries.

It is certain that Mexico, during the next few years, will substantially increase her use of Colorado River water. If the Treaty is not ratified, it is probable that under the 1929 Pan American Arbitration Treaty Mexico will ask that all problems concerning the use of the river be arbitrated. Such arbitration could result in an allocation of water to Mexico greater than that provided by the proposed Treaty. Even if the questions were not arbitrated, further delay in the negotiation of a treaty would be hazardous to United States' interests, due to the material increase in uses of Colorado River water by Mexico prior to the definition of Mexico's rights. It is understood that no treaty relating to the uses of waters of any stream has been negotiated which has not recognized the then existing uses being made by the negotiating countries of the waters of the stream. In most instances provision has been made for increased uses. It seems important to crystallize at this time Mexico's rights to the use of Colorado River water at as low a quantity as is possible. It is believed this has been done by the Treaty.

EXPLANATION OF TREATY PROVISIONS RELATING TO THE RIO GRANDE

Part II of the Treaty, including Articles 4 to 9, inclusive, relate specifically to the Rio Grande. Certain general provisions of the Treaty also are pertinent to this river.

Article 4 allocates the waters of the Rio Grande; Article 5 provides for the construction of the major storage reservoirs and joint diversion dams; Article 6 provides for study of flood control works; Article 7 provides for the study of and preparation of plans for hydro-electric power plants; Article 8 provides that the Commission created by the Treaty (Article 2) shall formulate rules for operating the river and sets up some general rules for operating the major storage reservoirs; and Article 9 pertains to general regulations for the operation of the river and the keeping of records.

By Article 4 there is allocated to Mexico all of the water reaching the main channel from the San Juan and Alamo Rivers, including the return flow from the lands irrigated by those rivers; one-half of the flow from the main channel of the Rio Grande below the lowest major international storage dam, not otherwise allocated by the Treaty; two-thirds of the flow reaching the main channel of the Rio Grande from certain Mexican tributaries, including the Conchos, San Diego, San Rodrigo, Escondido, and Salado rivers, and Las Vacas Arroyo, subject to certain limitations; and one-half of all other flow in the river not otherwise allocated between Fort Quitman and the lowest major international storage dam.

Article 4 also allocates to the United States all the waters of the principal United States tributaries, specifically named as the Pecos and Devils rivers, Goodenough Spring, and Alamito, Terlingua, San Felipe, and Pinto creeks; one-half the flow of the main channel of the Rio Grande below the lowest major international storage dam

not otherwise specifically allocated by the Treaty; one-third of the flow reaching the main channel from the main Mexican tributaries above the lowest international dam, specifically enumerated as Conchos, San Diego, San Rodrigo, Escondido, and Salado rivers, and the Las Vacas Arroyo, provided that one-third of the flow shall be not less than 350,000 acre-feet reckoned in five-year progressive means, and one-half of all other flow reaching the river between Fort Quitman and the lowest major international storage dam not otherwise allocated by the Treaty.

Article 4 further provides that in case of extraordinary drought or serious accident to the hydraulic systems on the Mexican measured tributaries, making it difficult for Mexico to make available the minimum of 350,000 acre-feet reckoned in five-year progressive means, any deficiencies resulting from the above causes at the end of a five-year cycle shall be made up in the following five-year cycle from the measured tributaries, provided, however, that whenever the conservation capacities in at least two of the major international reservoirs, including the one farthest upstream, assigned to the United States, shall be filled with water belonging to that country all debits shall be considered to be fully paid and a new five-year cycle shall commence.

It should be noted that while Mexico guarantees a certain contribution from her major tributaries above the lowest international storage reservoir the United States makes no such guarantee in connection with her tributaries.

Article 5 provides for agreement by the two governments to construct jointly through their respective Sections of the Commission:

First, the dams required for the conservation storage regulating the flow of the river in such a way as to insure the continuance of the existing uses and the development of the greatest number of feasible projects; and

Second, the dams and other joint works required to divert the flow of the river.

The Treaty specifies the general location of the three

major storage dams, one between Santa Helena Canyon and the mouth of the Pecos River; one between Eagle Pass and Laredo, Texas; and the third in the section between Laredo and Roma, Texas. Various reservoir sites have been investigated in these reaches of the river. However, little exploration work had been done at the time the Treaty was negotiated. Therefore, the Treaty provides that one or more of the dams may be omitted and others may be built as may be determined by the Commission, subject to the approval of the two governments.

The Treaty sets up certain general criteria for the guidance of the Commission in the selection and design of the dams and reservoirs. It specifies the Commission shall determine the most feasible sites, maximum feasible reservoir capacity at each site, the conservation capacity required by each country at each site, taking into consideration the amount and regimen of its share of the water and its contemplated uses, the capacity required for silt retention, and the capacity required for flood control. It is contemplated that the needs of each country at each site will be estimated and in the planning the most feasible capacity will be determined in order to regulate the water supply of each country in accordance with its requirements, the study being made on the basis essentially of there being two rivers and two sets of reservoirs. The results will then be combined and the total required capacity of all reservoirs will thereby be ascertained.

Silt capacity shall be assigned to each country, in proportion to the required conservation capacity, and each country shall have an undivided interest in the flood control capacity of each reservoir.

Article 5 provides that the construction of international storage dams shall start within two years following the approval of the respective plans by the two governments, and that work shall start with the construction of the lowest major international storage dam, providing, however, that the work on the other dams may start at the same time. The lowest dam shall be completed within eight years from the effective date of the Treaty.

The cost of construction, operation, and maintenance of each of the international storage dams shall be prorated between the two governments in proportion to the capacity allocated to each country for conservation purposes at the reservoir of each dam. It should be specifically noted that the cost is not to be prorated in proportion to estimated benefits but in proportion to the actual capacity used by each country. It should be noted also that by this formula although flood control capacity is not specifically divided between the two countries, yet the provisions for that capacity shall be paid for in the same proportion as the conservation capacity assigned to each country.

Article 5 also provides that the construction of dams and other joint works required for the diversion of the flows of the river shall be initiated on the dates recommended by the Commission and approved by the two governments, and that the cost of construction, operation, and maintenance of these works shall be prorated between the two governments in proportion to the benefits received, the benefits to be determined by the Commission and approved by the two governments.

Article 6 provides for the study, investigation, and the preparation of plans for flood control works other than those provided for by the international storage dams. Such works may include levees, floodways, grade control structures, and works for the canalization and rectification of reaches of the river. The Commission is to report to the two governments the works which should be built, the estimated costs, and the part of the works that should be constructed by each country, and that should be operated and maintained by each Section of the Commission.

Article 6 finally provides that each country agrees to construct, through its Section of the Commission, those works recommended by the Commission and approved by the two governments, and that each government shall pay the cost of the works constructed by it and the costs of operation and maintenance of the part of the works assigned to it for such purpose.

It is anticipated that the works covered by Article 6 will be of a relatively minor nature. When a river such as the Rio Grande is controlled by regulatory reservoirs, thereby changing its entire regimen, certain types of improvements may be necessary to stabilize the river channel. Such a condition is developing on the Lower Colorado River below Boulder Dam.

Article 7 provides for a study, investigation, and preparation by the Commission of plans for hydro-electric plants which may be feasible at the international dams. The Article provides that the Commission shall report to the two governments the works which may be built, their estimated cost, and the parts that should be constructed by each government.

Article 7 also provides that each government shall pay one-half the cost of the construction, and the operation and maintenance of the plants, and that the electricity generated by each plant shall be assigned in like proportion.

Article 8 provides that the Commission shall formulate regulations for the storage, conveyance, and delivery of the water of the Rio Grande from Fort Quitman to the Gulf of Mexico within one year following the placing in operation of the first major international storage dam, and that such regulations shall be submitted to each government for its approval.

Article 8 also provides that the Commission can make modifications, amendments, or supplements to such regulations, subject to the approval of the two governments. As a general guide certain general rules are specifically set up, these rules to be controlling unless modified or amended by agreement of the Commission with the approval of the two governments. The rules are intended to provide for the most efficient operation of the storage reservoirs, making for a minimum of spills. A system of accounting for the water stored in the reservoirs is specified.

Provision is made:

First, that the storage in the major reservoirs above the lowest shall be maintained at the maximum practicable water level consistent with operation for flood control, irrigation, and power. It is anticipated the lowest reservoir will be the main operating reservoir. The provision for the maintenance of maximum practicable water level in the upper reservoirs is to prevent loss of water, since water released from them indiscriminately might result in spill from the lowest reservoirs which could not be recaptured in any other reservoir for subsequent use;

Second, that the inflows to each reservoir shall be credited to each country, in accordance with the ownership of such inflow;

Third, that reservoir losses shall be charged in proportion to the ownership of the water in storage;

Fourth, that the releases from any reservoir shall be charged to the country requesting them, except that releases for the generation of electric energy, or other common purpose, shall be charged in proportion to the ownership of water in storage.

Article 8 also provides that flood discharges and spills from the upper reservoirs shall be divided in the same proportion as the ownership of the inflows at the time of such flood discharges and spills, with some modification explained hereinafter. The flood discharges and spills from the lowest reservoir are to be divided equally except that one country may with the consent of the Commission use such flood water as would otherwise spill from the share of the other. Provision is made for the use by one country of the conservation capacity belonging to the other country under certain conditions. This provision eliminates the possibility of wasting of water by spill, due to one country's having its conservation capacity entirely filled while the conservation capacity of the other country is not filled.

Article 8 further provides that either country may utilize the water stored to its credit in any of the interna-

tional reservoirs, providing the water so taken is for direct beneficial use or for storage in other reservoirs.

Article 9 deals mainly with the operation of the river channel and the keeping of records. It provides that the channel of the river may be used by either country to convey the water belonging to it, and that either country may construct the works necessary for diversion at any point along the stream for its use, providing that the Section of the Commission of the particular country making use of water has made a finding that the water necessary for the diversion will be available at that point from the water allocated to that country. This provision applies to future diversions. The diversion works, unless they are for joint use, are not subject to the approval of the Commission. The plans, however, are to be submitted to the Commission for its information. Diversions in excess of the amount of water belonging to one country can be made if authorized by the Commission, if this can be done without injury to the other country, and if it can be replaced at some other point on the river. This provision may be found useful in such areas as the Presidio.

The Commission may authorize the temporary use by one country of water belonging to the other country when that country is not using such water. During periods of extraordinary drought in one country, coincident with an abundant supply in the other country, the Commission may authorize the use of water stored in the international reservoirs to the credit of the country enjoying the abundant water supply for the use of the country undergoing the drought. It is largely due to this provision that Article 8 provides that water withdrawn from international reservoirs shall be for direct beneficial use or for storage in other reservoirs. This provision prevents one country from depleting its supplies by wasteful use and calling on the other country for water under the extraordinary drought provision.

Waters that are imported into the basin from another

watershed shall be credited to the country making the importation.

Main channel losses are to be charged in proportion to the ownership of the water being conveyed in the channel. Consumptive uses from the main stream and from the unmeasured tributaries below Fort Quitman are to be charged against the share of the country making those uses.

Article 9 provides that each country shall have the right to divert from the main stream of the river any amount of water, including that belonging to the other country, for the purpose of generating hydro-electric energy, providing that such diversion does not injure the other country, that it does not interfere with the international generation of power, and that any water not returned directly to the river shall be charged to the share of the country making the diversion. The feasibility of such diversions that are proposed after the Treaty becomes effective is to be determined by the Commission.

Article 9 provides for measuring the water by the establishment of gauging stations, and provides that the cost of maintaining the necessary stations on the main channel shall be borne equally by the two governments. The operation and maintenance of all gauging stations and the cost thereof is to be apportioned between the two Sections, in accordance with a determination made by the Commission.

Certain general articles of the Treaty are important, so far as the Lower Rio Grande is concerned. Article 17 provides for the use of the channel of the river for the discharge of floods or other excess water and provides that neither country shall have a claim against the other due to such flood flows. It provides that works shall be operated, so far as feasible, to avoid material damage to either country.

Article 19 provides for special agreements which may be necessary to regulate the generation, development and disposition of electric power at international plants, including the necessary provisions for the export of electric current. This provision applies only to the Lower Rio Grande

since international hydro-electric plants will be located only on this river. The export provision is particularly beneficial to the United States since it is probable that Mexico's share of the electric energy generated at international plants will be in excess of her requirements for at least several years. This excess energy can, therefore, be made available for use in the United States.

Article 26 is a transitory provision which provides that for a period of eight years after the Treaty becomes effective Mexico will cooperate with the United States in making water available from the Azucar Reservoir on the San Juan during drought periods. It provides the amounts in which the water shall be made available.

EFFECT OF THE PROVISIONS OF THE TREATY RELATING TO THE RIO GRANDE

The total virgin water production on the Lower Rio Grande is estimated at about 6,800,000 acre-feet. At present in excess of 4,000,000 acre-feet on the average flows into the Gulf of Mexico unconsumed. The flow of the stream is erratic, varying between wide limits. Much of the water going to the gulf consists of flood flows. At times the flow of the river becomes much less than the current requirements in the Brownsville area. Regulation of the water supplies to provide a firm supply for present uses and to provide for additional uses, as well as additional flood protection, is required. The most feasible means of bringing about these various objectives is the construction and operation of large international reservoirs along the main channel of the river. The Treaty provides that this shall be done.

The allocation of water between the two nations, as made by the Treaty, results in Mexico receiving approximately one-half of the supply and the United States one-half. However, as part of the Mexican share there is included the water which will reach the river from the Alamo and San Juan rivers below the lowest international storage reservoir. This water will consist largely of spills from Azucar Reservoir, much of which will be largely unusable.

Preliminary studies indicate that approximately sixty percent of the water ultimately reaching the stream above the lowest international reservoir will belong to the United States. Such studies indicate that this will average about 2,000,000 acre-feet gross per annum. The net amount will depend upon the capacity of the reservoirs finally constructed on the stream. Such amount, it appears, will be sufficient to furnish the existing areas with an adequate water supply and will provide water for additional areas almost equal to the present ones. Mexico's share of the regulated supply will permit substantial increase in her development in the Matamoras region.

The United States will receive the same benefit from the projects provided for under the Treaty as it would from Federal Project No. 5 (Appendix A). In addition thereto virtually complete flood protection will be provided for the Lower Valley which would not have been provided by Project No. 5, and a greater area of new land can be brought in. It appears that the United States' share of the cost of the international works will not substantially exceed the cost of construction of Federal Project No. 5.

A description of the Rio Grande Basin and a more complete discussion of the water supply is contained in Appendix A.

EXPLANATION OF TREATY PROVISIONS RELATING TO THE TIJUANA RIVER

Part IV, consisting of Article 16, relates specifically to the Tijuana River. This article provides that the Commission shall study the problems of the Tijuana and recommend to the two governments an equitable apportionment of the waters of the system between the two countries, and shall submit for approval plans for the storage and control of the waters for flood control and for domestic, irrigation, and other feasible uses and shall submit estimates of cost of the works, recommendations as to the manner in which the costs shall be divided between the two governments, and the portions of the works which will be operated and maintained by the Commission and parts to be operated and maintained by each Section.

Article 16 then provides that the Sections of the Commission shall construct the works approved by both governments and shall divide the costs of the works and shall distribute the waters in accordance with the approval of the governments.

The Treaty provides that each government shall share equally in the cost of the operation and maintenance of joint works and that each government shall pay the cost of maintenance of the works that are assigned specifically to it.

A discussion of the Tijuana River Basin is included in Appendix C.

EXPLANATION OF TREATY PROVISIONS RELATING TO THE COLORADO RIVER

The articles relating specifically to the Colorado River are all contained in Part III of the Treaty. General articles in other parts of the Treaty also are important to the Colorado River Basin.

Articles 10, 11, and 15 of the Treaty provide for the amounts, points and manner of delivery of Colorado River water by the United States to Mexico.

Article 10 provides that the United States shall deliver to Mexico, in accordance with a schedule to be furnished by her, a minimum of 1,500,000 acre-feet of water from any and all sources, and that when surplus water is in the river the United States will undertake to deliver up to but not exceeding 1,700,000 acre-feet per year, the availability of surplus to be determined by the United States Section of the Commission, with the further provision that Mexico can acquire no right to the use of waters of the Colorado River System "for any purpose whatsoever" in excess of 1,500,000 acre-feet annually. In the event it is difficult for the United States to deliver the minimum quantity of 1,500,000 acre-feet on account of extreme drought or other conditions, the amount delivered shall be reduced in the same proportion as consumptive uses in the United States are reduced.

The Treaty provides for three general points of delivery—the limitrophe section of the river, a point on the land boundary near San Luis, Sonora, and the point where the Alamo or other equivalent canal crosses the upper land boundary. Deliveries in the limitrophe section of the river are to be made from any waters reaching that section—"whatever their origin." From the time that Davis Dam and reservoir are placed in operation until January 1, 1980, 500,000 acre-feet of the water allocated to Mexico shall be delivered to the Alamo Canal by means of the All-American Canal and 1,000,000 acre-feet shall be delivered in the

limitrophe section of the river. After January 1, 1980, 375,000 acre-feet shall be delivered through the All-American Canal and 1,125,000 acre-feet in the limitrophe section of the river.

In Article 15, which provides for the scheduling of the deliveries of water to Mexico, certain minimum and maximum limitations on the scheduling are fixed. Two schedules are provided for, one for the delivery of water by the All-American Canal for the two periods, and one for the delivery of water in the limitrophe section of the river. The Treaty itself schedules minimum rates of delivery accounting for 900,000 acre-feet of the total minimum guaranteed delivery of 1,500,000 acre-feet. The minimum schedule was so designed as to account for practically all of the firm return flow that might reach the river below Imperial Dam under ultimate conditions of development, thereby making it possible for the United States to receive credit for such return as against its obligation to deliver the 1,500,000 acre-feet. There is a further provision that Mexico cannot call for more than 5,500 cubic feet per second at any time, the purpose of which was to keep the maximum deliveries within the capacity of the available facilities.

It may be possible that at some time in the future by mutual agreement Imperial Dam may be used to deliver water to Mexico by some means other than through the All-American Canal. For example, water might be delivered to Sonora lands through an extension of the canal constructed to serve the first unit of the Gila project. In the event such agreement is made, the deliveries through the All-American Canal shall be reduced by the amount of the deliveries to other points on the land boundary. This is covered by paragraph B of Article 15.

Paragraph C of Article 15 is important. It gives the United States the option of supplying winter water for the months of October to February, inclusive, through the Alamo Canal from any source whatsoever in lieu of the use of the All-American Canal for this purpose. This permits the United States to supply such water from drainage returns reaching the river between Imperial Dam and the

present heading of the Alamo Canal, should this become desirable due to the scarcity of water. A similar provision for summer deliveries would not be significant since the summer schedule for delivery of water to Mexico in the limitrophe section of the river will always be sufficiently high to encompass practically all drainage water reaching the stream between Imperial Dam and the lower boundary.

Paragraph D of Article 15 is a declaration of intention on the part of the United States to deliver additional quantities of water through the All-American Canal providing this can be done without detriment to the United States, and providing further that the delivery of such additional quantities will not have the effect of increasing the total amount of water delivered to Mexico. This will permit Mexico to receive larger quantities of clear water during the period when the silt problem is the greatest, if this can be done without detriment to the United States.

In paragraph D Mexico also declares her intention to cooperate with the United States by attempting to curtail deliveries of water through the All-American Canal if necessary to make full use of all available water supply. Such curtailment might be desirable in periods of low water supply in order that the United States shall get credit for all available return flow reaching the stream below Imperial Dam.

Paragraph E of Article 15 provides for the manner in which the 200,000 acre-feet of surplus shall be delivered to Mexico if such surplus is available.

Paragraph F gives Mexico the privilege of changing her schedules by not more than twenty percent of any monthly quantity upon thirty days' notice, but such change shall not result in any change in the maximum and minimum limits fixed by the schedule.

Paragraph G provides that water delivered to the limitrophe section of the river under Schedule I may be increased any year if the amount delivered through the All-American Canal under Schedule II is correspondingly reduced; provided the limitations as to the rates of delivery shall always be correspondingly increased and reduced.

Certain phases of the allocation and scheduling articles are important. Attention is called to the fact that delivery of water to Mexico is from waters of the Colorado River "from any and all sources" and also "that the United States shall deliver all waters allocated to Mexico wherever these waters may arrive in the bed of the limitrophe section of the Colorado River" except the water to be delivered to the All-American Canal and at the land boundary near San Luis, Sonora, and that "such waters shall be made up of the waters of the said river whatever their origin * * * * * ." The phrase "from any and all sources" and statement "whatever their origin" mean that there shall be included as a part of the deliveries to Mexico and charged against the allocation to Mexico any drain water or waste water accruing to the river from the United States projects, regardless of their quality, either from the standpoint of silt or dissolved solids.

Attention is called to the part of Article 10 which states that "Mexico shall acquire no right beyond that provided by this sub-paragraph by the use of the waters of the Colorado River System for any purpose whatsoever in excess of 1,500,000 acre-feet annually." The phrase "for any purpose whatsoever" is significant. It is conceivable that it will be necessary for Mexico to use some of the waters allocated to her for sluicing purposes, not only to remove sand from her canals but to carry the sand and silt down the stream to the gulf. Such sluicing water must be taken from the 1,500,000 acre-feet that is allocated to Mexico. The net amount remaining for diversion may therefore be less than 1,500,000 acre-feet, but she will have no additional claim on the United States for the delivery of additional water for sluicing or any other purposes, such as salinity control.

The provision for reducing deliveries to Mexico in the event of drought in the same proportion as consumptive uses in the United States are reduced applies to conditions in both the Upper and Lower Basins. It is certain that severe droughts will be felt in the Upper Basin prior to the time they are felt in the Lower Basin. If curtailment of

uses in the Upper Basin results on account of the drought, proportionate reduction would be made of deliveries of water to Mexico, on the basis, however, of the relationship between the curtailment to the total consumptive use in the United States.

The amount of water to be delivered through the All-American Canal has some significance. If the major diversion structure constructed by Mexico on the stream provided for in Article 12 (discussed in the next paragraph) is located in Mexico below the lower boundary some 90,000 acres of land now irrigated in Mexico will be too high to be served by the canal extending from the diversion structure to the Alamo Canal in Mexico. The 375,000 acre-feet to be delivered to the upper portion of the Alamo Canal by the All-American Canal after January 1, 1980, will be about sufficient to serve such 90,000 acres of land. Until that time a minimum delivery up to 500,000 acre-feet from the All-American Canal is provided for. During this first period when the silt problem will be greater than it will be during the latter period, 500,000 acre-feet of clear water is guaranteed to Mexico. This delivery will not interfere with the operation of United States facilities because of surplus water in the river.

Article 12 provides for the construction of certain works by Mexico and the United States, including a major diversion structure for the diversion of a greater part of the waters allocated to Mexico, and the Davis storage dam and reservoir, both of which are to be constructed within a five-year period. The major diversion structure is to be constructed by Mexico at its expense, and simultaneously therewith there is to be constructed, at Mexico's expense, such levees, drainage facilities and other works and improvements to existing works as are, in the opinion of the Commission, deemed to be necessary to protect lands within the United States against damage from floods or seepage that might result from the construction, operation, and maintenance of the diversion structure.

Article 12 also provides that the United States shall

construct or acquire in its own territory such works as may be necessary to convey a part of the water of the Colorado River allocated to Mexico to the Mexican diversion points on the international boundary line. Such works will include the canal and other facilities necessary to convey water from the lower end of the Pilot Knob Wasteway to the international boundary and a canal to connect the main diversion structure if this structure should be built in the limitrophe section of the river with the Mexican system of canals at a point on the international land boundary near San Luis, Sonora. The Article provides that such works required or constructed shall be operated and maintained by the United States Section at the expense of Mexico, and that Mexico shall pay the cost of any sites or right of way required for such work. This article also provides for the construction, operation, and maintenance of the gauging stations necessary for the administration of the terms of the Treaty.

If the main diversion structure for Mexican uses is constructed in the limitrophe section of the river, the design and construction shall be under the control of the Commission. If it is located entirely in Mexico, such is not the case. However, in either event, the required protective works shall be determined by the Commission.

Article 13 is a general article providing for the study, investigation, and preparation of plans for flood control on the Colorado River from the Imperial Dam to the Gulf of California.

Article 14 provides for the payment by Mexico of a portion of the cost of the construction of Imperial Dam and the Imperial Dam-Pilot Knob section of the All-American Canal; and provides further for the payment by Mexico of the proportionate part of the total costs of the operation and maintenance of such facilities. It provides further that in the event the return from the sale of hydro-electric energy becomes available for the repayment of a portion of the cost of these works, Mexico's obligation for repay-

ment shall be reduced in the same proportion as the total costs are reduced.

Certain general provisions are important so far as the Colorado River is concerned. Article 17 provides for the use of the channels of the international rivers for the discharge of flood or other excess water without limitation by either country and with the provision that neither country shall have any claim whatever with respect to damage caused by such use. In other words, while the water schedules furnished by Mexico cannot call for delivery in excess of 5,500 cubic feet per second, yet the United States may use the channel of the river to carry water released for flood control from Lake Mead or any other reservoirs constructed and operated on the stream or its tributaries without Mexico having any right to claim damage which might be caused by such releases. Each country, however, declares its intention to operate its facilities in such a manner consistent with normal operation as to avoid, as far as feasible, material damage in the territory of the other.

Article 27 is a transitory article providing that Articles 10, 11, and 15 of the Treaty, which are the allocation, point of delivery, and scheduling articles, shall not be applied during the five-year period or until Davis Dam and the major Mexican diversion structures are placed in operation. Until such works are placed in operation, these articles give Mexico the right to construct and operate at her expense a temporary diversion structure in the bed of the Colorado River for the purpose of diverting water into the Alamo Canal, providing that the plans for such structure, its construction, and operation shall be subject to the approval of the United States Section. The United States declares its intent during the five-year transitory period to use its best possible efforts to cooperate with Mexico to the end that the irrigation requirements for lands irrigated in Mexico during the year 1943 shall be satisfied; water therefor, however, being water not required for use in the United States.

EFFECT OF THE TREATY PROVISIONS ON THE USES OF COLORADO RIVER WATER IN THE UNITED STATES

GENERAL

At the time the Colorado River Compact was negotiated the commissioners of the seven States visualized the possibility of the negotiation of a treaty with the United Mexican States which would allocate waters of the Colorado River for use in Mexico. Specific provisions were made in the Compact for the use of certain waters for that purpose. The allocation section of the Compact is quoted as follows:

ARTICLE III

(a) There is hereby apportioned from the Colorado River System in perpetuity to the Upper Basin and to the Lower Basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.

(b) In addition to the apportionment in paragraph (a), the Lower Basin is hereby given the right to increase its beneficial consumptive use of such waters one million acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River System, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the Upper Basin and the Lower Basin, and whenever necessary the States of the Upper Division shall deliver at Lee Ferry water to supply one-half of the defi-

ciency so recognized in addition to that provided in paragraph (d).

(d) The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this Compact.

(e) The States of the Upper Division shall not withhold water, and the States of the Lower Division shall not require the delivery of water which can not reasonably be applied to domestic and agricultural uses.

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c) may be made in the manner provided in paragraph (g) at any time after October first, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g) In the event of a desire for a further apportionment, as provided in paragraph (f), any two signatory States, acting through their governors, may give joint notice of such desire to the governors of the other signatory States, and to the President of the United States of America, and it shall be the duty of the governors of the signatory States and of the President of the United States of America forthwith to appoint representatives, whose duty it shall be to divide and apportion equitably between the Upper Basin and Lower Basin the beneficial use of the unapportioned water of the Colorado River System, as mentioned in paragraph (f), subject to the legislative ratification of the signatory States and the Congress of the United States of America.

Attention is directed to subsection (c) which provides specifically that should a treaty be negotiated with Mexico the waters allocated to Mexico should come first from waters in addition to those apportioned by subsections (a)

and (b), or, in other words, waters in excess of 16,000,000 acre-feet per annum. The subsection provides further that, should such surplus over the 16,000,000 acre-feet be insufficient to satisfy the Mexican allocation, the deficiency should be borne equally by the Upper and Lower Basins. Attention is directed also to provisions of subsection (f). This subsection recognizes all waters covered by subsections (a), (b), and (c) as apportioned waters. It then specifically provides that any water in excess of that apportioned by subsections (a), (b), and (c) may be apportioned after October 1, 1963, if and when either the Upper or the Lower Basin shall have reached its total beneficial consumptive use of waters apportioned under subsections (a) and (b).

It is probable that for many years, extending well beyond the time (1988) when the costs of Boulder Dam and all other works presently constructed in the basin are amortized, ample water will be available under all conditions to supply all uses in the United States and the obligation of the United States to Mexico under the terms of the Treaty. The following discussion relates, therefore, to that time when the two nations may be using for consumptive-use purposes all the water supply available in the basin.

EFFECT ON USES OF WATER FOR CONSUMPTIVE USE IN THE UNITED STATES

A study of the water supply records together with the operation of existing and proposed reservoirs indicates that the 1,500,000 acre-feet allocated to Mexico will all be supplied from water over and above the 16,000,000 acre-feet apportioned by sub-paragraphs (a) and (b) of Article III of the Colorado River Compact.

It is estimated that a minimum of about 630,000 acre-feet of water annually will be available for additional uses in the United States which may be apportioned under Article III (f) and (g) of the Compact. This is the minimum quantity. The quantity might be in excess of 2,000,000 acre-feet, depending upon certain interpretations of the Compact and the amount of water now being lost from

natural causes which may be salvaged by future development in the basin.

The burden on the water above Imperial Dam imposed by the Treaty obligations will be influenced by two main factors, viz: the areas on which Arizona will use the major part of its share of the Colorado River, and the amount of desilting water required under far-future conditions. Under the most favorable combination of circumstances it is estimated the Mexican demand on water above Imperial will be limited to the 375,000 acre-feet to be delivered through the All-American Canal. Under the most unfavorable combination of circumstances the maximum demand on water above Imperial Dam to satisfy the Treaty obligations to Mexico is estimated at 600,000 acre-feet.

Two general regions are available in Arizona to utilize substantial quantities of water stored by Lake Mead for which Arizona has a contract with the Secretary of Interior (See Appendix B—Description of Lower Colorado River Basin). One of these two regions is the Lower Gila Valley, extending from the east side of the present Yuma project several miles up the Gila River. It includes the Yuma Mesa land. The gross Gila project area is about 645,000 acres with possibly 500,000 acres irrigable. Works already have been constructed to irrigate a part of the Yuma Mesa division of the first unit of the project. The net area in the first unit is about 160,000 acres. If the entire Gila project is irrigated, engineers for the United States Bureau of Reclamation estimate that the total return flow and desilting water reaching the river below Imperial Dam will be about 1,300,000 acre-feet. This includes the return flow from the Yuma project, the Gila project, seepage losses from the All-American Canal, and desilting water at Imperial Dam.

The other region where large quantities of Colorado River water can be used in Arizona comprises irrigated and irrigable areas along the Upper Gila River and its tributaries. More land exists in this region than the Gila River System will irrigate. A great need also exists for supplemental water supplies for the lands that are at pres-

ent irrigated. Return flow and waste waters from such areas, if served by Colorado River water, will return by way of the Gila River. Some reuse will be made of the return flow along the Gila River proper. Finally, the residual water will be of such quality that it may not be reused in the United States but will flow out of the mouth of the Gila River into the Colorado River below Imperial Dam. It is assumed that when the concentration of dissolved solids in the water ranges between 3,000 parts and 4,000 parts per million, water will not be diverted for use in the United States. Such returns and waste water, after reaching the Colorado River, will be charged against the allocation of water to Mexico. If the major portion of Arizona's water is used in the central part of the state it is estimated that the maximum demand on water from above Imperial Dam will be about 600,000 acre-feet. This condition presupposes that the use of water on the Yuma project would be reduced to a minimum by the lining of its canals, that only 80,000 acres of the Gila River project would be irrigated, that no irrigation would be practiced in the Mohave Valley, that the irrigated acreage on the Colorado River-Indian project (Parker Valley) would be limited to 60,000, and the balance of Arizona water, except that used along her tributaries, would be used in the central part of the state.

Another intermediate condition was assumed which presupposes that 100,000 acres would be irrigated under the Colorado River-Indian project, that 160,000 acres would be irrigated on the Gila project, and that the balance of Arizona's water, other than that used on the Yuma project and along her tributaries, would be utilized in the central part of the state. Under this condition it is estimated that the maximum demand of water from above Imperial Dam will be about 500,000 acre-feet. This will be during those years when no original Gila River water is available for use by Mexico. When Gila River water is available and regulated by the reservoir proposed for construction on the lower reaches of the Gila River (Dwg. SSC-10 Appendix B) it is estimated that the demand for

water above Imperial Dam to satisfy the treaty obligation to Mexico will be limited to the 375,000 acre-feet to be delivered to the All-American Canal. This condition was taken as the most probable of the three conditions outlined.

Included in the above estimates of water reaching the river below Imperial Dam under ultimate conditions of development in the United States is 100,000 acre-feet for desilting purposes. The required quantity of water for this purpose has been variously estimated at from 200,000 to 400,000 acre-feet per annum. For the purpose of this discussion it is assumed that such water will amount to only 100,000 acre-feet per annum (See Appendix B). The 100,000 acre-feet will be only two to two and one-half percent of the total water which will be diverted by means of Imperial Dam.

Therefore, 600,000 acre-feet is taken as a round figure to represent the maximum burden that will be placed upon the water above Imperial Dam to satisfy the United States' obligation to Mexico under the terms of the Treaty. This amount would be reduced to the extent that the water used for desilting purposes exceeds 100,000 acre-feet per annum.

For such a period as 1897 to 1943, inclusive, it is concluded that the 1,500,000 acre-feet can be delivered to Mexico without causing any reduction at any time in the uses by the United States of the 16,000,000 acre-feet of water allocated to the Upper and Lower Colorado River Basins by Article III (a) and (b) of the Colorado River Compact. If the Lower Basin gets credit for return flow reaching the river below Imperial Dam, it is estimated that the minimum average annual quantity of water available after the Mexico water is delivered and after the 16,000,000 acre-feet of III (a) and (b) water are consumed in the United States will be 631,000 acre-feet. This is water that will be subject to allocation after 1963 under Article III (f) and (g) of the Colorado River Compact. The quantity of so-called III (f) water might be increased by additional salvage water in the basin (due to the conversion of natural losses to beneficial use). Three (f) water would also be increased by some nine hundred thousand acre-feet if it were inter-

preted that the Lower Basin under the terms of the Colorado River Compact did not get credit for the return flow reaching the river below Imperial Dam.

Table A is an estimate of the water supply of the Colorado River for the period 1897 to 1943. It shows the quantities from which the above conclusions were reached.

TABLE A
ESTIMATED WATER SUPPLY OF THE COLORADO
RIVER SYSTEM
1897-1943

No.	Item	Acre-Feet
1	Virgin flow at Lee Ferry.....	16,271,000
2	Inflow—Lee Ferry to Boulder Dam.....	1,060,000
3	Inflow—Boulder Dam to Imperial Dam....	195,000
4	Natural losses—Boulder Dam to Imperial Dam	—1,075,000
5	Virgin flow at Imperial Dam.....	16,451,000
6	Virgin flow—Gila River at mouth.....	1,300,000
7	Total virgin flow at International Boundary	17,751,000
8	Salvaged water along the main stream below Boulder Dam due to developments in the United States (Minimum).....	380,000
9	Total water supply	18,131,000
10	Water allocated to the Upper and Lower Colorado River Basins by Article III (a) and (b) of the Colorado River Compact..	16,000,000
11	Remainder to be allocated under the provisions of Article III (c) and (f) of the Colorado River Compact.....	2,131,000
12	Water allocated to Mexico by the provisions of the pending Treaty (III (c) water under the Compact).....	1,500,000

13	Remainder to be allocated under the provisions of Article III (f) of the Colorado River Compact after 1963 (Minimum)	631,000
	Assuming the Lower Basin receives credit for return flow reaching the river below Imperial Dam.	
14	Return flow and desilting water reaching river below Imperial Dam	900,000
15	Remainder to be allocated under provisions of Article III (f) of the Colorado River Compact after 1963 if the Lower Basin does not receive credit for return flow reaching the river below Imperial Dam, over	1,531,000

The quantity of III (f) water will be further increased by additional salvage of water in the basin.

For the period 1897 to 1943, which is used herein as a basis for the water supply studies, the lowest ten-year run-off was for the period 1931 to 1940, inclusive.

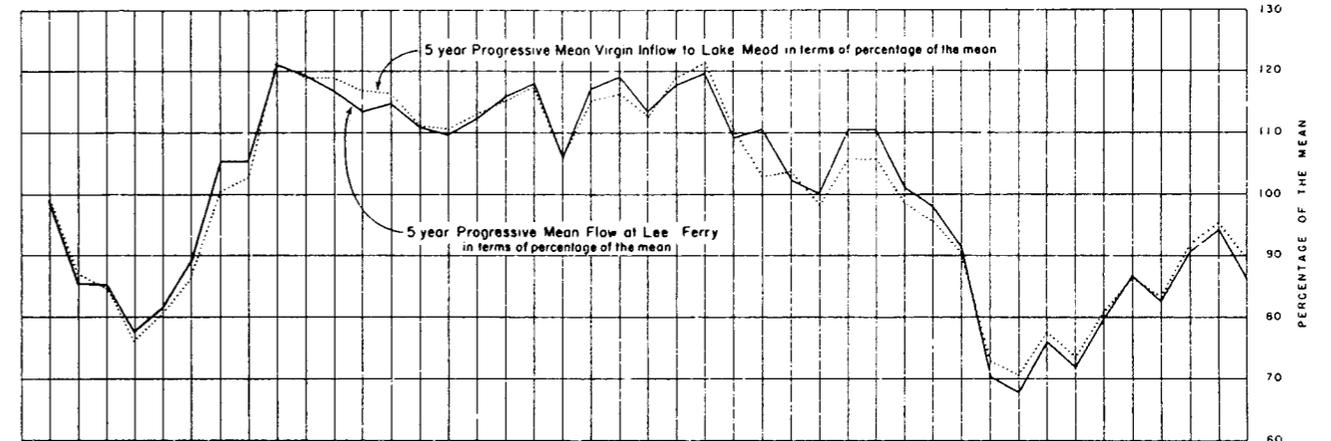
A study of the operation of present and proposed reservoirs indicates that their capacity will be sufficient to equate the estimated water supply for such a period as 1897 to 1943, inclusive. Some shortages during such a low water period will occur in the upper regions of the Upper Basin due to the lack of available reservoir sites of sufficient size fully to equate the flow of the tributaries serving those areas. It is estimated, however, that the main stream water supply for the Lower Basin would not be curtailed during such a period of low run-off as 1931 to 1940.

A detailed operation study discloses that during such a period of low run-off as 1931 to 1940, if the Upper Basin delivered 75,000,000 acre-feet in accordance with its obligation under the Compact, the drawdown of Lake Mead required to supply the Lower Basin with the average water supply available to it would not exceed a total of 17,000,000 acre-feet.

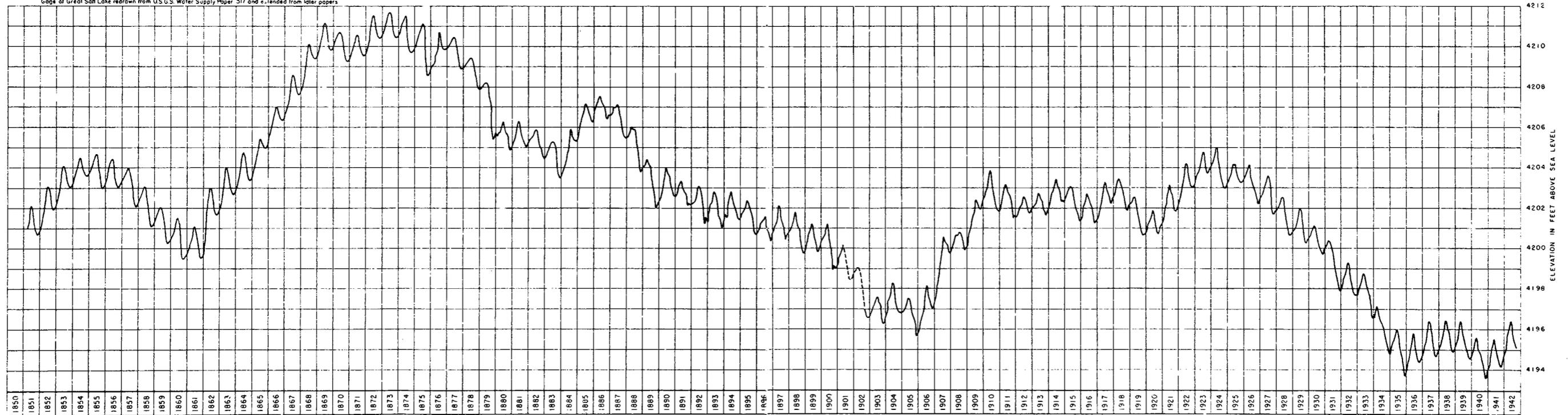
The run-off of the Colorado River system for the period 1931-1940 was the lowest since at least 1850. A

STAGES OF GREAT SALT LAKE VERSUS VIRGIN FLOW AT LEE FERRY AND AT BOULDER DAM

SIX STATES COMMITTEE
ARIZONA TEXAS COLORADO
NEW MEXICO UTAH WYOMING
R. J. TIPTON, Consulting Engineer
Drawn by A.C.S.G.H.F. Dec - 1944
Prepared by COLORADO WATER CONSERVATION BOARD



Gage of Great Salt Lake redrawn from U.S.G.S. Water Supply Paper 517 and extended from later papers



good correlation exists between the stage of Great Salt Lake and the run-off of the Colorado River System. Storms in general furnish precipitation to both the Great Lake Basin and the Colorado River Basin. There is a record of the stage of Great Salt Lake since 1850. The minimum stage occurred during the period 1931-1940. On the attached graph No. SSC-2 is indicated the stage of the lake, together with five-year progressive means of the estimated water supply of the Colorado River at Lee Ferry and at Boulder Dam. The close correlation between the several items may be noted.

During the period of record of the stage of Great Salt Lake there has been a progressive increase in the consumption of water tributary to the lake. Therefore, under present conditions of development within the basin the stage of the lake would not be as high as it was during the early part of the record. However, the change in depletion would not be sufficiently great to bring the high peak which existed prior to 1900 down to the peak which existed during the 1920's, nor would the stage of the 1850's be brought as low as the low stage in the middle 1930's.

Therefore, it may be concluded that the recent low water period in the intermountain region, including the Colorado River Basin, was by far the lowest that has occurred since at least 1850.

It may be noted also from an inspection of the drawing that the period 1897-1940, inclusive, includes two low periods and one high period. It may be that on a long time basis the average annual water supply available for use in the Colorado River Basin may be greater than that.

OPERATION OF BULLSHEAD RESERVOIR AND EFFECT OF TREATY PROVISIONS ON POWER CONTRACTORS

The operation of Lake Mead during the period of amortization of the cost of construction of Boulder Dam and its appurtenances has been so conceived as to generate 4,330,000,000 kilowatt hours of firm energy at the beginning of the amortization period, and 3,880,000,000 kilo-

watt hours of firm energy at the end of the amortization period. In addition to the release of water for the generation of firm energy additional amounts may be released for flood control purposes, some of which will be used for the generation of secondary energy.

The demand for water for irrigation and municipal purposes in the Lower Basin below Boulder Dam will not be parallel with the releases made from Lake Mead for the generation of electrical energy. The releases for power purposes will be fairly uniform throughout the year, being somewhat higher in the winter period than in the summer period. The demand for water for municipal and irrigation purposes, on the other hand, will be relatively low during the winter period and high during the summer period.

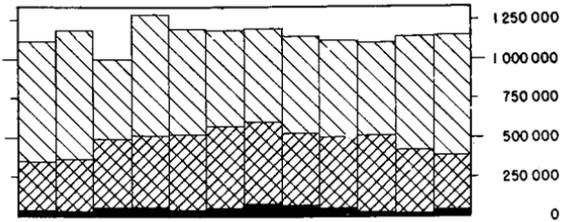
A reregulating reservoir below Boulder Dam has always been considered a part of the project, the function of such reservoir primarily to be to regulate the water released for the generation of energy to make the regimen of this water equivalent to the requirements for its use below. Since the time Boulder Dam was conceived Bullshead Reservoir (Davis Dam) has always been considered the reservoir which would serve the reregulating function.

Bullshead Reservoir, in addition to reregulating power releases for use in the United States below Boulder Dam, will also be used to regulate the water required for deliveries to Mexico, in accordance with the schedules set up for such deliveries. It is for this reason that Bullshead Reservoir is recognized in the treaty as an essential facility to permit the United States to fulfill its obligation under the Treaty. Contracts were let for construction of Davis Dam but work was stopped by the War Production Board on account of the war situation.

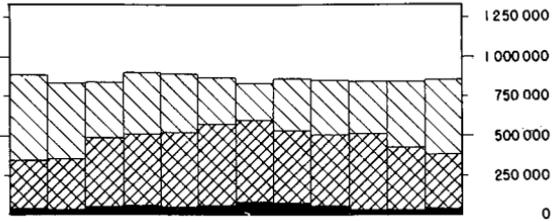
Under the authorization for Davis Dam which appears in House Document 186, Seventy-seventh Congress, First Session, the following statements are made:

The Bullshead Dam project combines multiple purposes for a maximum degree of conservation of waters of the Colorado River. It will serve navi-

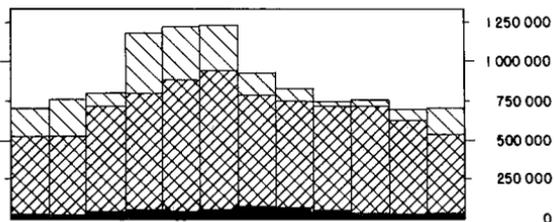
RELEASES IN ACRE FEET



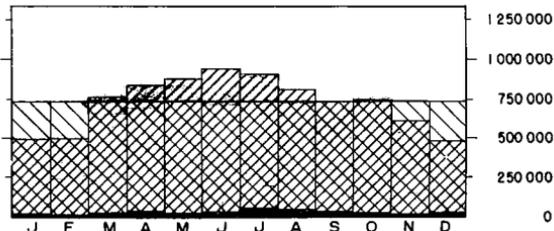
ESTIMATED AVERAGE CONDITIONS - PRESENT



ESTIMATED LOW WATER CONDITIONS - PRESENT



ESTIMATED AVERAGE CONDITIONS - 1988
(TOTAL DELIVERY TO MEXICO FROM ALL SOURCES 1,700,000 ACRE FEET)



ESTIMATED ULTIMATE CONDITIONS
(ALSO LOW WATER CONDITIONS - 1988)

Releases from Lake Mead for Generation of Energy and for Flood Control.



Requirements for Consumptive and other Uses below Boulder Dam.



UNITED STATES

MEXICO

SIX STATES COMMITTEE
ARIZONA TEXAS COLORADO
NEW MEXICO UTAH WYOMING

R. J. TIPTON, Consulting Engineer

**RELEASES FROM LAKE MEAD
DURING TYPICAL PERIODS
AND
DEMAND ON THE RELEASES**

gation; flood control; river regulation for irrigation, for municipal water supply, and for metering the water which may be passed downstream for use beyond the boundary of the United States; power development; recreation; silt protection; wild life, and related purposes.

* * * * *

When the waters of the Colorado River are apportioned between the United States and Mexico by international agreement, Bullshead dam will serve an important function in providing that fine degree of control needed in effect to meter out the water in accordance with a treaty or agreement. This potential future use has been taken into consideration and is a motivating factor in proposals to build the project, though no costs have been allocated to it.

The attached drawing No. SSC-3 indicates graphically the relation between releases from Lake Mead and the demand on those releases below Lake Mead. The drawing represents four conditions: Present average conditions, present low water conditions, assumed 1988 average conditions, and ultimate conditions which also represent assumed 1988 low water conditions. On the graphs are indicated water released for the generation of electrical energy, and the demand on that water below Boulder for various purposes, including the fulfillment of the obligation of the United States to Mexico. Under some of the conditions it may be noted that the downstream demand in the summer period is greater than the amount of water released from Boulder, but that the amount of water released from Boulder during the winter period is greater than the downstream demand. It is contemplated that the excess water released in the winter time will be stored in Bullshead Reservoir and subsequently released to take care of the difference between the summer releases and the demand below Davis.

The amount of Bullshead Reservoir capacity required to reregulate Lake Mead releases is estimated between

1,200,000 and 1,400,000 acre-feet depending upon the seasonal distribution of requirements below Davis Dam.

With Bullshead Reservoir operating as contemplated, the terms of the Treaty will in no way adversely affect the amount of electrical energy that can be generated at Boulder Dam and will in no way adversely affect the outstanding contracts for the purchase of such energy. Actually the terms of the Treaty may benefit the power contractors and the United States during periods of low run-off during the amortization period.

THE CALIFORNIA SITUATION

GENERAL

Two groups of interests in California are opposing ratification of the Treaty. These interests are the Imperial Irrigation District and those who have the so-called junior priorities for the use of Colorado River water. The latter group involves principally the Metropolitan Water District of Southern California and the City and County of San Diego. Those having contracts to purchase electrical energy generated at Boulder Dam also are opposing ratification, for reasons not clear.

THE IMPERIAL VALLEY IRRIGATION DISTRICT

The Imperial Valley Irrigation District and its predecessor have always controlled the operation of the Lower Colorado River so far as the use of water by Mexico is concerned, and have in the past made all deliveries of Colorado River water to Mexico, subject, however, to Mexican control of its Mexican subsidiary corporation owning and operating the Alamo Canal in Mexico. Apparently the officials of this district have had in mind that if a Treaty were negotiated for the delivery of water to Mexico the district would continue to make such deliveries and would be able thereby to derive considerable financial benefit through payments from Mexican water users and through the generation of electric energy at the proposed Pilot Knob power plant. The terms of the Treaty remove the control of the river, so far as fulfilling the international obligation is concerned, from the hands of the Imperial Irrigation District, and make it impossible for that district to charge for the deliveries of water to Mexico. It is assumed from this situation comes most of the opposition of the Imperial Valley group.

In the early 1900's certain California interests owning land in the Imperial Valley and other California and

some Mexican interests controlling land in Lower California, being desirous of bringing those lands under cultivation by the use of Colorado River water, negotiated a contract with certain Mexican interests whereby a canal could be constructed heading on the Colorado River in the United States and passing through the upper part of Lower California around the sand hills which exist in that region and thence running back into the United States, crossing the boundary near Calexico to serve the lands in the Imperial Valley. This canal, known as the Alamo, was constructed to a nominal capacity of 10,000 cubic feet per second. In order to conform with the control required by Mexican law, the terms of the contract were written into a concession from the Mexican Government to the Mexican interests in Lower California, which interests were incorporated and later became a subsidiary of the Imperial Irrigation District. The concession was dated May 17, 1904, and was approved by the Congress of Mexico on June 10, 1904. The following are some of the pertinent provisions of the concession:

Contract entered into between the Citizen General D. Manuel Gonzales Cosio, secretary of state and of development, in representation of the executive government, and Lic. Ignacio Sepulveda, as representative of the Sociedad de Irrigacion y Terrenos de la Baja California, S. A., to carry the waters of the Colorado River through Mexican territory and for the use of said waters.

Article I. The Sociedad de Irrigacion y Terrenos de las Baja California, S. A., is authorized to carry through the canal which it has built in Mexican territory, and through other canals that it may build, if convenient, water to an amount of two hundred and eighty-four cubic meters per second from the waters taken from the Colorado River and territory of the United States by the California Development Company and which waters this company has ceded to the Sociedad de Irrigacion y Terrenos de la Baja California, S. A. It is also authorized to carry to the lands of the United

States the water with the exception of that mentioned in the following article:

Art. 2. From the water mentioned in the foregoing article, enough shall be used to irrigate the lands susceptible of irrigation in Lower California, with the water carried through the canal or canals, without in any case the amount of water used exceeding one-half of the volume of water passing through said canals.

It may be noted that the Mexican interests had a right to use water from the canal for the irrigation of lands in Lower California, but the amount of the water so taken from the canal was not to exceed one-half of the amount of water carried into Mexico by the canal. The canal went into operation and served lands both in Mexico and the United States until the All-American Canal was placed in operation in 1942. After the Imperial Irrigation District was formed, the canal has been operated by that district, and a subsidiary of the district has operated the Mexican portion of the canal, including some of its main laterals. Up until the time the All-American Canal went into operation, a maximum of about 228,000 acres of land had been irrigated under the Alamo Canal in Mexico, and about 440,000 acres in the Imperial Valley in the United States.

The average annual diversion through the Alamo Canal for the thirteen-year period preceding the placing in operation of Boulder Dam was 2,970,000 acre-feet. The amount of water actually diverted from the river for Mexico's use is not definitely known. All reports of the use by Mexico of water from the Alamo Canal are based upon the aggregate deliveries to the laterals of that canal. The reported quantities do not include canal losses, wastes from the canal in Mexico, or the proportionate share of water diverted for the benefit of Mexico that might have tailed into Salton Sea. The maximum aggregate diversions to the laterals of the Alamo Canal prior to the placing in operation of Boulder Dam was reported as 728,500 acre-feet in the year

1925. It is estimated that this represented a minimum diversion from the river of 970,000 acre-feet not including Mexico's proportionate share of any water that might have tailed into Salton Sea.

At the time the All-American Canal was designed an excess capacity was provided in the canal from the Imperial Dam on the Colorado River to Pilot Knob. Apparently it was assumed that while excess water was in the river this capacity could be used to carry some of the excess to a power plant at Pilot Knob, which could generate a substantial amount of electric energy for many years.

It may also have been assumed that whatever water was allocated to Mexico by treaty would be carried through the All-American Canal and be discharged through such power plant.

In the original contract between the Imperial Irrigation District and the Secretary of the Interior for the construction of the All-American Canal, including the Imperial Irrigation District, was to retain control of the operation of the entire system. The contract was later modified so that the United States would have control of the operation of the Imperial Dam and the All-American Canal down to and including Siphon Drop, through which is delivered water for the Yuma reclamation project.

In other words the existing contract would place in the hands of the Imperial Irrigation District the All-American Canal from Siphon Drop for its remaining length including the Pilot Knob feature. Actually the works have not yet been turned over to the district since the Secretary of the Interior has not declared the project complete and repayment costs have not commenced.

It is believed that prior to the negotiation of the Treaty certain proposals were made by the Imperial Irrigation District to furnish water to the Mexican interests by way of the All-American Canal and Pilot Knob Wasteway which discharges behind the Rockwood Heading gates into the Alamo Canal. Available information would seem

to indicate that such proposals involved in effect a repayment by the Mexican government in the form of a service charge or rental of a part of the cost of Imperial Dam and All-American Canal down to and including Pilot Knob wasteway, and a similar service charge for the use of the short reach of the Alamo Canal which is located in the United States. Such service charges were to have been in addition to the operation and maintenance charge. The service charge was to have been a perpetual charge so long as the facilities were used.

It has been reported that during the forty-year repayment period of the cost of the All-American Canal and Imperial Dam, Mexican payments to the Imperial Irrigation District would have equaled more than one-half the cost of the Imperial Dam and the Imperial Dam-Pilot Knob reach of the canal, even though not more than one-fifth of the capacity of the All-American Canal might have been used for the delivery of water to Mexico and less than this proportion of the Imperial Dam.

It has been estimated that there could be generated at Pilot Knob power plant during an assumed amortization period from 1945-1985 an average of 160 million kilowatt hours of electrical energy per year. This energy should have a value of not less than \$320,000 per year. Amortization of the cost of the power plant and operation and maintenance and depreciation probably would amount to about \$180,000 a year, leaving a minimum net profit of approximately \$140,000 a year. The profit at the beginning of the amortization period is estimated at \$260,000 a year.

The Treaty contemplates that the Imperial Dam and the All-American Canal down to and including Pilot Knob wasteway, and any works located in the United States that are used solely for the purpose of delivering water to Mexico under the terms of the Treaty, shall be under the control of the United States.

The reason for the very vigorous objections on the part of the Imperial Irrigation District interests becomes

obvious. However, no other policy than that established by the Treaty would be tenable. While none of the western states is in favor of any more federal control and operation of facilities for the use of the water in the West than is absolutely necessary, yet this is one instance where such control is necessary, an instance where the United States having obligated itself to make certain deliveries of water to another nation must be in control of the works required for that purpose.

The terms of the Treaty provide that Mexico shall repay the cost of the portion of Imperial Dam and the All-American Canal down to and including Pilot Knob wasteway, which is used for delivery of water to Mexico, as well as a proportionate part of the operation and maintenance costs. The Treaty also provides that Mexico shall pay the entire cost of any facilities located in the United States that are used solely for the delivery of water to Mexico, as well as the entire cost of operation and maintenance of those facilities.

The Imperial Irrigation District obviously will be reimbursed for any works it now owns that will be taken over and used solely for the delivery of water to Mexico such as the Alamo Canal in the United States. It also obviously will be relieved of any obligation for the repayment of the cost of any part of the Imperial Dam and the All-American Canal that are not used for the delivery of water to it.

It appears sound policy that revenues from any energy generated by the deliveries of water to Mexico should accrue to the United States to be applied first to the repayment of the cost of power plants and next to the repayment of the cost of any other works required to fulfill the international obligations that are not repaid by Mexico. The Imperial District also is interested in the problem as it relates to so-called junior priorities, which are discussed in the next section.

CALIFORNIA JUNIOR PRIORITIES

Prior to the ratification of the Colorado River Compact by the various states other than California, California was required to limit by statute her use of waters allocated under Section III (a) of the Colorado River Compact to 4,400,000 acre-feet per year and not over one-half the surplus of the water not allocated by Sections III (a) and III (b) of the Compact. California passed this self-limiting statute, the pertinent terms of which are recited in the Boulder Canyon Project Act. California then set up a system of priorities covering the use of the 4,400,000 acre-feet of Article III (a) water and 962,000 acre-feet of surplus water. These priorities are listed below. In the table also is given the estimated present use under each priority.

Prior- ity No.	Description	Acre- Feet	Totals	Estimated Present Use Under Each Priority
1	Palo Verde Irrigation District, 104,500 acres.			
2	Yuma Project 25,000 acres.			
3	(a) Imperial Irriga- tion District and lands under All-American Canal in Imperial and Coachella Valleys. (b) Palo Verde Irri- gation District in Low- er Palo Verde mesa, 16,000 acres.			
	Total for 1, 2, 3.....	3,850,000		2,650,000
4	Metropolitan Water District of So. Cal. and City of Los Angeles..	550,000		85,000 ¹
	Total from III (a) water.....		4,400,000	2,735,000

¹ Average for 1939 to 1943 inclusive. Includes water for filling Mathews reservoir. Diversions were 36,282 acre-feet and 34,598 acre-feet in 1942 and 1943 respectively.

Priority No.	Description	Acre- Feet	Totals	Estimated Present Use Under Each Priority
5	(a) Metropolitan Water District of Southern California and the City of Los Angeles..	550,000		
	(b) City and County of San Diego.....	112,000		
6	(a) Imperial Irrigation District and lands under the All-American Canal in the Imperial and Coachella Valleys.			
	(b) Palo Verde Irrigation District in Lower Palo Verde mesa, 16,000 acres.			
	Total for 6(a) and (b)	300,000		
	Total from surplus..		962,000	none
	Total of all priorities..		5,362,000	2,735,000

The various California interests then negotiated contracts with the Secretary of Interior for the delivery of water from Lake Mead to satisfy the several priorities.

The contracts for the delivery of water from Lake Mead are all made

subject to the availability thereof for use in California under the Colorado River Compact and the Boulder Canyon Project Act.”

The contracts provide further:

The United States shall not be obligated to deliver water to the district when for any reason such delivery would interfere with the use of Boul-

der Canyon Dam and reservoir for river regulation, improvement of navigation, flood control, and of states or private perfected rights in or to the waters of the Colorado River or its tributaries in pursuance of Article III of the Colorado River Compact; and, this contract is made for the express condition and with the express covenant that the right of the district to the waters of the Colorado River or its tributaries is subject to and controlled by the Colorado River Compact.

Attention is called to subsection (f) of Article III of the Colorado River Compact. This subsection provides that further equitable apportionment of the beneficial uses of the waters of the Colorado River system unapportioned by paragraphs (a), (b), and (c) may be made after October 1, 1963, if and when either basin shall have reached its total beneficial consumptive use as provided in paragraphs (a) and (b) of Article III of the Compact. Therefore, until the Upper Basin is consuming its total allocation of 7,500,000 acre-feet or until the Lower Basin is consuming its total allocation of 8,500,000 acre-feet, no state in either basin can acquire any title to surplus, and it should be noted that any surplus apportioned in the future under subsection (f) must be from surplus after any Treaty obligations are satisfied.

It is apparent, therefore, that the contracts held by California for the delivery of 962,000 acre-feet of surplus water are not firm contracts and are contingent upon what further apportionment might be made of waters of the Colorado River System after October 1, 1963. The water available for delivery under these contracts would not only be contingent upon the apportionment that might be made of the surplus after 1963, but it would appear that availability of water might also be contingent upon agreement between the Lower Basin States as to the division of that part of the surplus apportioned to the Lower Basin after 1963. The status of the various California priorities in relation to the apportionment of water, as made by the Colorado River Compact and as visualized by the Boul-

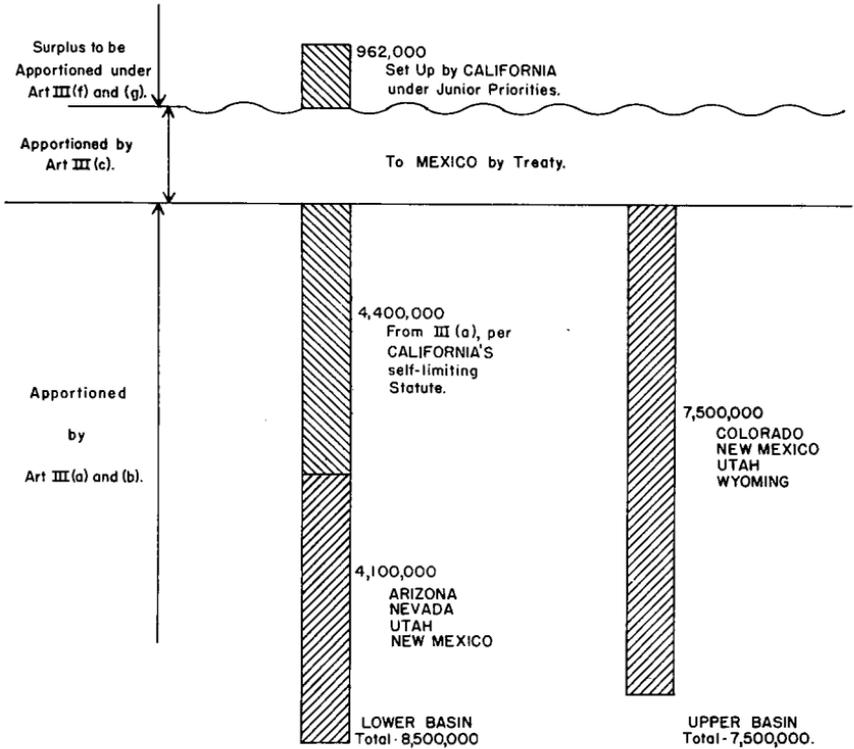
der Canyon Project Act, is shown graphically on the attached drawing No. SSC-4. The drawing is self explanatory.

The amount that might be allocated to the junior priorities of California will be dependent upon negotiations by the commissioners of the seven states appointed by their respective governors in accordance with the procedure set up by Article III (g) of the Compact. Prior to the time that additional water is apportioned under the terms of the Compact, other states in the basin may be in a position to use some of the unapportioned surplus water before projects constructed to use such water under the junior priorities 5 and 6 of California are using any substantial amount of the unapportioned surplus. Therefore, the status of the contracts for the delivery of water to the junior priorities may be materially affected by the action of other states within the basin.

The reason for the concern on the part of the interests holding the junior priorities is apparent. However, the uncertain status of water for these priorities was not created by the terms of the Treaty. That status existed under the terms of the Colorado River Compact at the time the priorities were set up. If the terms of the proposed Treaty in any way adversely affect the status of these junior priorities, it is probable that their status would be even more jeopardized if the problems concerning the use of the waters of the Colorado River by the two nations were arbitrated, and it is certain that their status would have become increasingly more hazardous had Treaty negotiations been long delayed, with the result of a further material increase in use of the waters of the Colorado River by Mexico.

It is believed that the terms of the present proposed Treaty are the best that could be had. Under such terms, potential uses in the basin in the United States can be crystallized and definitely fixed. The question of the availability of water for various California priorities is a California dilemma. California, by her own act, set up the system of priorities which placed one-half the water assumed to

WATER APPORTIONED, TO BE APPORTIONED AND THE CALIFORNIA SITUATION UNDER THE COLORADO RIVER COMPACT



PRIORITIES SET UP BY CALIFORNIA AND INCLUDED IN CONTRACT BETWEEN CALIFORNIA AND THE UNITED STATES.

Priority No.	Item	Acre feet.
1	Palo Verde Irrigation District - 104500 acres.	
2	Yuma Project of U.S. Bureau of Reclamation - 25,000 acres.	
3.	(a) Imperial Irrigation District and lands under the All-American Canal in the Imperial and Coachella Valleys.	
	(b) Palo Verde Irrigation District in Lower Palo Verde Mesa - 16,000 acres.	
	Total for 1, 2 and 3.	3,850,000
4.	(a) Metropolitan Water District, Southern California and the City of Los Angeles.	550,000
	(b) City and County of San Diego.	112,000
5.	(a) Metropolitan Water District of Southern California and the City of Los Angeles.	550,000
6.	(a) Imperial Irrigation District and lands under the All-American Canal in the Imperial and Coachella Valleys.	
	(b) Palo Verde Irrigation District in Lower Palo Verde Mesa - 16,000 acres.	
	Total for 6(a) and (b)	300,000
		962,000
		5,312,000

ALL UNITS in ACRE FEET.

SIX STATES COMMITTEE
ARIZONA TEXAS COLORADO
NEW MEXICO UTAH WYOMING
R. J. TIPTON, Consulting Engr.

Drawn by A.C.S. G.H.F. Dec. 1944
Prepared by COLORADO WATER CONSERVATION BOARD SSC-4

have been necessary for the Metropolitan Water District of California and all the San Diego water from the Colorado River on an infirm status, leaving the water that would be available for her junior priorities to come out of surplus which cannot be allocated until sometime after 1963.

If a conflict between major agricultural uses and major municipal uses should develop in California it will be California's problem to determine which is the more important use and adjust the differences.

CALIFORNIA'S MAJOR OBJECTIONS TO THE WATER ALLOCATIONS MADE BY THE TREATY AND ANSWERS THERETO

California interests have raised a number of objections to the Treaty, the most important of which are listed and discussed below.

1. After full development the water supply will be insufficient to meet Lower Basin obligations and the delivery of 1,500,000 acre-feet to Mexico.

As has already been shown, sufficient water will be available to meet the United States' obligation to Mexico and the amount of water apportioned to the Lower Basin by Article III (a) and III (b) of the Compact. These are the only firm apportionments of water to the Lower Basin. Any other obligations which the Lower Basin interests might have to deliver water in addition to that apportioned to the Lower Basin by Articles III (a) and III (b) of the Compact are not firm obligations because no water has been allocated by the Compact to it for that purpose and no allocation can be made for that purpose until after October 1, 1963. Future allocation must be made by commissioners appointed by the governors of the seven Colorado River Basin states.

2. California's contracts were the basis for a large bonded indebtedness and now stand to be injured or repudiated by the provisions of the Treaty.

California has firm contracts for the delivery of only 4,400,000 acre-feet of water from Lake Mead. Contracts

for the delivery of water to the so-called junior priorities, amounting to 962,000 acre-feet, are not firm contracts because no allocation of water for that purpose has been made by the Colorado River Compact. Such allocation must await the time when either basin is consuming the total amount of water allocated to it by the Colorado River Compact and such allocation in any event cannot be made prior to October 1, 1963.

The terms of the Mexican Treaty do not make the contracts to deliver water to the junior priorities infirm. They were infirm at the time they were made. The question might be raised as to the availability of water for them even though no water were delivered to Mexico. This is because of the possibility of the development by other states of a need for surplus water prior to the time that the total water claimed by California, namely 5,362,000 acre-feet, was being used. It is firmly believed that the status of the junior priorities of California will become more uncertain if the problems with Mexico concerning the uses of the Colorado River are not resolved at this time. Arbitration or delay might, and probably would, result in an allocation of water to Mexico greater than that made by the pending Treaty.

Whatever bonds were issued to finance projects having no firm water supply are not being jeopardized by the Treaty but by the fundamental infirmity of the contracts for the delivery of water which might never be available. Attention is called to the fact also that during the period of amortization of the bonds that were financed for such projects as the Los Angeles Aqueduct there may be a lack of need for the full capacity of such facilities. During the year 1943 only 35,000 acre-feet of water was diverted through the Los Angeles Aqueduct even though the population of Southern California had reached an all-time peak due to the many army camps and war industries located in that area as a result of the war. It appears probable that none of the junior priorities for the Los Angeles Aqueduct will be needed prior to the time the outstanding bonds mature. Again this is a California problem. If conflict

arises between interests in California as to the use of California's share of the water of the Colorado River which might be recognized by the deliveries to the Lower Colorado River Basin then California must reconcile those differences.

It is not conceivable that Imperial Irrigation District bonds were sold on the basis of speculative returns from the sale of water to Mexico or the generation of energy at Pilot Knob power plant. Therefore it is believed the terms of the Treaty do not jeopardize in any way the outstanding bonds of the Imperial Irrigation District. The Treaty does not adversely affect outstanding bonds of the power contractors.

3. Mexico is not entitled to more water than it used or could have used before the construction of Boulder Dam; namely about 750,000 acre-feet per year.

(a) Under natural flow conditions, with development in the United States as it was immediately preceding the placing in operation of Boulder Dam and for such a period of run-off as 1902 to 1940, there would have been sufficient water in the river each year, so far as quantity is concerned, to have provided Mexico with 1,500,000 acre-feet. However, the seasonal distribution of the flow would not have been parallel in all years with the seasonal distribution of the 1,500,000 acre-feet in accordance with the manner in which Mexico is using water. For twenty-six years out of a 39-year period, 1902-1940, the maximum deviation from an assumed ideal requirement would have been one percent or less per annum. There would have been seven years when the deviation would have been greater than five percent, five years when it would have been greater than ten percent, and two years when it would have been greater than fifteen percent. The same conditions, of course, were to some extent true with respect to the lack of parallelism between the water supply and the requirements of the Imperial Valley (Appendix B, pp. 106, 107).

It must be understood also that the actual diversion for the benefit of Mexico prior to the construction of Boul-

der Dam was more than 750,000 acre-feet. All reports of the use of water by Mexico prior to placing in operation of Boulder Dam are in terms of aggregate deliveries to the Mexican laterals of the Alamo Canal and do not include canal losses or wastes; neither do they include desilting water. This has been discussed herein before.

(b) Moreover, Mexico had then a right to use up to one-half the water carried by the Alamo Canal. The average annual diversion by the Alamo Canal for the thirteen-year period immediately preceding the placing in operation of Boulder Dam was approximately 3,000,000 acre-feet. The maximum diversion was 3,423,511 acre-feet and the minimum was 2,049,954 acre-feet in the low water year of 1934. During eight of the years the diversions were well in excess of 3,000,000 acre-feet. Therefore, Mexico had a right to use an average of 1,500,000 acre-feet under the Alamo Canal concession and had a right to use a maximum of 1,711,755 acre-feet prior to the placing in operation of Boulder. At least sixty percent of the Mexican allocation will be supplied from return flow and waste water. The water she will, therefore, receive under the Treaty will not only be no more than she could have received under natural flow conditions before Boulder was placed in operation, but it will be of much inferior quality. Moreover, it would be impossible to negotiate a treaty with Mexico limiting her use to 750,000 acre-feet. Her use in 1943 was approximately 1,833,000 acre-feet. In view of this and the fact that Mexico has projected plans which would require considerably more than 1,500,000 acre-feet per year, it appears probable that no board of arbitration would base an allocation of water to Mexico on the amount she was using prior to the placing in operation of Boulder Dam.

4. The allocation of 1,500,000 acre-feet is double that heretofore offered Mexico.

(a) There seems little point to this contention. It must be understood that Mexico did not accept the offer of 750,000 acre-feet per annum formerly made nor did the United States accede to the demand of Mexico for an annual delivery of 3,600,000 acre-feet. No agreement was

reached at that time. It is just as pertinent to say that the present allocation to Mexico is only forty percent of that which Mexico formerly demanded as it would be to say that the present allocation is double the amount which the United States offered.

(b) Further, the former offer did not limit the annual delivery of water to Mexico to 750,000 acre-feet. Under such offer, Mexico might have received more water than she will receive under the terms of the proposed Treaty. In the 1929 offer the American Section of the International Water Commission suggested that 750,000 acre-feet per year be delivered to Mexico according to a schedule after Boulder Dam was built, and suggested there might be added to that amount sufficient water to compensate for losses in the main canal. It is assumed deliveries would have been made either to the Alamo Canal by the present heading or through the All-American Canal by way of Pilot Knob wasteway. In either case Mexico would have received in addition to the 750,000 acre-feet an estimated 200,000 or 300,000 acre-feet to compensate for canal losses. If deliveries had been made by the present heading Mexico would have received in addition to the above amounts whatever was required for desilting purposes at the head of the Alamo Canal and all return flow accruing to the river below that point. The sum of these quantities might have exceeded the 1,500,000 acre-feet Mexico is to receive under the present Treaty. If the 750,000 acre-feet was to have been delivered by means of the All-American Canal the amount received by Mexico would have exceeded by far the amount she will receive under the present Treaty.

5. The allocation to Mexico is in violation of the Boulder Dam Project Act which specifically restricted its benefits to the United States.

(a) This restriction is a self-serving one and does not bind the United States in its relations with another country. Mexico has no opportunity to regulate the waters of the river. At various times she has expressed a willingness to take care of a share of the cost of Boulder Dam or other reservoirs on the stream. It is doubtful whether

a court of arbitration would consider the United States justified in taking through the operation of her projects of waters some of which could have been reasonably used by Mexico. No doubt there would be taken into consideration the fact that the Mexican area and the United States area in the Imperial Valley were developed together, being served by one canal under a concession granted by Mexico. It might appear unfair for one country at some subsequent date after the project had been operating essentially as one project for over thirty years to insure the water supply for one part of the project and deprive the other country of such insurance because of the lack of facilities in the other country to bring about such insurance.

(b) One situation which disturbs those who are supporting a treaty is that Mexico is receiving automatically material benefits from the operation of Boulder Dam and will receive those benefits for many years which may, if the problem is not settled now, cause considerable difficulty in the future.

Not only is Mexico receiving, by virtue of the operation of the project, a regulated water supply from the unused water allocated to the Lower Basin, but she is also receiving a regulated supply from the unused water allocated to the Upper Basin. By long use of such regulated water it is feared that, if the benefits that Mexico might receive from the project in perpetuity are not crystallized at as low a quantity as possible at this time, the United States will be faced in the future with the difficult task of attempting to curtail a use which Mexico has built up over a long period of years. This is particularly true when it is understood that all water treaties between nations negotiated to date have recognized the existing uses at the time the treaty was negotiated and in some instances have provided for additional uses.

The Boulder Canyon Project Act provided that, prior to the commencement of the construction of the project, contracts had to be entered into to insure the repayment of the entire cost of the project other than that allocated

to flood control within a fifty-year period. When bids were called for the purchase of hydro-electric energy to be generated by the project, the bids exceeded by far the amount of energy that the project would generate. Contracts were entered into with a selected group of the bidders which will result in power revenues repaying substantially the entire cost of the project, other than that allocated to flood control, within the prescribed fifty-year period.

Prior to the completion of the project a system of operation was devised which during the period of amortization will generate an average of about four billion kilowatt hours of firm energy per annum. This operation will require the use of the entire regulatory capacity of the reservoir and will result in the complete regulation of about seventy-five percent of the water reaching the project during the fifty-year period of amortization. After irrigation and domestic requirements in the United States below Boulder Dam are satisfied from the regulated supply released by the project for the generation of hydro-electric energy there will flow into Mexico for many years a water supply so regulated as to permit her to use considerably more water than she has used in the past. Consequently, Mexico for many years automatically will receive a water supply so regulated that she can put it to a beneficial use and will thereby receive benefits from the operation of the project.

The proposed treaty will result, under assumed ultimate conditions, in Mexico receiving only from about 375,000 to 500,000 acre-feet of water from above Imperial Dam. For many years, however, she will receive substantially more than this amount from above Imperial Dam which will be so regulated that she can use considerably more than 1,500,000 acre-feet per annum.

Physical conditions in Mexico are such that water can be put to beneficial use easily. The construction of no large works is required. The reverse is true in the United States. It can be expected, therefore, that substantial increase in the use of water will take place in Mexico prior to the time the United States is utilizing all of the water that will be available to it.

(c) Under natural flow conditions prior to the construction of Boulder Dam after due allowance for the uses of water in the United States above Laguna Dam, Mexico could have been supplied with the water allocated to her under the Treaty for all years for such a period as 1902 to 1940, inclusive, by the use of less than one-half the capacity of Bullshead Reservoir and without using one acre-foot of the storage capacity of Lake Mead. In other words, Boulder Dam could be eliminated from the river and the Treaty deliveries could be made to Mexico under pre-Boulder conditions by means of Bullshead Reservoir. One of the purposes for which the construction of Davis Dam and Bullshead Reservoir was authorized was to "meter out" water to Mexico in the event a treaty were negotiated allocating water to that country.

6. The power contractors have undertaken to pay the cost of Boulder Dam. The Treaty operation may restrict the power capacity at Boulder.

This statement with respect to effects of Treaty allocation is not true. The terms of the Treaty will not reduce the amount of energy generated at Boulder Dam by one kilowatt hour. Actually during low water periods the amount of firm energy generated might be increased by the operation of the Treaty, as explained hereinbefore.

7. The Treaty contemplates the construction of diversion and protective works, the feasibility of which has not been established.

It must be recognized that Mexico could construct a diversion structure below the lower boundary within a treaty. It would be practicable also for Mexico to construct a gravity heading in the limitrophe section of the river without providing a diversion dam across the river. A study of topographic maps and river profiles indicates that the limithrope section of the river and the reach of the river immediately below the lower boundary are at a substantially higher elevation than the lands served by the Alamo Canal. Such studies indicate that there could be constructed across the river a diversion structure that

would require very little addition to the levees and drainage works in the Yuma Valley to protect United States lands. As a matter of fact, investigations were under way looking to the possibility of the construction of such works in the event a treaty was not negotiated. Substantial injury could result to United States interests by such action on the part of Mexico without any control being exercised by the United States. The Treaty provides that when such works are constructed at the same time there shall be constructed those works required to protect United States lands. The extent of such works must be determined by the Commission as a whole.

8. Imperial Valley is not protected against excessive run-offs from the Mexican canals to the Salton Sea.

At the present time Salton Sea is receiving something over 1,000,000 acre-feet, largely from wastes and return flow, from the Imperial Irrigation District lands in the United States. This is two-thirds of the total amount of water that is allocated to Mexico. The amount of land that Mexican users desire to irrigate, as compared with the amount of water they will receive from the Colorado River, would indicate that the amount of water wasted to the Salton Sea probably will be negligible. However, it is believed it will be possible to arrive at an agreement with Mexico whereby the waste can be limited to a reasonable amount.

9. There is no provision in the Treaty for reimbursement to the Imperial Irrigation District for expenditures on works used by Mexico.

The only works not specifically covered by the Treaty for reimbursement are those built by the Imperial Irrigation District in Mexico under the Mexican concession, some of which are primarily for the benefit of the district. Any claim the district may have against Mexico for reimbursement of the cost of such works is not prejudiced in any way by the terms of the Treaty. As a matter of fact, with the Treaty in effect it should be easier for the

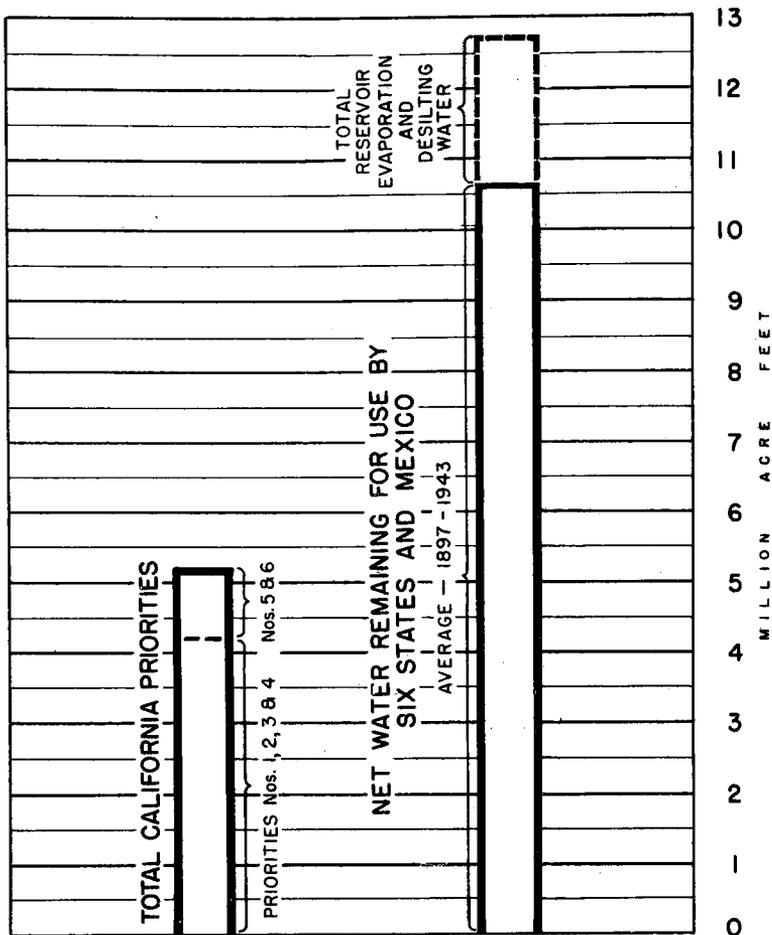
Imperial Irrigation District to arrive at an equitable settlement with Mexico.

10. The Treaty at least should have made allocation of water in excess of 750,000 acre-feet junior to the California so-called junior priorities.

The state of California, when she became a signatory to the Colorado River Compact, agreed that any water allocated to Mexico should be senior to what now are called the junior priorities of California. As heretofore made plain, Articles III (a) and (b) apportioned certain quantities of water to the Upper and Lower basins. The Compact under Article III (c) provides for water for Mexico over and above the amounts apportioned under Articles III (a) and (b) if a treaty is negotiated with Mexico. It then provides further that if the water over and above that allocated by Articles III (a) and (b) is insufficient to satisfy the allocation, each basin shall make up equal parts of the deficiency out of water allocated by Articles III (a) and III (b). The Treaty provides for additional apportionment of water not apportioned by Articles III (a), (b) and (c) at such time as either of the basins is using all the water apportioned to it under Articles III (a) and (b) after October 1, 1963. It is out of this type of water that the California junior priorities must be satisfied, and California agreed to this when she ratified the Compact.

11. The Treaty gives away a great vital resource of the southwest.

The Treaty merely fixes Mexico's equitable apportionment of the use of the waters of the Colorado River. It is probable that a board of arbitration would award to Mexico at least as much, and undoubtedly more, water than she will receive under the terms of the Treaty, all of which would be in recognition of her equitable share of the water. The Treaty, therefore, is not giving away anything which was owned by the United States or any interests therein. As a matter of fact, the settlement of the international question by the Treaty will now permit de-



SIX STATES COMMITTEE

ARIZONA TEXAS COLORADO

NEW MEXICO UTAH WYOMING

R. J. TIPTON, Consulting Engineer

CALIFORNIA PRIORITIES Nos. 1 to 6

VERSUS

NET WATER SUPPLY OF
COLORADO RIVER SYSTEM REMAINING

Prepared by COLORADO WATER CONSERVATION BOARD
Drawn by A. C. S. G. H. F.

Dec. 1944

SSC-5

velopment of the water supplies of the Colorado River in the United States on a firm and sound basis.

CALIFORNIA'S POSITION IN RELATION TO THE USE OF WATER BY OTHER COLORADO RIVER BASIN STATES

California's contracts with the Secretary of the Interior provide for the delivery from Lake Mead of an aggregate of 5,362,000 acre-feet of water in accordance with the terms of the Compact and the provisions of the Project Act. Under California's interpretation the contracts call for net delivery; that is, no reservoir evaporation or desilting water is to be charged against the delivery. In other words, none of the 5,362,000 acre-feet would return to the stream for reuse by Arizona or by Mexico. This quantity of water is about thirty-three percent of the total net quantity available from the Colorado River and all of its tributaries to take care of present and future uses in all of the states of the Colorado River Basin. In other words, if California's contracts were satisfied under her interpretation, there would remain only sixty-five percent of the total net water supply of the Colorado River System for use by the other six states of the Colorado River Basin and by Mexico, and California produces none of the water of the Colorado River Basin.

This situation is shown graphically on drawing No. SSC-5. On drawing No. SSC-6 are indicated the water produced by each of the states in the Colorado River basin, the amount consumed at the present time, and the total amount that might be consumed under ultimate conditions. It may be noted that the State of Colorado produces by far the major part of the water, equaling about two-thirds of all the water produced above Boulder Dam and something over seventy percent of all the water produced above Lee Ferry. The graph indicates no water produced by the State of California. The other states of the basin produce varying amounts.

APPENDIX A

RIO GRANDE BASIN

GENERAL

The Rio Grande, one of the principal streams of the Western United States, is an interstate and international stream. It rises in the state of Colorado and flows for a distance of 180 miles to the Colorado-New Mexico state line, thence southward for a distance of slightly over 400 miles across the state of New Mexico. From the point where it leaves New Mexico the river forms the boundary between Texas and the Republic of Mexico for a distance of about 1200 miles to its mouth. The total length of the river is about 1800 miles.

The Rio Grande Basin, including several non-producing areas, embraces 335,500 square miles, an area about forty percent as large as the Republic of Mexico, about eighty-five percent as large as the states of Texas and New Mexico combined. The effective or contributing watershed of the Rio Grande comprises 171,650 square miles, 51.6 percent of which is in the United States and 48.4 percent in Mexico.

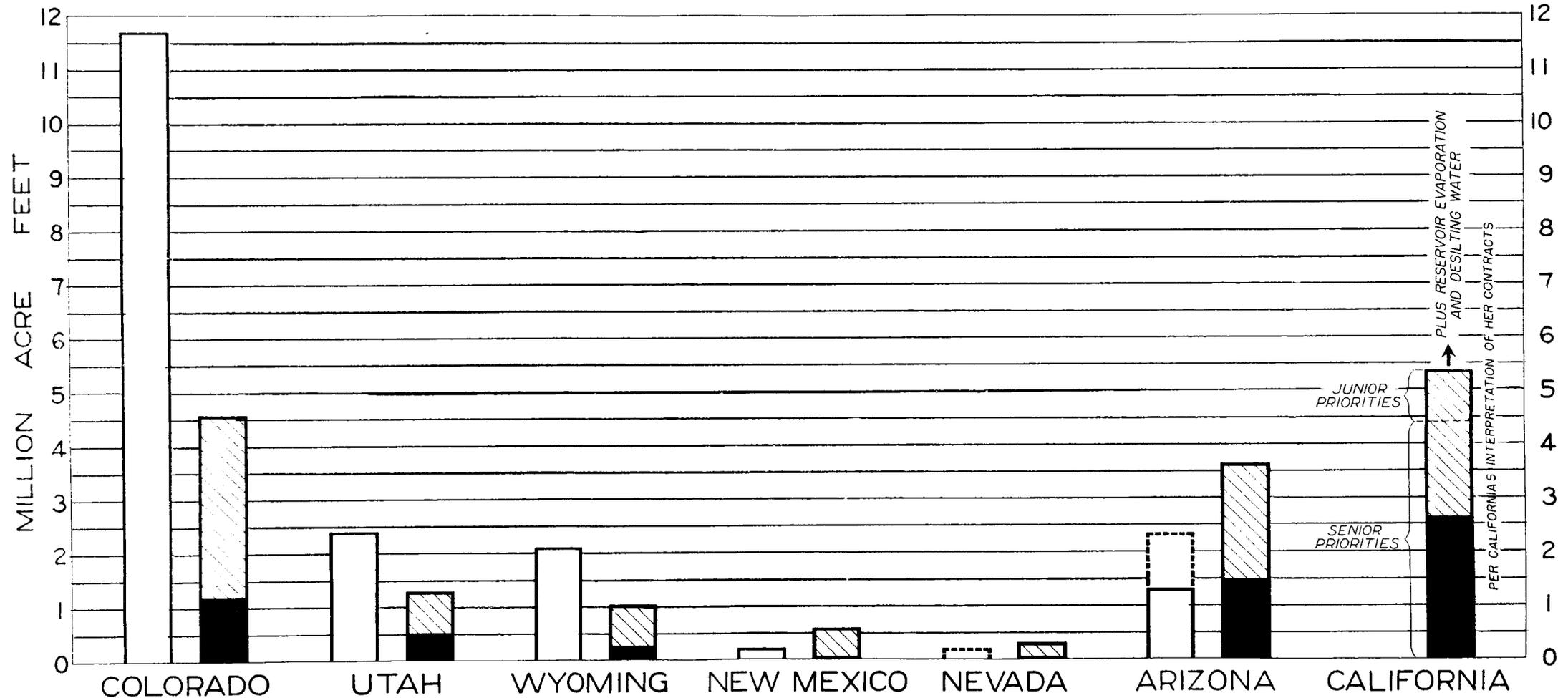
The Rio Grande may be divided naturally into two basins: the Upper and the Lower. The Upper Basin extends from the headwaters in Colorado to Fort Quitman, Texas, and the Lower Basin extends from Fort Quitman for a distance of about 1100 miles to its mouth at the Gulf of Mexico. These two basins are distinct and separate so far as the use of water and the problems regarding such use are concerned.

Most of the water of the Upper Basin is being consumed at the present time by irrigation in the states of Colorado, New Mexico, Texas, and the Republic of Mexico. Of an original supply of some 2,000,000 acre-feet at present

COLORADO RIVER SYSTEM

WATER PRODUCTION AND CONSUMPTION BY STATES

Estimated for the purpose of this memorandum from the best information available.

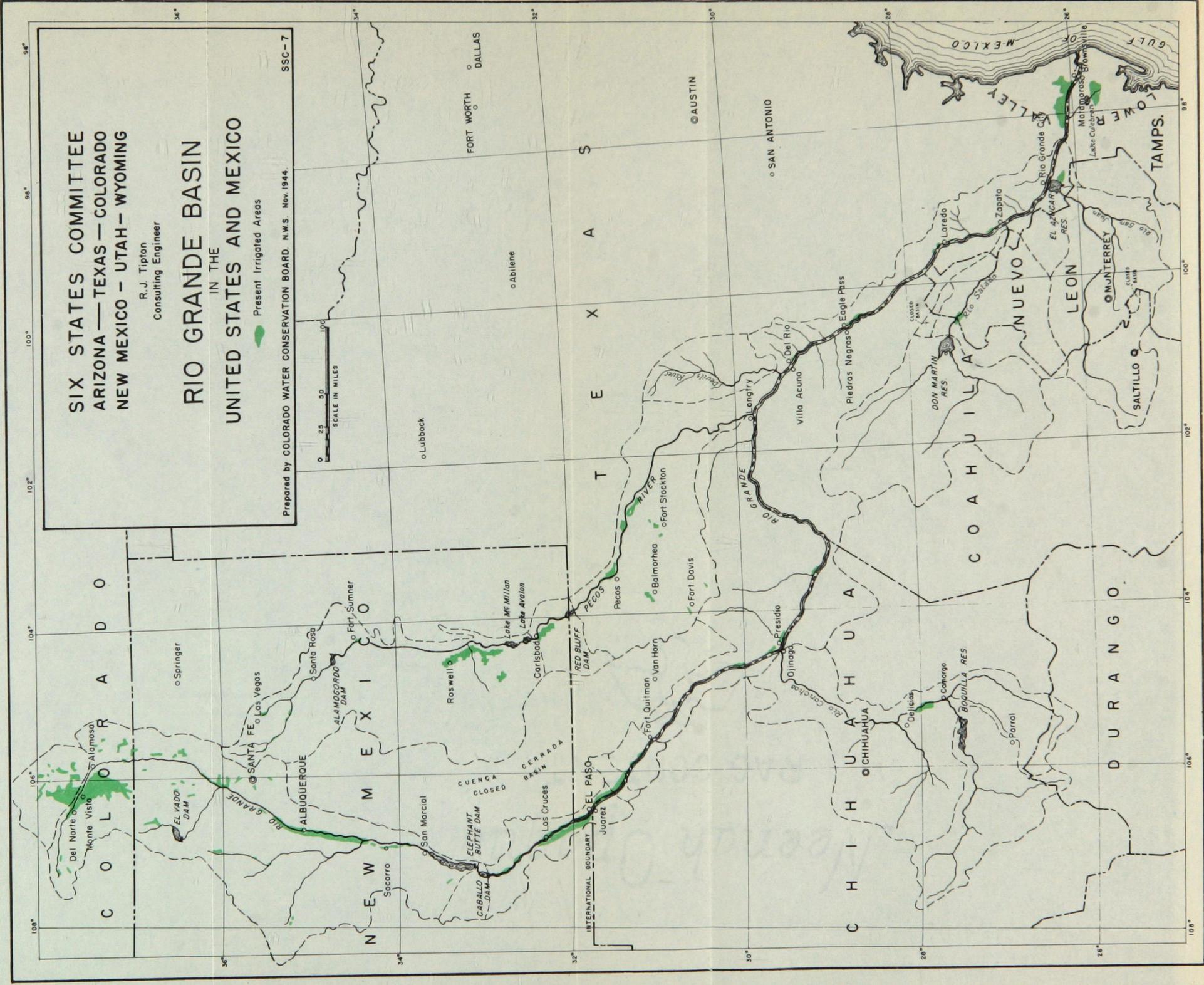


- LEGEND -

- -
- WATER PRODUCTION
 LOST IN TRANSIT FROM BOULDER DAM TO IMPERIAL DAM
 PRESENT CONSUMPTION (Not including projects under construction)
 ESTIMATED FUTURE CONSUMPTION OF III(a) AND III(b) WATER

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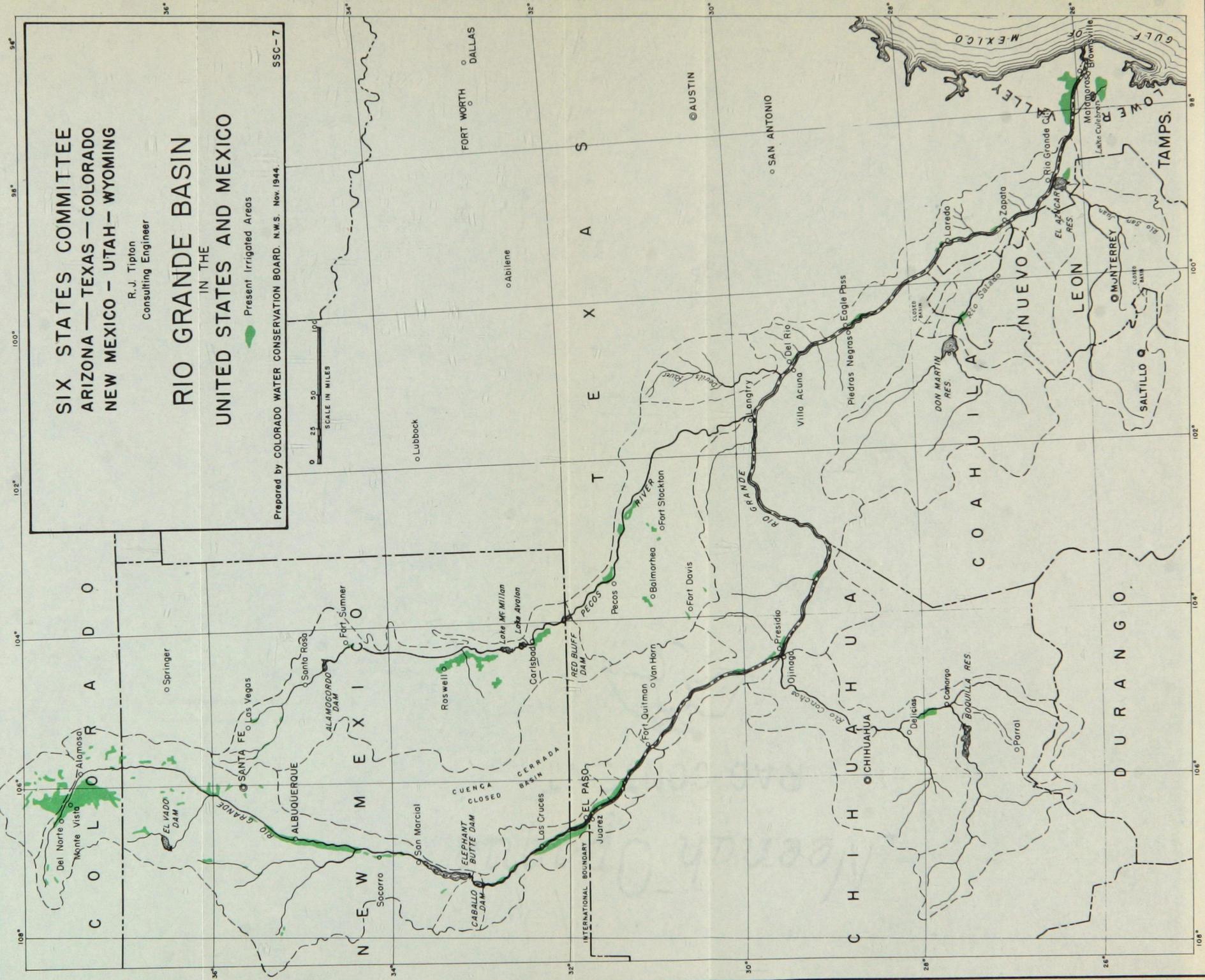
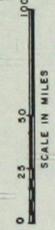
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R. J. Tipton
 Consulting Engineer

RIO GRANDE BASIN
 IN THE
 UNITED STATES AND MEXICO

Present Irrigated Areas

Prepared by COLORADO WATER CONSERVATION BOARD, N.W.S. Nov. 1944. SSC-7



only about 200,000 acre-feet per annum flows from the Upper to the Lower Basin.

Due to the common need of the three states of Colorado, New Mexico, and Texas, and the Republic of Mexico for water from the Upper Rio Grande for irrigation, and due to the fact that the available water supply is not sufficient to irrigate all the workable lands adjacent to the stream, differences arose at an early date between Mexico and the United States and between the three states over the uses of the water of the Upper Rio Grande. The international difficulty was accentuated and brought to a head by the occurrence in the 1890's of a period of extremely low run-off.

A convention which apportioned to Mexico 60,000 acre-feet of water from the Rio Grande annually in perpetuity was finally entered into between the United States and the Republic of Mexico on May 21, 1906, and proclaimed by the President on January 16, 1907. The 2,600,000 acre-foot Elephant Butte Reservoir was constructed and placed in operation in 1916 to insure along with other purposes the fulfilling of the terms of the Treaty. The international controversy over the uses of the waters of the Upper Rio Grande were, therefore, settled in 1907. It was necessary, however, to construct additional works consisting of the American Dam and the American Canal to make the terms of the convention workable.

The interstate controversies were resolved by the consumption of a compact which also was approved by the Congress in 1940.

The remainder of this discussion will be confined to the Lower Rio Grande, which is the subject of the pending Treaty between the United States and Mexico.

In the Lower Rio Grande Basin, which is defined as that portion of the Rio Grande Basin extending from Fort Quitman to the Gulf of Mexico, the drainage area actually tributary to the Rio Grande is 139,650 square miles, of which 58,120 square miles are in the United States and 81,530 square miles are in Mexico.

WATER SUPPLY

The river after leaving Fort Quitman in its course through the Lower Basin develops a considerable flow, mainly from tributaries originating in the Republic of Mexico.

The total water supply originating in the Lower Rio Grande Basin, including about 200,000 acre-feet which enters from the Upper Basin, is estimated at about 6,800,000 acre-feet. Of this quantity approximately seventy per cent originates in Mexico. At present about 4,000,000 acre-feet are flowing to the Gulf of Mexico unused. Drawing SSC-8 indicates diagrammatically the virgin water supply of the Lower Basin and its origin. The water supply is represented by colored bands, red and blue, the combined width of the bands at any point being in proportion to the water supply originating above that point. The blue bands represent water originating above that point. The blue bands represent water originating in the United States and the red bands water originating in Mexico.

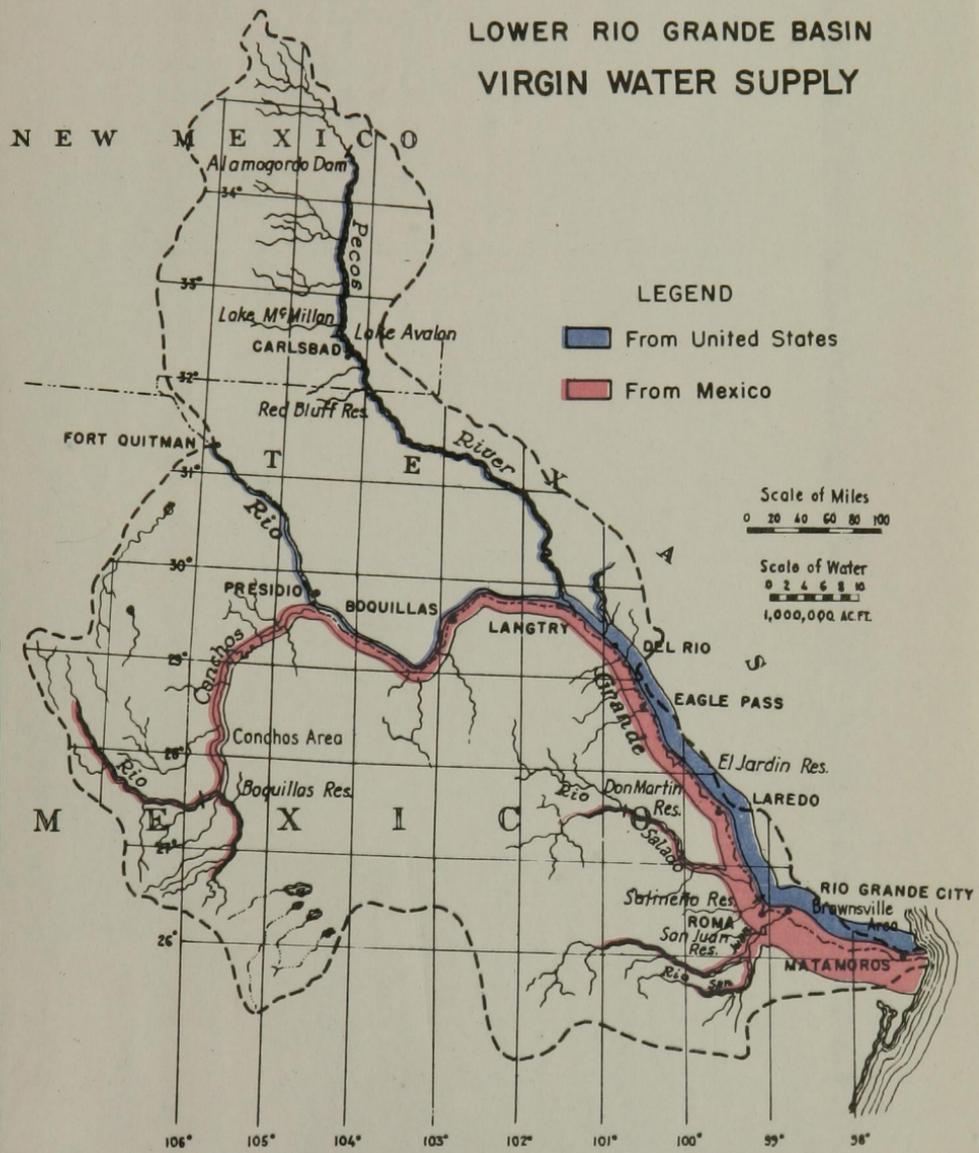
The residual flow from the Upper Basin of about 200,000 acre-feet will be fairly constant. Very few spills will occur from Elephant Butte after proposed reservoirs are constructed in the San Luis Valley of Colorado.

From Fort Quitman to the town of Presidio, a distance of about 145 miles through the so-called Big Bend country, there is very little gain to the river. Just below Presidio a large tributary, the Rio Conchos, enters from Mexico. The mouth of the Conchos is about 950 miles above the mouth of the river at the Gulf of Mexico. The estimated contribution by the Rio Conchos under present conditions of development is 874,000 acre-feet annually.

Two small tributaries, Alamito and Terlingua creeks, enter the stream from United States a short distance below the mouth of the Rio Conchos. Six hundred and three miles above the mouth one of the principal United States tributaries, the Pecos River, joins. Its mean annual contribution under present conditions of development is estimated at about 302,000 acre-feet. The only other important American tributary, the Devils River, enters the stream about

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LOWER RIO GRANDE BASIN
VIRGIN WATER SUPPLY



561 miles above the gulf and contributes an estimated annual quantity of 463,000 acre-feet.

Goodenough Springs, with an estimated flow of 118,000 acre-feet, is a United States tributary entering the stream between the mouths of the Pecos and Devils rivers. Two small United States tributaries, San Felipe and Pinto creeks, contribute small quantities of water at points a short distance below the mouth of the Devils River. Three small Mexican tributaries then join the stream at points varying from 519 miles and 483 miles above the mouth. These are the Rios San Diego, San Rodrigo, and Escondido.

A reach of river about 188 miles in length is then encountered where no live streams of importance enter the river. Through this reach, however, some spring flow occurs. At the end of the reach, about 295 miles above the mouth, the Mexican tributary Rio Salados, with an estimated average annual flow under present conditions of 512,000 acre-feet, enters the stream. The Mexican tributary Rio Alamo contributes an estimated 124,000 acre-feet per annum at a point about 257 miles above the mouth.

The last important tributary is the Rio San Juan, entering the stream from Mexico about 234 miles above the mouth of the river. The Rio San Juan under present conditions of development contributes about 770,000 acre-feet to the stream.

While several million acre-feet of unused water enter the Gulf of Mexico annually unused, only a small percentage of the total flow can be considered firm water. The relatively large average flow results from frequent flood flows which not only are unusable but which cause considerable damage at times. Drawing SSC-9 is a daily hydrograph of the flow of the Lower Rio Grande at Rio Grande City for the years 1932 to 1942. The erratic character of the flow may be noted. Almost every year flood flows varying from a few thousand second feet to over 200,000 second feet occur. At other periods the flow drops to very small amounts. Frequently the river is dry in the mid section of the Lower Valley.

IRRIGATION DEVELOPMENT IN THE UNITED STATES

At the present time about 757,200 acres of land are irrigated by the Lower Rio Grande, about 500,000 acres of which are located in the lower valley and slightly over 200,000 acres are along the Pecos River. About 5,000 acres are at present irrigated in the vicinity of Presidio and about 6,600 acres immediately below that point.

Probably the greatest potentiality for additional irrigation is in the delta region of the lower valley. This area, with the exception of Key West, Florida, is the most southerly part of the continental United States. Its climate is at once semi-arid and semi-tropical. While the average rainfall is about twenty-three inches, yet it has been as low as eleven inches. The rainfall is not properly distributed seasonably to mature the high priced cash crops which are raised in the valley area by means of irrigation. About one-half of all the irrigated land of Texas is within this area. A small amount of the land was irrigated in the 1890's but it was not until the first railroad was completed to the valley in 1905 that land colonization, which reached its peak about 1912, became active. During the colonization period a number of irrigation systems were constructed by private capital. After colonization was practically complete irrigation districts were organized under state laws to take over and extend the irrigation works. At present there are thirty-four irrigation districts and private systems in the valley which embrace a total of 861,600 acres, of which 715,000 acres are considered susceptible of irrigation. Irrigation facilities have been provided for 583,000 acres. Large areas of good arable land lie above the boundaries of the present irrigation districts.

The total value of farm and urban property in the valley is in excess of \$200,000,000. The average size of the irrigated farms is about fifty acres. All irrigation in the valley at present is dependent upon pumping plants since former treaties prohibited building diversion structures across

the stream. Twenty pumping plants originally were built, two were washed into the river and have not been rebuilt, and four have been consolidated with other plants. Fourteen major pumping plants, therefore, remain in use. The pumping lifts vary from twelve feet near Brownsville to something over thirty feet at the head of the valley. In the upper districts more than one pump lift is required to cover the lands of the district. In one district, Hidalgo County, the total lift reaches 140 feet.

Modern canal and lateral systems distribute the water to the lands of the districts from the pumping plants. The approximate aggregate length of the pumping lines is 3300 miles, of which 900 miles are concrete line, 700 miles are concrete pipeline, and 1700 miles are unlined earth canals.

The irrigated lands include about 110,000 acres of citrus groves. The annual value of the crops produced in the area is over \$22,000,000 under prices obtaining before the war. Last year (1944) it is estimated the annual value of the crops was about \$125,000,000.

The Maverick County Water Improvement District completed early in 1938 an irrigation project with its main canal heading near the town of Eagle Pass. The district contemplates the irrigation of 42,000 acres.

The irrigated area in the vicinity of Presidio is an old area having been irrigated for many years. It has had a precarious existence due to the poor quality of the water above the mouth of the Conchos River and due to frequent overflowing of the land which lies below the mouth of the Conchos. The area above the mouth of the Conchos suffered from flood flows during 1942 when Elephant Butte reservoir spilled during practically the entire summer.

The Pecos River is the most important United States tributary of the Lower Rio Grande from the standpoint of irrigation. Its basin comprises about 35,000 square miles, 20,000 in Eastern New Mexico and 15,000 in Western Texas. The total mean annual water production available for irrigation has been estimated at about 1,100,000 acre-feet, eighteen percent of which arises below Girvin, Texas, which is located below all irrigation in the basin. Eighty-

two percent of the run-off above Girvin originates in New Mexico and eighteen percent in Texas.

All of the run-off is not available for irrigation use, but of the 582,000 acre-feet above Girvin which is so available it is estimated that ninety percent originates in New Mexico and ten percent in Texas. At the present time the Pecos River contributes slightly over 300,000 acre-feet to the main stream. It is estimated that this flow will not be materially depleted by additional development in the Pecos River basin.

Agriculture and stock raising are the most important industries in the basin. Irrigation was initiated in the basin by Pueblo Indians or their ancestors at some prehistoric date. Recorded history begins about 1540 when the Spaniards visited the upper reaches of the Pecos. At the close of the Eighteenth Century some expansion of irrigation took place due to Spanish colonization, and with the exception of one project in the upper reaches of the river, irrigation is carried on about the same as it was under the Spaniards.

Modern irrigation commenced in the middle and lower reaches of the basin in the late 1880's, after railroad transportation was made available. The principal irrigated areas in the middle portion basin are the Fort Sumner, Roswell, and Carlsbad areas. Development on the Fort Sumner area began about 1906, and in the Roswell area during the period 1889 to 1904. One of the most important artesian areas in the United States is in the Roswell Basin. Some 92,000 acres of land are irrigated by artesian water, the development of which commenced in the 1890's. The Carlsbad project was constructed by the United States Bureau of Reclamation about 1907. About 25,000 acres of land are served by this project, which in addition to the canal system includes the McMillan, Avalon, and the Alamogordo reservoirs. The Alamogordo Reservoir was constructed in 1937 largely as a replacement to McMillan Reservoir, which is nearly filled with silt. The total project reservoir capacity is 189,300 acre-feet. The total reservoir capacity in the basin in New Mexico is 214,300 acre-feet.

The first modern irrigation in the lower portion of the

Pecos in Texas commenced about 1876. For about twenty-five years after 1888 development steadily progressed until ten irrigation projects had been constructed in the lower basin of the Pecos to serve lands extending along the river for a distance of 125 miles from Arno, Texas, to Girvin, Texas.

The Red Bluff Dam creating a reservoir with a capacity of 304,000 acre-feet was completed in 1936. This is a main stream reservoir located at the head of the lower valley of the Pecos. It was conceived to furnish supplemental water to seven existing irrigation districts in which are situated all the land irrigated from the main stream in the lower portion of the Pecos. Some hydro-electric energy is generated at Red Bluff Reservoir. The total reservoir capacity in the basin in Texas is 324,500 acre-feet.

About 210,000 acres are now irrigated in the Pecos River basin, 156,000 acres of which are in the State of New Mexico and 54,000 in the State of Texas.

The Devils River, which enters the Rio Grande about 561 miles above its mouth, is the largest United States tributary of the Lower Rio Grande, contributing at present an estimated annual quantity of 463,000 acre-feet. Most of the Devils River Basin consists of canyon with no valleys that are susceptible of irrigation. It is probable, therefore, that there will be little depletion of the Devils River water by additional development within its basin.

Much of the water of the Devils River comes from steadily flowing springs. This, therefore, has made attractive the development of hydro-electric energy by means of plants which are largely run-of-the-stream plants.

Large floods occur at times in Devils River resulting from tropical storms which originate in the gulf region. The maximum flood flow from the Devils River that has been recorded was over 600,000 second-feet, which occurred in the year 1932. Investigations have been made by the United States Section of the International Boundary Commission of the practicability of providing flood control reservoirs on the Devils River. Such reservoirs could be multiple purpose.

IRRIGATION DEVELOPMENT IN MEXICO

The Rio Grande drainage basin in Mexico includes portions of the states of Chihuahua, Durango, Coahuila, Nuevo Leon, and Tamaulipas in Northern Mexico. This is shown on drawing No. SSC-7. The drainage basin embraces the water sheds of three important streams, the Rio Conchos, Rio Salado, and Rio San Juan, together with several smaller streams, creeks, and springs. The contributing area of the Rio Grande Basin in Mexico of about 81,000 square miles furnishes approximately 3,000,000 acre-feet of the present annual flow reaching the Rio Grande.

Irrigation in Mexico has been practiced for many years. The first irrigation, largely by individual effort, took place along the principal tributaries and in the vicinity of Juarez on the main river. About 264,000 acres, mostly along the tributaries, were being irrigated by 1900. Irrigation has increased largely through the development of a few large projects since 1926 to a total area of about 574,000 acres within the drainage basin of the Rio Grande in Mexico. When projects now under construction or proposed for early construction are complete the irrigated area will increase to something over 1,000,000 acres.

The first areas irrigated from the main stream probably were in the Juarez valley. A firm water supply of 60,000 acre-feet was provided for this valley by the Convention of 1906 between the United States and Mexico. Prior to the Convention approximately 25,000 acres had been irrigated from the Rio Grande, but during the extreme drought period extending from the early 1890's to 1904 much of the area had been temporarily abandoned. After the drought and after the 1906 Convention the area again increased to about 25,000 acres. In 1929 the National Irrigation Commission took over the operation of the system which irrigates the Juarez valley and designed and constructed a system of drains. The irrigated acreage increased to about 50,000 in 1942. This increase was brought about largely through the use and reuse of return flow. The Juarez Valley project was turned over to the National

Bank of Agricultural Credit in April, 1936, there having been invested by that bank up to that time 644,570 pesos.

With the water supply limited by Treaty, and with practically complete utilization of that supply by the existing area, it can be concluded that no material expansion will take place.

Small areas are irrigated between the Juarez Valley and the lower valley in Mexico by the main stream of the Rio Grande. The total of this acreage was about 27,600 in 1942. More than one-half of this area is located in the Presidio Valley near the mouth of the Rio Conchos, where about 15,000 acres are now irrigated. About 9,300 acres are irrigated in the Del Rio-Eagle Pass reach of the Rio Grande, while the remainder of the 27,600 acres is widely scattered.

A large irrigation project has been outlined for the Lower Rio Grande Valley in Mexico opposite the so-called Brownsville area or lower valley in the United States. While in the United States the lands lying adjacent to the river are higher than the river, thereby making pumping necessary, the lands in Mexico slope very rapidly away from the river permitting the successful operation of a gravity diversion with no diversion dam across the river. Such a gravity diversion known as the Retamal Heading was constructed in the south bank of the river opposite Donna, Texas, about 1937. The heading is a concrete structure with a twenty-foot width of opening and with the sill of the gate below the bottom of the river. Water is diverted through the intake and stored in three off-channel reservoirs, Culebron, Villa Cardenas, and Palito Blanco No. 2, formed by levees. The reservoirs, with a combined capacity of 240,000 acre-feet, are located immediately south of the Rio Grande opposite the towns of Weslaco, Mercedes, and La Feria, Texas.

Several hundred thousand acres of fertile delta land lie south of the Rio Grande and south and southwest of the Mexican town of Matamoros. These lands can be served by canals leading from the Retamal Heading and the reservoirs. Flood control, irrigation, and drainage works have

been planned for a total of about 250,000 acres. From 1935 through 1940 about 5,500,000 pesos were spent on construction and about 4,000,000 pesos on colonization. No estimate is available as to the cost to complete the project. The National Irrigation Commission took over this project on April 30, 1941. At present a canal from Culebron Reservoir can serve about 50,000 acres, but the area developed to date covers only about 14,000 acres.

Irrigation was initiated along the Rio Conchos prior to 1900. In 1914 La Boquilla Dam was constructed primarily for the generation of electric energy. La Boquilla Dam is a gravity section masonry structure, about 244 feet high and forms a reservoir of 2,116,000 acre-feet capacity. The reservoir is approximately the same size as Elephant Butte Reservoir and was built about the same time. This hydroelectric system, built by the Compania Agricola y de Fuerza Electrica del Rio Conchos, S. A., financed by English capital, includes two smaller dams, downstream at La Colina and Rosetilla.

The area irrigated prior to the construction of La Boquilla approximated 55,000 acres, most of which was along the tributaries, the Rio San Pedro and Rio Florida. Under the better regulated water supply afforded by the operation of the power dams, the irrigated acreage increased to nearly 100,000 by 1930, when construction of the Delicias Project was begun. After water has been released at La Boquilla Dam for power purposes it is diverted from the river for project use by the Ojo Caliente diversion dam. The irrigation water is carried along the left side of the river by the main project canal for a distance of about sixty-five miles to the Rio San Pedro. Another canal heads in the Rio San Pedro to carry the water to the remainder of the project. Las Virgenes Dam is under construction on the Rio San Pedro to provide additional storage for the project. This dam is of the round-head, buttress type, with its crest 162 feet above bedrock.

When the project was turned over to the National Bank of Agricultural Credit in 1936 about 57,000 acres of project lands were being irrigated. The investment at that time

totalled about 8,000,000 pesos. Development of the project has continued and the irrigated acreage has increased. By 1942 about 80,000 acres were being irrigated. Some increase in the irrigated area along the river and tributaries has also been taking place. At present the total irrigable area irrigated by the stream and its tributaries is 170,000 acres. Plans contemplate a further increase of about 90,000 acres, making a total estimated ultimate irrigated area of about 260,000 acres. No estimate of the investment to date, within the project or along the river, is available. An estimate prepared by the Irrigation Commission in 1942 indicates that about 25,000,000 pesos will be required to complete the project. How much of this amount has been expended since that estimate is not known.

It has been estimated that about 60,000 acres embracing many small areas along the stream were being irrigated from the Rio Salado in 1900. No appreciable increase in irrigation took place until the Don Martin Project was put in operation in 1930. This is a major project, which includes the Don Martin Dam and a complete system of canals and laterals by which it was proposed to irrigate about 160,000 acres of land. The dam is a composite structure consisting of an earth and gravel embankment about 3,200 feet in length and a concrete overflow section 768 feet in length. The maximum height of the embankment is 114 feet. The spillway section is one of the first examples of a roundhead buttress type, on which are installed 22 radial gates 25 ft. x 14 $\frac{1}{4}$ ft. The reservoir has a capacity of 1,123,000 acre-feet. The cost of the works has been estimated at about 35,908,000 pesos.

The water supply has been found to be inadequate for the project as originally proposed. Although development reached a peak of 110,000 acres in 1936, the acreage has since been reduced to about 75,000. No further expansion is expected.

With the expansion of irrigation under this project, other areas along the Rio Salado that were formerly independently irrigated have been absorbed as a part of the

project. The total acreage irrigated along the stream in 1942 was about 93,000.

A large area, which reached 250,000 acres in 1924, is irrigated along the Rio San Juan above the new El Azucar Reservoir, which is located near the mouth of the river. This area, comprised of many small units along the river and tributaries, is served by natural flow only. In 1942 the total area had decreased to about 170,000 acres.

The Lower San Juan Project, which is estimated to cost in excess of 60,000,000 pesos, was started in recent years. El Azucar dam, across the San Juan, which provides the principal storage for the project, has been completed with the exception of steel spillway gates which could not be obtained because of the war. El Azucar dam is a large earth-fill structure about 135 feet high and over 18,000 feet long. The spillway is a 920-foot curved concrete section with a capacity of half a million second-feet. The system of canals designed to irrigate about 150,000 acres along the lower San Juan and Rio Grande is now under construction. About 14,000 acres have been developed to date.

A relatively small project is operated on the Rios San Diego and San Rodrigo between Villa Acuna and Piedras Negras, where about 27,900 acres were irrigated in 1942. This area has some regulated water furnished by Centenario and San Miguel reservoirs, which have a combined capacity of nearly 20,000 acre-feet. It is not anticipated that there can be much expansion in this area.

FEDERAL PROJECT NO. 5

The Retamal Heading, previously described, is located above twenty-one of the major United States projects which serve lands in the lower valley and above about ninety-eight small irrigation systems. Over 300,000 acres of irrigated lands in the United States are located below the Retamal Heading and the population of the towns located below that point is about 80,000. The elevation of the heading is such that it could dry the river during periods of low run-off. In the face of recurring shortages and the possibility of more

severe shortages, due to the operation of Retamal Heading, and due to the fact that no treaty had been negotiated providing for the construction of international reservoirs, the United States Section of the International Boundary Commission was authorized by the Secretary of State in October, 1938, to investigate means of protecting the United States area against present and potential water shortages and to determine the feasibility and best means of effecting flood control. As a result of the investigation Federal Project No. 5 was conceived. The project is also known as the Valley Gravity Canal and Storage Project.

The proposed project was designed to divert water by gravity without a diversion dam from a point on the river about ten miles above the town of Zapata. From this point the water would be carried in a concrete lined canal having a capacity of 3,000 cubic feet per second for a distance of seventy-two miles, to the Los Olmos Reservoir, an off-channel structure across Los Olmos creek to be created by a dam ninety feet in height. The reservoir would have a capacity of 315,000 acre-feet. Water would be released from the Los Olmos Reservoir through the Los Olmos electric plant into a feeder canal. The power drop would be eighty-six feet and the total electrical energy generated would be 100,000,000 kilowatt hours per annum. The feeder canal would have a capacity of 3,300 cubic feet per second and would extend for a distance of thirty miles from Los Olmos Reservoir to a terminal reservoir having a capacity of 90,000 acre-feet.

This reservoir, called the Mission Reservoir, would provide the fine degree of regulation necessary to supply water in accordance with the fluctuating demand of the valley lands. From the Mission Reservoir a gravity distribution canal would supply practically all of the lands irrigated in the valley, making unnecessary the operation of the present pumps. The distribution canal would be concrete lined and would have a capacity at its heading of 3,500 cubic feet per second and a length of sixty-seven miles. It was estimated that the project as described would permit

the successful irrigation of the 583,000 acres at present under irrigation facilities in the valley.

Investigations were made of reservoir sites on United States tributaries that could be developed to increase the irrigated area. Certain sites were investigated on the Devils River. It was concluded that by the development of some up-stream storage the project would provide a water supply for the 715,000 irrigable acres under organized districts and existing private systems in the valley.

The project would convert from an international to a domestic status the water required for the irrigation of lands in the United States in the lower valley that are located under existing districts and private projects. The estimated cost of the project was about \$60,000,000, including the portion of the up-stream storage that would be allocated for irrigation purposes. The project was authorized by Congress for construction and an initial appropriation of \$2,500,000 was made to start work. Actual construction work was not commenced because negotiations had been started on the pending Treaty.

If the Treaty is ratified it is probable that only a part of the Valley Gravity Project will be required.

WATER PROBLEMS OF LOWER RIO GRANDE

The major problems of the Lower Rio Grande involve flood protection, silt, and salinity control and the regulation of water supplies for irrigation and other uses. In the Presidio area the most acute problem is salinity control and flood protection. No economic solution has yet been found for either problem. Along the reach of river between the Presidio area and the Lower Valley the greatest problem is flood control. In the Lower Valley the problem, both from the United States and Mexican standpoint, is the regulation of the water supplies by the construction and operation of large storage reservoirs on the main stream, which will afford practically complete flood control and will regulate the water supplies so they can be effectively used for irrigation purposes.

The requirements of the present irrigated area in the United States in the lower valley vary between some 700,000 acre-feet and 1,000,000 acre-feet annually. The demand fluctuates between rather wide limits, not only annually but seasonally, due to variation in rainfall. Almost every year during the early spring months little precipitation occurs and the flow of the stream drops below the irrigation requirements. While to date the duration of the deficiencies has not been protracted, yet since the principal crops raised in the area are citrus fruits and winter vegetables even a short period of drought can cause considerable damage.

Numerous small towns exist in the valley. Most of these towns depend entirely on river water, taken from irrigation canals, for their domestic and municipal water supplies. During some periods of shortage the threat to the municipal water supply has been so great that steps have been taken from time to time to haul water to the towns by tank cars.

The reservoirs, the construction and operation of which are provided for in the Treaty, will provide a substantial degree of flood control for the lower valley and the middle reaches of the river and will so regulate the flow that the water supply for the present areas will be assured and a substantial increase in irrigation be made, both in the United States and in Mexico. The reservoirs can also be operated to generate hydro-electric energy.

Superimposed on the hydrograph shown on drawing SSC-9 are the estimated requirements for present and future development in the United States and Mexico in the lower valley. The international reservoirs mentioned above will equate the flow of the stream to the indicated requirements.

APPENDIX B

COLORADO RIVER BASIN

GENERAL

The Colorado River, one of the most important rivers of the Western United States, rises in the Rocky Mountains of Colorado, Wyoming, and Utah, and flows for a distance of about 1700 miles from its extreme headwaters to the Gulf of California. The drainage basin embraces parts of the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and the Republic of Mexico. The river forms the boundary between the United States and Mexico for a distance of twenty miles, extending from a point about six miles west of Yuma to a point about one hundred miles above its mouth.

The drainage area comprises about 244,000 square miles located in the various states and the Republic of Mexico as follows:

Drainage Area by States:	Square Miles
Wyoming	19,000
Colorado	39,000
New Mexico	23,000
Utah	40,000
Arizona	103,000
Nevada	12,000
California	6,000
	<hr/>
In United States	242,000
Mexico	2,000
	<hr/>
Total	244,000

Principal tributaries of the Colorado River include the Green, which rises in Wyoming and flows southerly into Utah and thence easterly into Colorado, where it is

joined by the Yampa River, which rises in the mountains of Colorado; the main stream formerly called the Grand, which is the largest tributary of the entire system and rises on the Western Slope of the Rocky Mountains of Colorado; the Gunnison, which rises in south-central Colorado and flows west and then north, joining the Colorado River at Grand Junction; the San Juan, which rises in Southern Colorado and flows into New Mexico, thence westerly through New Mexico into Utah, joining the Colorado a short distance north of the Utah-Arizona boundary line; the Little Colorado, which rises in Western New Mexico and Eastern Arizona and joins the Colorado just above the Grand Canyon; the Virgin River, which rises in Southwestern Utah and Southeastern Nevada and empties into Lake Mead; the Bill Williams River, which rises in Central Arizona and joins the Colorado River at Parker Dam; and the Gila River, which rises in Southwestern New Mexico and Southeastern Arizona and flows westerly across Arizona joining the Colorado River at Yuma.

The major portion of Arizona lies in the Gila River basin. No tributaries enter the river from California or from Mexico.

WATER SUPPLY

The mean annual virgin flow of the Colorado River for such a period as 1897 to 1943, inclusive, at the lower international boundary is estimated at 17,751,000 acre-feet. Of this amount 16,271,000 acre-feet, or ninety-two percent of the total, is produced in the Upper Basin of the Colorado River. One million three hundred thousand acre-feet is the estimated virgin flow of the Gila River at its mouth.

The following table is the estimated amount of water produced by the major tributaries and reaches of the Colorado River and which reached the main stream under virgin conditions.

	Estimated Virgin Flow for Period Such as 1897-1943	
Tributary or Reach of River	Acre-Feet	
Green (Above Linwood, Utah)	1,874,000	
Yampa	1,861,000	
White (Above Watson, Utah)	583,000	
Colorado (Above Cisco, Utah)	7,238,000	
San Juan (Above Bluff, Utah)	2,620,000	
Miscellaneous (Largely Tributaries from Utah)	2,095,000	
	<hr/>	
Total Upper Basin		16,271,000
Virgin River	310,000	
Little Colorado River (near its mouth)	338,000	
Misc. Tributaries between Lee Ferry and Boulder Dam	412,000	
Gila River near Phoenix	2,300,000	
Natural losses—Boulder Dam to Imperial Dam	—1,070,000	
Natural losses—Phoenix to mouth of Gila River	—1,000,000	
	<hr/>	
Total net contribution Lower Basin to Main Stream		1,480,000
Total virgin flow at Interna- tional Boundary		17,751,000

The run-off of the basin varies widely from year to year and from period to period. The following table indicates the estimated virgin flow at Lee Ferry for each of the years 1897 to 1943 inclusive. The last column of the table gives the estimated virgin flow in ten-year progressive series.

Virgin Flow of Colorado River at Lee Ferry

Year	Combined Flow of Main Upper Tributaries	Adopted Flow at Lee Ferry		Normal Past Depletions Irr.	Div. T. M.	Past Depletions Above Lee Ferry	Virgin Flow	10-Year Progressive Mean
		Lee Ferry	Paria Total					
1897	18,721	19,797	19,797	650	5	734	20,531	
1898	12,206	12,948	12,948	711	5	652	13,600	
1899	16,925	17,899	17,899	772	5	824	18,723	
1900	11,996	12,686	12,686	834	5	755	13,441	
1901	12,925	13,668	13,668	896	5	847	14,515	
1902	8,245	8,454	8,454	957	6	751	9,205	
1903	12,550	12,346	12,346	1,036	6	938	13,284	
1904	12,505	11,675	11,675	1,118	11	994	12,669	
1905	13,800	15,290	15,290	1,197	21	1,206	16,496	
1906	18,131	18,656	18,656	1,276	21	1,427	20,083	
1907	20,755	21,179	21,179	1,358	21	1,641	22,320	
1908	10,852	12,065	12,065	1,437	21	1,312	13,377	
1909	20,543	23,295	23,295	1,516	21	1,937	25,232	
1910	12,392	13,583	13,583	1,568	21	1,509	15,092	15,250
1911	14,688	16,473	16,473	1,620	22	1,708	18,181	15,480
1912	17,686	18,393	18,393	1,671	22	1,879	20,272	15,460
1913	12,394	12,581	12,581	1,724	30	1,631	14,212	16,110
1914	18,206	19,868	19,868	1,774	35	2,098	17,850	16,650
1915	10,964	12,396	12,396	1,826	55	1,740	21,966	17,760
1916	16,865	18,380	18,380	1,878	85	2,098	14,136	18,780
1917	19,918	20,436	20,436	1,929	105	2,420	20,579	18,540
1918	13,373	13,775	13,775	1,982	105	2,420	22,856	18,590
1919	9,980	10,611	10,611	2,032	115	1,868	15,310	18,600
1920	18,764	20,387	20,387	2,080	115	2,613	12,479	17,570
1921	18,728	19,572	19,572	2,127	115	2,633	23,000	18,360
1922		16,070	16,100	2,175	115	2,427	22,205	18,760
			E30				18,527	18,580

Virgin Flow of Colorado River at Lee Ferry—Continued

Year	Combined Flow of Main Upper Tributaries	Adopted Flow at Lee Ferry		Normal Past Depletions Irr.	Div. T. M.	Past Depletions Above Lee Ferry	Virgin Flow	10-Year Progressive Mean
		Lee Ferry	Paria E30					
1923		16,940	E30	2,175	115	2,473	19,443	19,100
1924		11,700	18	2,175	115	2,084	13,802	18,280
1925		12,400	46	2,175	115	2,153	14,599	18,330
1926		13,100	16	2,175	115	2,198	15,314	17,800
1927		17,500	45	2,175	117	2,521	20,066	17,520
1928		14,700	16	2,175	120	2,318	17,034	17,640
1929		19,600	34			2,685	22,319	18,620
1930		12,400	21			2,157	14,578	17,780
1931		6,220	10			1,698	7,928	16,350
1932		15,100	38			2,364	17,502	16,250
1933		9,730	18			1,951	11,699	15,480
1934		3,948	18			1,520	5,486	14,650
1935		10,266	17			2,020	12,303	14,420
1936		12,108	37			2,185	14,330	14,320
1937		11,980	26			2,230	14,236	18,730
1938		15,640	26			2,570	18,236	13,850
1939		8,839	33			2,075	10,947	12,710
1940		7,589	28			2,015	9,632	12,210
1941		17,846	E30			2,760	20,636	13,480
1942		14,738	E30			2,650	17,418	13,470
1943		9,405	E30			2,240	11,675	13,470
Avg.		14,345				1,865	16,223	

Sources of Information: U. S. B. R. 1935 Hydrology Report and Supplemental Memorandum from Mr. Ritter revising and bringing data up to 1942. 1943 supplied from records at U. S. B. R. office.

USE OF COLORADO RIVER WATER IN THE UNITED STATES

Irrigation commenced in the Colorado River Basin at some prehistoric date. Remnants of irrigation systems which were used by Indians and cliff dwellers or their predecessors are in existence in Arizona and other parts of the basin. Modern irrigation did not start in the basin until after the discovery of gold in California. The migration of people to California, many of whom stopped along the way, resulted in the starting in of irrigation in various parts of the basin. It was about 1856 there was begun construction of canal systems for irrigation of land in the Palo Verde Valley in California and the Blacks Fork area in Wyoming and along the tributaries of the Green in Utah and the Colorado River proper in Colorado.

The following table shows the irrigated area in the various states of the Colorado River Basin by states as reported by the United States Bureau of Census, for various years since 1902:

IRRIGATED AREAS COLORADO RIVER BASIN

As reported by U. S. Bureau of Census

Values in Acres

Sums—	1902	1909	1919	1929	1939
State Totals	927,183	1,550,546	2,312,047	2,537,124	2,601,963
Arizona ..	246,866	317,661	461,694	572,289	640,110
California .	10,000	213,611	447,384	464,653	454,768
Colorado ..	417,839	617,242	766,532	856,413	844,494
Nevada ...	11,481	13,850	8,546	12,308	13,880
New Mexico	29,809	37,300	53,808	55,310	49,841
Utah	92,622	167,287	362,576	347,452	324,899
Wyoming .	118,566	183,595	211,507	228,699	273,971

Need for flood control on the Lower River and the regulation of water for the Imperial Valley and for the then proposed Los Angeles Aqueduct caused the first major water project, Boulder Dam, to be constructed. As a part of the Boulder Dam Canyon Project there were constructed the Imperial Dam and the All-American Canal for the de-

livery of water to the Imperial Valley and to make unnecessary the operation of Laguna Dam for the diversion of water to the Yuma project. Imperial Dam was so constructed as to permit the diversion of water both to the All-American Canal and to the canal which will serve the Gila project in Arizona.

Since the building of the Boulder Canyon Project a number of other large projects have been conceived. Some have been constructed and others are under construction. Included among these are the Colorado-Big Thompson transmountain diversion project in Colorado, the Parker Dam, which diverts water for the Los Angeles Aqueduct, and the canal for the first unit of the Gila project. Davis Dam was authorized, but the work was stopped by the War Production Board on account of the war.

The total consumption by irrigation, reservoir evaporation, and exportation in the Colorado River Basin, without taking credit for salvage water under present condition of development, is estimated to average 7,200,000 acre-feet per year, 5,000,000 acre-feet of which takes place in the Lower Basin and 2,200,000 acre-feet in the Upper Basin. This is less than one-half of the water supply allocated by Articles III (a) and III (b) of the Colorado River Compact.

The U. S. Bureau of Reclamation, under Section 15 of the Boulder Canyon Project Act, has been carrying on a comprehensive investigation of possibilities in the Colorado River Basin. Studies would indicate that probably under ultimate conditions of development the Upper Basin will consume at least the 7,500,000 acre-feet apportioned to it by Article III (a) of the Colorado River Compact. All studies indicate that the potentialities for the use of water in the states of the Colorado River Basin if developed would consume all of the water produced by the Colorado River System except the return flow which reaches the river too far down to be used in the United States. In other words, after full development in the United States, it is possible that the only water that would flow into Mexico, in the absence of a treaty providing otherwise, would be return flow unusable in the United States.

Since the above is true, no further description will be given of the Upper Basin nor the potential projects that may use water of the Colorado River. However, since the development of the Lower Basin will have a direct bearing on return flow that will reach the river below Imperial Dam, and since the delivery of water to Mexico under the terms of the Treaty is related to some of the works in the Lower Basin, a more complete description of that basin will be given.

DESCRIPTION OF THE LOWER COLORADO RIVER BASIN

The Lower Colorado River Basin is defined by Article II (g) of the Colorado River Compact as "those parts of the states of Arizona, California, Nevada, New Mexico, and Utah within and from which water naturally drains into the Colorado River System below Lee Ferry, and also all parts of said states located without the drainage area of the Colorado River System which are now, or shall hereafter be, beneficially served by waters diverting from the stream below Lee Ferry." The natural drainage area of the Colorado River System below Lee Ferry includes practically all the State of Arizona, parts of Nevada, Utah, and New Mexico, and a very small part of the State of California.

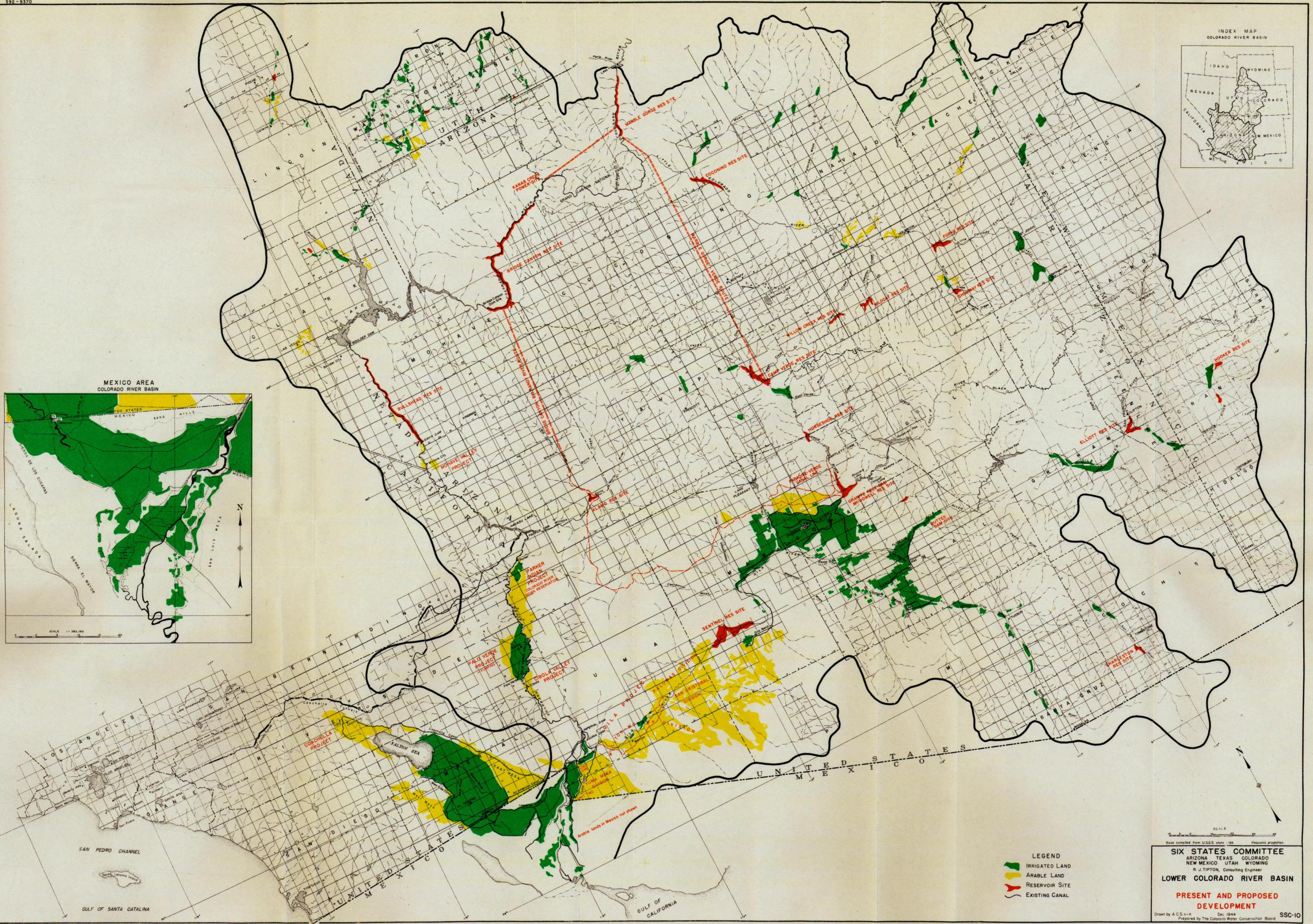
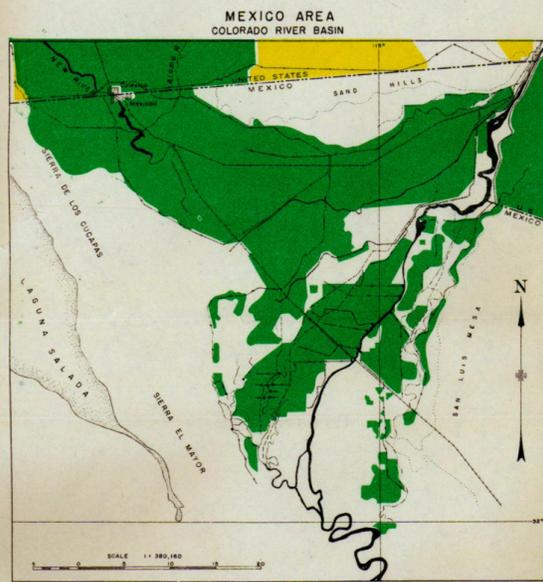
The main stream of the drainage basin is the Colorado River proper extending from Lee Ferry to the Gulf of Lower California. The principal tributaries are the Gila River, most of the drainage area of which is in Arizona; the Williams River, which is all in Arizona; the Little Colorado, the extreme headwaters of which rise in New Mexico—the main portion of the drainage area, however, being in Arizona; and the Virgin River, which rises in Utah and flows through the extreme northwest corner of Arizona into Nevada and thence into the Colorado River by way of an arm of Lake Mead. The Muddy River is a tributary of the Virgin River, which also enters an arm of Lake Mead. No live tributaries enter the stream from the California side.

The attached map No. SSC-10 shows the Lower Colorado River Basin as defined by the Compact. The drainage area of the Colorado River System is bounded by the black irregular line. That portion of the Lower Basin lying outside the drainage basin of the Colorado River System which now receives water and which will receive additional quantities from the Colorado River lying all in the State of California is shown on the map. Present irrigated areas are shown in green, and the arable areas, some of which may be irrigated in the future, are shown in orange. The present principal reservoirs in the Lower Basin are shown by closely stippled areas, the principal one of which is Lake Mead.

Parker Dam, which forms Lake Havasu on the boundary between Arizona and California, is located about 150 miles below Boulder Dam. Davis damsite is shown on the map between Boulder and Parker Dams. Bullshead Reservoir, to be created by Davis Dam, with a capacity of 1,600,000 acre-feet, will extend to Boulder Dam. Bullshead Reservoir will be used to regulate the water released from Lake Mead for the generation of hydro-electric energy and make the water so released parallel with the irrigation and municipal demand below Davis Dam, including the water to be delivered to the international boundary line for use by Mexico.

The Colorado River aqueduct which furnishes water to the Southern California Metropolitan Water District diverts from Lake Havasu by means of pumps. The line of the aqueduct extending from Lake Havasu to its western terminus at Lake Mathews may be noted on the map.

Future proposed reservoirs are shown in red. In addition to Davis Reservoir two other proposed reservoirs on the main stream may be noted on the map—Bridge Canyon, the dam of which will be a short distance above the high water of Lake Mead, and Marble Canyon, the dam of which will be above the boundary of Grand Canyon National Park. Various reservoir sites exist on the tributaries and some ultimately will be constructed. The one on the Little Colorado, indicated on the map, will be largely



- LEGEND**
- IRRIGATED LAND
 - ARABLE LAND
 - RESERVOIR SITE
 - EXISTING CANAL

SIX STATES COMMITTEE
 ARIZONA TEXAS COLORADO
 NEW MEXICO UTAH WYOMING
 R. J. TIPTON, Consulting Engineer

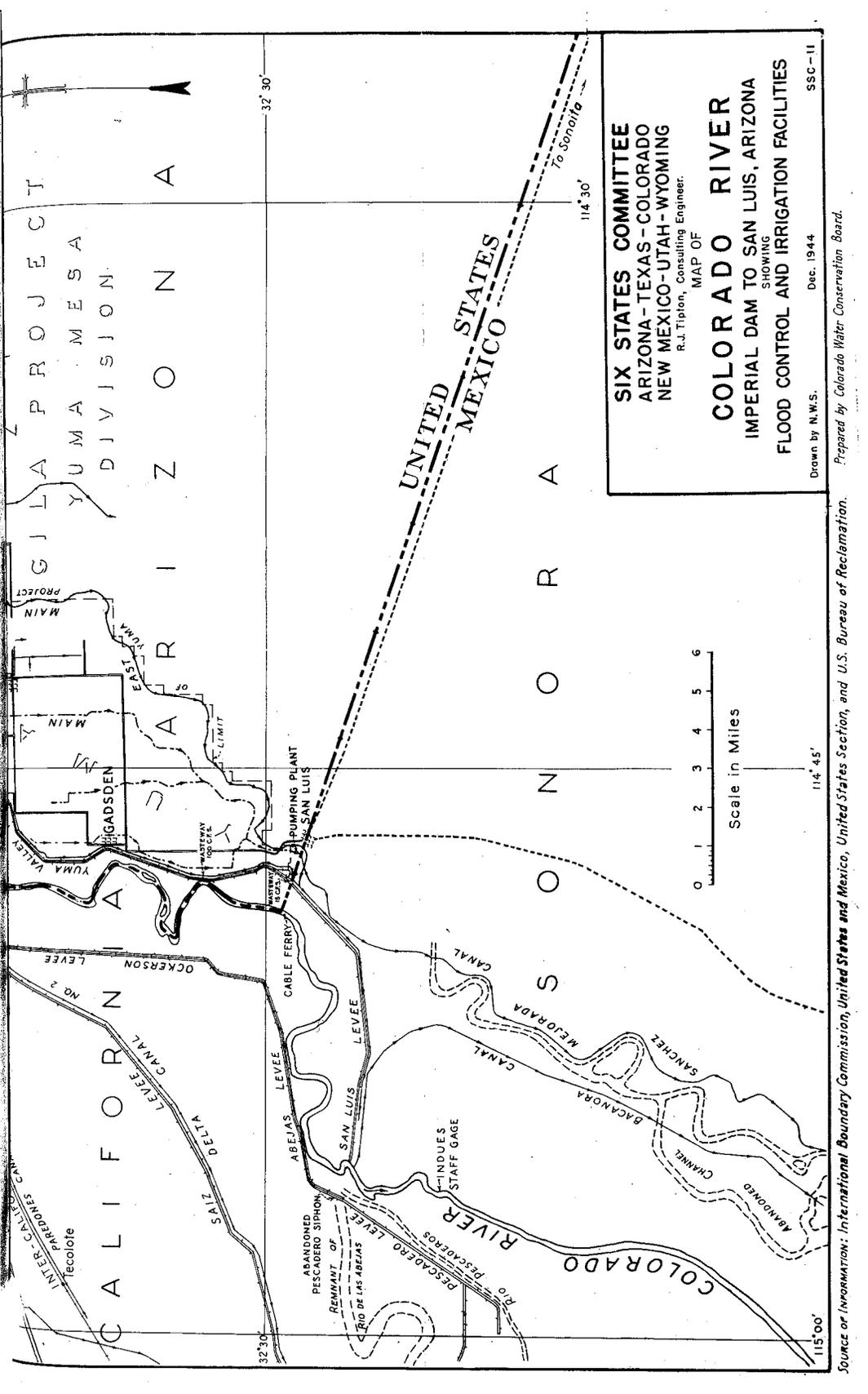
LOWER COLORADO RIVER BASIN

PRESENT AND PROPOSED DEVELOPMENT

Drawn by A.C.S.-r. Dec. 1944
 Prepared by The Colorado Water Conservation Board

SSC-10

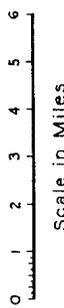
Base compiled from U.S.G.S. state base maps and map by The Metropolitan Water District of Southern California



CALIFORNIA
 GILA PROJECT
 YUMA MESA
 DIVISION
 ARIZONA

UNITED STATES
 MEXICO

SIX STATES COMMITTEE
 ARIZONA-Texas-COLORADO
 NEW MEXICO-UTAH-WYOMING
 R.J. Tipton, Consulting Engineer.
 MAP OF
COLORADO RIVER
 IMPERIAL DAM TO SAN LUIS, ARIZONA
 SHOWING
 FLOOD CONTROL AND IRRIGATION FACILITIES



Drawn by N.W.S.
 Dec. 1944
 SSC-11

Source of Information: International Boundary Commission, United States Section, and U.S. Bureau of Reclamation. Prepared by Colorado Water Conservation Board.

for the control of silt. The one shown on Williams River will be for silt and flood control. The reservoir shown on the middle reaches of the Gila River below the town of Gila Bend will be constructed for flood control and the regulation of return flow and flood flows which reach the reservoir site from the upper portion of the Gila River.

The present and some of the potentially irrigable areas in both California and Arizona are listed in the following tables. The area designations are the same as those appearing on the map.

CALIFORNIA

Values in Acres

Project or Area	Arable But Not Irrigated	Irrigated 1932-42	Total
All-American Canal			
Imperial Irrigation District..	122,160	400,840	523,000
Coachella	113,730	15,000	128,730
West Mesa	125,790		125,790
East Mesa	169,740		169,740
Pilot Knob Mesa.....	20,580		20,580
	<hr/>	<hr/>	<hr/>
Total All-American.....	552,000	415,840	967,840
Yuma Project			
Reservation	5,340	2,400	7,740
Bard	1,550	4,770	6,320
	<hr/>	<hr/>	<hr/>
Total Yuma	6,890	7,170	14,060
Palo Verde			
Palo Verde Irrigation Dist...	37,570	35,430	73,000
Mesa	16,000		16,000
	<hr/>	<hr/>	<hr/>
Total Palo Verde	53,570	35,430	89,000
	<hr/>	<hr/>	<hr/>
Grand Total.....	612,460	458,440	1,070,900

- ARIZONA

Value in Acres

Project or Area	Arable But Not Irrigated	Irrigated	Total
Williams River	5,950	2,380	8,330
Little Colorado	96,100	24,760	120,860
Kanab-Johnson .....	.....	1,090	1,090
<hr/>			
Sub total tribs. above Gila..	102,050	28,230	130,280
Ft. Mohave	21,940	140	22,080
Colorado River Indian Reservation (Parker)	69,140	5,380	74,520
Sub total main stream below Boulder and above Imperial Dam	91,080	5,520	96,600
<hr/>			
Central Arizona	1,500,000	.....	1,500,000
Gila Project—			
North Gila Valley.....	2,380	4,420	6,800
South Gila Valley.....	5,300	4,540	9,840
Yuma Mesa	172,430	100	172,530
Welton-Mohawk Palomas and San Cristobal	464,800	7,800	472,600
<hr/>			
Total Gila Project.....	644,910	16,860	661,770
Yuma	6,820	47,610	545,430
<hr/>			
Grand Totals	2,344,860	98,220	2,443,080

The total available irrigable lands are in excess of the available water supply.

It is assumed that most of Arizona's water will be used below Boulder Dam and that the areas irrigated above the dam in the Little Colorado River, Kanab Creek, Virgin River, and other small tributary basins will not exceed some 50,000 acres. Twenty thousand acres may be irrigated in the Mohave Valley below Boulder along the main stream if there is not greater need for this water some place else.

It is estimated that about 60,000 acres will be irrigated in the Colorado River-Indian Reservation. The Yuma project is practically fully irrigated.

Assuming the above areas to be fully irrigated, a substantial amount of water, for which Arizona has contracts with the Secretary of the Interior for delivery from Lake Mead, will remain for use in other areas. Two major possibilities exist for the use of this water. One possibility is the Gila project extending, as shown on the map, from the mouth of the Gila River up to the proposed flood control and conservation reservoir on the Gila. This area includes the Yuma Mesa which lies immediately east of the present Yuma project and south of the Gila River. A canal has been constructed from Imperial Dam to serve a part of the Yuma Mesa division of the first unit of the project. This division embraces a gross area of 172,430 acres, about 120,000 acres of which are irrigable. The balance of the Gila project comprises a gross of about 465,000 acres. It is reported that the lands of the Gila project are not of good quality and that if all were irrigated they would require the application of relatively large amounts of water, to keep the land in good condition. A part of the area, particularly the Yuma Mesa addition, also is very gravelly.

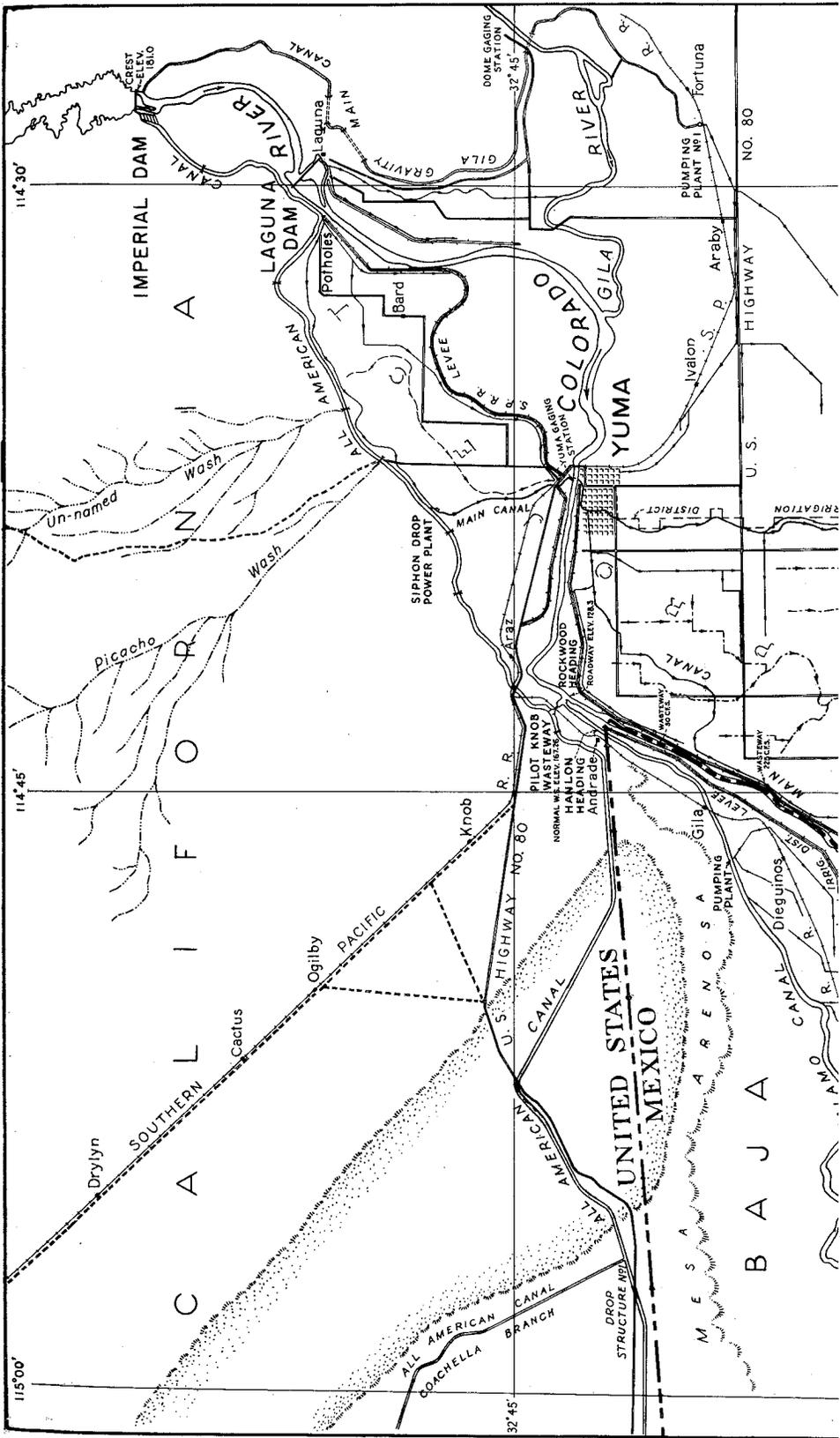
It may be that Arizona will choose to use a major portion of her share of the Colorado River in central Arizona, largely in the Gila River Basin. A number of projects have been proposed to accomplish this, and investigations of some of these proposed plans are actively under way. One plan contemplates diverting water by a pumping plant from Lake Havasu and transporting the water in a canal across country in a generally southerly and then easterly direction, the line to terminate in Salt River at or near the Granite Reef diversion dam which diverts water to the Salt River project. The line of the canal is indicated by the dashed red line on the map. Several irrigable areas are indicated on the map along this line. The indicated areas are diagrammatic, because more good land exists along the proposed route of the canal than there will be water successfully to irrigate.

Two other aqueduct possibilities are under investigation, either of which would cover essentially the same area as would be covered by the Parker-Phoenix aqueduct. One plan would involve a diversion at Bridge Canyon Reservoir to a long tunnel, and thence to a canal which would join the proposed Parker-Phoenix aqueduct where it takes out of the Williams River. This line would be an all gravity line. The other possibility is a tunnel extending from Marble Canyon Reservoir to the headwaters of the Verde River. This line would involve no canal. Considerable power could be generated on the Verde River.

In California on the main stream the Palo Verde project may be extended. The largest potential areas are in the Imperial and Coachella Valleys, which would be served by the All-American Canal. Among such lands are the East and West Mesas, both outlined on the map, and the Coachella Valley in the vicinity of Indio. A portion of the Coachella Canal has been constructed and contracts have been let for the construction of the balance of the line. The West Mesa would be served by pumping.

The lands at present irrigated in Mexico from Colorado River waters in both Lower California and Sonora are shown in green on the map. They are shown to a larger scale on the insert on the left side of the map. The upper contiguous area is irrigated from the Alamo Canal while most of the lower area on the Lower California side of the river has been irrigated by pumps. Some of the area on the Sonora side has been irrigated by pumps from the main stream, while another area just below the San Luis mesa has been irrigated by drainage and waste water from the Yuma project which is pumped from the main Yuma drain to the Sanchez Mejorado Mexican Canal, the Mexican interests paying a portion of the pumping costs. It is reported that approximately 900,000 acres of irrigated and irrigable land are available in Mexico to use Colorado River water without excessive pumping head.

The attached map, No. SSC-11, is a larger scale map showing the Colorado River and various diversion, drainage, and protection facilities in the boundary region. The



115°00'

114°45'

114°30'

32°45'

IMPERIAL DAM

LAGUNA DAM

SIPHON DROP POWER PLANT

YUMA GAGING STATION

UNITED STATES
MEXICO

U.S. HIGHWAY NO. 80

SOUTHERN PACIFIC

Ogilby PACIFIC

ALL AMERICAN CANAL

ALL AMERICAN CANAL BRANCH

DROP STRUCTURE

Un-named Wash

Wash

Wash

Picacho

Drylyn

Cactus

Knob

PILOT KNOB WASTEWAY

HAILON HEADING

ROCKWOOD WASTEWAY

ROADWAY RELAY

WASTEWAY SOCIETY

WASTEWAY SOCIETY

WASTEWAY SOCIETY

MAIN CANAL

CANAL

IRRIGATION DISTRICT

LAGUNA MAIN CANAL

GRAVITY

LEVEE

GRAVITY

COLORADO RIVER

GILA RIVER

YUMA

ARABY

IVALON

U. S.

HIGHWAY NO. 80

PUMPING PLANT NPI

Fortuna

COACHELLA

ALL AMERICAN CANAL

Dieguinos

ARENSA

GILA

LEVEE

PUMPING PLANT

COACHELLA

AMERICAN

COACHELLA

boundary between the United States and Mexico is shown on the map. Within the limits of the map the boundary starts on the left side as a land boundary between California and Lower California, and extends in a slightly north by east direction to the Colorado River a short distance below Rockwood Heading. From that point the Colorado River forms the boundary for a distance, including the meanderings of the river, of about twenty miles. The portion of the river which forms the boundary is called the limitrophe section of the river. From the lowest point on the limitrophe section about two miles west of the town of San Luis, Sonora, the boundary extends in a southeasterly direction between the State of Arizona in the United States and the State of Sonora in Mexico. The boundary between California and Lower California is commonly called the upper boundary and the boundary between Sonora and Arizona is called the lower boundary.

The United States Bureau of Reclamation-Yuma project, indicated on the map, extends from the Laguna Dam on the Colorado River to the lower boundary. This project is one of the early Bureau of Reclamation projects and serves lands both in California and Arizona, most of the land lying in Arizona. The project was formerly served by a canal diverting from the river at Laguna Dam and running along the upper side of the California portion of the Yuma project and thence across the river through a siphon to the Arizona side.

The All-American Canal is indicated as diverting at the Imperial Dam, in the upper right hand corner of the map, and extending in a generally southwesterly direction to a point near the upper boundary, where it runs parallel to the boundary for some distance and thence northwesterly to skirt some high sand hills and again southwesterly to Drop Structure No. 1 where the Coachella branch of the canal takes out in a northwesterly direction. The All-American Canal proper extends on westward connecting with the old Imperial Canal near Calexico.

Most of Yuma project water is now furnished through the All-American Canal, the diversion from the canal being

at Siphon Drop, which is shown on the map. The All-American Canal down to this point was constructed to a capacity of 15,155 cubic feet per second, it being contemplated that 2,000 cubic feet per second would be discharged through the Siphon Drop power plant and thence to the main canal of the Yuma project. About 1,200 cubic feet per second of the 2,000 cubic feet per second is returned to the river at a wasteway above the Yuma siphon and the balance is carried across the river through the siphon for use on the Arizona portion of the project. The All-American Canal from Siphon Drop down to the Pilot Knob wasteway, shown on the map, is constructed to a capacity of 13,155 cubic feet per second and from that point to Drop Structure No. 1 is constructed to a capacity of 10,155 cubic feet per second. It probably was contemplated that a power plant would be constructed at the Pilot Knob wasteway and surplus water would be discharged up to a rate of 3,000 cubic feet per second through the All-American Canal down to Pilot Knob wasteway and discharged at that point through the power plant back to the river or to the Alamo Canal to serve Mexico.

The Alamo Canal is shown on the map diverting from the river at Rockwood Heading a short distance above the upper boundary, from which point the canal extends in a southwesterly direction crossing the upper land boundary about $1\frac{1}{2}$ miles below the Rockwood Heading, and running therefrom in a generally southwesterly direction in Lower California, skirting the sand hills. The canal turns and runs in a somewhat northwesterly direction, entering the United States near Calexico. The full length of the canal is shown on the map of the Lower Colorado River Basin, Dwg. No. SSC-10.

Various protective works consisting mainly of levees have been constructed along the lower reaches of the river to protect existing irrigated lands and irrigation facilities immediately contiguous to the river, and to prevent the river from again breaking through into the old Alamo and New Rivers and flowing thereby through the Mexicali and

Imperial Valleys to the Salton Sea. These various levees are indicated on the map.

The canal recently constructed to serve the first unit of the Gila project is shown as diverting from the river at Imperial Dam and running in a generally southern direction, crossing the Gila River through a siphon and terminating at Pumping Plant Number 1. A portion of the Yuma Mesa division of the Gila project is shown on the map.

The pumping plant near San Luis, Sonora, which serves the Sanchez Mejorado Canal in Sonora is indicated on the map. This is the plant used to pump drain and waste water from the Yuma main drain.

USE OF COLORADO RIVER WATER IN MEXICO

Most of the water that has been used from the Colorado River in Mexico has been in Lower California on the delta which has been formed by the Colorado River over long period of time. Some lands have been irrigated in the State of Sonora both by pumping and by gravity. It has been variously estimated that the irrigable area that could be served by the Colorado River in Mexico is some 800,000 to 1,500,000 acres. The most substantial irrigation in Mexico has been carried on under the Alamo Canal, which was constructed at the beginning of the century under a concession heretofore discussed. The Alamo Canal irrigated both lands in the Mexicali Valley in Mexico and Imperial Valley in the United States.

The area irrigated in the Mexicali Valley in Mexico increased rapidly from a few thousand acres in 1908 to over 190,000 acres in 1920. The agricultural depression of the early 1920's caused some recession. The average then increased to a peak of 216,000 acres in 1925 prior to the depression of the 1930's. During that depression the irrigated area dropped in one year to less than 100,000 acres. At present the area averages about 200,000 acres.

From 8,000 to about 9,000 acres of land are irrigated in Sonora by pumped diversions from the Yuma drain near San Luis.

In addition to the land served from the Yuma water, approximately 25,000 acres on the left bank of the river are served by pumping from the river and about 23,000 acres by gravity. On the right bank of the river some 47,000 acres are irrigated by pumping. Approximately one-half of this acreage is above the railroad and about one-half is below the railroad.

It is estimated that the total diversions of the Colorado River water for use by Mexico has exceeded 1,000,000 acre-feet for each year since 1935, and that they have exceeded

1,300,000 acre-feet since 1936. The maximum diversion of 1,833,700 acre-feet was made in the year 1943. The maximum diversions of the Colorado River water for Mexican use, prior to the placing in operation of Boulder Dam, is estimated to have been made in 1925 and to have equaled 955,000 acre-feet, not including Mexico's proportionate share of water tailed to the Salton Sea. For two years prior to the placing in operation of Boulder Dam the estimated diversion exceeded 900,000 acre-feet and for six years it exceeded 800,000 acre-feet.

Much has been said concerning the opportunity of Mexico to use water prior to placing Boulder Dam in operation. It has been alleged that the land susceptible of irrigation was limited on account of flood hazard, and that the natural flow of the stream was such as not to provide a dependable supply of more than 750,000 acre-feet per annum for Mexico. It would have been feasible for Mexico to have protected additional lands by levees. Additional lands that were protected by the existing levees could also have been irrigated.

A study was made of the water supply of the river at Laguna Dam for the period 1902 to 1940, inclusive, to determine the shortages that would have accrued to Mexico under a demand of 1,500,000 acre-feet and under conditions of development that existed prior to the construction of Boulder Dam. The results of this study are shown in the following tables. The first table shows a summary of the shortages that would have been sustained by Mexico and also the shortages that would have been sustained by the Imperial Irrigation District, assuming the demand by that district to be 2,500,000 acre-feet. It may be noted that the shortages of the district would have been as severe as the assumed shortages of Mexico.

It must be understood that the indicated shortages reflect a non-parallelism between water supply and seasonal distribution of demand. The surplus water remaining after the requirements of the two areas were satisfied is shown in the third column of the table. It may be noted that in general these surpluses are large.

The second table shows the estimated monthly shortages and the third table shows the estimated water supply. By an inspection of the first and second tables it may be noted that less than 700,000 acre-feet of storage capacity would have been required to deliver 1,500,000 acre-feet to Mexico annually from the natural flow of the stream after all uses (immediately prior to the construction of Boulder Dam) in the United States above Laguna Dam had been satisfied. In other words, less than one-half of the capacity of Bullshead Reservoir would be required for this purpose.

TABLE NO. 1

Shortages to Imperial Valley and Mexico Based on Water Supply in Following Table With Imperial Irrigation District Demand Assumed at 2,500,000 Acre-Feet Per Annum and the Mexican District Demand At 1,500,000 Acre-Feet Per Annum (Values in 1,000 Acre-Feet)

Year	Annual Shortages Mexican Area	Imperial District	Remaining Surplus Water
1900	...	...	.....
1901	...	...	.....
1902	432	504	2,625
1903	62	99	5,662
1904	15	21	4,397
1905	18	28	10,452
1906	...	...	12,397
1907	...	...	19,339
1908	...	...	7,365
1909	...	...	19,786
1910	47	54	8,958
1911	...	...	12,405
1912	...	...	12,157
1913	1	1	7,040
1914	...	...	16,557
1915	31	47	8,287
1916	...	...	14,158
1917	...	...	15,062

TABLE NO. 1—Continued
(Values in 1,000 Acre-Feet)

Year	Annual Shortages		Remaining Surplus Water
	Mexican Area	Imperial District	
1918	...	...	8,634
1919	14	22	5,921
1920	...	...	16,476
1921	...	...	14,855
1922	...	...	12,396
1923	...	...	13,448
1924	152	168	7,184
1925	...	...	8,510
1926	29	44	8,040
1927	...	...	12,927
1928	13	20	9,456
1929	...	...	14,197
1930	...	...	7,467
1931	228	262	1,681
1932	...	...	10,780
1933	87	92	4,840
1934	673	884	4
1935	...	...	5,692
1936	...	...	7,405
1937	42	38	7,671
1938	...	...	10,531
1939	173	159	4,594
1940	194	179	3,600

TABLE NO. 3

Water Supply Colorado River at Laguna Dam Depleted to Represent 1935 Conditions
of Development in the United States
(All Values in 1,000 Acre-Feet)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1902	219	208	287	248	2,000	2,125	428	31	143	233	234	...
1903	180	175	361	694	1,844	2,721	1,931	413	306	476	306	...
1904	214	206	353	359	1,490	2,198	1,066	686	565	652	345	...
1905	301	869	2,073	1,357	2,069	4,076	1,497	505	296	451	428	...
1906	275	351	969	1,377	2,975	4,555	2,021	906	600	687	563	...
1907	1,168	970	1,205	1,968	2,096	5,189	5,550	2,060	1,198	745	614	...
1908	379	413	812	961	1,497	2,222	1,723	1,210	563	557	466	...
1909	533	585	816	1,581	3,098	5,831	4,516	2,222	2,722	830	547	...
1910	937	488	1,485	1,616	3,308	2,493	644	419	299	402	452	...
1911	473	691	971	1,119	2,600	3,504	2,782	956	463	1,701	691	...
1912	322	413	683	1,096	2,346	6,117	2,601	1,210	525	656	693	...
1913	231	334	496	1,464	2,255	2,605	1,122	475	506	647	494	...
1914	489	533	926	1,323	3,213	6,358	2,893	1,214	572	865	616	...
1915	433	812	657	1,383	2,490	2,695	1,765	587	264	455	377	...
1916	724	935	1,460	1,527	3,252	3,359	2,111	1,592	657	1,434	676	...
1917	403	381	504	1,087	2,715	5,191	5,636	1,283	526	478	431	427
1918	408	317	794	745	1,754	3,572	2,584	626	415	490	480	449
1919	231	390	549	1,178	2,192	1,968	1,140	572	306	324	424	647

TABLE NO. 3—Continued
(All Values in 1,000 Acre-Feet)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1920	668	1,756	954	1,096	2,787	7,581	2,584	1,062	496	420	622	450
1921	419	421	857	819	2,642	6,513	2,758	1,783	1,036	538	468	601
1922	471	543	870	1,113	3,427	5,755	1,902	735	514	277	360	429
1923	345	352	482	1,097	2,874	5,025	2,582	1,398	1,231	777	780	487
1924	468	468	540	1,331	2,561	3,161	1,099	288	211	282	386	389
1925	234	381	584	1,114	1,779	2,465	1,722	655	1,217	1,154	697	509
1926	392	311	490	1,191	2,743	3,528	1,406	524	269	413	319	454
1927	309	731	675	1,004	3,041	3,400	2,672	949	1,804	1,065	758	519
1928	480	499	618	867	3,297	3,831	1,591	580	309	475	528	381
1929	305	342	773	1,493	2,763	4,711	2,101	2,149	1,532	1,020	552	456
1930	322	334	572	1,242	1,877	2,746	1,141	1,502	500	480	426	325
1931	261	389	376	429	917	1,269	417	295	129	498	362	263
1932	317	954	792	1,485	2,702	3,676	2,401	714	686	334	376	343
1933	277	271	486	430	970	3,314	1,430	353	287	407	267	348
1934	325	295	312	298	913	543	40	29	104	87	125	226
1935	301	342	341	588	1,074	3,356	1,804	550	373	370	282	311
1936	257	299	432	804	3,132	2,829	1,136	847	583	311	435	340
1937	252	617	736	1,279	3,000	2,427	1,439	397	343	408	372	401
1938	323	332	867	994	3,059	4,092	2,084	534	806	514	496	430
1939	357	318	550	1,190	2,054	1,786	476	181	698	324	303	310
1940	296	318	424	503	1,737	1,560	440	176	418	734	464	478

APPENDIX C

THE TIJUANA RIVER

GENERAL

The drainage area of the Tijuana River system lies partly in the State of California in the United States and partly in the Territory of Baja California in Mexico. The drainage area is somewhat triangular in shape and varies in width from less than two miles, near the Pacific Ocean, to about sixty-five miles, measured along the easterly drainage divide which lies about sixty miles eastward from the coast.

The total drainage area of the Tijuana River system is about 1,679 square miles, of which 1,214 square miles, or seventy-two percent, lies in Mexico, and 465 square miles, or twenty-eight percent, lies in the United States. Of this drainage area, about 938 square miles lie above and are partially controlled by the Rodriguez Dam on the Rio Las Palmas in Mexico, and about 250 square miles lie above and are partially controlled by the dams on Cottonwood Creek, built by the city of San Diego.

The Tijuana River is formed by the confluence of the Rio Las Palmas and the Arroyo Matanuco immediately below the Rodriguez Dam in Mexico. From this point the river flows northwesterly about eleven miles to where it crosses the international boundary line near the City of Tijuana, Mexico, and thence six miles westerly to the Pacific Ocean. The mouth of the river lies about $1\frac{1}{2}$ miles north of the international boundary line. At a point about six miles below the Rodriguez Dam the river is joined by the tributary Cottonwood Creek, which drains approximately 539 square miles, of which 427 square miles lie in the United States and 112 square miles lie in Mexico.

The principal tributary of Cottonwood Creek is the Rio de Tecate in Mexico, which flows westerly close to the

international boundary from its headwaters on the divide to its confluence with Cottonwood Creek. The Marron Dam site is located on Cottonwood Creek just below this confluence.

The mean annual rainfall of the Tijuana Basin is approximately ten inches on the coastal plain and twenty to twenty-six inches on the high mountain areas. About seventy percent of the total annual precipitation occurs during the winter months. The mean annual discharge of the Tijuana River at the international boundary line is estimated to be 26,000 acre-feet with the existing developments.

Flood-producing storms usually occur during the winter season, although at times violent storms of cloudburst proportion have occurred during the summer. Floods resulting from notable storms occurred in 1916, 1921, and 1927. The flood of 1916 is estimated to have had a peak discharge of 75,000 cubic feet per second in the Lower Tijuana Valley.

EXISTING DEVELOPMENTS

The principal existing developments in the Tijuana River System in the United States consist of the Barrett and Morena Dams and reservoirs built by the city of San Diego on the Cottonwood Creek as features of their municipal water supply, and the agricultural development along the lower Tijuana below the town of San Ysidro, California. The Barrett and Morena reservoirs have capacities of 43,000 and 66,000 acre-feet, respectively.

The principal existing developments in Mexico consist of the Rodriguez Dam and reservoir (capacity 110,000 acre-feet) and the agricultural developments along the river from that dam to the city of Tijuana.

The Tijuana River Basin is sparsely settled except for the city of Tijuana, Baja California, which has a population of about 12,000, and the town of San Ysidro, California, with a population of approximately 1,400. About 500 people live along the lower Tijuana in the United States. The

mountainous drainage areas in both countries have many summer residents but few permanent inhabitants.

Outside of Tijuana, Baja California, and San Ysidro, California, most of the people within the drainage basin are engaged in agriculture, dairying and stock breeding. Approximately 1,200 acres in the United States and about 600 acres in Mexico are planted to truck and other irrigated crops. Water for the irrigation of the cultivated land in the United States is supplied by means of wells pumping from the underground water table. The occasional larger floods which inundate the valley lands replenish their underground supply. The underground water table is also drawn on by pumping for the domestic supply for a population of about 14,000 in the lower part of the San Diego metropolitan area. The Lower Tijuana Valley is served by north and south highways in both countries and by the San Diego and Arizona Eastern Railroad, which connects San Diego with El Centro and passes into Mexico near Tijuana.

PROBABLE FUTURE DEVELOPMENTS

The plans for future development in the Tijuana River Basin will probably include the construction of additional dams and reservoirs for the further control of floods and the regulation of the water supply. It is probable that a dam will be constructed on Cottonwood Creek at the Marron site which is located on the international boundary line near Monument No. 250. Such a dam would control the run-off from the Rio de Tecate in Mexico and from Cottonwood Creek in the United States, which combined have a drainage area above the dam site of about 241 square miles. The Marron Reservoir would have a capacity of about 200,000 acre-feet, which is estimated as sufficient to fully equate the flow. The average annual inflow to the reservoir is estimated as 16,000 acre-feet and the net yield is estimated as 12,000 acre-feet. It is also probable that dams will be constructed on the Rio Las Palmas or its tributaries above the existing Rodriguez Dam. These dams would provide additional flood control benefits and act as carry-over res-

ervoirs. Existing developments along the Tijuana River proper, or from the Rodriguez Dam to the Pacific Ocean, probably will be further protected from flood flows by the construction of levees on each side of the stream. These levees would be provided with structures so built as to permit the controlled overflow of certain areas during flood flows in the river for the purpose of replenishing the groundwater supply. Water stored in the Marron Reservoir would be at sufficient elevation to permit the construction of a conduit into the San Diego metropolitan area and thus could be used to supplement the domestic water supply of this area.

THE SIX STATES COMMITTEE

Arizona, Colorado, New Mexico, Texas,
Utah, and Wyoming

VOL. III

Appendix
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Texts of the Compacts, Contracts,
and the Treaty

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APPENDIX

THE COLORADO RIVER COMPACT

The States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, having resolved to enter into a compact under the act of the Congress of the United States of America approved August 19, 1921 (42 Stat. L., p. 171), and the acts of the legislatures of the said States, have through their governors appointed as their commissioners: W. S. Norviel for the State of Arizona, W. F. McClure for the State of California, Delph E. Carpenter for the State of Colorado, J. G. Scrugham for the State of Nevada, Stephen B. Davis, jr., for the State of New Mexico, R. E. Caldwell for the State of Utah, Frank C. Emerson for the State of Wyoming, who, after negotiations participated in by Herbert Hoover, appointed by the President as the representative of the United States of America, have agreed upon the following articles:

ARTICLE I. The major purposes of this compact are to provide for the equitable division and apportionment of the use of the waters of the Colorado River System; to establish the relative importance of different beneficial uses of water; to promote interstate comity; to remove causes of present and future controversies and to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods. To these ends the Colorado River Basin is divided into two basins and an apportionment of the use of part of the water of the Colorado River system is made to each of them with the provision that further equitable apportionments may be made.

ART. II. As used in this compact—

(a) The term "Colorado River system" means that portion of the Colorado River and its tributaries within the United States of America.

(b) The term "Colorado River Basin" means all of

the drainage area of the Colorado River system and all other territory within the United States of America to which the waters of the Colorado River system shall be beneficially applied.

(c) The term "States of the upper division" means the States of Colorado, New Mexico, Utah, and Wyoming.

(d) The term "States of the lower division" means the States of Arizona, California, and Nevada.

(e) The term "Lee Ferry" means a point in the main stream of the Colorado River 1 mile below the mouth of the Paria River.

(f) The term "Upper Basin" means those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River system above Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the system above Lee Ferry.

(g) The term "Lower Basin" means those parts of the States of Arizona, California, Nevada, New Mexico, and Utah within and from which waters naturally drain into the Colorado River system below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River system which are now or shall hereafter be beneficially served by waters diverted from the system below Lee Ferry.

(h) The term "domestic use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power.

ART. III. (a) There is hereby apportioned from the Colorado River system in perpetuity to the upper basin and to the lower basin, respectively, the exclusive beneficial consumptive use of 7,500,000 acre-feet of water per annum, which shall include all water necessary for the supply of any rights which may now exist.

(b) In addition to the apportionment in paragraph (a), the lower basin is hereby given the right to increase

its beneficial consumptive use of such waters by 1,000,000 acre-feet per annum.

(c) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States of Mexico any right to the use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (a) and (b); and if such surplus shall prove insufficient for this purpose, then, the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the States of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (d).

(d) The States of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of 10 consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.

(e) The States of the upper division shall not withhold water, and the States of the lower division shall not require the delivery of water, which can not reasonably be applied to domestic and agricultural uses.

(f) Further equitable apportionment of the beneficial uses of the waters of the Colorado River system unapportioned by paragraphs (a), (b), and (c) may be made in the manner provided in paragraph (g) at any time after October 1, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (a) and (b).

(g) In the event of a desire for a further apportionment as provided in paragraph (f) any two signatory States, acting through their governors, may give joint notice of such desire to the governors of the other signatory States and to the President of the United States of America, and it shall be the duty of the governors of the signatory States and of the President of the United States of America forthwith to appoint representatives, whose duty

it shall be to divide and apportion equitably between the upper basin and lower basin the beneficial use of the unapportioned water of the Colorado River system as mentioned in paragraph (f), subject to the legislative ratification of the signatory States and the Congress of the United States of America.

ART. IV. (a) Inasmuch as the Colorado River has ceased to be navigable for commerce and the reservation of its waters for navigation would seriously limit the development of its basin, the use of its waters for purposes of navigation shall be subservient to the uses of such waters for domestic, agricultural, and power purposes. If the Congress shall not consent to this paragraph, the other provisions of this compact shall nevertheless remain binding.

(b) Subject to the provisions of this compact, water of the Colorado River system may be impounded and used for the generation of electrical power, but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes.

(c) The provisions of this article shall not apply to or interfere with the regulation and control by any State within its boundaries of the appropriation, use, and distribution of water.

ART. V. The chief official of each signatory State charged with the administration of water rights, together with the Director of the United States Reclamation Service and the Director of the United States Geological Survey, shall cooperate, ex officio—

(a) To promote the systematic determination and coordination of the facts as to flow, appropriation, consumption, and use of water in the Colorado River Basin, and the interchange of available information in such matters.

(b) To secure the ascertainment and publication of the annual flow of the Colorado River at Lee Ferry.

(c) To perform such other duties as may be assigned by mutual consent of the signatories from time to time.

ART. VI. Should any claim or controversy arise between any two or more of the signatory States: (a) With respect to the waters of the Colorado River system not covered by the terms of this compact; (b) over the meaning or performance of any of the terms of this compact; (c) as to the allocation of the burdens incident to the performance of any article of this compact or the delivery of waters as herein provided; (d) as to the construction or operation of works within the Colorado River Basin to be situated in two or more States, or to be constructed in one State for the benefit of another State; or (e) as to the diversion of water in one State for the benefit of another State, the governors of the States affected upon the request of one of them, shall forthwith appoint commissioners with power to consider and adjust such claim or controversy, subject to ratification by the legislatures of the States so affected.

Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or by direct future legislative action of the interested States.

ART. VII. Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian tribes.

ART. VIII. Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this contract. Whenever storage capacity of 5,000,000 acre-feet shall have been provided on the main Colorado River within or for the benefit of the lower basin, then claim of such rights, if any, by appropriators or users of water in the lower basin against appropriators or users of water in the upper basin shall attach to and be satisfied from water that may be stored not in conflict with Article III.

All other rights to beneficial use of waters of the Colorado River system shall be satisfied solely from the water apportioned to that basin in which they are situate.

ART. IX. Nothing in this compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of the provisions.

ART. X. This compact may be terminated at any time by the unanimous agreement of the signatory States. In the event of such termination, all rights established under it shall continue unimpaired.

ART. XI. This compact shall become binding and obligatory when it shall have been approved by the legislatures of each of the signatory States and by the Congress of the United States. Notice of approval by the legislatures shall be given by the governor of each signatory State to the governors of the other signatory States and to the President of the United States, and the President of the United States is requested to give notice to the governors of the signatory States of approval by the Congress of the United States.

In witness whereof the commissioners have signed this compact in a single original, which shall be deposited in the archives of the Department of State of the United States of America and of which a duly certified copy shall be forwarded to the governor of each of the signatory States.

Done at the city of Santa Fe, N. Mex., this 24th day of November, A. D. 1922.

THE BOULDER CANYON PROJECT ACT

[PUBLIC—No. 642—70TH CONGRESS]

[H. R. 5773]

An act to provide for the construction of works for the protection and development of the Colorado River Basin, for the approval of the Colorado River compact, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy as a means of making the project herein authorized a self-supporting and financially solvent undertaking, the Secretary of the Interior, subject to the terms of the Colorado River compact hereinafter mentioned, is hereby authorized to construct, operate, and maintain a dam and incidental works in the main stream of the Colorado River at Black Canyon or Boulder Canyon adequate to create a storage reservoir of a capacity of not less than twenty million acre-feet of water and a main canal and appurtenant structures located entirely within the United States connecting the Laguna Dam, or other suitable diversion dam, which the Secretary of the Interior is hereby authorized to construct if deemed necessary or advisable by him upon engineering or economic considerations, with the Imperial and Coachella Valleys in California, the expenditures for said main canal and appurtenant structures to be reimbursable, as provided in the reclamation law, and shall not be paid out of revenues derived from the sale or disposal of water power or electric energy at the dam authorized to be constructed at said Black Canyon or Boulder Canyon, or for water for potable purposes outside of the Imperial and Coachella Valleys: *Provided, however,* That no charge shall be made for water

or for the use, storage, or delivery of water for irrigation or water for potable purposes in the Imperial or Coachella Valleys; also to construct and equip, operate, and maintain at or near said dam, or cause to be constructed, a complete plant and incidental structures suitable for the fullest economic development of electrical energy from the water discharged from said reservoir; and to acquire by proceedings in eminent domain, or otherwise, all lands, rights of way, and other property necessary for said purposes.

SEC. 2. (a) There is hereby established a special fund, to be known as the "Colorado River Dam fund" (hereinafter referred to as the "fund"), and to be available, as hereafter provided, only for carrying out the provisions of this act. All revenues received in carrying out the provisions of this act shall be paid into and expenditures shall be made out of the fund, under the direction of the Secretary of the Interior.

(b) The Secretary of the Treasury is authorized to advance to the fund, from time to time and within the appropriations therefor, such amounts as the Secretary of the Interior deems necessary for carrying out the provisions of this act, except that the aggregate amount of such advances shall not exceed the sum of \$165,000,000. Of this amount the sum of \$25,000,000 shall be allocated to flood control and shall be paid to the United States out of 62½ per centum of revenues, if any, in excess of the amount necessary to meet periodical payments during the period of amortization, as provided in section 4 of this act. If said sum of \$25,000,000 is not repaid in full during the period of amortization, then 62½ per centum of all net revenues shall be applied to payment of the remainder. Interest at the rate of 4 per centum per annum accruing during the year upon the amounts so advanced and remaining unpaid shall be paid annually out of the fund, except as herein otherwise provided.

(c) Moneys in the fund advanced under subdivision (b) shall be available only for expenditures for construction and the payment of interest, during construction, upon

the amounts so advanced. No expenditures out of the fund shall be made for operation and maintenance except from appropriations therefor.

(*d*) The Secretary of the Treasury shall charge the fund as of June 30 in each year with such amount as may be necessary for the payment of interest on advances made under subdivision (*b*) at the rate of 4 per centum per annum accrued during the year upon the amounts so advanced and remaining unpaid, except that if the fund is insufficient to meet the payment of interest the Secretary of the Treasury may, in his discretion, defer any part of such payment, and the amount so deferred shall bear interest at the rate of 4 per centum per annum until paid.

(*e*) The Secretary of the Interior shall certify to the Secretary of the Treasury, at the close of each fiscal year, the amount of money in the fund in excess of the amount necessary for construction, operation, and maintenance, and payment of interest. Upon receipt of each such certificate the Secretary of the Treasury is authorized and directed to charge the fund with the amount so certified as repayment of the advances made under subdivision (*b*), which amount shall be covered into the Treasury to the credit of miscellaneous receipts.

SEC. 3. There is hereby authorized to be appropriated from time to time, out of any money in the Treasury not otherwise appropriated, such sums of money as may be necessary to carry out the purposes of this act, not exceeding in the aggregate \$165,000,000.

SEC. 4. (*a*) This act shall not take effect and no authority shall be exercised hereunder and no work shall be begun and no moneys expended on or in connection with the works or structures provided for in this act, and no water rights shall be claimed or initiated hereunder, and no steps shall be taken by the United States or by others to initiate or perfect any claims to the use of water pertinent to such works or structures unless and until (1) the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming shall have ratified the Colorado River

compact, mentioned in section 13 hereof, and the President by public proclamation shall have so declared, or (2) if said States fail to ratify the said compact within six months from the date of the passage of this act then, until six of said States, including the State of California, shall ratify said compact and shall consent to waive the provisions of the first paragraph of Article XI of said compact, which makes the same binding and obligatory only when approved by each of the seven States signatory thereto, and shall have approved said compact without conditions, save that of such six-State approval, and the President by public proclamation shall have so declared, and, further, until the State of California, by act of its legislature, shall agree irrevocably and unconditionally with the United States and for the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming, as an express covenant and in consideration of the passage of this act, that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California, including all uses under contracts made under the provisions of this act and all water necessary for the supply of any rights which may now exist, shall not exceed 4,200,000 acre-feet of the waters apportioned to the lower basin States by paragraph (a) of Article III of the Colorado River compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

The States of Arizona, California, and Nevada are authorized to enter into an agreement which shall provide (1) that of the 7,500,000 acre-feet annually apportioned to the lower basin by paragraph (a) of Article III of the Colorado River compact, there shall be apportioned to the State of Nevada 300,000 acre-feet and to the State of Arizona 2,800,000 acre-feet for exclusive beneficial consumptive use in perpetuity, and (2) that the State of Arizona may annually use one-half of the excess or surplus waters unapportioned by the Colorado River compact, and (3) that the State of Arizona shall have the exclusive beneficial con-

sumptive use of the Gila River and its tributaries within the boundaries of said State, and (4) that the waters of the Gila River and its tributaries, except return flow after the same enters the Colorado River, shall never be subject to any diminution whatever by any allowance of water which may be made by treaty or otherwise to the United States of Mexico but if, as provided in paragraph (c) of Article III of the Colorado River compact, it shall become necessary to supply water to the United States of Mexico from waters over and above the quantities which are surplus as defined by said compact, then the State of California shall and will mutually agree with the State of Arizona to supply, out of the main stream of the Colorado River, one-half of any deficiency which must be supplied to Mexico by the lower basin, and (5) that the State of California shall and will further mutually agree with the State of Arizona and Nevada that none of said three States shall withhold water and none shall require the delivery of water, which can not reasonably be applied to domestic and agricultural uses, and (6) that all of the provisions of said tri-State agreement shall be subject in all particulars to the provisions of the Colorado River compact, and (7) said agreement to take effect upon the ratification of the Colorado River compact by Arizona, California, and Nevada.

(b) Before any money is appropriated for the construction of said dam or power plant, or any construction work done or contracted for, the Secretary of the Interior shall make provision for revenues by contract, in accordance with the provisions of this act, adequate in his judgment to insure payment of all expenses of operation and maintenance of said works incurred by the United States and the repayment, within fifty years from the date of the completion of said works, of all amounts advanced to the fund under subdivision (b) of section 2 for such works, together with interest thereon made reimbursable under this act.

Before any money is appropriated for the construction of said main canal and appurtenant structures to connect the Laguna Dam with the Imperial and Coachella Valleys

in California, or any construction work is done upon said canal or contracted for, the Secretary of the Interior shall make provision for revenues, by contract or otherwise, adequate in his judgment to insure payment of all expenses of construction, operation, and maintenance of said main canal and appurtenant structures in the manner provided in the reclamation law.

If during the period of amortization the Secretary of the Interior shall receive revenues in excess of the amount necessary to meet the periodical payments to the United States as provided in the contract, or contracts, executed under this act, then, immediately after the settlement of such periodical payments, he shall pay to the State of Arizona $18\frac{3}{4}$ per centum of such excess revenues and to the State of Nevada $18\frac{3}{4}$ per centum of such excess revenues.

SEC. 5. That the Secretary of the Interior is hereby authorized, under such general regulations as he may prescribe, to contract for the storage of water in said reservoir and for the delivery thereof to such points on the river and on said canal as may be agreed upon, for irrigation and domestic uses, and generation of electrical energy and delivery at the switchboard to States, municipal corporations, political subdivisions, and private corporations of electrical energy generated at said dam, upon charges that will provide revenue which, in addition to other revenue accruing under the reclamation law and under this act, will in his judgment cover all expenses of operation and maintenance incurred by the United States on account of works constructed under this act and the payments to the United States under subdivision (b) of section 4. Contracts respecting water for irrigation and domestic uses shall be for permanent service and shall conform to paragraph (a) of section 4 of this act. No person shall have or be entitled to have the use for any purpose of the water stored as aforesaid except by contract made as herein stated.

After the repayments to the United States of all money advanced with interest, charges shall be on such basis and the revenues derived therefrom shall be kept in a separate

fund to be expended within the Colorado River Basin as may hereafter be prescribed by the Congress.

General and uniform regulations shall be prescribed by the said Secretary for the awarding of contracts for the sale and delivery of electrical energy, and for renewals under subdivision (b) of this section, and in making such contracts the following shall govern:

(a) No contract for electrical energy or for generation of electrical energy shall be of longer duration than fifty years from the date at which such energy is ready for delivery.

Contracts made pursuant to subdivision (a) of this section shall be made with a view to obtaining reasonable returns and shall contain provisions whereby at the end of fifteen years from the date of their execution and every ten years thereafter, there shall be readjustment of the contract, upon the demand of either party thereto, either upward or downward as to price, as the Secretary of the Interior may find to be justified by competitive conditions at distributing points or competitive centers, and with provisions under which disputes or disagreements as to interpretation or performance of such contract shall be determined either by arbitration or court proceedings, the Secretary of the Interior being authorized to act for the United States in such readjustments or proceedings.

(b) The holder of any contract for electrical energy not in default thereunder shall be entitled to a renewal thereof upon such terms and conditions as may be authorized or required under the then existing laws and regulations, unless the property of such holder dependent for its usefulness on a continuation of the contract be purchased or acquired and such holder be compensated for damages to its property, used and useful in the transmission and distribution of such electrical energy and not taken, resulting from the termination of the supply.

(c) Contracts for the use of water and necessary privileges for the generation and distribution of hydroelectric energy or for the sale and delivery of electrical energy shall be made with responsible applicants therefor who will pay

the price fixed by the said Secretary with a view to meeting the revenue requirements herein provided for. In case of conflicting applications, if any, such conflicts shall be resolved by the said 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 for permits and licenses, except that preference to applicants for the use of water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy, or for delivery at the switchboard of a hydroelectric plant, shall be given, first, to a State for the generation or purchase of electric energy for use in the State, and the States of Arizona, California, and Nevada shall be given equal opportunity as such applicants.

The rights covered by such preference shall be contracted for by such State within six months after notice by the Secretary of the Interior and to be paid for on the same terms and conditions as may be provided in other similar contracts made by said Secretary: *Provided, however,* That no application of a State or a political subdivision for an allocation of water for power purposes or of electrical energy shall be denied or another application in conflict therewith be granted on the ground that the bond issue of such State or political subdivision, necessary to enable the applicant to utilize such water and appurtenant works and privileges necessary for the generation and distribution of hydroelectric energy or the electrical energy applied for, has not been authorized or marketed, until after a reasonable time, to be determined by the said Secretary, has been given to such applicant to have such bond issue authorized and marketed.

(d) Any agency receiving a contract for electrical energy equivalent to one hundred thousand firm horsepower, or more, may, when deemed feasible by the said Secretary, from engineering and economic considerations and under general regulations prescribed by him, be required to permit any other agency having contracts hereunder for less than the equivalent of twenty-five thousand

firm horsepower, upon application to the Secretary of the Interior made within sixty days from the execution of the contract of the agency the use of whose transmission line is applied for, to participate in the benefits and use of any main transmission line constructed or to be constructed by the former for carrying such energy (not exceeding, however, one-fourth the capacity of such line), upon payment by such other agencies of a reasonable share of the cost of construction, operation, and maintenance thereof.

The use is hereby authorized of such public and reserved lands of the United States as may be necessary or convenient for the construction, operation, and maintenance of main transmission lines to transmit said electrical energy.

SEC. 6. That the dam and reservoir provided for by section 1 hereof shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of present perfected rights in pursuance of Article VIII of said Colorado River compact; and third, for power. The title to said dam, reservoir plant, and incidental works shall forever remain in the United States, and the United States shall, until otherwise provided by Congress, control, manage, and operate the same, except as herein otherwise provided: *Provided, however,* That the Secretary of the Interior may, in his discretion, enter into contracts of lease of a unit or units of any Government-built plant, with right to generate electrical energy, or, alternately, to enter into contracts of lease for the use of water for the generation of electrical energy as herein provided, in either of which events the provisions of section 5 of this act relating to revenue, term, renewals, determination of conflicting applications, and joint use of transmission lines under contracts for the sale of electrical energy, shall apply.

The Secretary of the Interior shall prescribe and enforce rules and regulations, conforming with the requirements of the Federal water power act, so far as applicable, respecting maintenance of works in condition of repair

adequate for their efficient operation, maintenance of a system of accounting, control of rates and service in the absence of State regulation or interstate agreement, valuation for rate-making purposes, transfers of contracts, contracts extending beyond the lease period, expropriation of excessive profits, recapture and/or emergency use by the United States of property of lessees, and penalties for enforcing regulations made under this act or penalizing failure to comply with such regulations or with the provisions of this act. He shall also conform with other provisions of the Federal water power act and of the rules and regulations of the Federal Power Commission, which have been devised or which may be hereafter devised, for the protection of the investor and consumer.

The Federal Power Commission is hereby directed not to issue or approve any permits or licenses under said Federal water power act upon or affecting the Colorado River or any of its tributaries, except the Gila River, in the States of Colorado, Wyoming, Utah, New Mexico, Nevada, Arizona, and California until this act shall become effective as provided in section 4 herein.

SEC. 7. That the Secretary of the Interior may, in his discretion, when repayments to the United States of all money advanced, with interest, reimbursable hereunder, shall have been made, transfer the title to said canal and appurtenant structures, except the Laguna Dam and the main canal and appurtenant structures down to and including Siphon Drop, to the districts or other agencies of the United States having a beneficial interest therein in proportion to their respective capital investments under such form of organization as may be acceptable to him. The said districts or other agencies shall have the privilege at any time of utilizing by contract or otherwise such power possibilities as may exist upon said canal, in proportion to their respective contributions or obligations toward the capital cost of said canal and appurtenant structures from and including the diversion works to the point where each respective power plant may be located. The net proceeds from any power development on said canal shall be paid

into the fund and credited to said districts or other agencies on their said contracts, in proportion to their rights to develop power, until the districts or other agencies using said canal shall have paid thereby and under any contract or otherwise an amount of money equivalent to the operation and maintenance expense and cost of construction thereof.

SEC. 8. (a) The United States, its permittees, licensees, and contractees, and all users and appropriators of water stored, diverted, carried, and/or distributed by the reservoir, canals, and other works herein authorized, shall observe and be subject to and controlled by said Colorado River compact in the construction, management, and operation of said reservoir, canals, and other works and the storage, diversion, delivery, and use of water for the generation of power, irrigation, and other purposes, anything in this act to the contrary notwithstanding, and all permits, licenses, and contracts shall so provide.

(b) Also the United States, in constructing, managing, and operating the dam, reservoir, canals, and other works herein authorized, including the appropriation, delivery, and use of water for the generation of power, irrigation, or other uses, and all users of water thus delivered and all users and appropriators of water stored by said reservoir and/or carried by said canal, including all permittees and licensees of the United States or any of its agencies, shall observe and be subject to and controlled, anything to the contrary herein notwithstanding, by the terms of such compact, if any, between the States of Arizona, California, and Nevada, or any two thereof, for the equitable division of the benefits, including power, arising from the use of water accruing to said States, subsidiary to and consistent with said Colorado River compact, which may be negotiated and approved by said States and to which Congress shall give its consent and approval on or before January 1, 1929; and the terms of any such compact concluded between said States and approved and consented to by Congress after said date: *Provided*, That in the latter case such compact shall be subject to all contracts, if any, made by the Secre-

tary of the Interior under section 5 hereof prior to the date of such approval and consent by Congress.

SEC. 9. That all lands of the United States found by the Secretary of the Interior to be practicable of irrigation and reclamation by the irrigation works authorized herein shall be withdrawn from public entry. Thereafter, at the direction of the Secretary of the Interior such lands shall be opened for entry, in tracts varying in size but not exceeding one hundred and sixty acres, as may be determined by the Secretary of the Interior, in accordance with the provisions of the reclamation law, and any such entryman shall pay an equitable share in accordance with the benefits received, as determined by the said Secretary, of the construction costs of said canal and appurtenant structures; said payments to be made in such installments and at such times as may be specified by the Secretary of the Interior, in accordance with the provisions of the said reclamation law, and shall constitute revenue from said project and be covered into the fund herein provided for: *Provided*, That all persons who have served in the United States Army, Navy, or Marine Corps during the war with Germany, the war with Spain, or in the suppression of the insurrection in the Philippines, and who have been honorably separated or discharged therefrom or placed in the Regular Army or Navy Reserve, shall have the exclusive preference right for a period of three months to enter said lands, subject, however, to the provisions of subsection (c) of section 4, act of December 5, 1924 (Forty-third Statutes at Large, p. 702); and also, so far as practicable, preference shall be given to said persons in all construction work authorized by this act: *Provided further*, That in the event such an entry shall be relinquished at any time prior to actual residence upon the land by the entryman for not less than one year, lands so relinquished shall not be subject to entry for a period of sixty days after the filing and notation of the relinquishment in the local land office, and after the expiration of said sixty-day period such lands shall be open to entry, subject to the preference in this section provided.

SEC. 10. That nothing in this act shall be construed as modifying in any manner the existing contract, dated October 23, 1918, between the United States and the Imperial irrigation district, providing for a connection with Laguna Dam; but the Secretary of the Interior is authorized to enter into contract or contracts with the said district or other districts, persons, or agencies for the construction, in accordance with this act, of said canal and appurtenant structures, and also for the operation and maintenance thereof, with the consent of the other users.

SEC. 11. That the Secretary of the Interior is hereby authorized to make such studies, surveys, investigations, and do such engineering as may be necessary to determine the lands in the State of Arizona that should be embraced within the boundaries of a reclamation project, heretofore commonly known and hereafter to be known as the Parker-Gila Valley reclamation project, and to recommend the most practicable and feasible method of irrigating lands within said project, or units thereof, and the cost of the same; and the appropriation of such sums of money as may be necessary for the aforesaid purposes from time to time is hereby authorized. The Secretary shall report to Congress as soon as practicable, and not later than December 10, 1931, his findings, conclusions, and recommendations regarding such project.

SEC. 12. "Political subdivision" or "political subdivisions" as used in this act shall be understood to include any State, irrigation or other district, municipality, or other governmental organization.

"Reclamation law" as used in this act shall be understood to mean that certain act of the Congress of the United States approved June 17, 1902, entitled "An act appropriating the receipts from the sale and disposal of public land in certain States and territories to the construction of irrigation works for the reclamation of arid lands," and the acts amendatory thereof and supplemental thereto.

"Maintenance" as used herein shall be deemed to in-

clude in each instance provision for keeping the works in good operating condition.

“The Federal Water Power Act,” as used in this act, shall be understood to mean that certain act of Congress of the United States approved June 10, 1920, entitled “An act to create a Federal Power Commission; to provide for the improvement of navigation; the development of water power; the use of the public lands in relation thereto; and to repeal section 18 of the river and harbor appropriation act, approved August 8, 1917, and for other purposes,” and the acts amendatory thereof and supplemental thereto.

“Domestic” whenever employed in this act shall include water uses defined as “domestic” in said Colorado River compact.

SEC. 13. (a) The Colorado River compact signed at Santa Fe, New Mexico, November 24, 1922, pursuant to act of Congress approved August 19, 1921, entitled “An act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes,” is hereby approved by the Congress of the United States, and the provisions of the first paragraph of Article II of the said Colorado River compact, making said compact binding and obligatory when it shall have been approved by the legislature of each of the signatory States, are hereby waived, and this approval shall become effective when the State of California and at least five of the other States mentioned, shall have approved or may hereafter approve said compact as aforesaid and shall consent to such waiver, as herein provided.

(b) The rights of the United States in or to waters of the Colorado River and its tributaries howsoever claimed or acquired, as well as the rights of those claiming under the United States, shall be subject to and controlled by said Colorado River compact.

(c) Also all patents, grants, contracts, concessions, leases, permits, licenses, rights of way, or other privileges from the United States or under its authority, necessary

or convenient for the use of waters of the Colorado River or its tributaries, or for the generation or transmission of electrical energy generated by means of the waters of said river or its tributaries, whether under this act, the Federal water power act, or otherwise, shall be upon the express condition and with the express covenant that the rights of the recipients or holders thereof to waters of the river or its tributaries, for the use of which the same are necessary, convenient, or incidental, and the use of the same shall likewise be subject to and controlled by said Colorado River compact.

(d) The conditions and covenants referred to herein shall be deemed to run with the land and the right, interest, or privilege therein and water right, and shall attach as a matter of law, whether set out or referred to in the instrument evidencing any such patent, grant, contract, concession, lease, permit, license, right of way, or other privilege from the United States or under its authority, or not, and shall be deemed to be for the benefit of and be available to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, and the users of water therein or thereunder, by way of suit, defense, or otherwise, in any litigation respecting the waters of the Colorado River or its tributaries.

SEC. 14. This act shall be deemed a supplement to the reclamation law, which said reclamation law shall govern the construction, operation, and management of the works herein authorized, except as otherwise herein provided.

SEC. 15. The Secretary of the Interior is authorized and directed to make investigation and public reports of the feasibility of projects for irrigation, generation of electric power, and other purposes in the States of Arizona, Nevada, Colorado, New Mexico, Utah, and Wyoming for the purpose of making such information available to said States and to the Congress, and of formulating a comprehensive scheme of control and the improvement and utilization of the water of the Colorado River and its tributaries. The sum of \$250,000 is hereby authorized to be appro-

priated from said Colorado River Dam fund, created by section 2 of this act, for such purposes.

SEC. 16. In furtherance of any comprehensive plan formulated hereafter for the control, improvement, and utilization of the resources of the Colorado River system and to the end that the project authorized by this act may constitute and be administered as a unit in such control, improvement, and utilization, any commission or commissioner duly authorized under the laws of any ratifying State in that behalf shall have the right to act in an advisory capacity to and in cooperation with the Secretary of the Interior in the exercise of any authority under the provisions of sections 4, 5, and 14 of this act, and shall have at all times access to records of all Federal agencies empowered to act under said sections, and shall be entitled to have copies of said records on request.

SEC. 17. Claims of the United States arising out of any contract authorized by this act shall have priority over all others, secured or unsecured.

SEC. 18. Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within their borders, except as modified by the Colorado River compact or other interstate agreement.

SEC. 19. That the consent of Congress is hereby given to the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming to negotiate and enter into compacts or agreements, supplemental to and in conformity with the Colorado River compact and consistent with this act for a comprehensive plan for the development of the Colorado River and providing for the storage, diversion, and use of the waters of said river. Any such compact or agreement may provide for the construction of dams, headworks, and other diversion works or structures for flood control, reclamation, improvement of navigation, diversion

of water, or other purposes and/or the construction of power houses or other structures for the purpose of the development of water power and the financing of the same; and for such purposes may authorize the creation of interstate commissions and/or the creation of corporations, authorities, or other instrumentalities.

(a) Such consent is given upon condition that a representative of the United States, to be appointed by the President, shall participate in the negotiations and shall make report to Congress of the proceedings and of any compact or agreement entered into.

(b) No such compact or agreement shall be binding or obligatory upon any of such States unless and until it has been approved by the legislatures of each of such States and by the Congress of the United States.

SEC. 20. Nothing in this act shall be construed as a denial or recognition of any rights, if any, in Mexico to the use of the waters of the Colorado River system.

SEC. 21. That the short title of this act shall be "Boulder Canyon project act."

Approved, December 21, 1928.

THE BOULDER CANYON PROJECT ADJUSTMENT ACT

Contract for Construction of Diversion Dam, Main Canal and Appurtenant Structures and for Delivery of Water.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized and directed to, and he shall, promulgate charges, or the basis of computation thereof, for electrical energy generated at Boulder Dam during the period beginning June 1, 1937, and ending May 31, 1987, computed to be sufficient, together with other net revenues from the project, to accomplish the following purposes:

(a) To meet the cost of operation and maintenance, and to provide for replacements, of the project during the period beginning June 1, 1937, and ending May 31, 1987;

(b) To repay to the Treasury, with interest, the advances to the Colorado River Dam Fund for the project made prior to June 1, 1937, within fifty years from that date (excluding advances allocated to flood control by section 2 (b) of the Project Act, which shall be repayable as provided in section 7 hereof), and such portion of such advances made on and after June 1, 1937 as (on the basis of repayment thereof within such fifty-year period or periods as the Secretary may determine, will be repayable prior to June 1, 1987;

(c) To provide \$600,000 for each of the years and for the purposes specified in section 2 (c) hereof; and

(d) To provide \$500,000 for each of the years and for the purposes specified in section 2 (d) hereof.

Such charges may be made subject to revisions and adjustments at such times, to such extent, and in such manner, as by the terms of their promulgation the Secretary shall prescribe.

SEC. 2. All receipts from the project shall be paid into the Colorado River Dam Fund and shall be available for:

(a) Annual appropriation for the operation, mainte-

nance, and replacements of the project, including emergency replacements necessary to insure continuous operations;

(b) Repayment to the Treasury, with interest (after making provision for the payments and transfers provided in subdivisions (c) and (d) hereof), of advances to the Colorado River Dam Fund for the construction of the project (excluding the amount allocated to flood control by section 2 (b) of the Project Act), and any readvances made to said fund under section 5 hereof; and

(c) Payment subject to the provisions of section 3 hereof, in commutation of the payments now provided for the States of Arizona and Nevada in section 4 (b) of the Project Act, to each of said States of the sum of \$300,000 for each year of operation, beginning with the year of operation ending May 31, 1938, and continuing annually thereafter until and including the year of operation ending May 31, 1987, and such payments for any year of operation which shall have expired at the time when this subdivision (c) shall become effective shall be due immediately, and be paid, without interest, as expeditiously as administration of this Act will permit, and each such payment for subsequent years of operation shall be made on or before July 31, following the close of the year of operation for which it is made. All such payments shall be made from revenues hereafter received in the Colorado River Dam Fund.

Notwithstanding the foregoing provisions of this subsection, in the event that there are levied and collected by or under authority of Arizona or Nevada or by any lawful taxing political subdivision thereof, taxes upon—

- (i) the project as herein defined;
- (ii) the electrical energy generated at Boulder Dam by means of facilities, machinery, or equipment both owned and operated by the United States, or owned by the United States and operated under contract with the United States;
- (iii) the privilege of generating or transforming such electrical energy or of use of such facilities, ma-

chinery, or equipment or of falling water for such generation or transforming; or

(iv) the transmission or control of such electrical energy so generated or transformed (as distinguished from the transmission lines and other physical properties used for such transmission or control) or the use of such transmission lines or other physical properties for such transmission or control,

payments made hereunder to the State by or under the authority of which such taxes are collected shall be reduced by an amount equivalent to such taxes. Nothing herein shall in anywise impair the right of either the State of Arizona or the State of Nevada, or any lawful taxing political subdivision of either of them, to collect nondiscriminatory taxes upon that portion of the transmission lines and all other physical properties, situated within such State and such political subdivision, respectively, and belonging to any of the lessees and/or allottees under the Project Act and/or under this Act, and nothing herein shall exempt or be construed so as to exempt any such property from nondiscriminatory taxation, all in the manner provided by the constitution and laws of such State. Sums, if any, received by each State under the provisions of the Project Act shall be deducted from the first payment or payments to said State authorized by this Act. Payments under this section 2 (c) shall be deemed contractual obligations of the United States, subject to the provisions of section 3 of this Act.

(d) Transfer, subject to the provisions of section 3 hereof, from the Colorado River Dam Fund to a special fund in the Treasury, hereby established and designated the "Colorado River Development Fund," of the sum of \$500,000 for the year of operation ending May 31, 1938, and the like sum of \$500,000 for each year of operation thereafter, until and including the year of operation ending May 31, 1987. The transfer of the said sum of \$500,000 for each year of operation shall be made on or before July 31 next following the close of the year of operation for which it is made: *Provided*, That any such transfer for any year

of operation which shall have ended at the time this section 2 (d) shall become effective, shall be made, without interest, from revenues received in the Colorado River Dam Fund, as expeditiously as administration of this Act will permit, and without readvances from the general funds of the Treasury. Receipts of the Colorado River Development Fund for the years of operation ending in 1938, 1939, and 1940 (or in the event of reduced receipts during any of said years, due to adjustments under section 3 hereof, then the first receipts of said fund up to \$1,500,000), are authorized to be appropriated only for the continuation and extension, under the direction of the Secretary, of studies and investigations by the Bureau of Reclamation for the formulation of a comprehensive plan for the utilization of waters of the Colorado River system for irrigation, electrical power, and other purposes, in the States of the upper division and the States of the lower division, including studies of quantity and quality of water and all other relevant factors. The next such receipts up to and including the receipts for the year of operation ending in 1955 are authorized to be appropriated only for the investigation and construction of projects for such utilization in and equitably distributed among the four States of the upper division. Such receipts for the years of operation ending in 1956 to 1987, inclusive, are authorized to be appropriated for the investigation and construction of projects for such utilization in and equitably distributed among the States of the upper division and the States of the lower division. The terms "Colorado River system," "States of the upper division," and "States of the lower division" as so used shall have the respective meanings defined in the Colorado River compact mentioned in the Project Act. Such projects shall be only such as are found by the Secretary to be physically feasible, economically justified, and consistent with such formulation of a comprehensive plan. Nothing in this Act shall be construed so as to prevent the authorization and construction of any such projects prior to the completion of said plan of comprehensive development; nor shall this Act be construed as affecting the right of any State

to proceed independently of this Act or its provisions with the investigation or construction of any project or projects. Transfers under this section 2 (d) shall be deemed contractual obligations of the United States, subject to the provisions of section 3 of this Act.

SEC. 3. If, by reason of any act of God, or of the public enemy, or any major catastrophe, or any other unforeseen and unavoidable cause the revenues, for any year of operation, after making provision for costs of operation, maintenance, and the amount to be set aside for said year for replacements, should be insufficient to make the payments to the States of Arizona and Nevada and the transfers to the Colorado River Development Fund herein provided for, such payments and transfers shall be proportionately reduced, as the Secretary may find to be necessary by reason thereof.

SEC. 4. (a) Upon the taking effect of this Act, pursuant to section 10 hereof, the charges, or the basis of computation thereof, promulgated hereunder, shall be applicable as from June 1, 1937, and adjustments of accounts by reason thereof, including charges by and against the United States, shall be made so that the United States and all parties that have contracted for energy, or for the privilege of generating energy, at the project, shall be placed in the same position, as nearly as may be, as determined by the Secretary, that they would have occupied had such charges, or the basis of computation thereof, and the method of operation which may be provided for under section 9 hereof, been effective on June 1, 1937: *Provided*, That such adjustments with contractors shall not be made in cash, but shall be made by means of credits extended over such period as the Secretary may determine.

(b) In the event payments to the States of Arizona and Nevada, or either of them, under section 2 (c) hereof, shall be reduced by reason of the collection of taxes mentioned in said section, adjustments shall be made, from time to time, with each allottee which shall have paid any such taxes, by credits or otherwise, for that proportion of the

amount of such reductions which the amount of the payments of such taxes by such allottee bears to the total amount of such taxes collected.

SEC. 5. If at any time there shall be insufficient sums in the Colorado River Dam Fund to meet the cost of replacements, however necessitated, in addition to meeting the other requirements of this Act, or of regulations authorized hereby and promulgated by the Secretary, the Secretary of the Treasury, upon request of the Secretary of the Interior, shall readvance to the said fund, in amounts not exceeding, in the aggregate, moneys repaid to the Treasury pursuant to section 2 (b) hereof, the amount required for replacements, however necessitated, in excess of the amount currently available therefor in said Colorado River Dam Fund. There is hereby authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, such sums, not exceeding said aggregate amount, as may be necessary to permit the Secretary of the Treasury to make such readvances. All such readvances shall bear interest.

SEC. 6. Whenever by the terms of the Project Act or this Act payment of interest is provided for, and whenever interest shall enter into any computation thereunder, such interest shall be computed at the rate of 3 per centum per annum, compounded annually.

SEC. 7. The first \$25,000,000 of advances made to the Colorado River Dam Fund for the project shall be deemed to be the sum allocated to flood control by section 2 (b) of the Project Act and repayment thereof shall be deferred without interest until June 1, 1987, after which time such advances so allocated to flood control shall be repayable to the Treasury as the Congress shall determine.

SEC. 8. The Secretary is hereby authorized from time to time to promulgate such regulations and enter into such contracts as he may find necessary or appropriate for carrying out the purposes of this Act and the Project Act, as modified hereby, and, by mutual consent, to terminate or

modify any such contract: *Provided, however,* That no allotment of energy to any allottee made by any rule or regulation heretofore promulgated shall be modified or changed without the consent of such allottee.

SEC. 9. The Secretary is hereby authorized to negotiate for and enter into a contract for the termination of the existing lease of the Boulder Power Plant made pursuant to the Project Act, and in the event of such termination the operation and maintenance, and the making of replacements, however necessitated, of the Boulder Power Plant by the United States, directly or through such agent or agents as the Secretary may designate, is hereby authorized. The powers, duties, and rights of such agent or agents shall be provided by contract, which may include provision that questions relating to the interpretation or performance thereof may be determined, to the extent provided therein, by arbitration or court proceedings. The Secretary in consideration of such termination of such existing lease is authorized to agree (a) that the lessees therein named shall be designated as the agents of the United States for the operation of said power plant; (b) that (except by mutual consent or in accordance with such provisions for termination for default as may be specified therein) such agency contract shall not be revocable or terminable; and (c) that suits or proceedings to restrain the termination of any such agency contract, otherwise than as therein provided, or for other appropriate equitable relief or remedies, may be maintained against the Secretary. Suits or other court proceedings pursuant to the foregoing provisions may be maintained in, and jurisdiction to hear and determine such suits or proceedings and to grant such relief or remedies is hereby conferred upon, the District Court of the United States for the District of Columbia, with the like right of appeal or review as in other like suits or proceedings in said court. The Secretary is hereby authorized to act for the United States in such arbitration proceedings.

SEC. 10. This Act shall be effective immediately for the

purpose of the promulgation of charges, or the basis of computation thereof, and the execution of contracts authorized by the terms of this Act, but neither such charges, nor the basis of computation thereof, nor any such contract, shall be effective unless and until this Act shall be effective for all purposes. This Act shall take effect for all purposes when, but not before, the Secretary shall have found that provision has been made for the termination of the existing lease of the Boulder Power Plant and for the operation thereof as authorized by section 9 hereof, and that allottees obligated under contracts in force on the date of enactment of this Act to pay for at least 90 per centum of the firm energy shall have entered into contracts (1) consenting to such operation, and (2) containing such other provisions as the Secretary may deem necessary or proper for carrying out the purposes of this Act. For purposes of this section such 90 per centum shall be computed as of the end of the absorption periods provided for in regulations heretofore promulgated by the Secretary and in effect at the time of the enactment of this Act.

If contracts in accordance with the requirements of this section shall not have been entered into prior to June 1, 1941, this Act shall cease to be operative and shall be of no further force or effect.

SEC. 11. Any contractor for energy from the project failing or refusing to execute a contract modifying its existing contract to conform to this Act shall continue to pay the rates and charges provided for in its existing contract, subject to such periodic readjustments as are therein provided, in all respects as if this Act had not been passed, and so far as necessary to support such existing contract all of the provisions of the Project Act shall remain in effect, anything in this Act inconsistent therewith notwithstanding.

SEC. 12. The following terms wherever used in this Act shall have the following respective meanings:

“Project Act” shall mean the Boulder Canyon Project Act;

“Project” shall mean the works authorized by the Project Act to be constructed and owned by the United States, exclusive of the main canal and appurtenances mentioned therein, now known as the All-American Canal;

“Secretary” shall mean the Secretary of the Interior of the United States;

“Firm energy” and “allottees” shall have the meaning assigned to such terms in regulations heretofore promulgated by the Secretary and in effect at the time of the enactment of this Act;

“Replacements” shall mean such replacements as may be necessary to keep the project in good operating condition during the period from June 1, 1937, to May 31, 1987, inclusive, but shall not include (except where used in conjunction with the word “emergency” or the words “however necessitated”) replacements made necessary by any act of God, or of the public enemy, or by any major catastrophe; and

“Year of operation” shall mean the period from and including June 1 of any calendar year to and including May 31 of the following calendar year.

SEC. 13. The Secretary of the Interior shall, in January of each year, submit to the Congress a financial statement and a complete report of operations under this Act during the preceding year of operation as herein defined.

SEC. 14. Nothing herein shall be construed as interfering with such rights as the States now have either to the waters within their borders or to adopt such policies and enact such laws as they may deem necessary with respect to the appropriation, control, and use of waters within their borders, except as modified by the Colorado River compact or other interstate agreement. Neither the promulgation of charges, or the basis of charges, nor anything contained in this Act, or done thereunder, shall in anywise affect, limit, or prejudice any right of any State in or to the waters of the Colorado River system under the Colorado River compact. Sections 13 (b), 13 (c), and 13 (d) of the Project Act and all other provisions of said Project Act not incon-

sistent with the terms of this Act shall remain in full force and effect.

SEC. 15. All laborers and mechanics employed in the construction of any part of the project, or in the operation, maintenance, or replacement of any part of the Boulder Dam, shall be paid not less than the prevailing rate of wages or compensation for work of a similar nature prevailing in the locality of the project. In the event any dispute arises as to what are the prevailing rates, the determination thereof shall be made by the Secretary of the Interior, and his decision, subject to the concurrence of the Secretary of Labor, shall be final.

SEC. 16. This Act may be cited as "Boulder Canyon Project Adjustment Act."

Approved, July 19, 1940.

THE CALIFORNIA WATER LIMITATION ACT

An act to limit the use by California of the waters of the Colorado River in compliance with the Act of Congress known as the "Boulder Canyon Project Act," approved December 21, 1928, in the event the Colorado River compact is not approved by all of the states signatory thereto.

(Approved by the Governor March 4, 1929.
In effect August 14, 1929.)

The people of the State of California do enact as follows:

AGREEMENT AS TO USE OF WATER OF COLORADO RIVER

SECTION 1. In the event the Colorado River compact signed at Santa Fe, New Mexico, November 24, 1922, and approved by and set out at length in that certain act entitled "An act to ratify and approve the Colorado River Compact, signed at Santa Fe, New Mexico, November 24, 1922, to repeal conflicting acts and resolutions and directing that notice be given by the governor of such ratifications and approval," approved January 10, 1929, (Statutes 1929, Chapter 1) is not approved within six months from the date of the passage of that certain act of the Congress of the United States known as the "Boulder Canyon Project Act," approved December 21, 1928, by the legislatures of each of the seven states signatory thereto as provided by Article XI of the said Colorado River Compact, then when six of said States, including California, shall have ratified and approved said compact, and shall have consented to waive the provisions of the first paragraph of Article XI of said compact which makes the same binding and obligatory when approved by each of the States signatory thereto, and shall have approved said compact without conditions save that of such six states approved and the President by public proclamation shall have so declared, as provided by the said "Boulder Canyon Project Act," the State of California as of the date of such proclamation agrees irrevocably and unconditionally with the United States and for

the benefit of the States of Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming as an express covenant and in consideration of the passage of the said "Boulder Canyon Project Act" that the aggregate annual consumptive use (diversions less returns to the river) of water of and from the Colorado River for use in the State of California including all uses under contracts made under the provisions of said "Boulder Canyon Project Act," and all water necessary for the supply of any rights which may now exist, shall not exceed four million four hundred thousand acre-feet of the waters apportioned to the lower basin states by paragraph "a" of Article III of the said Colorado River Compact, plus not more than one-half of any excess or surplus waters unapportioned by said compact, such uses always to be subject to the terms of said compact.

CONSTRUCTION

SECTION 2. By this act the State of California intends to comply with the conditions respecting limitation on the use of water as specified in subdivision 2 of section 4 (a) of the said "Boulder Canyon Project Act" and this act shall be so construed.

THE IMPERIAL DISTRICT CONTRACT

Contract for Construction of Diversion Dam, Main Canal, and Appurtenant Structures and for Delivery of Water.

ARTICLE 1. This Contract, made this 1st day of December, nineteen hundred thirty-two, pursuant to the Act of Congress approved June 17, 1902, (32 Stat., 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as the Reclamation Law, and particularly pursuant to the Act of Congress approved December 21, 1928, (45 Stat., 1057), designated the Boulder Canyon Project Act, between THE UNITED STATES OF AMERICA, hereinafter referred to as the United States, acting for this purpose by Ray Lyman Wilbur, Secretary of the Interior, hereinafter styled the Secretary, and IMPERIAL IRRIGATION DISTRICT, an irrigation district created, organized and existing under and by virtue of the laws of the State of California, with its principal place of business at El Centro, Imperial County, California, hereinafter referred to as the District;

Witnesseth:

EXPLANATORY RECITALS

ARTICLE 2. Whereas, for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters for reclamation of public lands and other beneficial uses exclusively within the United States, the Secretary, subject to the terms of the Colorado River Compact, is authorized to construct, operate and maintain a dam and incidental works in the main stream of the Colorado River at Black Canyon or Boulder Canyon, adequate to create a storage reservoir of a capacity of not less than twenty-million acre-feet of water, and a main

canal and appurtenant structures located entirely within the United States connecting the Laguna Dam, or other suitable diversion dam, which the Secretary is also authorized to construct if deemed necessary or advisable by him upon engineering or economic considerations, with the Imperial and Coachella Valleys in California, the expenditures for said main canal and appurtenant structures to be reimbursable as provided in the reclamation law; and

ARTICLE 3. Whereas, after full consideration of the advantages of both the Black Canyon and Boulder Canyon dam sites, the Secretary has determined upon Black Canyon as the site of the aforesaid dam, hereinafter styled the Hoover Dam, creating thereby a reservoir to be hereinafter styled the Boulder Canyon Reservoir; and

ARTICLE 4. Whereas, there are included within the boundaries of the District areas of private and public lands, and additional private and public lands will by appropriate proceedings be included within the District, and the District is desirous of entering into a contract for the construction of a suitable diversion dam and main canal and appurtenant structures, hereinafter respectively styled Imperial Dam and All-American Canal, located entirely within the United States connecting with the Imperial and Coachella Valleys, and for the delivery to the District of stored water from Boulder Canyon Reservoir; and

ARTICLE 5. Whereas, the Secretary has determined, upon engineering and economic considerations, that it is advisable to provide for the construction of such diversion dam and main canal and appurtenant structures, and has determined that the revenues provided for by this contract are adequate in his judgment to insure payment of all expenses of construction, operation and maintenance of the said diversion dam, main canal and appurtenant structures in the manner provided in the reclamation law;

ARTICLE 6. Now therefore, in consideration of the mutual covenants herein contained, the parties hereto agree as follows, to-wit:

CONSTRUCTION BY UNITED STATES

ARTICLE 7. The United States will construct the Imperial Dam in the main stream of the Colorado River at the approximate location indicated on the map marked Exhibit "A" attached hereto and by this reference made a part hereof, and will also construct the All-American Canal and appurtenant structures to the Imperial and Coachella Valleys, the approximate location of said canal to be as shown on the aforesaid Exhibit "A." Said canal shall be constructed to a designed capacity of fifteen thousand (15,000) cubic feet of water per second from and including the diversion and desilting works at said dam to Syphon Drop; thirteen thousand (13,000) cubic feet of water per second from Siphon Drop to Pilot Knob, and ten thousand (10,000) cubic feet of water per second westerly from Pilot Knob to Engineer Station nineteen hundred and seven as said Engineer Station is indicated on said Exhibit "A." Other portions of said canal shall be constructed with such capacities as the Secretary may conclusively determine to be necessary or advisable upon engineering or economic considerations to accomplish the ends contemplated by this contract; provided, however, that changes in capacities, locations, lengths and alignments, may be made during the progress of the work as may, in the opinion of the Secretary, whose opinion shall be final and binding upon the parties hereto, be expedient, economical, necessary or advisable, except the capacities above indicated from and including the diversion and desilting works at Imperial Dam to Engineer Station nineteen hundred and seven as hereinabove in this article referred to, which capacities may be changed only by mutual agreement between the Secretary and the District. The ultimate cost to the District of the aforesaid works shall in no event exceed the aggregate sum of thirty-eight million, five hundred thousand dollars (\$38,500,000). Such cost shall include all expenses of whatsoever kind heretofore or hereafter incurred by the United States from the Reclamation Fund or the Colorado River Dam Fund in connection with, growing out of, or resulting from the construction of said diversion dam, main canal and

appurtenant structures, including but not limited to the cost of labor, materials, equipment, engineering, legal work, superintendence, administration, overhead, any and all costs arising from operation and maintenance of said dam, main canal and appurtenant structures prior to the time that said costs are assumed by the District, damage of all kinds and character and rights-of-way as hereinafter provided. The District hereby agrees to repay to the United States expenditures incurred on account of any and all damages due to the existence, operation or maintenance of the diversion dam and main canal, the incurrence of which increases expenditures by the United States beyond said sum of \$38,500,000. The United States will invoke all legal and valid reservations of rights-of-way under acts of Congress, or otherwise reserved or held by it, without cost to the District, except that the United States reserves the right where rights-of-way are thus acquired to reimburse the owners of such lands for the value of improvements which may be destroyed, and the District agrees that the United States may include such disbursements in the cost of the work to be performed hereunder. If rights-of-way are required over an existing project of the Bureau of Reclamation, such sum or sums as may be necessary to reimburse the United States on account of the construction charges allocated to irrigable areas absorbed in such rights-of-way shall also be considered as a part of and be included with other costs of the work to be performed hereunder. The District agrees to convey to the United States without cost, unencumbered fee simple title to any and all lands now owned by it, which, in the opinion of the Secretary may be required for right-of-way purposes for the aforesaid diversion dam, main canal and appurtenant structures. Where rights-of-way within the State of California are required for the construction of works herein provided for, and such rights-of-way are not reserved to the United States under acts of Congress, or otherwise, or the lands over which such rights-of-way are required are not then owned by the District, the District agrees that it will, upon request of the Secretary, acquire title to such lands, and in

turn convey unencumbered fee simple title thereto to the United States at the actual cost thereof to the District, subject to the approval of such cost by the Secretary.

ASSUMPTION OF OPERATION AND MAINTENANCE BY DISTRICT

ARTICLE 8. Upon sixty (60) days' written notice from the Secretary of the completion of construction of the aforesaid diversion dam, main canal and appurtenant structures, or of any major unit thereof, useful to the District, as determined by the Secretary, whose determination thereof shall be final and binding upon the parties hereto, the District shall assume the care, operation and maintenance of said diversion dam, main canal and appurtenant structures or major units thereof, including Laguna Dam, and thereafter the District shall at its own cost and without expense to the United States care for, operate and maintain the same in such manner that such works shall remain in as good and efficient condition and of equal capacity for the diversion, transportation and distribution of water as when received from the United States, reasonable wear and damage by the elements excepted. Operation and maintenance of Imperial Dam by the District is a part of the obligation undertaken under this contract by the District for the transportation and delivery of water to public and Indian lands of the United States, and shall not interfere with the control of such dam by the United States. The United States may, from time to time, in the discretion of the Secretary, resume operation and maintenance of said dam upon not less than 60 days' written notice and require reassumption thereof by the District on like notice. During such times, after completion, as the dam is operated and maintained by the United States, the District shall on March 1 of each year advance to the United States the estimated cost of operation and maintenance for the following twelve months, upon estimates furnished therefor on or before September 1st next preceding. After the care, operation and maintenance of the aforesaid works have been assumed by the District,

the District shall save the United States, its officers, agents and employees harmless as to any and all injury and damage to persons and property which may arise out of the care, operation and maintenance thereof. In the event the United States fails to complete the works herein contemplated and the District fails to elect to make use of the works theretofore partially or wholly constructed, the District shall be fully relieved of any and all responsibility for any further operation and maintenance of the works theretofore taken over by the District for that purpose and thereupon the District shall no longer be responsible for said maintenance or operation or damage to person or property which may arise therefrom.

KEEPING DIVERSION DAM, MAIN CANAL, AND APPURTENANT STRUCTURES IN REPAIR

ARTICLE 9. Except in case of emergency no substantial change in any of the works to be constructed by the United States and transferred to the District under the provisions hereof shall be made by the District without first having had and obtained the written consent of the Secretary and the Secretary's opinion as to whether any change in any such works is or is not substantial shall be conclusive and binding upon the parties hereto. The District shall promptly make any and all repairs to and replacements of all works constructed hereunder or transferred to it under the terms and conditions hereof, which, in the opinion of the Secretary, are deemed necessary for the proper operation and maintenance of such works. In case of neglect or failure of the District to make such repairs, the United States may, at its option, after reasonable notice to the District, cause such repairs to be made and charge the actual cost thereof, plus fifteen per centum (15%) to cover overhead and general expense, to the District. On or before September first of each calendar year the United States shall give written notice to the District of the amount expended by the United States for repairs under this article during the twelve-month period immediately preceding.

Such cost, plus overhead and general expense as stated above, shall be repaid by the District on March first immediately succeeding.

AGREEMENT BY DISTRICT TO PAY FOR WORKS CONSTRUCTED BY THE UNITED STATES

ARTICLE 10. (a) The District agrees to pay the United States the actual cost, not exceeding thirty-eight million, five hundred thousand dollars (\$38,500,000), incurred by the United States on account of the aforesaid works, subject, however, to the provisions of Article seven (7) hereof; provided, that should Congress fail to make necessary appropriations to complete the work herein provided for, then the Secretary may, at such reasonable time as he may consider advisable, after Congress shall have failed for five consecutive years to make the necessary appropriations which shall have been annually requested by the Secretary, give the District notice of the termination of work by the United States and furnish a statement of the amount actually expended by the United States thereon. Upon the receipt of such notice by the District the District shall be given two years from and after such receipt of notice to elect whether it will utilize said works theretofore constructed, or some particular part thereof. Such election on the part of the District shall be expressed by resolution of the Board of Directors submitted to the electorate of the District for approval or rejection in the manner provided by law for submission of contracts with the United States. If the District elects not to utilize, or fails within said two-year period to elect to utilize said works or some portion thereof, then the District shall have no further rights therein and no obligations therefor. If the District elects to utilize said works or a portion thereof, then the reasonable value to the District of the works so utilized not exceeding the actual cost thereof to the United States shall be paid by the District under the terms of this contract; the first payment to be due and payable on the first day of March following the first day of September next succeeding

the final determination of the reasonable value to the District of such works, in case no further work is done by the District. Should the District elect to complete the work contemplated by this contract, or some portion thereof, the first payment shall be due and payable on the first day of March following the first day of September next succeeding the date of final completion of the work by the District as determined by the Secretary. In determining the value of such works to the District there shall be taken into account, among other things, the method of financing required and cost of money, so that in no event shall all of the works contemplated by this contract cost the District more than they would have cost the District had they all been constructed by the United States under the terms of this contract. In the event of failure of the parties to agree as to the reasonable value to the District of the works which the District elects to use, the same shall be determined as provided in Article twenty-seven (27) hereof.

(b) The District as a whole is obligated to pay to the United States the full amount herein agreed upon regardless of the default or failure of any tract in the District, or of any landowner in the District, in the payment of the assessments levied by the District against such tract or landowner, and the District shall, when necessary, levy and collect appropriate assessments to make up for the default or delinquency of any tract of land or of any landowner in the payment of assessments, so that in any event, and regardless of any defaults or delinquencies in the payment of any assessment or assessments, the amounts due or to become due the United States shall be paid to the United States by the District when due.

(c) The District shall be divided into units by the Board of Directors of the District. Said units shall be named, commencing with Imperial Unit, which unit shall comprise the lands of the District as of July 1, 1931. Each of the other units shall be as determined by the Board of Directors of the District and shall be described by legal description of the lands embraced therein or by designation of exterior boundaries or otherwise suitable for identifica-

tion. Additional lands may be added to any unit herein or hereafter designated.

(d) The lands within each unit as hereinabove provided for will be benefited by the works to be constructed under this contract in the proportion that the area within such unit bears to the total area of the District and the costs of the said works, construction and otherwise, shall be apportioned to and paid by the lands within each unit in that proportion. In levying assessments or other charges to meet the cost of the said works, the Board of Directors of the District shall take into consideration payments to be made under this contract, with proper allowance for existing and anticipated delinquencies and redemptions, in order to provide sufficient funds to meet such payments as same become due and said board shall also take into account all sums expended or to be expended under the contract of October 23, 1918, for the right to connect with the Laguna Dam, the cost of all surveys and investigations and other expenditures properly chargeable as a part of the cost of the said works but which are not included as a part of the construction cost thereof reimbursable to the United States under this contract. While the cost of the said works and other expenditures above mentioned shall be apportioned to the various units according to their respective areas, it is understood that the assessments or other charges to be imposed upon the lands within each respective unit shall be on an ad valorem or other basis as now or may hereafter be provided by law for assessment or imposition of other charges upon lands within irrigation districts. Rates of assessment or schedule in the various units from year to year or from time to time may be different or unequal as between the various units. If the amount collected from the lands in any unit in any year shall be less than the amount apportioned to such unit for that year for such purpose, the deficit shall nevertheless be charged to that unit and any fund or funds of the District from which money may be taken to make up such deficit in order to provide for the payment in full of the obligations of the District, shall be entitled to reimbursement for such money from subsequent

collections of unpaid assessments or charges in said unit or from the amounts received for the redemption of lands sold for delinquent assessments or charges or from subsequent or additional levies made on the lands within that unit to provide for such reimbursement.

(e) In the event lands now or hereafter within Coachella Valley County Water District, a county water district organized and existing under the laws of the State of California, are included within Imperial Irrigation District, the said Coachella Valley County Water District shall have the privilege, at its option, if, as and when authorized to do so by law, to pay to Imperial Irrigation District the total amount of any annual and/or special assessments levied by the last named District upon said lands or any installment of such assessments or any of the several individual assessments or installments thereof, in any case as the same become due and payable. The regular and lawful proceedings, rights and remedies of the last named District shall be in no manner impaired or affected by the provisions of this subarticle. The agreement in this subarticle contained is made expressly for the benefit of said Coachella Valley County Water District.

(f) If for any reason only a part of the works herein contemplated is constructed either by the United States or by the District, then the Board of Directors of the District shall, after public hearing, determine whether or not all of the lands in the District are benefited by the works constructed. If the board shall find and declare that any certain lands within the District are not benefited by such construction, then no assessments shall thereafter be levied upon such lands for the purpose of meeting the obligations under this contract; and, for the purpose of this subarticle, no land shall be regarded as benefited by the construction of such works until the works contemplated by this contract as indicated on said Exhibit "A" from which water would reasonably be obtained for such lands shall have been constructed.

(g) The District shall have the right to refuse water service to any lands within the District which may at any

time be delinquent in the payment of any assessment levied for the purpose of carrying out the provisions of this contract.

CHANGES IN DISTRICT BOUNDARIES

ARTICLE 11. After the date of this contract no change shall be made in the boundaries of the District and the Board of Directors shall make no order changing the boundaries of the District, unless and until the Secretary shall assent to such change in writing, and such assent shall have been filed with the Board of Directors of the District; provided, however, that such assent is hereby given for the inclusion of all of the lands indicated on Exhibit "A" referred to in Article 34 hereof.

TERMS OF PAYMENT

ARTICLE 12. The amount herein agreed to be paid to the United States shall be due and payable in not more than forty (40) annual installments commencing with the calendar year next succeeding the year when notice of completion of all work provided for herein is given to the District or under the provisions of Article 10 (a) hereof upon termination of work through failure of Congress to make necessary appropriations therefor. The first five of such annual installments shall each be one per centum (1%) of the amount herein agreed to be paid to the United States; the next ten of such installments shall each be two per centum (2%) of the amount herein agreed to be paid to the United States, and the remainder of such annual installments shall each be three per centum (3%) of the amount herein agreed to be paid to the United States. The sums payable annually as set forth above shall be divided into two equal semi-annual payments, payable on March first and September first of each year; provided, however, that if notice of the completion of work is given to the District subsequent to September first of any year the first semi-annual installment of charges hereunder shall be due and payable on March first of the second succeeding year.

OPERATION AND MAINTENANCE COSTS

ARTICLE 13. Each agency other than the District for which capacity is provided in the works to be constructed hereunder shall bear such proportionate part of the cost of operation and maintenance (including repairs and replacements) of the component parts thereof and of the Laguna Dam as may be determined by the Secretary to be equitable and just, but not less than an amount in proportion to the total amount as are the relative capacities provided in each component part for such agency and for all other agencies, including the District. Each agency shall advance to the District, on or before January first of each year, its proportionate share of the estimated cost for that year of operation and maintenance in accordance with a notice to be issued by the District, provided that payment shall in no event be due until thirty days after receipt of notice. Prior to March 1st of each year the District shall provide each agency with a statement showing in detail the costs for the previous year for operation and maintenance of the works on account of which such agency has made advances. Differences between actual costs and estimated costs shall be adjusted in next succeeding notices. Upon request of any agency both the advance notice of estimated costs and the subsequent statement of actual costs for each year shall be reviewed by the Secretary and his determination of proper charges shall be final. Such review shall not change the due date for advance payments as herein provided, and the cost of such review shall be borne equally by the requesting agency and the District. The District may, at its option, withhold the delivery of water from any agency until its proportionate share of the costs of operation and maintenance have been advanced or paid, as in this article provided.

POWER POSSIBILITIES

ARTICLE 14. As one of the considerations for the partial termination of the contract of October 23, 1918, as provided for in Article sixteen (16) hereof, the power possi-

bilities on the All-American Canal down to and including Syphon Drop with water carried for the benefit of the Yuma Project as provided for in Article fifteen (15) hereof, are hereby reserved to the United States. Subject to the foregoing provisions of this Article and the participation by other agencies as provided for in Article twenty-one (21) hereof, the District shall have the privilege at any time of utilizing by contract or otherwise such power possibilities as may exist upon said canal. The net proceeds as hereinafter defined in Article thirty-two (32) hereof and as determined by the Secretary for each calendar year from any such power development shall be paid into the Colorado River Dam Fund on March first of the next succeeding calendar year and be credited to the District on this contract until the District shall have paid thereby and/or otherwise an amount of money equivalent to that herein agreed to be paid to the United States. Thereafter such net power proceeds shall belong to the District. It is agreed that in the event the net power proceeds in any calendar year, creditable to the District, shall exceed the annual installment of charges payable under this contract during the then current calendar year, the excess of such net power proceeds shall be credited on the next succeeding unpaid installment to become due from the District under this contract.

DIVERSION AND DELIVERY OF WATER FOR YUMA PROJECT

ARTICLE 15. As a further consideration for the partial termination of the contract of October 23, 1918, as provided in Article sixteen (16) hereof, the District hereby agrees to divert at the Imperial Dam, and to transport and deliver at Siphon Drop and/or such intermediate points as may be designated by the Secretary, the available water to which the Yuma Project (situated entirely within the United States and not exceeding in area 120,000 acres plus lands lying between the project levees and the Colorado River as such levees are located in 1931) is entitled, not exceeding two thousand (2,000) second-feet of water in

the aggregate, or such part thereof as the Secretary may direct, for the use and benefit of said project, including the development of power at Siphon Drop, such water to be diverted, transported and delivered continuously in so far as reasonable diligence will permit; provided, however, that water shall not be diverted, transported or delivered for the Yuma Project when the Secretary notifies the District that said project for any reason may not be entitled thereto; provided, further, that the District shall divert, transport and deliver such water in excess of requirements for irrigation or potable purposes, as determined by the Secretary, on the Yuma Project as so limited, only when such water is not required by the District for irrigation or potable purposes. The diversion, transportation and delivery of water for the Yuma Project as aforesaid shall be without expense to the United States or its successors in control of said project, as to capital investment required to provide facilities for such diversion and transportation of water, except such checks, turnouts and other structures required for delivery from said canal.

CONTRACT OF OCTOBER 23, 1918

ARTICLE 16. That certain contract between the United States of America and the District, bearing date of October 23, 1918, providing for a connection with Laguna Dam, is hereby terminated, except as to the provisions of Article nine (9) thereof, and as one of the considerations for the partial termination of said contract by the United States, the District hereby promises and agrees to make full payment to the United States of all unpaid installments of charges as provided in Article nine (9) of said agreement, anything in said contract to the contrary notwithstanding. As an additional consideration for the partial termination of said contract of October 23, 1918, the District hereby promises and agrees to furnish to the United States or its successors in interest in the control, operation and maintenance of the Yuma Project, from any power development on the All-American Canal at or near Pilot Knob, up to but not to exceed four thousand horsepower of electrical

energy for use by the agency in charge of project operations for irrigation and drainage pumping purposes and necessary incidental use on said Yuma Project, such power to be furnished at cost (including overhead and general expense) plus ten per cent; provided, however, that the District shall not be required to furnish such power at or near Pilot Knob except at such times as all power feasible of development at Siphon Drop or developed elsewhere within a radius of 40 miles from the city of Yuma for the benefit of the Yuma Project is being used for project operations as in this article specified.

DELIVERY OF WATER BY UNITED STATES

ARTICLE 17. The United States shall, from storage available in the reservoir created by Hoover Dam, deliver to the District each year at a point in the Colorado River immediately above Imperial Dam, so much water as may be necessary to supply the District a total quantity, including all other waters diverted for use within the District from the Colorado River, in the amounts and with priorities in accordance with the recommendation of the Chief of the Division of Water Resources of the State of California, as follows (Subject to availability thereof for use in California under the Colorado River Compact and the Boulder Canyon Project Act):

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.

SECTION 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.

SECTION 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.

SECTION 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.

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

SECTION 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.

SECTION 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.

SECTION 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.

SECTION 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.

SECTION 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.

SECTION 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.

SECTION 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.

The Secretary reserves the right to, and the District agrees that he may, contract with any of the allottees above named in accordance with the above stated recommendation, or, in the event that such recommendation as to Palo Verde Irrigation District is superseded by an agreement between all the above allottees or by a final judicial determination, to contract with the Palo Verde Irrigation District in accordance with such agreement or determination; *Provided*, that priorities numbered fourth and fifth shall not thereby be disturbed.

As far as reasonable diligence will permit said water shall be delivered as ordered by the District, and as reasonably required for potable and irrigation purposes within the boundaries of the District in the Imperial and Coachella Valleys in California. This contract is for permanent water services but is subject to the condition that Hoover Dam and Boulder Canyon Reservoir shall be used; First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of perfected rights in pursuance of Article VIII of the Colorado River Compact; and third, for power. This contract is made upon the express condition and with the express covenant that the District and the United States shall observe and be subject to, and controlled by said Colorado River Compact in the construction, management and operation of Hoover Dam, Imperial Dam, All-American Canal, and other works and the storage, diversion, delivery and use of water for the generation of power, irrigation, and other purposes. The United States reserves the right to temporarily discontinue or reduce the amount of water to be delivered for the purpose of investigation, inspection, maintenance, repairs, replacements or installation of equipment and/or machinery at Hoover Dam, but as far as feasible the United States will give the District reasonable notice in advance of such temporary discontinuance or reduction. The United States, its officers, agents and em-

ployees shall not be liable for damages when, for any reason whatsoever, suspension or reductions in delivery of water occur. This contract is without prejudice to any other or additional rights which the District may now have not inconsistent with the foregoing provisions of this article, or may hereafter acquire in or to the waters of the Colorado River. Nothing in this contract shall be construed to prevent the District from diverting water to the full capacity of the All-American Canal if and when water over and above the quantity apportioned to it hereunder is available, and no power development at Imperial and/or Laguna Dam shall be permitted to interfere with such diversion by the District, but, except as provided in Article twenty-one (21), water shall not be diverted, transported or carried by or through the works to be constructed hereunder for any agency other than the District, except by written consent of the Secretary.

MEASUREMENT OF WATER

ARTICLE 18. The water which the District receives under the apportionment as provided in Article seventeen (17) hereof shall be measured at such point or points on the canal as may be designated by the Secretary. Measuring and controlling devices shall be furnished and installed by the United States as a part of the work provided for herein, but shall be operated and maintained by and at the expense of the District. They shall be and remain at all times under the complete control of the United States, whose authorized representatives may at all times have access to them over the lands and rights-of-way of the District.

RECORD OF WATER DIVERTED

ARTICLE 19. The District shall make full and complete written reports as directed by the Secretary, on forms to be supplied by the United States, of all water diverted from the Colorado River, and the disposition thereof. The records and data from which such reports are made shall be accessible to the United States on demand of the Secretary.

REFUSAL OF WATER IN CASE OF DEFAULT

ARTICLE 20. The United States reserves the right to refuse to deliver water to the District in the event of default for a period of more than twelve (12) months in any payment due the United States under this contract, or, in the discretion of the Secretary to reduce deliveries in such proportion as the amount in default by the District bears to the total amount due. It is understood, however, that the provisions of this article shall not relieve the District of its obligation to divert, transport and deliver water for the use and benefit of the Yuma Project as herein elsewhere provided, nor shall it relieve the District of its obligation hereunder to divert, transport and deliver water for the use and benefit of other agencies with whom the United States may contract for the diversion, transportation and delivery of water through or by the works to be constructed under the terms hereof. The United States further reserves the right to forthwith assume control of all or any part of the works to be constructed hereunder and to care for, operate and maintain the same, so long as the Secretary deems necessary or advisable, if, in his opinion, which shall be final and binding upon the parties hereto, the District does not carry out the terms and conditions of this contract to their full extent and meaning. In such event, the District's pro rata share of the actual cost of such care, operation and maintenance by the United States shall be repaid to the United States, plus fifteen per centum (15%) to cover overhead and general expense, on March first of each year immediately succeeding the calendar year during which the works to be constructed hereunder are operated and maintained by the United States. Nothing herein contained shall relieve the District of the obligation to pay in any event all installments and penalties provided in this contract.

USE OF WORKS BY THE UNITED STATES AND OTHERS

ARTICLE 21. The United States also reserves the right to, and the District agrees that it may, at any time prior to the transfer of constructed works to the District for

operation and maintenance, increase the capacity of the said works and contract for such increased capacity with other agencies for the delivery of water for use in the United States; provided, however, that such other agencies shall not thereby be entitled to participate in power development on said All-American Canal, except at points where and to the extent that the water diverted and/or carried for them contributes to the development of power. In the event other agencies thus contract with the United States, each of such agencies shall assume such proportion of the total cost of said works to be used jointly by such agency and the District, including Laguna Dam, as the Secretary may determine to be equitable and just but not less than the proportion that the capacity provided for such agency in such works bears to the total capacity thereof (except in that part thereof above Siphon Drop including Laguna Dam, in which part the proportion which such other agency shall assume shall be not less than the proportion that the capacity provided for such agency therein bears to the total capacity thereof less the capacity to be provided hereunder without cost to and for the Yuma Project) and the District's financial obligations under this contract shall be adjusted accordingly. In no event shall construction costs chargeable to the District be increased by reason of additional capacity being provided for any such agency or agencies or contract or contracts having been made with same. Any such agency thus contracting shall also be required to reimburse the District in such amounts and at such times as the Secretary may determine to be equitable and just for payments theretofore made by the District for the right to use Laguna Dam.

TITLE TO REMAIN IN THE UNITED STATES

ARTICLE 22. Title to the aforesaid Imperial Dam and All-American Canal to be constructed by the United States under the terms and conditions hereof, shall be and remain in the United States notwithstanding transfer of the care, operation and maintenance thereof to the District; pro-

vided, however, that the Secretary may, in his discretion, when repayments to the United States of all moneys advanced shall have been made, transfer the title to said main canal and appurtenant structures, except the diversion dam and the main canal and appurtenant structures down to and including Siphon Drop, to the District or other agencies of the United States having a beneficial interest therein in proportion to their respective capital investments under such form or organization as may be acceptable to him.

ASSESSMENT OF PUBLIC LAND

ARTICLE 23. The following lands are hereby designated as subject to the provisions of the act of August 11, 1916 (39 Stat., 506), and the act of May 15, 1922 (42 Stat., 541):

(a) All unentered public lands and entered lands for which no final certificate has been issued, situate within the District at the date hereof; and when included within the District, unentered public lands and entered lands for which no final certificate has been issued, hereafter to be included within the District pursuant to this contract, all described in a statement marked Exhibit "B" attached hereto and by reference thereto made a part hereof; and

(b) Unentered public lands and entered lands for which no final certificate has been issued not so described but hereafter annexed to the District, upon the Secretary's consenting, in the case of such lands hereafter annexed to the District, to assessment hereunder of such added lands, which consent will be requested by resolution of the Board of Directors of the District and will be manifested by letter filed with the District, a copy of such letter to be filed also with the General Land Office, and a copy with the proper Local Land Office.

Within a reasonable time, to be determined by the Secretary, from the date water is available for and can be delivered to any public lands within the boundaries of the District, such lands shall be opened to entry.

RULES AND REGULATIONS

ARTICLE 24. There is reserved to the Secretary the right to prescribe and enforce rules and regulations not inconsistent with this contract, governing the diversion and delivery of water hereunder to the District and to other contractors. Such rules and regulations may be modified, revised and/or extended from time to time after notice to the District and opportunity for it to be heard, as may be deemed proper, necessary or desirable by the Secretary to carry out the true intent and meaning of the law and of this contract, or amendments thereof, or to protect the interests of the United States. The District hereby agrees that in the operation and maintenance of the Imperial Dam and All-American Canal, all such rules and regulations will be fully adhered to.

INSPECTION BY THE UNITED STATES

ARTICLE 25. The Secretary may cause to be made from time to time a reasonable inspection of the works constructed by the United States under the terms hereof to the end that he may ascertain whether the terms of this contract are being satisfactorily executed by the District. The actual expense of such inspection in any calendar year, as found by the Secretary, shall be paid by the District to the United States on March first of each year immediately following the year in which such inspection is made, and upon statement to be furnished by the Secretary. The Secretary or his representative shall at all times have the right of ingress to and egress from all works of the District for the purpose of inspection, repairs and maintenance of works of the United States, and for all other purposes.

ACCESS TO BOOKS AND RECORDS

ARTICLE 26. The officials or designated representatives of the District shall have full and free access to the books and records of the United States, so far as they relate to the matters covered by this contract, with the right at any time during office hours to make copies of and from the

same; and the Secretary shall have the same right in respect of the books and records of the District.

DISPUTES OR DISAGREEMENTS

ARTICLE 27. Disputes or disagreements as to the interpretation or performance of the provisions of this contract, except as otherwise provided herein, shall be determined either by arbitration or court proceedings, the Secretary being authorized to act for the United States in such proceedings. Whenever a controversy arises out of this contract, and the parties hereto agree to submit the matter to arbitration, the District shall name one arbitrator and the Secretary shall name one arbitrator, and the two arbitrators thus chosen shall elect three other arbitrators, but in the event of their failure to name all or any of the three arbitrators within thirty (30) days after their first meeting, such arbitrators not so elected, shall be named by the Senior Judge of the United States Circuit Court of Appeals for the Ninth Circuit. The decision of any three of such arbitrators shall be a valid and binding award of the arbitrators.

INTEREST AND PENALTIES

ARTICLE 28. No interest shall be charged on any installments of charges due from the District hereunder except that on all such installments or any part thereof, which may remain unpaid by the District to the United States after the same become due, there shall be added to the amount unpaid a penalty of one-half of one per centum ($\frac{1}{2}\%$) and a like penalty of one-half of one per centum ($\frac{1}{2}\%$) of the amount unpaid shall be added on the first day of each month thereafter so long as such default shall continue.

AGREEMENT SUBJECT TO COLORADO RIVER COMPACT

ARTICLE 29. This contract is made upon the express condition and with the express understanding that all rights

based upon this contract shall be subject to and controlled by the Colorado River Compact, being the compact or agreement signed at Santa Fe, New Mexico, November 24, 1922, pursuant to Act of Congress approved August 19, 1921, entitled "An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes," which compact was approved by the Boulder Canyon Project Act.

APPLICATION OF RECLAMATION LAW

ARTICLE 30. Except as provided by the Boulder Canyon Project Act, the reclamation law shall govern the construction, operation and maintenance of the works to be constructed hereunder.

CONTRACT TO BE AUTHORIZED BY ELECTION AND CONFIRMED BY COURT

ARTICLE 31. The execution of this contract by the District shall be authorized by the qualified electors of the District at an election held for that purpose. Thereafter, without delay, the District shall prosecute to judgment proceedings in court for a judicial confirmation of the authorization and validity of this contract. The United States shall not be in any manner bound under the terms and conditions of this contract unless and until a confirmatory final judgment in such proceedings shall have been rendered, including final decision, or pending appellate action if ground for appeal be laid. The District shall without delay and at its own cost and expense furnish the United States for its files, copies of all proceedings relating to the election upon this contract and the confirmation proceedings in connection therewith, which said copies shall be properly certified by the Clerk of the Court in which confirmatory judgment is obtained.

METHOD OF DETERMINING NET POWER PROCEEDS

ARTICLE 32. In determining the net proceeds for each calendar year from any power development on the All-American Canal, to be paid into the Colorado River Dam Fund as provided in Article fourteen (14) hereof, there shall be taken into consideration all items of cost of production of power, including but not necessarily limited to amortization of and interest on capital investment in power development, replacements, improvements, and operation and maintenance, if any. Any other proper factor of cost not here expressly enumerated may be taken into account in determining the net proceeds.

CONTINGENT UPON APPROPRIATIONS

ARTICLE 33. This contract is subject to appropriations being made by Congress from year to year of moneys sufficient to do the work provided for herein, and to there being sufficient moneys available in the Colorado River Dam Fund to permit allotments to be made for the performance of such work. No liability shall accrue against the United States, its officers, agents or employees, by reason of sufficient moneys not being so appropriated nor on account of there not being sufficient moneys in the Colorado River Dam Fund to permit of said allotments. If more than three years elapse after this contract becomes effective and before appropriations are available to permit the United States to make expenditures hereunder, the District may, at its option, upon giving sixty (60) days written notice to the Secretary, cancel this contract. Such option shall be expressed by vote of the electors of the District with the same formalities as required for the authorization of contracts with the United States.

INCLUSION OF LANDS

ARTICLE 34. (a) In this article where the words "area to be included" are used such words shall be understood to mean those certain areas shown on Exhibit "A" and

bounded by the lines indicated thereon as "Boundary of Additional Areas in Proposed Enlarged Imperial Irrigation District."

(b) The District agrees to change its boundaries within a reasonable time after the execution of this contract, in the manner provided by law, so as to include within the District the public lands of the United States in Imperial County lying south of the northerly boundary line of Township eleven (11) South of the San Bernardino Base Line, and within the area to be included.

(c) The District further agrees to change its boundaries, if lawful petition or petitions therefor be presented to its Board of Directors prior to the first day of January, 1940, so as to include within the District any privately owned and/or entered lands for which final certificate has not been issued, in Imperial County, lying south of the northerly boundary line of Township eleven (11) South of the San Bernardino Base Line, and within the area to be included.

(d) The District further agrees to change its boundaries, in the manner provided by law, so as to include within the District the lands lying north of the northerly boundary line of Township eleven (11) South of the San Bernardino Base Line, and within the area to be included, if lawful petition or petitions sufficient in all respects for such inclusion be presented to its Board of Directors at any time prior to the expiration of thirty days from and after the date on which a confirmatory judgment, as required by Article 31 hereof, declaring this contract in all respects valid and duly authorized, shall have become final; provided, however, that the District shall not change its boundaries so as to include any of said lands lying north of the northerly boundary line of said Township eleven (11) South, unless the said petition or petitions so filed shall be sufficient to lawfully include in the aggregate not less than ninety (90%) per centum (the areas to be approved by the Secretary) of the said lands, exclusive of the Dos Palmas area and exclusive of Indian lands and public lands

of the United States. Within a reasonable time after the inclusion of such lands pursuant to said petition or petitions the District further agrees to change its boundaries, in the manner provided by law, so as to also include within the District the public lands of the United States within the area to be included and lying north of the northerly boundary line of said Township eleven (11) South.

(e) Whenever any of the lands within the area to be included are included within the District the inclusion thereof shall be made upon conditions substantially as hereinafter contained (filling blank spaces with appropriate unit names as may be required and other proper designations), and the Secretary, on behalf of the United States, hereby consents to such inclusion and conditions, which conditions are as follows:

CONDITION NO. 1

DEFINITIONS

In the following conditions, the word "District" shall mean Imperial Irrigation District; the word "Board" shall mean the Board of Directors of Imperial Irrigation District; the words "All-American Canal Contract" shall mean that certain contract between the United States of America by Ray Lyman Wilbur, Secretary of the Interior, and Imperial Irrigation District, dated.....;

(date of this contract)

and entitled "Contract for construction of diversion dam, main canal and appurtenant structures and for Delivery of Water," authorized by the electors of Imperial Irrigation District at an election held.....;

(date of this contract authorized;

and the words "distribution system" shall mean the secondary main canal and lateral system or systems, including all canals, pipe lines, structures, pumping plants, machinery and incidental works necessary or convenient under the rules and regulations of Imperial Irrigation District for delivery of water for irrigation and domestic purposes from the All-American Canal, as the same is shown on Exhibit

“A” attached to and made a part of said All-American Canal Contract, to lands in..... (name)

Unit as such unit is hereinafter defined.

CONDITION NO. 2

DIVISION INTO UNITS

For the purposes of these conditions and in compliance with the terms of the All-American Canal Contract, the District shall be divided into units, commencing with Imperial Unit, which unit shall comprise the lands within the District as of July 1, 1931, and such other lands as may at any time or from time to time be added thereto in the discretion of the Board.

.....Unit shall comprise (name)

.....

(here shall follow description or other designation of the unit involved as provided by Article 10 (c) of the All-American Canal Contract).

CONDITION NO. 3

ALL-AMERICAN CANAL CONTRACT

The lands within.....Unit shall be, (name)

in all respects, bound by all of the terms and conditions of the All-American Canal Contract and particularly by Article 10 thereof, and shall pay, as a unit obligation, the several amounts and in the manner and at the times provided for in said contract, as the Board may determine; provided, that said lands in.....Unit (name)

shall pay to the District, as a unit obligation, that proportion of the total sum paid by the District to the United States under that certain contract of October 23, 1918, between the United States and the District for the right to connect with Laguna Dam, prior to the payment of the first

installment on said contract of October 23, 1918, for which said land shall be assessed, that the total area of Unit bears to the total area (name)

of the District at the date notice of completion of all work provided for in the All-American Canal Contract shall be given, pursuant to Article 12 thereof, to the District. Said sum shall be divided into ten annual installments, as nearly equal as may be practicable, and paid, commencing with the calendar year next succeeding the calendar year when such notice of completion shall be so given.

CONDITION NO. 4

DISTRIBUTION SYSTEM

The lands within Unit shall (name)

pay, as a unit obligation, the total capital cost of any distribution system which may be constructed by or under authority of the District, to serve the lands within said Unit or any part thereof. (name)

When said distribution system, or any part thereof, is constructed, or an obligation therefor is incurred, said lands shall pay annually, such sum or sums as may be necessary to meet the then current obligation therefor, whether for principal or interest or both, or otherwise. Said distribution system shall at all times be and remain the exclusive property of the District unless the District shall provide otherwise, in the discretion of the board. When funds for the construction of said distribution system are made available, the District shall construct or authorize the same to be constructed, as the board may determine.

CONDITION NO. 5

PUMPING COSTS

The board shall provide by rule for the payment by the lands served of the cost of power required to pump water to or for the use of such lands.

CONDITION NO. 6

CHARGES TO BE PART OF ASSESSMENT

Any and all charges against or upon the lands within
.....Unit provided for by the fore-
(name)

going conditions unless otherwise collected from the lands
within.....Unit, shall be a part of,
(name)

but in addition to, the annual assessment upon the said
lands for other District purposes and payable in install-
ments accordingly, and shall constitute an additional an-
nual charge upon the land, and the board shall levy such
assessment upon the said lands upon an ad valorem or other
basis as now or hereafter provided by law, in an amount
or in amounts sufficient to raise the several sums provided
for from the said lands within.....
(name)

Unit; provided, that for the protection of the interests and
security of the United States, pending completion of con-
struction of the All-American Canal to such extent that
water is available in said canal for use in.....
.....Unit, the annual assessment upon the
(name)

lands within said unit for District purposes shall be lim-
ited to raise only the just proportion chargeable to said
unit for expenditures connected with or applying to the
All-American Canal and/or arising from expenditures
made in or on behalf of said unit.

(f) In the event petition or petitions for inclusion, pur-
suant to this article, of any privately owned lands or en-
tered lands for which no final certificate has at the time
been issued, lying south of the northerly boundary line of
Township eleven (11) South of the San Bernardino Base
Line, and within the area to be included, be presented sub-
sequent to the expiration of thirty days from and after the
date on which a confirmatory judgment, as required by
Article 31 hereof, declaring this contract in all respects
valid and duly authorized, shall have become final, then the

District may in the discretion of the Board of Directors require as a condition precedent to the granting of said petition or petitions and in addition to the other conditions above named, that the petitioners shall pay to the District such respective sums as nearly as the same can be estimated (the amounts to be determined by the board), as the holders of title or evidence of title to the several parcels of land involved in said petition or petitions and their grantors would have been required to pay to the District as assessments had such lands been included within the District at the expiration of said 30-day period, or such portion of said sum as the Board of Directors may at the time determine. The provisions of this sub-article shall also apply to all lands lying north of the northerly boundary line of said Township eleven (11) South, and within the area to be included, provided the ninety per centum (90%) petition required by sub-article (*d*) of this article is filed prior to the expiration of said 30-day period.

(*g*) In the event the petition or petitions for inclusion of the said lands lying north of the northerly boundary line of said Township eleven (11) South of the San Bernardino Base Line, as in sub-article (*d*) above provided are not made and filed with the Board of Directors of the District prior to the expiration of thirty days from and after the date on which a confirmatory judgment, as required by Article 31 hereof, declaring this contract in all respects valid and duly authorized, shall have become final, as hereinabove provided, then said lands shall not thereafter be included within the District under the provisions of this contract and the works referred to in this contract north of the northerly boundary line of said Township eleven (11) South of the San Bernardino Base Line shall not be constructed under this contract and the District shall be relieved from all responsibility therefor, anything in this contract to the contrary notwithstanding, and the capacities in the works to be constructed under this contract shall be reduced accordingly.

(*h*) Nothing contained in this contract shall impair any right or remedy of any person entitled to object or pro-

test against the inclusion within the District of any particular tract or tracts of land, or the conditions imposed by the Board of Directors of the District on the inclusion of any particular tract or tracts, nor impair the power of the board to hear and determine any such objections or protests, but if in the opinion of the Secretary such determination by the board substantially impairs the interests of, or security otherwise available to, the United States, under this contract, then and in such event the United States shall be under no obligation to proceed further under this contract. In the event any petition or petitions be filed for the inclusion within the District of any lands within the area to be included and, after the conditions set out in sub-article (e) of this article, or conditions less burdensome, are imposed thereon, a sufficient majority statement or statements in writing be filed objecting to the inclusion of such lands with the conditions imposed thereon, so that the Board of Directors is required to dismiss such petition or petitions, then it shall be regarded as if such petition or petitions had not been filed.

PRIORITY OF CLAIMS OF THE UNITED STATES

ARTICLE 36. Claims of the United States arising out of this contract shall have priority over all others, secured and unsecured.

RIGHTS RESERVED UNDER SECTION 3737 REVISED STATUTES

ARTICLE 36. All rights of action for breach of any of the provisions of this contract are reserved to the United States as provided in Section 3737 of the Revised Statutes of the United States.

REMEDIES UNDER CONTRACT NOT EXCLUSIVE

ARTICLE 37. Nothing contained in this contract shall be construed as in any manner abridging, limiting or depriving the United States or the District of any means of

enforcing any remedy either at law or in equity for the breach of any of the provisions hereof which it would otherwise have. The waiver of a breach of any of the provisions of this contract shall not be deemed to be a waiver of any other provision hereof or of a subsequent breach of such provision.

INTEREST IN CONTRACT NOT TRANSFERABLE

ARTICLE 38. No interest in this contract is transferable by the District to any other party, and any such attempted transfer shall cause this contract to become subject to annulment at the option of the United States.

MEMBER OF CONGRESS CLAUSE

ARTICLE 39. No Member of or Delegate to Congress or Resident Commissioner, shall be admitted to any share or part of this contract, or to any benefit that may arise therefrom. Nothing, however, herein contained shall be construed to extend to this contract if made with a corporation for its general benefit.

In Witness Whereof, the parties hereto have caused this contract to be executed the day and year first above written.

THE ARIZONA CONTRACT

Contract for Delivery of Water

This Contract made this 9th day of February, 1944, pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplemental thereto, all of which acts are commonly known and referred to as the Reclamation Law, and particularly pursuant to the Act of Congress approved December 21, 1928 (45 Stat. 1057), designated the Boulder Canyon Project Act, and acts amendatory thereof or supplementary thereto, between The United States of America, hereinafter referred to as "United States," acting for this purpose by Harold L. Ickes, Secretary of the Interior, hereinafter referred to as the "Secretary," and the State of Arizona, hereinafter referred to as "Arizona," acting for this purpose by the Colorado River Commission of Arizona, pursuant to Chapter 46 of the 1939 Session Laws of Arizona,

Witnesseth That:

EXPLANATORY RECITAL

2. Whereas, for the purpose of controlling floods, improving navigation, regulating the flow of the Colorado River, providing for storage and for the delivery of stored waters for the reclamation of public lands and other beneficial uses exclusively within the United States, the Secretary acting under and in pursuance of the provisions of the Colorado River Compact and Boulder Canyon Project Act, and acts amendatory thereof or supplementary thereto, has constructed and is now operating and maintaining in the main stream of the Colorado River at Black Canyon that certain structure known as and designated Boulder Dam and incidental works, creating thereby a reservoir designated Lake Mead of a capacity of about thirty-two million (32,000,000) acre-feet, and

3. Whereas, said Boulder Canyon Project Act provides that the Secretary under such general rules and regulations as he may prescribe, may contract for the storage of water in the reservoir created by Boulder Dam, and for the delivery of such water at such points on the river as may be agreed upon, for irrigation and domestic uses, and provides further that no person shall have or be entitled to have the use for any purpose of the water stored, as aforesaid, except by contract made as stated in said Act, and

4. Whereas, it is the desire of the parties to this contract to contract for the storage of water and the delivery thereof for irrigation of lands and domestic uses within Arizona, and

5. Whereas, nothing in this contract shall be construed as affecting the obligations of the United States to Indian tribes,

6. Now, Therefore, in consideration of the mutual covenants herein contained, the parties hereto agree as follows, to-wit:

DELIVERY OF WATER

7. (a) Subject to the availability thereof for use in Arizona under the provisions of the Colorado River Compact and the Boulder Canyon Project Act, the United States shall deliver and Arizona, or agencies or water users therein, will accept under this contract each calendar year from storage in Lake Mead, at a point or points of diversion on the Colorado River approved by the Secretary, so much water as may be necessary for the beneficial consumptive use for irrigation and domestic uses in Arizona of a maximum of 2,800,000 acre-feet.

(b) The United States also shall deliver from storage in Lake Mead for use in Arizona, at a point or points of diversion on the Colorado River approved by the Secretary, for the uses set forth in subdivision (a) of this Article, one-half of any excess or surplus waters unapportioned by

the Colorado River Compact to the extent such water is available for use in Arizona under said compact and said act, less such excess or surplus water unapportioned by said compact as may be used in Nevada, New Mexico, and Utah in accordance with the rights of said states as stated in subdivisions (f) and (g) of this Article.

(c) This contract is subject to the condition that Boulder Dam and Lake Mead shall be used: First, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses and satisfaction of perfected rights in pursuance of Article VIII of the Colorado River Compact; and third, for power. This contract is made upon the express condition and with the express covenant that the United States and Arizona, and agencies and water users therein, shall observe and be subject to and controlled by said Colorado River Compact and the Boulder Canyon Project Act in the construction, management, and operation of Boulder Dam, Lake Mead, canals and other works, and the storage, diversion, delivery and use of water for the generation of power, irrigation and other uses.

(d) The obligation to deliver water at or below Boulder Dam shall be diminished to the extent that consumptive uses now or hereafter existing in Arizona above Lake Mead diminish the flow into Lake Mead, and such obligation shall be subject to such reduction on account of evaporation, reservoir and river losses, as may be required to render this contract in conformity with said compact and said act.

(e) This contract is for permanent service, subject to the conditions stated in subdivision (c) of this Article, but as to the one-half of the waters of the Colorado River System unapportioned by paragraphs (a), (b), and (c) of Article III of the Colorado River Compact, such water is subject to further equitable apportionment at any time after October 1, 1963, as provided in Article III (f) and Article III (g) of the Colorado River Compact.

(f) Arizona recognizes the right of the United States and the State of Nevada to contract for the delivery from

storage in Lake Mead for annual beneficial consumptive use within Nevada for agricultural and domestic uses of 300,000 acre-feet of the water apportioned to the Lower Basin by the Colorado River Compact, and in addition thereto to make contract for like use of 1/25 (one twenty-fifth) of any excess or surplus waters available in the Lower Basin and unapportioned by the Colorado River Compact, which waters are subject to further equitable apportionment after October 1, 1963, as provided in Article III (f) and Article III (g) of the Colorado River Compact.

(g) Arizona recognizes the rights of New Mexico and Utah to equitable shares of the water apportioned by the Colorado River Compact to the Lower Basin and also water unapportioned by such compact, and nothing contained in this contract shall prejudice such rights.

(h) Arizona recognizes the right of the United States and agencies of the State of California to contract for storage and delivery of water from Lake Mead for beneficial consumptive use in California, provided that the aggregate of all such deliveries and uses in California from the Colorado River shall not exceed the limitation of such uses in that State required by the provisions of the Boulder Canyon Project Act and agreed to by the State of California by an act of its Legislature (Chapter 16, Statutes of California of 1929) upon which limitation the State of Arizona expressly relies.

(i) Nothing in this contract shall preclude the parties hereto from contracting for storage and delivery above Lake Mead of water herein contracted for, when and if authorized by law.

(j) As far as reasonable diligence will permit, the water provided for in this contract shall be delivered as ordered and as reasonably required for domestic and irrigation uses within Arizona. The United States reserves the right to discontinue or temporarily reduce the amount of water to be delivered, for the purpose of investigation and inspection, maintenance, repairs, replacements or installation of equipment or machinery at Boulder Dam, or other

dams heretofore or hereafter to be constructed, but so far as feasible will give reasonable notice in advance of such temporary discontinuance or reduction.

(k) The United States, its officers, agents and employees shall not be liable for damages when for any reason whatsoever suspensions or reductions in the delivery of water occur.

(l) Deliveries of water hereunder shall be made for use within Arizona to such individuals, irrigation districts, corporations or political subdivisions therein of Arizona as may contract therefor with the Secretary, and as may qualify under the Reclamation Law or other federal statutes or to lands of the United States within Arizona. All consumptive uses of water by users in Arizona, of water diverted from Lake Mead or from the main stream of the Colorado River below Boulder Dam, whether made under this contract or not, shall be deemed, when made, a discharge pro tanto of the obligation of this contract. Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this contract.

(m) Rights-of-way across public lands necessary or convenient for canals to facilitate the full utilization in Arizona of the water herein agreed to be delivered will be granted by the Secretary subject to applicable federal statutes.

POINTS OF DIVERSION; MEASUREMENTS OF WATER

8. The water to be delivered under this contract shall be measured at the points of diversion, or elsewhere as the Secretary may designate (with suitable adjustment for losses between said points of diversion and measurement), by measuring and controlling devices or automatic gauges approved by the Secretary, which devices, however, shall be furnished, installed, and maintained by Arizona, or the users of water therein in manner satisfactory to the Secretary; said measuring and controlling devices or automatic gauges shall be subject to the inspection of the

United States, whose authorized representatives may at all times have access to them, and any deficiencies found shall be promptly corrected by the users thereof. The United States shall be under obligation to deliver water only at diversion points where measuring and controlling devices or automatic gauges are maintained, in accordance with this contract, but in the event diversions are made at points where such devices are not maintained, the Secretary shall estimate the quantity of such diversions and his determination thereof shall be final.

CHARGES FOR STORAGE AND DELIVERY OF WATER

9. No charge shall be made for the storage or delivery of water at diversion points as herein provided necessary to supply present perfected rights in Arizona. A charge of 50¢ per acre-foot shall be made for all water actually diverted directly from Lake Mead during the Boulder Dam cost repayment period, which said charge shall be paid by the users of such water, subject to reduction by the Secretary in the amount of the charge if it is concluded by him at any time during said cost-repayment period that such charge is too high. After expiration of the cost-repayment period, charges shall be on such basis as may hereafter be prescribed by Congress. Charges for the storage or delivery of water diverted at a point or points below Boulder Dam, for users, other than those specified above, shall be as agreed upon between the Secretary and such users at the time of execution of contracts therefor, and shall be paid by such users; provided such charges shall, in no event, exceed 25¢ per acre-foot.

RESERVATIONS

10. Neither Article 7, nor any other provision of this contract, shall impair the right of Arizona and other states and the users of water therein to maintain, prosecute or defend any action respecting, and is without prejudice to, any of the respective contentions of said states and water

users as to (1) the intent, effect, meaning, and interpretation of said compact and said act; (2) what part, if any, of the water used or contracted for by any of of them falls within Article III (a) of the Colorado River Compact; (3) what part, if any, is within Article III (b) thereof; (4) what part if any, is excess or surplus waters unapportioned by said Compact; and (5) what limitations on use, rights of use and relative priorities exist as to the waters of the Colorado River system; provided, however, that by these reservations there is no intent to disturb the apportionment made by Article III (a) of the Colorado River Compact between the Upper Basin and the Lower Basin.

DISPUTES AND DISAGREEMENTS

11. Whenever a controversy arises out of this contract, and if the parties hereto then agree to submit the matter to arbitration, Arizona shall name one arbitrator and the Secretary shall name one arbitrator and the two arbitrators thus chosen shall meet within ten days after their selection and shall elect one other arbitrator within fifteen days after their first meeting, but in the event of their failure to name the third arbitrator within thirty days after their first meeting, such arbitrator not so selected shall be named by the Senior Judge of the United States Circuit Court of Appeals for the Tenth Circuit. The decision of any two of the three arbitrators thus chosen shall be a valid and binding award.

RULES AND REGULATIONS

12. The Secretary may prescribe and enforce rules and regulations governing the delivery and diversion of waters hereunder, but such rules and regulations shall be promulgated, modified, revised or extended from time to time only after notice to the State of Arizona and opportunity is given to it to be heard. Arizona agrees for itself, its agencies and water users that in the operation and maintenance of the works for diversion and use of the water to be delivered hereunder, all such rules and regulations will be fully adhered to.

AGREEMENT SUBJECT TO COLORADO RIVER COMPACT

13. This contract is made upon the express condition and with the express covenant that all rights of Arizona, its agencies and water users, to waters of the Colorado River and its tributaries, and the use of the same, shall be subject to and controlled by the Colorado River Compact signed at Santa Fe, New Mexico, November 24, 1922, pursuant to the Act of Congress approved August 19, 1921 (42 Stat. 171), as approved by the Boulder Canyon Project Act.

EFFECTIVE DATE OF CONTRACT

14. This contract shall be of no effect unless it is unconditionally ratified by an Act of the Legislature of Arizona, within three years from the date hereof, and further, unless within three years from the date hereof the Colorado River Compact is unconditionally ratified by Arizona. When both ratifications are effective, this contract shall be effective.

INTEREST IN CONTRACT NOT TRANSFERABLE

15. No interest in or under this contract, except as provided by Article 7 (1), shall be transferable by either party without the written consent of the other.

APPROPRIATION CLAUSE

16. The performance of this contract by the United States is contingent upon Congress making the necessary appropriations for expenditures for the completion and the operation and maintenance of any dams, power plants or other works necessary to the carrying out of this contract, or upon the necessary allotments being made therefor by any authorized federal agency. No liability shall accrue against the United States, its officers, agents or employees by reason of the failure of Congress to make

any such appropriations or of any federal agency to make such allotments.

MEMBER OF CONGRESS CLAUSE

17. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract if made with a corporation or company for its general benefit.

DEFINITIONS

18. Wherever terms used herein are defined in Article II of the Colorado River Compact or in Section 12 of the Boulder Canyon Project Act, such definitions shall apply in construing this contract.

19. In Witness Whereof, the parties hereto have caused this contract to be executed the day and year first above written.

THE NEVADA CONTRACT

Contract for Delivery of Water

1. THIS CONTRACT, made this 30th day of March, nineteen hundred forty-two, pursuant to the Act of Congress approved June 17, 1902 (32 Stat. 388), and acts amendatory thereof or supplementary thereto, all of which acts are commonly known and referred to as the Reclamation Law, and particularly pursuant to the Act of Congress approved December 21, 1928 (45 Stat. 1057), designated the Boulder Canyon Project Act, and acts amendatory thereof or supplementary thereto, between THE UNITED STATES OF AMERICA (hereinafter referred to as "United States"), acting for this purpose by Harold L. Ickes, Secretary of the Interior (hereinafter referred to as the "Secretary"), and the STATE OF NEVADA, a body politic and corporate, and its Colorado River Commission (said Commission acting in the name of the State, but as principal in its own behalf as well as in behalf of the State; the term State as used in this contract being deemed to be both the State of Nevada and its Colorado River Commission), acting in pursuance of an act of the Legislature of the State of Nevada, entitled "An Act creating a commission to be known as the Colorado River commission of Nevada, defining its powers and duties, and making an appropriation for the expenses thereof, and repealing all acts and parts of acts in conflict with this act," approved March 20, 1935 (Chapter 71, Stats. of Nevada, 1935);

Witnesseth That:

EXPLANATORY RECITALS

2. WHEREAS, for the purpose of controlling floods, improving navigation, regulating the flow of the Colorado River, providing for storage and for the delivery of stored waters for the reclamation of public lands and other beneficial uses exclusively within the United States, the Secre-

tary, acting under and in pursuance of the provisions of the Colorado River Compact and the Boulder Canyon Project Act, and acts amendatory thereof or supplementary thereto, has constructed and is now operating and maintaining in the main stream of the Colorado River at Black Canyon that certain structure known as and designated Boulder Dam and incidental works, creating thereby a reservoir designated Lake Mead; and

3. WHEREAS, the State is desirous of entering into a contract for the delivery to it of water from Lake Mead:

4. NOW, THEREFORE, in consideration of the mutual covenants herein contained, the parties hereto agree as follows, to-wit:

DELIVERY OF WATER BY THE UNITED STATES

5. (a) Subject to the availability thereof for use in Nevada under the provisions of the Colorado River Compact and the Boulder Canyon Project Act, the United States shall, from storage in Lake Mead, deliver to the State each year at a point or points to be selected by the State and approved by the Secretary, so much water as may be necessary to supply the State a total quantity not to exceed One Hundred Thousand (100,000) acre-feet each calendar year. The right of the State to contract for the delivery to it from storage in Lake Mead of additional water is not limited by this contract. Said water may be used only within the State of Nevada, exclusively for irrigation, household, stock, municipal, mining, milling, industrial, and other like purposes, but shall not be used for the generation of electric power.

(b) Water agreed to be delivered to the State hereunder shall be delivered continuously as far as reasonable diligence will permit, but the United States shall not be obligated to deliver water to the State when for any reason, as conclusively but not arbitrarily determined by the Secretary, such delivery would interfere with the use of Boulder Dam or Lake Mead for river regulation, improvement of navigation, flood control, and/or satisfaction of perfected rights, in or to the waters of the Colorado River, or

its tributaries, in pursuance of Article VIII of the Colorado River Compact.

(c) The United States reserves the right, for the purpose of investigation, inspection, maintenance, repairs and replacement or installation of equipment or machinery at Boulder Dam, to discontinue temporarily or reduce the amount of water to be delivered hereunder, but so far as feasible the United States will give the State reasonable notice in advance of such temporary discontinuance or reduction. The United States, its officers, agents and employees shall not be liable for damages when, for any reason whatsoever, suspensions or reductions in delivery of water occur.

(d) This contract is for permanent service, and is made subject to the express condition that the State, upon request of the Secretary, shall submit in writing prior to January 1st of any year, an estimate of the amount of water to be required under this contract for the succeeding calendar year.

RECEIPT OF WATER BY THE STATE

6. The State shall receive the water to be diverted by or delivered to it by the United States under the terms hereof at the point or points of delivery to be hereafter designated as stated in the next preceding article hereof, and shall perform all acts required by law or custom in order to maintain control over such water and to secure and maintain its lawful use and proper diversion from Lake Mead. The diversion and conveyance of such water to places of use shall be without expense to the United States.

MEASUREMENT OF WATER

7. The water to be delivered to the State hereunder shall be measured at the point or points of diversion from Lake Mead, or at such point or points in any works used by the State to convey water from Lake Mead to its place or places of use as shall be satisfactory to the Secretary, and by such measuring and controlling devices or such auto-

matic gauges or otherwise as shall be satisfactory to the Secretary. Said measuring and controlling devices, or automatic gauges shall be furnished, installed, and maintained in manner satisfactory to the Secretary, by and at the expense of the State, but they shall be and remain at all times under the complete control of the United States. The State's authorized representative shall be allowed access at all times to said measuring and controlling devices or automatic gauges.

RECORD OF WATER DIVERTED

8. The State shall make full and complete written monthly reports as directed by the Secretary on forms to be supplied by the United States of all water delivered to or diverted by the State from Lake Mead. Such reports shall be made by the fifth day of the month immediately succeeding the month in which the water is diverted.

CHARGE FOR DELIVERY OF WATER

9. A charge of fifty cents (\$0.50) per acre-foot shall be made for the diversion by or delivery of water to the State hereunder during the Boulder Dam cost-repayment period, subject to reduction by the Secretary in the amount of the charge if studies show to his satisfaction that the charge is too high. Thereafter, charges shall be on such basis as may hereafter be prescribed by the Congress. Charges shall be made against the State only for the number of acre-feet of water actually delivered to or diverted by it from Lake Mead.

BILLING AND PAYMENTS

10. The State shall pay monthly for all water delivered to it hereunder, or diverted by it from Lake Mead, in accordance with the charge in Article nine (9) hereof established. The United States will submit bills to the State by the tenth day of each month immediately following the

month during which the water is delivered or diverted and payments shall be due on the first day of the month immediately succeeding. If such charges are not paid when due, an interest charge of one per centum (1%) of the amount unpaid shall be added thereto as liquidated damages and, thereafter, as further liquidated damages, an additional interest charge of one per centum (1%) of the principal sum unpaid shall be added on the first day of each succeeding calendar month until the amount due, including such interest, is paid in full.

REFUSAL OF WATER IN CASE OF DEFAULT

11. The United States reserves the right to refuse to deliver water to the State, or to permit water to be diverted by the State from Lake Mead, in the event of default for a period of more than twelve (12) months in any payment due or to become due to the United States under this contract.

INSPECTION BY THE UNITED STATES

12. The Secretary or his representatives shall at all times have the right of ingress to and egress from all works of the State for the purpose of inspection, repairs, and maintenance of works of the United States, and for all other proper purposes. In each contract made by the State for the redelivery of any part of the water agreed to be delivered to the State hereunder, it shall be provided, for the use and benefit of the United States, that the authorized representatives of the United States shall at all times have access to measuring and controlling devices, or automatic gauges, over the lands and rights of way of the contractee. The Secretary or his representatives shall also have free access at all reasonable times to the books and records of the State relating to the diversion and distribution of water delivered to or diverted by the State from Lake Mead with the right at any time during office hours to make copies of or from the same.

RULES AND REGULATIONS

13. There is reserved to the Secretary the right to prescribe and enforce rules and regulations governing the delivery and diversion of water hereunder. Such rules and regulations may be modified, revised, and/or extended from time to time after notice to the State and opportunity for it to be heard, as may be deemed proper, necessary, or desirable by the Secretary to carry out the true intent and meaning of the law and of this contract, or amendments hereof, or to protect the interests of the United States. The State hereby agrees that in the operation and maintenance of its diversion works and conduits, all such rules and regulations will be fully adhered to.

AGREEMENT SUBJECT TO COLORADO RIVER COMPACT

14. This contract is made upon the express condition and with the express understanding that all rights hereunder shall be subject to and controlled by the Colorado River Compact, being the compact or agreement signed at Santa Fe, New Mexico, November 24, 1922, pursuant to an Act of Congress approved August 19, 1921, entitled "An Act to permit a compact or agreement between the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming, respecting the disposition and apportionment of the waters of the Colorado River, and for other purposes," which compact was approved in section 13 (a) of the Boulder Canyon Project Act.

PRIORITY OF CLAIMS OF THE UNITED STATES

15. Claims of the United States arising out of this contract shall have priority over all others, secured or unsecured.

CONTRACT CONTINGENT UPON APPROPRIATIONS

16. This contract is subject to appropriations being made by Congress from time to time of money sufficient to provide for the doing and performance of all things on the

part of the United States to be done and performed under the terms hereof, and to there being sufficient money available in the Colorado River Dam fund for such purposes. No liability shall accrue against the United States, its officers, agents or employees, by reason of sufficient money not being so appropriated, or on account of there not being sufficient money in the Colorado River Dam fund for such purposes.

EFFECT OF WAIVER OF BREACH OF CONTRACT

17. All rights of action for breach of any of the provisions of this contract are reserved to the United States as provided in Section 3737 of the Revised Statutes of the United States. The waiver of a breach of any of the provisions of this contract shall not be deemed to be a waiver of any provision hereof, or of any other subsequent breach of any provision hereof.

REMEDIES UNDER CONTRACT NOT EXCLUSIVE

18. Nothing contained in this contract shall be construed as in any manner abridging, limiting, or depriving the United States or the State of any means of enforcing any remedy either at law or in equity for the breach of any of the provisions hereof which it would otherwise have.

TRANSFER OF INTEREST IN CONTRACT

19. No voluntary transfer of this contract, or of the rights of the State hereunder, shall be made without the written approval of the Secretary; and any successor or assign of the rights of the State, whether by voluntary transfer, judicial sale, trustee's sale, or otherwise, shall be subject to all the conditions of the Boulder Canyon Project Act, and also subject to all the provisions and conditions of this contract to the same extent as though such successor or assign were the original contractor hereunder; provided,

that the execution of a mortgage or trust deed, or judicial or trustee's sale made thereunder, shall not be deemed a voluntary transfer within the meaning of this Article.

NOTICES

20. (a) Any notice, demand or request required or authorized by this contract to be given or made to or upon the United States shall be delivered, or mailed postage prepaid, to the Director of Power, United States Bureau of Reclamation, Boulder City, Nevada, except where, by the terms hereof, the same is to be given or made to or upon the Secretary, in which event it shall be delivered, or mailed postage prepaid, to the Secretary, at Washington, D. C.

(b) Any notice, demand or request required or authorized by this contract to be given or made to or upon the State shall be delivered, or mailed postage prepaid, to the Secretary of the Colorado River Commission of Nevada, Carson City, Nevada.

(c) The designation of any person specified in this article or in any such request for notice, or the address of any such person, may be changed at any time by notice given in the same manner as provided in this article for other notices.

OFFICIALS NOT TO BENEFIT

21. No Member of or Delegate to Congress or Resident Commissioner shall be admitted to any share or part of this contract or to any benefit that may arise herefrom, but this restriction shall not be construed to extend to this contract if made with a corporation or company for its general benefit.

UNCONTROLLABLE FORCES

22. Neither party shall be considered to be in default in respect to any obligation hereunder, if prevented from fulfilling such obligation by reason of uncontrollable forces, the term "uncontrollable forces" being deemed, for the

purposes of this contract, to mean any cause beyond the control of the party affected, including but not limited to inadequacy of water, failure of facilities, flood, earthquake, storm, lightning, fire, epidemic, war, riot, civil disturbance, labor disturbance, sabotage, and restraint by court or public authority, which by exercise of due diligence and foresight, such party could not reasonably have been expected to avoid. Either party rendered unable to fulfill any obligation by reason of uncontrollable forces shall exercise due diligence to remove such inability with all reasonable dispatch.

IN WITNESS WHEREOF, the parties hereto have caused this contract to be executed the day and year first above written.

THE CONVENTION OF 1906

Concluded at Washington May 21, 1906; ratified by the President of the United States, December 26, 1908; ratifications exchanged January 16, 1907; proclaimed by the President of the United States January 16, 1907.

The United States of America and the United States of Mexico being desirous to provide for the equitable distribution of the waters of the Rio Grande for irrigation purposes, and to remove all causes of controversy between them in respect thereto, and being moved by considerations of international comity, have resolved to conclude a Convention for these purposes and have named as their Plenipotentiaries:

The President of the United States of America, Elihu Root, Secretary of State of the United States; and

The President of the United States of Mexico, His Excellency Senor Don Joaquin D. Casasus, Ambassador Extraordinary and Plenipotentiary of the United States of Mexico at Washington;

Who, after having exhibited their respective full powers, which were found to be in good and due form, have agreed upon the following articles:

ARTICLE I

After the completion of the proposed storage dam near Engle, New Mexico, and the distributing system auxiliary thereto, and as soon as water shall be available in said system for the purpose, the United States shall deliver to Mexico a total of 60,000 acre-feet of water annually, in the bed of the Rio Grande at the point where the head works of the Acequia Madre, known as the Old Mexican Canal, now exist above the city of Juarez, Mexico.

ARTICLE II

The delivery of the said amount of water shall be assured by the United States and shall be distributed through the year in the same proportions as the water supply pro-

posed to be furnished from the said irrigation system to lands in the United States in the vicinity of El Paso, Texas, according to the following schedule, as nearly as may be possible:

	Acre-feet per month	Corresponding cubic feet of water
January	0	0
February	1,090	47,480,400
March	5,460	237,837,600
April	12,000	522,720,000
May	12,000	522,720,000
June	12,000	522,720,000
July	8,180	356,320,800
August	4,370	190,357,200
September	3,270	142,441,200
October	1,090	47,480,400
November	540	23,522,400
December	0	0
Total for the year.....	60,000	2,613,600,000

In case, however, of extraordinary drought or serious accident to the irrigation system in the United States, the amount delivered to the Mexican Canal shall be diminished in the same proportion as the water delivered to lands under said irrigation system in the United States.

ARTICLE III

The said delivery shall be made without cost to Mexico, and the United States agrees to pay the whole cost of storing the said quantity of water to be delivered to Mexico, of conveying the same to the international line, of measuring the said water, and of delivering it in the river bed above the head of the Mexican Canal. It is understood that the United States assumes no obligation beyond the delivering of the water in the bed of the river above the head of the Mexican Canal.

ARTICLE IV

The delivery of water as herein provided is not to be construed as a recognition by the United States of any claim on the part of Mexico to the said waters; and it is agreed that in consideration of such delivery of water, Mexico waives any and all claims to the waters of the Rio

Grande for any purpose whatever between the head of the present Mexican Canal and Fort Quitman, Texas, and also declares fully settled and disposed of, and hereby waives, all claims heretofore asserted or existing, or that may hereafter arise, or be asserted, against the United States on account of any damages alleged to have been sustained by the owners of land in Mexico, by reason of the diversion by citizens of the United States of waters of the Rio Grande.

ARTICLE V

The United States, in entering into this treaty, does not thereby concede, expressly or by implication, any legal basis for any claims heretofore asserted or which may be hereafter asserted by reason of any losses incurred by the owners of land in Mexico due or alleged to be due to the diversion of the waters of the Rio Grande within the United States; nor does the United States in any way concede the establishment of any general principle or precedent by the concluding of this treaty. The understanding of both parties is that the arrangement contemplated by this treaty extends only to the portion of the Rio Grande which forms the international boundary, from the head of the Mexican Canal down to Fort Quitman, Texas, and in no other case.

ARTICLE VI

The present Convention shall be ratified by both contracting parties in accordance with their constitutional procedure, and the ratifications shall be exchanged at Washington as soon as possible.

In witness whereof, the respective Plenipotentiaries have signed the Convention both in the English and Spanish languages and have thereunto affixed their seals.

Done in duplicate at the City of Washington, this 21st day of May, one thousand nine hundred and six.

THE TREATY

Treaty Between the United States and Mexico, Relating to Waters of the Colorado and Tijuana Rivers and of the Rio Grande.

The Government of the United States of America and the Government of the United Mexican States: animated by the sincere spirit of cordiality and friendly cooperation which happily governs the relations between them; taking into account the fact that Articles VI and VII of the Treaty of Peace, Friendship and Limits between the United States of America and the United Mexican States signed at Guadalupe Hidalgo on February 2, 1848, and Article IV of the boundary treaty between the two countries signed at the City of Mexico December 30, 1853 regulate the use of the waters of the Rio Grande (Rio Bravo) and the Colorado River for purposes of navigation only; considering that the utilization of these waters for other purposes is desirable in the interest of both countries, and desiring, moreover, to fix and delimit the rights of the two countries with respect to the waters of the Colorado and Tijuana Rivers, and of the Rio Grande (Rio Bravo) from Fort Quitman, Texas, United States of America, to the Gulf of Mexico, in order to obtain the most complete and satisfactory utilization thereof, have resolved to conclude a treaty and for this purpose have named as their plenipotentiaries:

The President of the United States of America:

Cordell Hull, Secretary of State of the United States of America, George S. Messersmith, Ambassador Extraordinary and Plenipotentiary of the United States of America in Mexico, and Lawrence M. Lawson, United States Commissioner, International Boundary Commission, United States and Mexico; and

The President of the United Mexican States:

Francisco Castillo Najera, Ambassador Extraordinary and Plenipotentiary of the United Mexican States in Washington, and Rafael Fernandez MacGregor, Mexican Commissioner, International Boundary Commission, United States and Mexico; who, having communicated to each other their respective Full Powers and having found them in good and due form, have agreed upon the following:

1—PRELIMINARY PROVISIONS

ARTICLE 1

For the purposes of this Treaty it shall be understood that:

(a) "The United States" means the United States of America.

(b) "Mexico" means the United Mexican States.

(c) "The Commission" means the International Boundary and Water Commission, United States and Mexico, as described in Article 2 of this Treaty.

(d) "To divert" means the deliberate act of taking water from any channel in order to convey it elsewhere for storage, or to utilize it for domestic, agricultural, stock-raising or industrial purposes whether this be done by means of dams across the channel, partition weirs, lateral intakes, pumps or any other methods.

(e) "Point of diversion" means the place where the act of diverting the water is effected.

(f) "Conservation capacity of storage reservoirs" means that part of their total capacity devoted to holding and conserving the water for disposal thereof as and when required, that is, capacity additional to that provided for silt retention and flood control.

(g) "Flood discharges and spills" means the voluntary or involuntary discharge of water for flood control as distinguished from releases for other purposes.

(h) "Return flow" means that portion of diverted water that eventually finds its way back to the source from which it was diverted.

(i) "Release" means the deliberate discharge of stored water for conveyance elsewhere or for direct utilization.

(j) "Consumptive use" means the use of water by evaporation, plant transpiration or other manner whereby the water is consumed and does not return to its source of supply. In general it is measured by the amount of water diverted less the part thereof which returns to the stream.

(k) “Lowest major international dam or reservoir” means the major international dam or reservoir situated farthest downstream.

(l) “Highest major international dam or reservoir” means the major international dam or reservoir situated farthest upstream.

ARTICLE 2

The International Boundary Commission established pursuant to the provisions of the Convention between the United States and Mexico signed in Washington March 1, 1889 to facilitate the carrying out of the principles contained in the Treaty of November 12, 1884 and to avoid difficulties occasioned by reason of the changes which take place in the beds of the Rio Grande (Rio Bravo) and the Colorado River shall hereafter be known as the International Boundary and Water Commission, United States and Mexico, which shall continue to function for the entire period during which the present Treaty shall continue in force. Accordingly, the term of the Convention of March 1, 1889 shall be considered to be indefinitely extended, and the Convention of November 21, 1900 between the United States and Mexico regarding that Convention shall be considered completely terminated.

The application of the present Treaty, the regulation and exercise of the rights and obligations which the two Governments assume thereunder, and the settlement of all disputes to which its observance and execution may give rise are hereby entrusted to the International Boundary and Water Commission, which shall function in conformity with the powers and limitations set forth in this Treaty.

The Commission shall in all respects have the status of an international body, and shall consist of a United States Section and a Mexican Section. The head of each Section shall be an Engineer Commissioner. Wherever there are provisions in this Treaty for joint action or joint agreement by the two Governments, or for the furnishing of reports, studies or plans to the two Governments, or similar provisions, it shall be understood that the particular

matter in question shall be handled by or through the Department of State of the United States and the Ministry of Foreign Relations of Mexico.

The Commission or either of its two Sections may employ such assistants and engineering and legal advisers as it may deem necessary. Each Government shall accord diplomatic status to the Commissioner, designated by the other Government. The Commissioner, two principal engineers, a legal adviser, and a secretary, designated by each Government as members of its Section of the Commission, shall be entitled in the territory of the other country to the privileges and immunities appertaining to diplomatic officers. The Commission and its personnel may freely carry out their observations, studies and field work in the territory of either country.

The jurisdiction of the Commission shall extend to the limitrophe parts of the Rio Grande (Rio Bravo) and the Colorado River, to the land boundary between the two countries, and to works located upon their common boundary, each Section of the Commission retaining jurisdiction over that part of the works located within the limits of its own country. Neither Section shall assume jurisdiction or control over works located within the limits of the country of the other without the express consent of the Government of the latter. The works constructed, acquired or used in fulfillment of the provisions of this Treaty and located wholly within the territorial limits of either country, although these works may be international in character, shall remain, except as herein otherwise specifically provided, under the exclusive jurisdiction and control of the Section of the Commission in whose country the works may be situated.

The duties and powers vested in the Commission by this Treaty shall be in addition to those vested in the International Boundary Commission by the Convention of March 1, 1889 and other pertinent treaties and agreements in force between the two countries except as the provisions of any of them may be modified by the present Treaty.

Each Government shall bear the expenses incurred in

the maintenance of its Section of the Commission. The joint expenses, which may be incurred as agreed upon by the Commission, shall be borne equally by the two Governments.

ARTICLE 3

In matters in which the Commission may be called upon to make provision for the joint use of international waters, the following order of preferences shall serve as a guide:

1. Domestic and municipal uses.
2. Agriculture and stock-raising.
3. Electric power.
4. Other industrial uses.
5. Navigation.
6. Fishing and hunting.
7. Any other beneficial uses which may be determined by the Commission.

All of the foregoing uses shall be subject to any sanitary measures or works which may be mutually agreed upon by the two Governments, which hereby agree to give preferential attention to the solution of all border sanitation problems.

II—RIO GRANDE (RIO BRAVO)

ARTICLE 4

The waters of the Rio Grande (Rio Bravo) between Fort Quitman, Texas, and the Gulf of Mexico are hereby allotted to the two countries in the following manner:

A. To Mexico:

(a) All of the waters reaching the main channel of the Rio Grande (Rio Bravo) from the San Juan and Alamo Rivers, including the return flow from the lands irrigated from the latter two rivers.

(b) One-half of the flow in the main channel of the Rio Grande (Rio Bravo) below the lowest major international storage dam, so far as said flow is not specifically allotted under this Treaty to either of the two countries.

(c) Two-thirds of the flow reaching the main channel of the Rio Grande (Rio Bravo) from the Conchos, San Diego, San Rodrigo, Escondido and Salado Rivers and the Las Vacas Arroyo, subject to the provisions of subparagraph (c) of paragraph B of this Article.

(d) One-half of all other flows not otherwise allotted by this Article occurring in the main channel of the Rio Grande (Rio Bravo), including the contributions from all the unmeasured tributaries, which are those not named in this Article, between Fort Quitman and the lowest major international storage dam.

B. To the United States:

(a) All of the waters reaching the main channel of the Rio Grande (Rio Bravo) from the Pecos and Devils Rivers, Goodenough Spring, and Alamito, Terlingua, San Felipe and Pinto Creeks.

(b) One-half of the flow in the main channel of the Rio Grande (Rio Bravo) below the lowest major international storage dam, so far as said flow is not specifically allotted under this Treaty to either of the two countries.

(c) One-third of the flow reaching the main channel of the Rio Grande (Rio Bravo) from the Conchos, San Diego, San Rodrigo, Escondido and Salado Rivers and the Las Vacas Arroyo, provided that this third shall not be less, as an average amount in cycles of five consecutive years, than 350,000 acre-feet (431,721,000 cubic meters) annually. The United States shall not acquire any right by the use of the waters of the tributaries named in this subparagraph, in excess of the said 350,000 acre-feet (431,721,000 cubic meters) annually, except the right to use one-third of the flow reaching the Rio Grande (Rio Bravo) from said tributaries, although such one-third may be in excess of that amount.

(d) One-half of all other flows not otherwise allotted by this Article occurring in the main channel of the Rio Grande (Rio Bravo), including the contribu-

tions from all the unmeasured tributaries, which are those not named in this Article, between Fort Quitman and the lowest major international storage dam.

In the event of extraordinary drought or serious accident to the hydraulic systems on the measured Mexican tributaries, making it difficult for Mexico to make available the run-off of 350,000 acre-feet (431,721,000 cubic meters) annually, allotted in subparagraph (c) of paragraph B of this Article to the United States as the minimum contribution from the aforesaid Mexican tributaries, any deficiencies existing at the end of the aforesaid five-year cycle shall be made up in the following five-year cycle with water from the said measured tributaries.

Whenever the conservation capacities assigned to the United States in at least two of the major international reservoirs, including the highest major reservoir, are filled with waters belonging to the United States, a cycle of five years shall be considered as terminated and all debits fully paid, whereupon a new five-year cycle shall commence.

ARTICLE 5

The two Governments agree to construct jointly, through their respective Sections of the Commission, the following works in the main channel of the Rio Grande (Rio Bravo):

I. The dams required for the conservation, storage and regulation of the greatest quantity of the annual flow of the river in a way to ensure the continuance of existing uses and the development of the greatest number of feasible projects, within the limits imposed by the water allotments specified.

II. The dams and other joint works required for the diversion of the flow of the Rio Grande (Rio Bravo).

One of the storage dams shall be constructed in the section between Santa Helena Canyon and the mouth of the Pecos River; one in the section between Eagle Pass and Laredo, Texas (Piedras Negras and Nuevo Laredo in Mexico); and a third in the section between Laredo and Roma,

Texas (Nuevo Laredo and San Pedro de Roma in Mexico). One or more of the stipulated dams may be omitted, and others than those enumerated may be built, in either case as may be determined by the Commission, subject to the approval of the two Governments.

In planning the construction of such dams the Commission shall determine:

- (a) The most feasible sites;
- (b) The maximum feasible reservoir capacity at each site;
- (c) The conservation capacity required by each country at each site, taking into consideration the amount and regimen of its allotment of water and its contemplated uses;
- (d) The capacity required for retention of silt;
- (e) The capacity required for flood control.

The conservation and silt capacities of each reservoir shall be assigned to each country in the same proportion as the capacities required by each country in such reservoir for conservation purposes. Each country shall have an undivided interest in the flood control capacity of each reservoir.

The construction of the international storage dams shall start within two years following the approval of the respective plans by the two Governments. The works shall begin with the construction of the lowest major international storage dam, but works in the upper reaches of the river may be constructed simultaneously. The lowest major international storage dam shall be completed within a period of eight years from the date of the entry into force of this Treaty.

The construction of the dams and other joint works required for the diversion of the flows of the river shall be initiated on the dates recommended by the Commission and approved by the two Governments.

The cost of construction, operation and maintenance of each of the international storage dams shall be prorated between the two Governments in proportion to the capacity

allotted to each country for conservation purposes in the reservoir at such dam.

The cost of construction, operation and maintenance of each of the dams and other joint works required for the diversion of the flows of the river shall be prorated between the two Governments in proportion to the benefits which the respective countries receive therefrom, as determined by the Commission and approved by the two Governments.

ARTICLE 6

The Commission shall study, investigate, and prepare plans for flood control works, where and when necessary, other than those referred to in Article 5 of this Treaty, on the Rio Grande (Rio Bravo) from Fort Quitman, Texas, to the Gulf of Mexico. These works may include levees along the river, floodways and grade-control structures, and works for the canalization, rectification and artificial channeling of reaches of the river. The Commission shall report to the two Governments the works which should be built, the estimated cost thereof, the part of the works to be constructed by each Government, and the part of the works to be operated and maintained by each Section of the Commission. Each Government agrees to construct, through its Section of the Commission, such works as may be recommended by the Commission and approved by the two Governments. Each Government shall pay the costs of the works constructed by it and the costs of operation and maintenance of the part of the works assigned to it for such purpose.

ARTICLE 7

The Commission shall study, investigate and prepare plans for plants for generating hydro-electric energy which it may be feasible to construct at the international storage dams on the Rio Grande (Rio Bravo). The Commission shall report to the two Governments in a Minute the works which should be built, the estimated cost thereof, and the part of the works to be constructed by each Government. Each Government agrees to construct, through its Section

of the Commission, such works as may be recommended by the Commission and approved by the two Governments. Both Governments, through their respective Sections of the Commission, shall operate and maintain jointly such hydroelectric plants. Each Government shall pay half the cost of the construction, operation and maintenance of such plants, and the energy generated shall be assigned to each country in like proportion.

ARTICLE 8

The two Governments recognize that both countries have a common interest in the conservation and storage of waters in the international reservoirs and in the maximum use of these structures for the purpose of obtaining the most beneficial, regular and constant use of the waters belonging to them. Accordingly, within the year following the placing in operation of the first of the major international dams which is constructed, the Commission shall submit to each Government for its approval, regulations for the storage, conveyance and delivery of the waters of the Rio Grande (Rio Bravo) from Fort Quitman, Texas, to the Gulf of Mexico. Such regulations may be modified, amended or supplemented when necessary by the Commission, subject to the approval of the two Governments. The following general rules shall severally govern until modified or amended by agreement of the Commission, with the approval of the two Governments:

(a) Storage in all major international reservoirs above the lowest shall be maintained at the maximum possible water level, consistent with flood control, irrigation use and power requirements.

(b) Inflows to each reservoir shall be credited to each country in accordance with the ownership of such inflows.

(c) In any reservoir the ownership of water belonging to the country whose conservation capacity therein is filled, and in excess of that needed to keep it filled, shall pass to the other country to the extent that such country may have unfilled conservation capacity, except that one country may at its option temporarily use the conservation capacity of

the other country not currently being used in any of the upper reservoirs; provided that in the event of flood discharge or spill occurring while one country is using the conservation capacity of the other, all of such flood discharge or spill shall be charged to the country using the other's capacity, and all inflow shall be credited to the other country until the flood discharge or spill ceases or until the capacity of the other country becomes filled with its own water.

(d) Reservoir losses shall be charged in proportion to the ownership of water in storage. Releases from any reservoir shall be charged to the country requesting them, except that releases for the generation of electrical energy, or other common purpose, shall be charged in proportion to the ownership of water in storage.

(e) Flood discharges and spills from the upper reservoirs shall be divided in the same proportion as the ownership of the inflows occurring at the time of such flood discharges and spills, except as provided in subparagraph (c) of this Article. Flood discharges and spills from the lowest reservoir shall be divided equally, except that one country, with the consent of the Commission, may use such part of the share of the other country as is not used by the latter country.

(f) Either of the two countries may avail itself, whenever it so desires, of any water belonging to it and stored in the international reservoirs, provided that the water so taken is for direct beneficial use or for storage in other reservoirs. For this purpose the Commissioner of the respective country shall give appropriate notice to the Commission, which shall prescribe the proper measures for the opportune furnishing of the water.

ARTICLE 9

(a) The channel of the Rio Grande (Rio Bravo) may be used by either of the two countries to convey water belonging to it.

(b) Either of the two countries may, at any point on the main channel of the river from Fort Quitman, Texas,

to the Gulf of Mexico, divert and use the water belonging to it and may for this purpose construct any necessary works. However, no such diversion or use, not existing on the date this Treaty enters into force, shall be permitted in either country, nor shall works be constructed for such purpose, until the Section of the Commission in whose country the diversion or use is proposed has made a finding that the water necessary for such diversion or use is available from the share of that country, unless the Commission has agreed to a greater diversion or use as provided by paragraph (d) of this Article. The proposed use and the plans for the diversion works to be constructed in connection therewith shall be previously made known to the Commission for its information.

(c) Consumptive uses from the main stream and from the unmeasured tributaries below Fort Quitman shall be charged against the share of the country making them.

(d) The Commission shall have the power to authorize either country to divert and use water not belonging entirely to such country, when the water belonging to the other country can be diverted and used without injury to the latter and can be replaced at some other point on the river.

(e) The Commission shall have the power to authorize temporary diversion and use by one country of water belonging to the other, when the latter does not need it or is unable to use it, provided that such authorization or the use of such water shall not establish any right to continue to divert it.

(f) In case of the occurrence of an extraordinary drought in one country with an abundant supply of water in the other country, water stored in the international storage reservoirs and belonging to the country enjoying such abundant water supply may be withdrawn, with the consent of the Commission, for the use of the country undergoing the drought.

(g) Each country shall have the right to divert from the main channel of the river any amount of water, includ-

ing the water belonging to the other country, for the purpose of generating hydroelectric power, provided that such diversion causes no injury to the other country and does not interfere with the international generation of power and that the quantities not returning directly to the river are charged against the share of the country making the diversion. The feasibility of such diversions not existing on the date this Treaty enters into force shall be determined by the Commission, which shall also determine the amount of water consumed, such water to be charged against the country making the diversion.

(h) In case either of the two countries shall construct works for diverting into the main channel of the Rio Grande (Rio Bravo) or its tributaries waters that do not at the time this Treaty enters into force contribute to the flow of the Rio Grande (Rio Bravo) such water shall belong to the country making such diversion.

(i) Main stream channel losses shall be charged in proportion to the ownership of water being conveyed in the channel at the times and places of the losses.

(j) The Commission shall keep a record of the waters belonging to each country and of those that may be available at a given moment, taking into account the measurement of the allotments, the regulation of the waters in storage, the consumptive uses, the withdrawals, the diversions, and the losses. For this purpose the Commission shall construct, operate and maintain on the main channel of the Rio Grande (Rio Bravo), and each Section shall construct, operate and maintain on the measured tributaries in its own country, all the gaging stations and mechanical apparatus necessary for the purpose of making computations and of obtaining the necessary data for such record. The information with respect to the diversions and consumptive uses on the unmeasured tributaries shall be furnished to the Commission by the appropriate Section. The cost of construction of any new gaging stations located on the main channel of the Rio Grande (Rio Bravo) shall be borne equally by the two Governments. The operation and main-

tenance of all gaging stations or the cost of such operation and maintenance shall be apportioned between the two Sections in accordance with determinations to be made by the Commission.

III—COLORADO RIVER

ARTICLE 10

Of the waters of the Colorado River, from any and all sources, there are allotted to Mexico:

(a) A guaranteed annual quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) to be delivered in accordance with the provisions of Article 15 of this Treaty.

(b) Any other quantities arriving at the Mexican points of diversion, with the understanding that in any year in which, as determined by the United States Section, there exists a surplus of waters of the Colorado River in excess of the amount necessary to supply users in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually to Mexico, the United States undertakes to deliver to Mexico, in the manner set out in Article 15 of this Treaty, additional waters of the Colorado River system to provide a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters) a year. Mexico shall acquire no right beyond that provided by this subparagraph by the use of the waters of the Colorado River system, for any purpose whatsoever, in excess of 1,500,000 acre-feet (1,850,234,000 cubic meters) annually.

In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) a year, the water allotted to Mexico under subparagraph (a) of this Article will be reduced in the same proportion as consumptive uses in the United States are reduced.

ARTICLE 11

(a) The United States shall deliver all waters allotted to Mexico wherever these waters may arrive in the bed of the limitrophe section of the Colorado River, with the exceptions hereinafter provided. Such waters shall be made up of the waters of the said river, whatever their origin, subject to the provisions of the following paragraphs of this Article.

(b) Of the waters of the Colorado River allotted to Mexico by subparagraph (a) of Article 10 of this Treaty, the United States shall deliver, wherever such waters may arrive in the limitrophe section of the river, 1,000,000 acre-feet (1,233,489,000 cubic meters) annually from the time the Davis dam and reservoir are placed in operation until January 1, 1980 and thereafter 1,125,000 acre-feet (1,387,675,000 cubic meters) annually, except that, should the main diversion structure referred to in subparagraph (a) of Article 12 of this Treaty be located entirely in Mexico and should Mexico so request, the United States shall deliver a quantity of water not exceeding 25,000 acre-feet (30,837,000 cubic meters) annually unless a larger quantity may be mutually agreed upon, at a point, to be likewise mutually agreed upon, on the international land boundary near San Luis, Sonora, in which event the quantities of 1,000,000 acre-feet (1,233,489,000 cubic meters) and 1,125,000 acre-feet (1,387,675,000 cubic meters) provided hereinabove as deliverable in the limitrophe section of the river shall be reduced by the quantities to be delivered in the year concerned near San Luis, Sonora.

(c) During the period from the time the Davis dam and reservoir are placed in operation until January 1, 1980, the United States shall also deliver to Mexico annually, of the water allotted to it, 500,000 acre-feet (616,745,000 cubic meters), and thereafter the United States shall deliver annually 375,000 acre-feet (462,558,000 cubic meters), at the international boundary line, by means of the All-American Canal and a canal connecting the lower end of the Pilot Knob Wasteway with the Alamo Canal or with any other

Mexican canal which may be substituted for the Alamo Canal. In either event the deliveries shall be made at an operating water surface elevation not higher than that of the Alamo Canal at the point where it crossed the international boundary line in the year 1943.

(d) All the deliveries of water specified above shall be made subject to the provisions of Article 15 of this Treaty.

ARTICLE 12

The two Governments agree to construct the following works:

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

(b) The United States, within a period of five years from the date of the entry into force of this Treaty, shall construct in its own territory and at its expense, and thereafter operate and maintain at its expense, the Davis storage dam and reservoir, a part of the capacity of which shall be used to make possible the regulation at the boundary of the

waters to be delivered to Mexico in accordance with the provisions of Article 15 of this Treaty.

(c) The United States shall construct or acquire in its own territory the works that may be necessary to convey a part of the waters of the Colorado River allotted to Mexico to the Mexican diversion points on the international land boundary line referred to in this Treaty. Among these works shall be included: the canal and other works necessary to convey water from the lower end of the Pilot Knob Wasteway to the international boundary, and, should Mexico request it, a canal to connect the main diversion structure referred to in subparagraph (a) of this Article, if this diversion structure should be built in the limitrophe section of the river, with the Mexican system of canals at a point to be agreed upon by the Commission on the international land boundary near San Luis, Sonora. Such works shall be constructed or acquired and operated and maintained by the United States Section at the expense of Mexico. Mexico shall also pay the costs of any sites or rights of way required for such works.

(d) The Commission shall construct, operate and maintain in the limitrophe section of the Colorado River, and each Section shall construct, operate and maintain in the territory of its own country on the Colorado River below Imperial Dam and on all other carrying facilities used for the delivery of water to Mexico, all necessary gaging stations and other measuring devices for the purpose of keeping a complete record of the waters delivered to Mexico and of the flows of the river. All data obtained as to such deliveries and flows shall be periodically compiled and exchanged between the two Sections.

ARTICLE 13

The Commission shall study, investigate and prepare plans for flood control on the Lower Colorado River between Imperial Dam and the Gulf of California, in both the United States and Mexico, and shall, in a Minute, report to the two Governments the works which should be built, the estimated cost thereof, and the part of the works to be con-

structed by each Government. The two Governments agree to construct, through their respective Sections of the Commission, such works as may be recommended by the Commission and approved by the two Governments, each Government to pay the costs of the works constructed by it. The Commission shall likewise recommend the parts of the works to be operated and maintained jointly by the Commission and the parts to be operated and maintained by each Section. The two Governments agree to pay in equal shares the cost of joint operation and maintenance, and each Government agrees to pay the cost of operation and maintenance of the works assigned to it for such purpose.

ARTICLE 14

In consideration of the use of the All-American Canal for the delivery to Mexico, in the manner provided in Articles 11 and 15 of this Treaty, of a part of its allotment of the waters of the Colorado River, Mexico shall pay to the United States:

(a) A proportion of the costs actually incurred in the construction of Imperial Dam and the Imperial Dam-Pilot Knob section of the All-American Canal, this proportion and the method and terms of repayment to be determined by the two Governments, which, for this purpose, shall take into consideration the proportionate uses of these facilities by the two countries, these determinations to be made as soon as Davis dam and reservoir are placed in operation.

(b) Annually, a proportionate part of the total costs of maintenance and operation of such facilities, these costs to be prorated between the two countries in proportion to the amount of water delivered annually through such facilities for use in each of the two countries.

In the event that revenues from the sale of hydroelectric power which may be generated at Pilot Knob become available for the amortization of part or all of the costs of the facilities named in subparagraph (a) of this Article, the part that Mexico should pay of the costs of said facilities shall be reduced or repaid in the same proportion as the balance of the total costs are reduced or repaid. It is

understood that any such revenue shall not become available until the cost of any works which may be constructed for the generation of hydroelectric power at said location has been fully amortized from the revenues derived therefrom.

ARTICLE 15

A. The water allotted in subparagraph (a) of Article 10 of this Treaty shall be delivered to Mexico at the points of delivery specified in Article 11, in accordance with the following two annual schedules of deliveries by months, which the Mexican Section shall formulate and present to the Commission before the beginning of each calendar year:

SCHEDULE I

Schedule I shall cover the delivery, in the limítrophe section of the Colorado River, of 1,000,000 acre-feet (1,233,489,000 cubic meters) of water each year from the date Davis dam and reservoir are placed in operation until January 1, 1980 and the delivery of 1,125,000 acre-feet (1,387,675,000 cubic meters) of water each year thereafter. This schedule shall be formulated subject to the following limitations:

With reference to the 1,000,000 acre-foot (1,233,489,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 600 cubic feet (17.0 cubic meters) nor more than 3,500 cubic feet (99.1 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 1,000 cubic feet (28.3 cubic meters) nor more than 3,500 cubic feet (99.1 cubic meters) per second.

With reference to the 1,125,000 acre-foot (1,387,675,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 675 cubic

feet (19.1 cubic meters) nor more than 4,000 cubic feet (113.3 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 1,125 cubic feet (31.9 cubic meters, nor more than 4,000 cubic feet (113.3 cubic meters) per second.

Should deliveries of water be made at a point on the land boundary near San Luis, Sonora, as provided for in Article 11, such deliveries shall be made under a sub-schedule to be formulated and furnished by the Mexican Section. The quantities and monthly rates of deliveries under such sub-schedule shall be in proportion to those specified for Schedule I, unless otherwise agreed upon by the Commission.

SCHEDULE II

Schedule II shall cover the delivery at the boundary line by means of the All-American Canal of 500,000 acre-feet (616,745,000 meters) of water each year from the date Davis dam and reservoir are placed in operation until January 1, 1980 and the delivery of 375,000 acre-feet (462,558,000 cubic meters) of water each year thereafter. This schedule shall be formulated subject to the following limitations:

With reference to the 500,000 acre-foot (616,745,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 300 cubic feet (8.5 cubic meters) nor more than 2,000 cubic feet (56.6 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 500 cubic feet (14.2 cubic meters) nor more than 2,000 cubic feet (56.6 cubic meters) per second.

With reference to the 375,000 acre-foot (462,558,000 cubic meter) quantity:

(a) During the months of January, February, October, November and December the prescribed rate of delivery shall be not less than 225 cubic feet (6.4 cubic meters) nor more than 1,500 cubic feet (42.5 cubic meters) per second.

(b) During the remaining months of the year the prescribed rate of delivery shall be not less than 375 cubic feet (10.6 cubic meters) nor more than 1,500 cubic feet (42.5 cubic meters) per second.

B. The United States shall be under no obligation to deliver, through the All-American Canal, more than 500,000 acre-feet (616,745,000 cubic meters) annually from the date Davis dam and reservoir are placed in operation until January 1, 1980 or more than 375,000 acre-feet (462,558,000 cubic meters) annually thereafter. If, by mutual agreement, any part of the quantities of water specified in this paragraph are delivered to Mexico at points on the land boundary otherwise than through the All-American Canal, the above quantities of water and the rates of deliveries set out under Schedule II of this Article shall be correspondingly diminished.

C. The United States shall have the option of delivering, at the point on the land boundary mentioned in subparagraph (c) of Article 11, any part or all of the water to be delivered at that point under Schedule II of this Article during the months of January, February, October, November and December of each year, from any source whatsoever, with the understanding that the total specified annual quantities to be delivered through the All-American Canal shall not be reduced because of the exercise of this option, unless such reduction be requested by the Mexican Section, provided that the exercise of this option shall not have the effect of increasing the total amount of scheduled water to be delivered to Mexico.

D. In any year in which there shall exist in the river water in excess of that necessary to satisfy the requirements in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) allotted to Mexico, the United States hereby declares its intention to cooperate with Mexico in attempting to supply additional quantities of water through the All-American Canal as such additional quantities are desired by Mexico, if such use of the Canal and facilities will not be detrimental to the United States, provided that the delivery of any additional quantities through the All-American Canal shall not have the effect of increasing the total scheduled deliveries to Mexico. Mexico hereby declares its intention to cooperate with the United States by attempting to curtail deliveries of water through the All-American Canal in years of limited supply, if such curtailment can be accomplished without detriment to Mexico and is necessary to allow full use of all available water supplies, provided that such curtailment shall not have the effect of reducing the total scheduled deliveries of water to Mexico.

E. In any year in which there shall exist in the river water in excess of that necessary to satisfy the requirements in the United States and the guaranteed quantity of 1,500,000 acre-feet (1,850,234,000 cubic meters) allotted to Mexico, the United States Section shall so inform the Mexican Section in order that the latter may schedule such surplus water to complete a quantity up to a maximum of 1,700,000 acre-feet (2,096,931,000 cubic meters). In this circumstance the total quantities to be delivered under Schedules I and II shall be increased in proportion to their respective total quantities and the two schedules thus increased shall be subject to the same limitations as those established for each under paragraph A of this Article.

F. Subject to the limitations as to rates of deliveries and total quantities set out in Schedules I and II, Mexico shall have the right, upon thirty days notice in advance to the United States Section, to increase or decrease each monthly quantity prescribed by those schedules by not more than 20% of the monthly quantity.

G. The total quantity of water to be delivered under Schedule I of paragraph A of this Article may be increased in any year if the amount to be delivered under Schedule II is correspondingly reduced and if the limitations as to rates of delivery under each schedule are correspondingly increased and reduced.

IV—TIJUANA RIVER

ARTICLE 16

In order to improve existing uses and to assure any feasible further development, the Commission shall study and investigate, and shall submit to the two Governments for their approval:

(1) Recommendations for the equitable distribution between the two countries of the waters of the Tijuana River system;

(2) Plans for storage and flood control to promote and develop domestic, irrigation, and other feasible uses of the waters of this system;

(3) An estimate of the cost of the proposed works and the manner in which the construction of such works or the cost thereof should be divided between the two Governments;

(4) Recommendations regarding the parts of the works to be operated and maintained by the Commission and the parts to be operated and maintained by each Section.

The two Governments through their respective Sections of the Commission shall construct such of the proposed works as are approved by both Governments, shall divide the work to be done or the cost thereof, and shall distribute between the two countries the waters of the Tijuana River system in the proportions approved by the two Governments. The two Governments agree to pay in equal shares the costs of joint operation and maintenance of the works involved, and each Government agrees to pay the cost of operation and maintenance of the works assigned to it for such purpose.

V—GENERAL PROVISIONS

ARTICLE 17

The use of the channels of the international rivers for the discharge of flood or other excess waters shall be free and not subject to limitation by either country, and neither country shall have any claim against the other in respect of any damage caused by such use. Each Government agrees to furnish the other Government, as far in advance as practicable, any information it may have in regard to such extraordinary discharges of water from reservoirs and flood flows on its own territory as may produce floods on the territory of the other.

Each Government declares its intention to operate its storage dams in such manner, consistent with the normal operations of its hydraulic systems, as to avoid, as far as feasible, material damage in the territory of the other.

ARTICLE 18

Public use of the water surface of lakes formed by international dams shall, when not harmful to the services rendered by such dams, be free and common to both countries, subject to the police regulations of each country in its territory, to such general regulations as may appropriately be prescribed and enforced by the Commission with the approval of the two Governments for the purpose of the application of the provisions of this Treaty, and to such regulations as may appropriately be prescribed and enforced for the same purpose by each Section of the Commission with respect to the areas and borders of such parts of those lakes as lie within its territory. Neither Government shall use for military purposes such water surface situated within the territory of the other country except by express agreement between the two Governments.

ARTICLE 19

The two Governments shall conclude such special agreements as may be necessary to regulate the generation, development and disposition of electric power at interna-

tional plants, including the necessary provisions for the export of electric current.

ARTICLE 20

The two Governments shall, through their respective Sections of the Commission, carry out the construction of works allotted to them. For this purpose the respective Sections of the Commission may make use of any competent public or private agencies in accordance with the laws of the respective countries. With respect to such works as either Section of the Commission may have to execute on the territory of the other, it shall, in the execution of such works, observe the laws of the place where such works are located or carried out, with the exceptions hereinafter stated.

All materials, implements, equipment and repair parts intended for the construction, operation and maintenance of such works shall be exempt from import and export customs duties. The whole of the personnel employed either directly or indirectly on the construction, operation or maintenance of the works may pass freely from one country to the other for the purpose of going to and from the place of location of the works, without any immigration restrictions, passports or labor requirements. Each Government shall furnish, through its own Section of the Commission, convenient means of identification to the personnel employed by it on the aforesaid works and verification certificates covering all materials, implements, equipment and repair parts intended for the works.

Each Government shall assume responsibility for and shall adjust exclusively in accordance with its own laws all claims arising within its territory in connection with the construction, operation or maintenance of the whole or of any part of the works herein agreed upon, or of any works which may, in the execution of this Treaty, be agreed upon in the future.

ARTICLE 21

The construction of the international dams and the formation of artificial lakes shall produce no change in the

fluvial international boundary, which shall continue to be governed by existing treaties and conventions in force between the two countries.

The Commission shall, with the approval of the two Governments, establish in the artificial lakes, by buoys or by other suitable markers, a practicable and convenient line to provide for the exercise of the jurisdiction and control vested by this Treaty in the Commission and its respective Sections. Such line shall also mark the boundary for the application of the customs and police regulations of each country.

ARTICLE 22

The provisions of the Convention between the United States and Mexico for the rectification of the Rio Grande (Rio Bravo) in the El Paso-Juarez Valley signed on February 1, 1933, shall govern, so far as delimitation of the boundary, distribution of jurisdiction and sovereignty, and relations with private owners are concerned, in any places where works for the artificial channeling, canalization or rectification of the Rio Grande (Rio Bravo) and the Colorado River are carried out.

ARTICLE 23

The two Governments recognize the public interest attached to the works required for the execution and performance of this Treaty and agree to acquire, in accordance with their respective domestic laws, any private property that may be required for the construction of the said works, including the main structures and their appurtenances and the construction materials therefor, and for the operation and maintenance thereof, at the cost of the country within which the property is situated, except as may be otherwise specifically provided in this Treaty.

Each Section of the Commission shall determine the extent and location of any private property to be acquired within its own country and shall make the necessary requests upon its Government for the acquisition of such property.

The Commission shall determine the cases in which it shall become necessary to locate works for the conveyance of water or electrical energy and for the servicing of any such works, for the benefit of either of the two countries, in the territory of the other country, in order that such works can be built pursuant to agreement between the two Governments. Such works shall be subject to the jurisdiction and supervision of the Section of the Commission within whose country they are located.

Construction of the works built in pursuance of the provisions of this Treaty shall not confer upon either of the two countries any rights either of property or of jurisdiction over any part whatsoever of the territory of the other. These works shall be part of the territory and be the property of the country wherein they are situated. However, in the case of any incidents occurring on works constructed across the limitrophe part of a river and with supports on both banks, the jurisdiction of each country shall be limited by the center line of such works, which shall be marked by the Commission, without thereby changing the international boundary.

Each Government shall retain, through its own Section of the Commission and within the limits and to the extent necessary to effecuate the provisions of this Treaty, direct ownership, control and jurisdiction within its own territory and in accordance with its own laws, over all real property—including that within the channel of any river—rights of way and rights *in rem*, that it may be necessary to enter upon and occupy for the construction, operation or maintenance of all the works constructed, acquired or used pursuant to this Treaty. Furthermore, each Government shall similarly acquire and retain in its own possession the titles, control and jurisdiction over such works.

ARTICLE 24

The International Boundary and Water Commission shall have, in addition to the powers and duties otherwise specifically provided in this Treaty, the following powers and duties:

(a) To initiate and carry on investigations and develop plans for the works which are to be constructed or established in accordance with the provisions of this and other treaties or agreements in force between the two Governments dealing with boundaries and international waters; to determine, as to such works, their location, size, kind and characteristic specifications; to estimate the cost of such works; and to recommend the division of such costs between the two Governments, the arrangements for the furnishing of the necessary funds, and the dates for the beginning of the works, to the extent that the matters mentioned in this subparagraph are not otherwise covered by specific provisions of this or any other Treaty.

(b) To construct the works agreed upon or to supervise their construction and to operate and maintain such works or to supervise their operation and maintenance, in accordance with the respective domestic laws of each country. Each Section shall have, to the extent necessary to give effect to the provisions of this Treaty, jurisdiction over the works constructed exclusively in the territory of its country whenever such works shall be connected with or shall directly affect the execution of the provisions of this Treaty.

(c) In general to exercise and discharge the specific powers and duties entrusted to the Commission by this and other treaties and agreements in force between the two countries, and to carry into execution and prevent the violation of the provisions of those treaties and agreements. The authorities of each country shall aid and support the exercise and discharge of these powers and duties, and each Commissioner shall invoke when necessary the jurisdiction of the courts or other appropriate agencies of his country to aid in the execution and enforcement of these powers and duties.

(d) To settle all differences that may arise between the two Governments with respect to the interpretation or application of this Treaty, subject to the approval of the two Governments. In any case in which the Commissioners do not reach an agreement, they shall so inform their re-

spective governments reporting their respective opinions and the grounds therefor and the points upon which they differ, for discussion and adjustment of the difference through diplomatic channels and for application where proper of the general or special agreements which the two Governments have concluded for the settlement of controversies.

(e) To furnish the information requested of the Commissioners jointly by the two Governments on matters within their jurisdiction. In the event that the request is made by one Government alone, the Commissioner of the other Government must have the express authorization of his Government in order to comply with such request.

(f) The Commission shall construct, operate and maintain upon the limitrophe parts of the international streams, and each Section shall severally construct, operate and maintain upon the parts of the international streams and their tributaries within the boundaries of its own country, such stream gaging stations as may be needed to provide the hydrographic data necessary or convenient for the proper functioning of this Treaty. The data so obtained shall be compiled and periodically exchanged between the two Sections.

(g) The Commission shall submit annually a joint report to the two Governments on the matters in its charge. The Commission shall also submit to the two Governments joint reports on general or any particular matters at such other times as it may deem necessary or as may be requested by the two Governments.

ARTICLE 25

Except as otherwise specifically provided in this Treaty, Articles III and VII of the Convention of March 1, 1889 shall govern the proceedings of the Commission in carrying out the provisions of this Treaty. Supplementary thereto the Commission shall establish a body of rules and regulations to govern its procedure, consistent with the provisions of this Treaty and of Articles III and VII of

the Convention of March 1, 1889 and subject to the approval of both Governments.

Decisions of the Commission shall be recorded in the form of Minutes done in duplicate in the English and Spanish languages, signed by each Commissioner and attested by the Secretaries, and copies thereof forwarded to each Government within three days after being signed. Except where the specific approval of the two Governments is required by any provision of this Treaty, if one of the Governments fails to communicate to the Commission its approval or disapproval of a decision of the Commission within thirty days reckoned from the date of the Minute in which it shall have been pronounced, the Minute in question and the decisions which it contains shall be considered to be approved by that Government. The Commissioners, within the limits of their respective jurisdictions, shall execute the decisions of the Commission that are approved by both Governments.

If either Government disapproves a decision of the Commission the two Governments shall take cognizance of the matter, and if an agreement regarding such matter is reached between the two Governments, the agreement shall be communicated to the Commissioners, who shall take such further proceedings as may be necessary to carry out such agreement.

VI—TRANSITORY PROVISIONS

ARTICLE 26

During a period of eight years from the date of the entry into force of this Treaty, or until the beginning of operation of the lowest major international reservoir on the Rio Grande (Rio Bravo), should it be placed in operation prior to the expiration of said period, Mexico will cooperate with the United States to relieve, in times of drought, any lack of water needed to irrigate the lands now under irrigation in the Lower Rio Grande Valley in the United States, and for this purpose Mexico will release water from El Azucar reservoir on the San Juan River

and allow that water to run through its system of canals back into the San Juan River in order that the United States may divert such water from the Rio Grande (Rio Bravo). Such releases shall be made on condition that they do not affect the Mexican irrigation system, provided that Mexico shall, in any event, except in cases of extraordinary drought or serious accident to its hydraulic works, release and make available to the United States for its use the quantities requested, under the following conditions: that during the said eight years there shall be made available a total of 160,000 acre-feet (197,358,000 cubic meters) and up to 40,000 acre-feet (49,340,000 cubic meters) in any one year; that the water shall be made available as requested at rates not exceeding 750 cubic feet (21.2 cubic meters) per second; that when the rates of flow requested and made available have been more than 500 cubic feet (14.2 cubic meters) per second the period of release shall not extend beyond fifteen consecutive days; and that at least thirty days must elapse between any two periods of release during which rates of flow in excess of 500 cubic feet (14.2 cubic meters) per second have been requested and made available. In addition to the guaranteed flow, Mexico shall release from El Azucar reservoir and conduct through its canal system and the San Juan River, for use in the United States during periods of drought and after satisfying the needs of Mexican users, any excess water that does not in the opinion of the Mexican Section have to be stored and that may be needed for the irrigation of lands which were under irrigation during the year 1943 in the Lower Rio Grande Valley in the United States.

ARTICLE 27

The provisions of Article 10, 11, and 15 of this Treaty shall not be applied during a period of five years from the date of the entry into force of this Treaty, or until the Davis dam and the major Mexican diversion structure on the Colorado River are placed in operation, should these works be placed in operation prior to the expiration of said period. In the meantime Mexico may construct and operate

at its expense a temporary diversion structure in the bed of the Colorado River in territory of the United States for the purpose of diverting water into the Alamo Canal, provided that the plans for such structure and the construction and operation thereof shall be subject to the approval of the United States Section. During this period of time the United States will make available in the river at such diversion structure river flow not currently required in the United States, and the United States will cooperate with Mexico to the end that the latter may satisfy its irrigation requirements within the limits of those requirements for lands irrigated in Mexico from the Colorado River during the year 1943.

VII—FINAL PROVISIONS

ARTICLE 28

This Treaty shall be ratified and the ratifications thereof shall be exchanged in Washington. It shall enter into force on the day of the exchange of ratifications and shall continue in force until terminated by another Treaty concluded for that purpose between the two Governments.

In witness whereof the respective Plenipotentiaries have signed this Treaty and have hereunto affixed their seals.

Done in duplicate in the English and Spanish languages, in Washington on this third day of February, 1944.

PROTOCOL

(Protocol, signed November 14, 1944, supplementary to treaty between United States and Mexico relating to waters of the Colorado and Tijuana Rivers and of the Rio Grande signed February 3, 1944.)

The Government of the United States of America and the Government of the United Mexican States agree and understand that:

Wherever, by virtue of the provisions of the Treaty between the United States of America and the United Mexican States, signed in Washington on February 3, 1944, relating to the utilization of the waters of the Colorado and Tijuana Rivers and of the Rio Grande from Fort Quitman, Texas, to the Gulf of Mexico, specific functions are imposed on, or exclusive jurisdiction is vested in, either of the Sections of the International Boundary and Water Commission, which involve the construction or use of works for storage or conveyance of water, flood control, stream gauging, or for any other purpose, which are situated wholly within the territory of the country of that Section, and which are to be used only partly for the performance of treaty provisions, such jurisdiction shall be exercised, and such functions, including the construction, operation and maintenance of the said works, shall be performed and carried out by the Federal agencies of that country which now or hereafter may be authorized by domestic law to construct, or to operate and maintain, such works. Such functions or jurisdictions shall be exercised in conformity with the provisions of the Treaty and in cooperation with the respective Section of the Commission, to the end that all international obligations and functions may be coordinated and fulfilled.

The works to be constructed or used on or along the boundary, and those to be constructed or used exclusively for the discharge of treaty stipulations, shall be under the jurisdiction of the Commission or of the respective Section, in accordance with the provisions of the Treaty. In carrying out the construction of such works the Sections

of the Commission may utilize the services of public or private organizations in accordance with the laws of their respective countries.

This Protocol, which shall be regarded as an integral part of the aforementioned Treaty signed in Washington on February 3, 1944, shall be ratified and the ratifications thereof shall be exchanged in Washington. This Protocol shall be effective beginning with the day of the entry into force of the Treaty and shall continue effective so long as the Treaty remains in force.

In witness whereof the respective Plenipotentiaries have signed this Protocol and have hereunto affixed their seals.

Done in duplicate, in English and Spanish languages, in Washington, this fourteenth day of November, 1944.

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